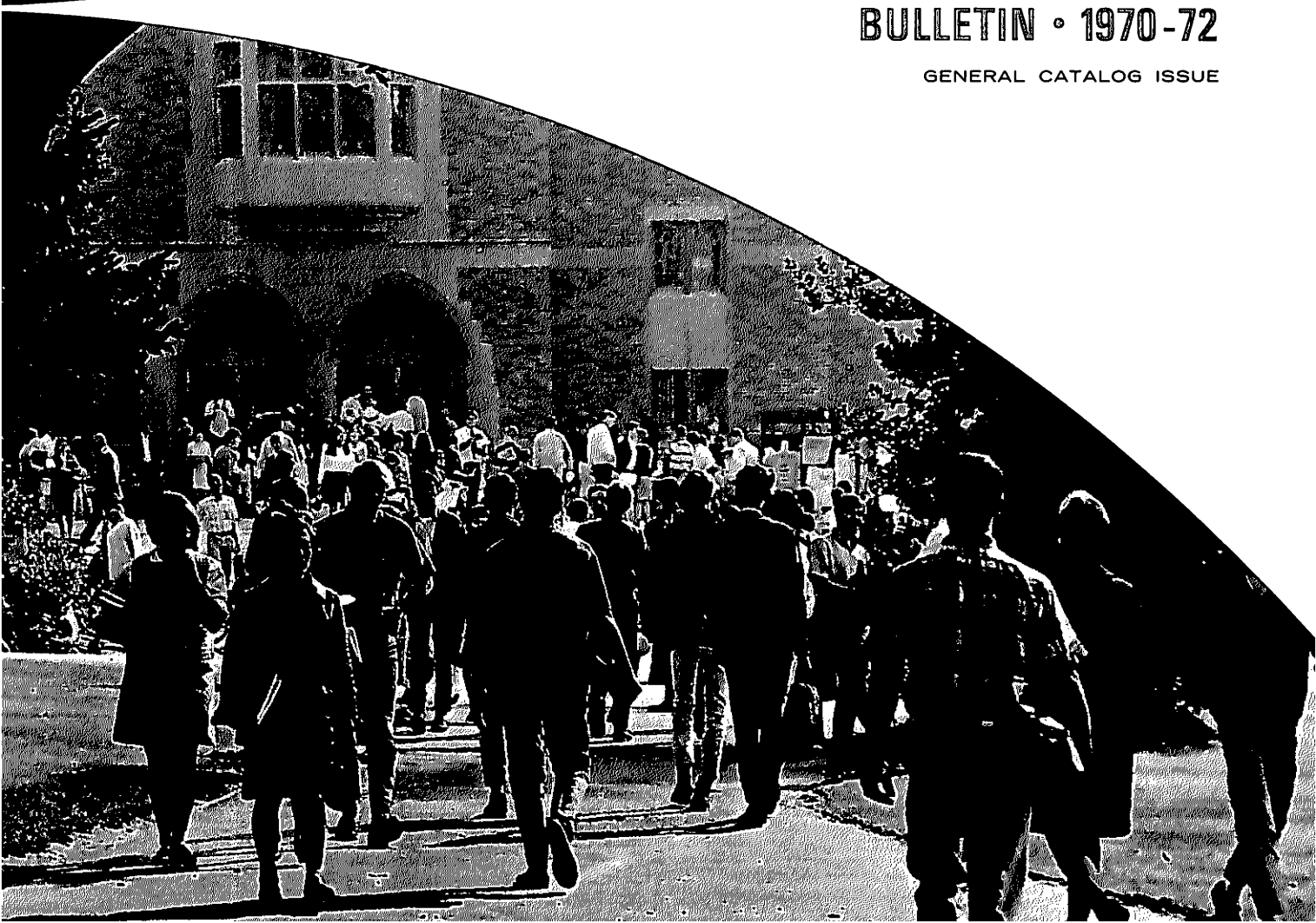




UNIVERSITY OF WASHINGTON
BULLETIN • 1970-72

GENERAL CATALOG ISSUE



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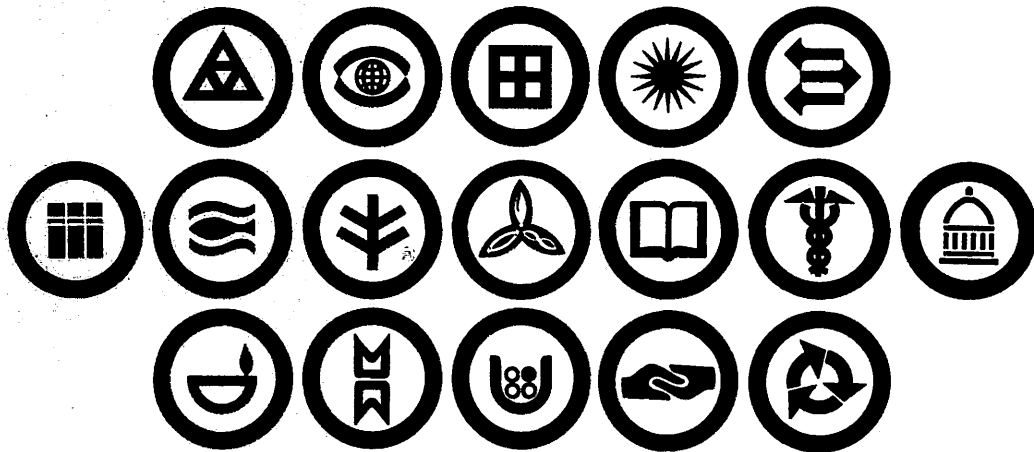
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UNIVERSITY OF WASHINGTON



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ACADEMIC CALENDAR 1970-71

Dates in this calendar are subject to change without notice; those appearing in admission and registration instructions take precedence over those in this catalog.

SPRING QUARTER, 1970

Advance registration for matriculated students enrolled Winter Quarter 1970	February 2-20
Application deadline for new and former students	March 1*
In-person registration for new and former students	March 19-26
Classes begin	March 30
Memorial Day holiday	May 30
Final examinations	June 8-12
Commencement	June 13

SUMMER QUARTER, 1970

Advance registration for matriculated students enrolled Spring Quarter 1970	April 20-24
Application deadline for new and former matriculated students	April 29*
Application deadline for nonmatriculated students	May 25*
In-person registration for new and former students	June 11-18
First-term classes begin	June 22
Independence Day holiday	July 4
First-term final examinations	July 22
Second-term classes begin	July 23
Second-term final examinations	August 21

AUTUMN QUARTER, 1970

Advance registration for matriculated students enrolled Spring Quarter 1970	May 18-June 4
Application deadline for new students	July 1*
Application deadline for former students	July 1*
In-person registration for new and former students	August 31-September 24
Classes begin	September 28
State Admission Day holiday	November 11
Thanksgiving recess	November 26 and 27
Final examinations	December 10-17

WINTER QUARTER, 1971

Advance registration for matriculated students enrolled Autumn Quarter 1970	November 2-20
Application deadline for new and former students	November 1*
In-person registration for new and former students	December 21-30
Classes begin	January 4
Washington's Birthday holiday	February 15
Final examinations	March 15-19

* Should University enrollment quotas be filled, it will not be possible to consider you for enrollment even though your application has been received prior to application filing dates. Enrollment may be possible for a subsequent quarter.

1971-1972

Dates in this calendar are subject to change without notice; those appearing in admission and registration instructions take precedence over those in this catalog.

SPRING QUARTER, 1971

Advance registration for matriculated students enrolled Winter Quarter 1971	February 1-19
Application deadline for new and former students	February 1*
In-person registration for new and former students	March 18-25
Classes begin	March 29
Memorial Day holiday	May 31
Final examinations	June 7-11
Commencement	June 12

SUMMER QUARTER, 1971

Advance registration for matriculated students enrolled Spring Quarter 1971	April 19-23
Application deadline for new and former matriculated students	May 1*
Application deadline for nonmatriculated students	May 15*
In-person registration for new and former students	June 10-17
First-term classes begin	June 21
Independence Day holiday	July 5
First-term final examinations	July 21
Second-term classes begin	July 22
Second-term final examinations	August 20

AUTUMN QUARTER, 1971


Advance registration for matriculated students enrolled Spring Quarter 1971	May 17-June 3
Application deadline for new students	June 1*
Application deadline for former students	June 1*
In-person registration for new and former students	August 30-September 23
Classes begin	September 27
State Admission Day holiday	November 11
Thanksgiving recess	November 25 and 26
Final examinations	December 9-16

WINTER QUARTER, 1972

Advance registration for matriculated students enrolled Autumn Quarter 1971	November 1-19
Application deadline for new and former students	November 1*
In-person registration for new and former students	December 22-30
Classes begin	January 3
Washington's Birthday holiday	February 21
Final examinations	March 13-17

* Should University enrollment quotas be filled, it will not be possible to consider you for enrollment even though your application has been received prior to application filing dates. Enrollment may be possible for a subsequent quarter.

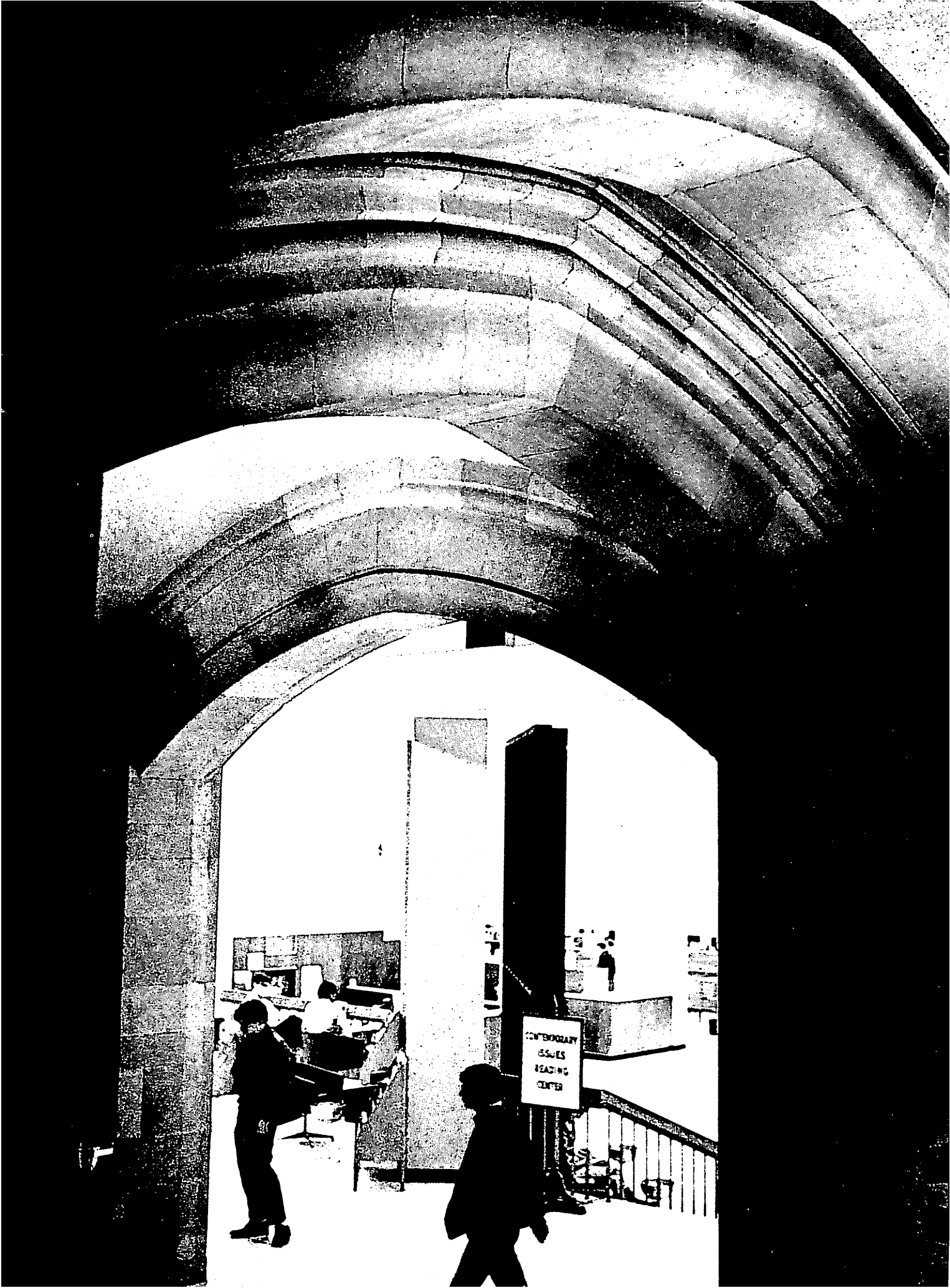




*It is the primary task of a great university
to attract and to cultivate the intellectual powers of
students who will be competent to engage successfully
in the strenuous race for ideas which marks especially
our time and upon which order, freedom,
human welfare, and peace depend.*

*The capacity to work with ideas, to use abstractions,
to find a degree of order in chaos, to reason
around corners and over difficulties, must be found,
stimulated, and above all, disciplined.*

Charles E. Odegard
President





GENERAL INFORMATION

The University of Washington was founded in 1861 on a ten-acre knoll in what is now downtown Seattle, and was moved in 1895 to its present 660-acre site on the shores of Lake Washington. Now offering instruction in more than two hundred academic disciplines, the "University of a Thousand Years" has entered its second century of service.

The University of Washington's enrollment for Autumn Quarter 1970 is expected to reach 33,000.

Enrollment for Autumn Quarter 1968 was 31,913. Of this number, 24,812 were undergraduates; the remainder were in professional and graduate programs. More than three-fourths of the undergraduates enter as freshmen from Washington high schools or as transfer students from Washington community colleges or other colleges and universities in the state. These students come from every county in Washington and represent the smallest as well as the largest communities. The remaining students enter from high schools, colleges, and universities from every state and territory of the United States and from foreign countries. During the year 1968-69, 1,232 noncitizens from approximately ninety countries have enrolled, ranking the University eleventh in the nation in size of foreign student population. The largest groups at the University are the Freshman Class, which had an Autumn 1968 enrollment of 6,554, and the professional schools and Graduate School, which together enrolled 7,101 students.

The majority of students who enter the University as freshmen are from the top one-third to one-fifth of their high school graduating class. The grade-point average for the Freshman Class entering in Autumn Quarter 1968 was 3.17.

In the belief that a state university should be just in meeting the educational needs of the young people of all racial groups within the state, special efforts are being made to encourage the application of minority students who are judged to show a reasonable likelihood of success.

Women comprised 39.6 per cent of the student population in Autumn Quarter 1968. Married students numbered 4,201 in the undergraduate program and 3,396 in graduate study.

The Faculty

The faculty of the University includes the president, vice presidents, provost, vice provosts, deans, professors, associate professors, assistant professors, instructors, research associates, and lecturers.

The University attracts faculty members from colleges and universities throughout the world. A survey for the years 1967-69 indicated that 45 per cent of new faculty members, ranking as assistant professors or above, came from the midwest and the eastern seaboard of the United States; 21 per cent, from California; 11 per cent, from the state of Washington; 14 per cent, from other areas of the United States; and 9 per

cent, from foreign universities. In 1968, the full-time academic staff of the University numbered approximately two thousand.

Accreditation

The University of Washington is accredited by the Northwest Association of Secondary and Higher Schools and is a member of the Association of American Universities. Individual schools and colleges are members of the various accrediting associations in their respective fields.

PROGRAMS OF STUDY

At the undergraduate level, the freshman or transfer student generally enrolls in the college that offers his chosen major. If he has not selected a major, he may enroll in the College of Arts and Sciences as a pre-major. Undergraduates preparing for professional study in fields such as architecture, business administration, dental hygiene, dentistry, medical technology, medicine, occupational therapy, physical therapy, and urban planning may complete preliminary work in the preprofessional programs offered within the College of Arts and Sciences. The baccalaureate degree is required for admission to the Graduate School and the School of Law.

The programs of study in a variety of fields not only train students for the professions and occupations but also prepare them to contribute to the culture and progress of society. The colleges and schools and the principal fields of study at the University of Washington are listed here. Most colleges, schools, and departments offer both graduate and undergraduate courses.

College of Architecture and Urban Planning

Architecture
Building Construction
Landscape Architecture
Urban Planning

College of Arts and Sciences

*African Studies
*Afro-American Studies
*American Studies
Anthropology
Art
Asian Languages and Literature
Asian Studies
†Astronomy
Atmospheric Sciences
Biology
Botany

Chemistry
Classics
Communications
Comparative Literature
*Dance
Drama
Economics
English
Far Eastern and Russian Institute
General Studies
†Genetics
Geography
Geological Sciences
Germanic Languages and Literature
History
Home Economics
Latin American Studies
†Linguistics
Mathematics
Microbiology
Music
Near Eastern Languages and Literature
*Near Eastern Studies
Oceanography
Philosophy
Physical and Health Education
Physics
Political Science
*Premajor and Preprofessional Programs
Preventive Medicine
Psychology
Romance Languages and Literature
Russian and East European Studies
Scandinavian Languages and Literature
Slavic Languages and Literature
Social Welfare
Sociology
Speech
Zoology

School and Graduate School of Business Administration

Accounting
Administrative Theory and Organizational Behavior
*Business Economics
Business, Government, and Society
Business Policy
Finance
International Business
Marketing
Operations Management
Personnel and Industrial Relations
Quantitative Methods
Risk and Insurance



Transportation
Urban Development

School of Dentistry

Community Dentistry
Continuing Dental Education
Dental Hygiene
Dentistry
Endodontics
Fixed Partial Dentures
Graduate Dental Education
Operative Dentistry
Oral Biology
Oral Diagnosis and Treatment Planning
Oral Surgery
Orthodontics
Pedodontics
Periodontics
Prosthodontics

College of Education

Educational Administration
Educational Curriculum and Instruction
Educational History, Philosophy, and Sociology
Educational Psychology
Higher Education
Independent Study, Research, and Student Teaching
Special Education

College of Engineering

Aeronautics and Astronautics
Bioengineering
Chemical Engineering
Civil Engineering
Electrical Engineering
*General Engineering
*Humanistic-Social Studies
Industrial Engineering
Mechanical Engineering
Mining, Metallurgical, and Ceramic Engineering
†Nuclear Engineering

College of Fisheries

Fishery Biology
Food Science
Quantitative Science
Wildlife Science

College of Forest Resources

Forest Engineering
Forest Management
Forest Sciences
Outdoor Recreation
Pulp and Paper Technology
Quantitative Science

Wildlife Science
Wood and Fiber Sciences
Wood Technology

School of Medicine

Anesthesiology
Human Biology
Biochemistry
Bioengineering
Biological Structure
Biomedical History
Experimental Animal Medicine
Medical Practice
Medical Technology
Medicine
Microbiology
Neurological Surgery
Obstetrics and Gynecology
Occupational Therapy
Ophthalmology
Orthopedics
Otolaryngology
Pathology
Pediatrics
Pharmacology
Physical Medicine and Rehabilitation
Physical Therapy
Physiology and Biophysics
Preventive Medicine
Prosthetics and Orthotics
Psychiatry
Radiology
Surgery
Urology

School of Nursing

College of Pharmacy

Pharmaceutical Chemistry
Pharmacognosy
Pharmacy and Pharmacy Administration

***Reserve Officers Training Corps**

Aerospace Studies
Military Science
Naval Science

†Graduate School of Public Affairs

Public Administration
Public Policy

School of Law

*Elective or area programs not leading to degrees, or for which baccalaureate degrees have not been authorized as of July 10, 1969.

†Graduate degrees only. Certain courses open to undergraduates.

‡Indicates doctoral program.

†School of Librarianship

†School of Social Work

Graduate School

Advanced degree subject matter fields in the Graduate School include the following:

†Aeronautics and Astronautics

†Anthropology

Architecture

Art

†Art History

†Asian Languages and Literature

Asian Studies

†Astronomy

†Atmospheric Sciences

†Biochemistry

†Biological Structure

Biology

†Biomathematics

Biomedical History

†Botany

†Business Administration

†Chemical Engineering

†Chemistry

†Civil Engineering

†Classics

†Communications

†Comparative Literature

†Comparative Physiology

†Computer Science

Dentistry

Drama

†Drama Arts

†Economics

†Education

†Electrical Engineering

†English

†Fisheries

†Forest Resources

†Genetics

†Geography

†Geological Sciences

†Geophysics

†Germanic Languages and Literature

†History

Home Economics

†Law

Librarianship

†Linguistics

†Mathematics

†Mechanical Engineering

†Microbiology

†Mining, Metallurgical, and Ceramic Engineering

†Music

Near Eastern Studies

†Nuclear Engineering

Nursing

†Oceanography

†Pathology

†Pharmacology

†Pharmacy

†Philosophy

Physical and Health Education

Physical Medicine and Rehabilitation

†Physics

†Physiology and Biophysics

†Physiology Psychology

†Political Science

†Preventive Medicine

†Psychology

Public Affairs

Radiological Sciences

†Romance Languages and Literature

Russian and East European Studies

†Scandinavian Languages and Literature

†Slavic Languages and Literature

Social Work

†Sociology

†Speech

Surgery

†Urban Planning

†Zoology

DEGREES

The University of Washington grants the following degrees upon satisfactory completion of appropriate programs of study in the departments, schools, and colleges:

Undergraduate Degrees

Bachelor of Arts	B.A.
Bachelor of Arts in Business Administration	B.A.B.A.
Bachelor of Arts in Environmental Design	B.A.E.D.
Bachelor of Arts in Urban Planning	B.A.Urb.Plan.
Bachelor of Fine Arts	B.F.A.
Bachelor of Landscape Architecture	B.L.Arch.
Bachelor of Music	B.Mus.
Bachelor of Science	B.S.
Bachelor of Science in Aeronautics and Astronautics	B.S.A.&A.
Bachelor of Science in Building Construction	B.S.B.C.
Bachelor of Science in Ceramic Engineering	B.S.Cer.E.
Bachelor of Science in Chemical Engineering	B.S.Ch.E.
Bachelor of Science in Civil Engineering	B.S.C.E.
Bachelor of Science in Electrical Engineering	B.S.E.E.



Bachelor of Science in Fisheries	B.S.Fish.
Bachelor of Science in Forest Resources	B.S.For.
Bachelor of Science in Industrial Engineering	B.S.I.E.
Bachelor of Science in Mechanical Engineering	B.S.M.E.
Bachelor of Science in Medical Technology	B.S.Med.Tech.
Bachelor of Science in Metallurgical Engineering	B.S.Met.E.
Bachelor of Science in Mining Engineering	B.S.Min.E.
Bachelor of Science in Nursing	B.S.Nurs.
Bachelor of Science in Occupational Therapy	B.S.Occ.Thery
Bachelor of Science in Pharmacy	B.S.Pharm.
Bachelor of Science in Physical Therapy	B.S.Phys.Thery
Bachelor of Science in Prosthetics and Orthotics	B.S. in P.&O.

Graduate Degrees

Master of Arts	M.A.
Master of Arts for Teachers	M.A.T.
Master of Arts in Home Economics	M.A.H.Ec.
Master of Science	M.S.
Master of Science in Aeronautics and Astronautics	M.S.A.&A.
Master of Science in Ceramic Engineering	M.S.Cer.E.
Master of Science in Ceramics	M.S.Cer.
Master of Science in Chemical Engineering	M.S.Ch.E.
Master of Science in Civil Engineering	M.S.C.E.
Master of Science in Dentistry	M.S.Den.
Master of Science in Electrical Engineering	M.S.E.E.
Master of Science in Engineering	M.S.E.
Master of Science in Forest Resources	M.S.F.R.
Master of Science in Home Economics	M.S.H.Ec.
Master of Science in Mathematical Statistics	M.S.Math.Stat.
Master of Science in Mechanical Engineering	M.S.M.E.
Master of Science in Metallurgical Engineering	M.S.Met.E.
Master of Science in Metallurgy	M.S.Met.
Master of Science in Mining Engineering	M.S.Min.E.
Master of Science in Physical Education	M.S.Phys.Ed.
Master of Science in Preventive Medicine	M.S.Prev.Med.
Master of Science in Radiological Sciences	M.S.Rad.Sci.
Master of Aeronautics and Astronautics	M.A.&A.
Master of Architecture	M.Arch.
Master of Business Administration	M.B.A.
Master of Communications	M.Comm.
Master of Comparative Law	M.C.L.
Master of Education	M.Ed.
Master of Electrical Engineering	M.E.E.

Master of Fine Arts	M.F.A.
Master of Forest Resources	M.F.R.
Master of Laws	L.L.M.
Master of Law Librarianship	M.Law Libr.
Master of Librarianship	M.Lib.
Master of Music	M.Mus.
Master of Nursing	M.N.
Master of Occupational Therapy	M.Occup.Thery
Master of Public Administration	M.P.A.
Master of Social Work	M.S.W.
Master of Speech Pathology and Audiology	M.Sp.Path.&Aud.
Master of Urban Planning	M.UrbanPlan.
Doctor of Business Administration	D.B.A.
Doctor of Education	Ed.D.
Doctor of Musical Arts	D.Mus.Arts
Doctor of Philosophy	Ph.D.

Dental, Law, and Medical Degrees

Doctor of Dental Surgery	D.D.S.
Doctor of Medicine	M.D.
Juris Doctor	J.D.

Undergraduate programs and degree requirements are described in the *Undergraduate Education* section.

Graduate degree requirements are described in the section on *Graduate Study*. For detailed information about the programs of study and requirements in the colleges, schools, and departments, see the sections describing each.

Sessions

University instruction is offered during three quarters of approximately eleven weeks each during the Autumn, Winter, and Spring Quarters, and for nine weeks during the Summer Quarter. Autumn Quarter begins in September and ends before the Christmas holidays; Winter Quarter continues from early January until the third week in March; and Spring Quarter extends from late March until the middle of June.

Summer Quarter

The opportunities for study during Summer Quarter are comparable to those of the regular school year, except that the number of courses offered is not as large. A wide selection of courses in most major fields is available to graduate and undergraduate students pursuing degree programs on a year-around basis, as well as to teachers and other summer-only students seeking to broaden, intensify, or refresh their subject matter competence. Freshman students entering from

*Elective or area programs not leading to degrees, or for which baccalaureate degrees have not been authorized as of July 10, 1969.

†Graduate degrees only. Certain courses open to undergraduates.

‡Indicates doctoral program.

high school are encouraged to begin their college work in the summer. Through the University Office of New-Student Services, enrollment in summer courses may be arranged under certain circumstances for specially qualified students who have not yet completed high school.

Admission requirements for Summer Quarter are the same as for any other quarter, and credits earned by students with regular matriculated standing are evaluated as residence credits. The Summer Quarter fees closely parallel those of a regular quarter; there is no additional fee for nonresidents during the summer.

Admitted students may register for either day or evening credit courses, or for a combination of day and evening credit courses on the basis of a single fee schedule. Fees are charged in accordance with the number of credits for which the student is registered. A complete listing of both graduate and undergraduate courses available during Summer Quarter is published in the *Summer Quarter Bulletin*. The schedule includes the time of day or evening during which the courses are offered.

For further information concerning the summer program, write for the *Summer Quarter Bulletin*, or address inquiries to the Summer Quarter Office, 303 Lewis Hall, University of Washington, Seattle 98105.

Continuing Education

For information concerning correspondence study, evening classes, and other programs in Continuing Education, see the *Continuing Education* section.

THE CAMPUS

The University of Washington's campus—660 acres of trees, landscape, and buildings—is located on the shores of Lake Washington and has long been considered one of the most attractive in the nation. Many different species of trees, shrubs, and flowers add beauty to the campus. There are more than fifty-five permanent buildings, including a modern, fully equipped 320-bed teaching hospital which forms a portion of the Health Sciences complex located at the southern end of the campus.

The major buildings in which the academic activities are centered form the central portion of the campus; student housing facilities are distributed around the periphery. The extensive athletic plant, playing fields, and recreational areas are situated on the campus as are the botanical and drug-plant gardens and a 200-acre arboretum which contains thousands of varieties of trees, plants, and shrubs from all over the world.

University Libraries

The University of Washington has been fortunate in amassing a fine collection of library materials essential to high quality education. The University Library system, consisting of the Suzzallo Library and 19 branch libraries, contains over 1,700,000 volumes; 250,000 research reports; 31,000 current serial subscriptions; as well as numerous maps, newspapers, microfilms, manuscripts, and countless state, federal, foreign, and international government documents.

The largest aggregation of books and materials is housed in the Suzzallo Library. It is there that students concerned with investigation in the atmospheric sciences, biology, botany, geological sciences, humanities, and the social sciences, find extensive library resources. Rare books, manuscripts, and a definitive collection of materials relating to the Northwest are also available in the Suzzallo Library.

Particularly important for all undergraduates is the Undergraduate Library. Its 100,000 volumes include commonly used reference works, books for assigned and collateral reading, as well as books for general reading. The undergraduate in any academic field will find in the Undergraduate Library nearly any book he is likely to need, except when he is doing a specialized project.

Most books in the Suzzallo Library and in the branch libraries are in open shelf collections to which students have direct access. Instead of many formal reading rooms, informal study areas are located conveniently within the book collections throughout the building. Librarians assigned to each collection or service unit assist students in the location and use of materials.

The 19 branch libraries consist of books and periodicals useful for work in various disciplines and are situated near the classrooms and laboratories of each discipline. Branch libraries in the sciences include Chemistry-Pharmacy, Computer Science, Engineering, Fisheries-Oceanography, Forest Resources, Health Sciences, Mathematics Research, and Physics. The Far Eastern Library, containing over 140,000 volumes in the Chinese, Japanese, and Korean languages, provides a resource of considerable dimension for scholars interested in Far Eastern studies. Libraries in other disciplines include Architecture, Art, Business Administration, Drama, Geography, Law, Music, Political Science, and Social Work.

The University of Washington Library system participates in many regional and national bibliographic enterprises. The Pacific Northwest Bibliographic Center, owned and supported by 40 libraries in the Pacific Northwest, maintains in the Suzzallo Library



a union card catalog of over 3,750,000 author entries. This catalog is an aid to locating uncommon books from other library collections that may be required by faculty, researchers, and advanced students.

Museum

The Thomas Burke Memorial Washington State Museum, located at the northwest corner of the campus, houses creative displays of anthropology and natural history.

University Theatres

The School of Drama operates three theatres: the Showboat, a proscenium theatre; The Penthouse, an arena theatre; and the Glenn Hughes Playhouse, a thrust theatre. Faculty and student directed plays are presented during the academic year, and range in type from classics to musicals. The University's School of Drama was a pioneer in the theatre-in-the-round productions in which the Penthouse Theatre specializes.

Henry Art Gallery

The Henry Art Gallery brings to the campus and the community exhibitions of contemporary work in painting, sculpture, printmaking, architecture, design, and the decorative arts. Film programs and other events are also scheduled. The Henry Gallery is the University's art museum, with small but distinguished collections of European and American paintings and prints, and contemporary American and Japanese ceramics.

The Center for Asian Arts

The Center for Asian Arts, with administrative offices in 131 Art Building, initiates new programs concerned with the arts of Asia which involve both teaching and research. As these programs become established they are assigned to the appropriate departments or schools in the Colleges of Architecture and Urban Planning and Arts and Sciences. In cooperation with the appropriate departments and the Office of Lectures and Concerts, the Center gives performances, arranges exhibits, and organizes symposia and workshops.

STUDENT HOUSING

Students are free to make their own housing arrangements, and they are urged to select the type that will best serve their academic and personal needs.

The University recognizes that a student's total education is influenced by the nature and quality of the living environment outside the classroom and encourages the development of an environment in the residence halls that will be conducive to broad intellectual growth and greater participation in the life of the academic community. Students should consider living in the resi-

dence halls during some part of their University career, particularly when they first arrive on campus.

Residence Halls

Residence hall accommodations for men and women at the University of Washington are available in a variety of types, including four coeducational buildings. All are located within walking distance to campus classrooms and laboratory buildings. Except for McMahon, the halls operate with active student government organizations in "houses" of from fifty to a hundred and twenty students each. Preference in assignment to McMahon Hall is given to students of at least Junior Class standing or age twenty or older.

Most rooms are planned for double occupancy, and are furnished with twin beds and individual desks and wardrobes. Attractive dining areas, study rooms, kitchenettes, and laundry rooms have been included for student comfort and convenience. Ample study and recreation areas, including lounges and game areas, are provided in all halls.

For information about special language programs conducted in the residence halls, please refer to the material under the heading of Living-Language Groups.

Contact the Office of Student Residences, Schmitz Hall, University of Washington, Seattle, Washington 98105, for reservations or further information.

University Housing for Married Students

The University maintains an apartment building adjacent to the campus—the Commodore-Duchess—for married students without children or for single students over the age of twenty-one. Preference for housing in these apartments is given to graduate students with part-time teaching or research responsibilities. Second preference is given to other graduate, medical, dental, and law students.

A limited number of University-owned apartments for married students with children are available at Sand Point Homes. In assignment of these facilities, preference is given first to graduate students holding sub-faculty appointments, and, second, to veterans of either graduate or undergraduate standing, and third, to other graduate and professional students.

For information concerning housing for married students, contact the Office of Student Residences, Schmitz Hall, University of Washington, Seattle, Washington 98105. Please indicate that you desire information for married students and state family size and academic level. This office also maintains listings of housing facilities available off campus (see "Privately Operated Accommodations").

Union Bay Village Nursery School

Day care with nursery school and a kindergarten program for thirty-two children from three to six years of age is available at the Union Bay Nursery School. At least one of the parents must be a student, faculty, or staff member. The nursery is located near campus, in a building provided by the University, and is independently operated by students and staff members. Further information may be obtained by writing directly to the Nursery School, 3900 Union Bay Circle, Seattle, Washington 98105, or by calling LA 4-0988.

Privately Operated Accommodations

Listings of off-campus rental properties such as rooming and boarding houses, housekeeping rooms, apartments, and houses are maintained in the Office of Student Residences, Schmitz Hall, for the convenience of single and married students. The University does not inspect these accommodations and, therefore, students and parents must accept full responsibility for making a selection. Because these listings change so frequently they cannot be mailed out and must be consulted in person.

Fraternities and Sororities

Twenty sororities and 33 fraternities own and operate complete living facilities near the University campus. Members either live in the chapter houses or, as commuters living at home, have use of the facilities. These living groups conduct educational, social, recreational, and cultural activities, and place particular emphasis on study programs for new students.

Fraternities and sororities are granted a broad degree of self-government. However, the University makes available, through the offices of the Dean of Men and Dean of Women, staff members to advise house leaders on all phases of chapter life and operation. Activities of the fraternities and sororities are coordinated and governed by the student Interfraternity Council and Panhellenic Association, respectively. These organizations also coordinate and supervise the rush programs for their member fraternities and sororities.

For additional information write to: the University of Washington Panhellenic Association or Interfraternity Council, Student Union Building, Seattle, Washington 98105.

Men's Cooperative

Allerlei House, a men's cooperative, provides economical living facilities for a small number of men students who share work and expenses. This residence, located one block from campus at 4632 22nd N.E., operates as a recognized University organization. Please write directly for further information.

Religious Living Units

Faith and Life Community (Inter-faith), University Christian Union Women's House and University Christian Union Men's House (Protestant), and Baptist Student Center also provide housing for students at the University of Washington. Their primary purpose is to offer an environment consistent with religious ideals and to encourage maximum scholastic achievement.

Living-Language Groups

Russian House is a living group for both men and women interested in learning the Russian language. Since Russian is spoken at all times among residents, the student should have some familiarity with the language before applying for admission to the House program. For further information write to the University of Washington, Russian House Faculty Adviser, Department of Slavic Languages and Literature, Seattle, Washington 98105.

Living-Language Programs in French, German, Italian, Japanese, Spanish, and Swedish are conducted in co-educational residence halls by students in cooperation with language departments. Members are grouped according to language interests and have most meals together. Candidates for the French, Italian, Japanese, Spanish, and Swedish Programs must have at least second-year standing and be nineteen years of age or older. For further information, please write to the department concerned.

CAMPUS ACTIVITIES

Lecture-Concert Series

Each year the University presents more than fifty programs featuring some fifteen to twenty special events and concerts, including dramatic presentations, dance groups, concerts, and approximately thirty-five to forty lectures. Also included are ballet, foreign films, and opera.

Recreational Facilities

The new Intramural Activities Building provides additional facilities for the expanding student recreation programs. It contains four full-size multipurpose gymnasiums, an indoor swimming pool, and other facilities designed primarily for student recreational use. In addition, the building has meeting rooms, a kitchen, and a student lounge with an adjoining sundeck.

The University provides the student with opportunities for a well-rounded college experience, which includes participation in social, recreational, and athletic activities. The Student Union Building (the HUB) is a cultural, social, recreational, and service center where all may hear fresh points of view and learn more about



fellow students. Activities are planned and coordinated by student committees with the assistance of trained staff advisers. Regular dining facilities are provided by the Husky Den, the Cafeteria, the Husky Hollow, the Evergreen Dining Room, and special dining rooms also available as private banquet rooms. Among the HUB's many facilities are the ticket office, auditorium, lost-and-found service, post office, lounges, bowling alley, billiard room, table tennis room, ballroom, bookstore, offices of student government, and meeting rooms.

Intercollegiate athletic facilities at the University are expanding to keep pace with the growing intercollegiate program. Two major renovations were completed for the 1967 season—Graves Field, just east of the Golf Driving Range, and a clubhouse, complete with shower and equipment facilities. Located adjacent to the field, the clubhouse serves the baseball team. Eighteen new tennis courts round out the improvements in the intercollegiate athletics complex.

Conibear Crew House, located on the shore of Lake Washington just north of Edmundson Pavilion, is one of the most modern college shellhouses in the country. It also provides living accommodations for 75 men. The Clarence S. "Hec" Edmundson Pavilion, seating 11,500 persons, is used for basketball, handball, wrestling, volleyball, gymnastics, other sports and student events, and in addition houses a large swimming pool for men and a practice gym.

Hutchinson Hall, the center for women's physical education activities and instruction, is equipped for basketball, badminton, tennis, swimming, dancing, fencing, and has adjacent tennis courts and playing fields.

A golf driving range with twenty automatic tees is available for student, faculty, and staff use. Waterfront facilities support sailing and canoeing programs. A new marine recreational facility is planned for the future.

Since the University is located in a major recreational area, off-campus and public facilities for swimming, sailing, skiing, riding, camping, and fishing are plentiful. Mountain climbing also ranks high among Northwest sports.

Athletics

Intramural Activities

Intramural programs are open to the entire student body. The men's intramural program includes some thirty sports during the academic year. The women's recreational program offers approximately twelve sports. The Department of Intramural Activities supports 24 sports-related clubs in an extensive extramural program. Opportunities for coeducational recreation are available to students, faculty, and staff.

Intercollegiate Athletics

The Intercollegiate Athletics program offers a 14-sport program for male students, in which nearly six hundred men participate annually in baseball, basketball, crew, cross country, football, golf, gymnastics, skiing, soccer, swimming, tennis, track, volleyball, and wrestling. Top-flight competition in the several sports is scheduled with conference schools in the Athletic Association of Western Universities, as well as with other schools in and outside the state. The well-rounded program emphasizes both scholarship and aggressive competition in sports.

Drama

A dozen productions are scheduled regularly each year by the University's School of Drama. There are also a number of master's thesis presentations which range from early Greek theatre to contemporary drama. Try-outs for all University dramatic productions are open to the entire student body. In addition, the Readers Theatre of the Department of Speech sponsors a series of interpretative readings, both from ancient and contemporary sources in poetry, prose, and drama.

Music

In addition to the fine music available to students through the lecture-concert series, both undergraduates and graduates from all academic fields are invited to participate in a variety of musical groups.

Vocal and instrumental performing groups include: University Symphony Orchestra, University Sinfonietta, Concert Band, Wind Sinfonietta, Marching Band, University Singers, University Chorale, Madrigal Singers, Opera Workshop, Opera Theatre, Festival Opera, Contemporary Group, Gagaku Ensemble, and Collegium Musicum.

Forensics

The University forensics program includes extracurricular debate, discussion, oratory, extemporaneous speaking, and oral interpretation of literature, and is open to all undergraduates. Special achievement in forensics is recognized by membership in Delta Sigma Rho, national honorary society.

During a typical season, students represent the University in three hundred or more debates and a great variety of individual speaking events. In addition, some students are selected to represent the University in public discussions and debates before local civic, service, and community groups. Freshmen are especially urged to participate, and each year's schedule includes four or more tournaments for beginners in college forensics. Outstanding freshmen also represent the University in varsity activities.

Religious Activities

There are many student religious centers in the University District which encourage students to participate in programs of religious worship, and to meet other students through planned social and educational activities.

Student Government

The Associated Students of the University of Washington (ASUW) is the central student organization on campus. Each full-time student is a member and, through his elected representatives on the Board of Control, shares in the responsibility for the welfare of students, student benefits, and support and aid to campus organizations and activities.

Student Organizations

Students are encouraged to become active in at least one of the approximately three hundred voluntary student organizations on campus, which include honoraries, professional and social organizations, cooperative houses and residence clubs, service and coordinating clubs, activity groups, church and fraternal organizations, and geographical groups.

Student Publications

Student publications at the University of Washington include the *Daily*, the *Tyee* yearbook, and the *ASUW Student Directory*. The *Daily* is published Tuesday through Friday mornings throughout the academic year, and is distributed on campus without charge. During Summer Quarter the *Daily* is published once a week. Any student with an interest in journalism is eligible to serve on the *Daily* staff. The *Tyee* yearbook is prepared by students who have volunteered their services. Top editorial and managerial positions on ASUW publications carry nominal salary allowances.

A number of other publications, such as *Assay*, a journal of creative writing, are prepared by various student groups.

Campus Events

During the academic year, many events are scheduled for student participation. They include the College of Forest Resources' annual Garb Day, Homecoming Weekend for both students and alumni, the International Banquet for foreign students and their friends, the Dance Drama of the Physical Education Department, Parents' Weekend, Governor's Day, the Christmas Concert, ASUW Christmas Party, Scholarship Banquet, Election Banquets, Fine Arts Festival, Husky Winter Sports Club Carnival, and Commencement in June.

Other ASUW sponsored activities include the College Bowl, dances, People-to-People international student

events, art exhibits, film series, and the booking of nationally known speakers and popular musical artists.

University Preview, held during the first week of Autumn Quarter for entering students, includes a University reception; tours of Henry Suzzallo Library; Frosh Night at the HUB, an event designed to introduce students to programs sponsored by various organizations and committees; and a transfer-student program. The Husky Guide program is a student-to-student orientation plan in which older students help to introduce incoming students to the University.

Activities on Parade, held in the HUB ballroom early in the Autumn Quarter, highlights the many opportunities offered through participation in the activities of the ASUW committees and recognized student organizations.

Foreign Students

Over fifteen hundred foreign students from more than ninety countries now attend the University of Washington. Day to day contact with these students provides American students with the opportunity to learn ways in which other people live. Such contacts are valuable and take place in classes in all subjects, even though they are obviously especially valuable in fields of study such as political science, languages and literature, and geography. The free exchange of ideas and opinions, both in class and elsewhere when students meet informally, is an important benefit of attending a large university with a sizeable foreign student population. Foreign students also significantly enrich the cultural environment at the University through their contributions in the fields of art, music, and drama.

The fifteen foreign student organizations recognized by the University provide a variety of programs designed to acquaint American students with the practices, customs, and traditions of other countries. The Foundation for International Understanding Through Students, a private community organization, has offices on campus and provides numerous activities for the mutual benefit of foreign and American students. The ASUW's People-to-People program furthers international understanding through such projects as Student Ambassadors Abroad, and a weekly coffee hour which offers a casual atmosphere in which all students may become better acquainted.

STUDENT SERVICES

Academic Advising

Faculty members are available for personal discussions with students outside the classroom. However, since most professors at the University are engaged in a



variety of teaching, research, and public service activities which occupy much of their time, students must take the initiative in establishing advisory relationships. The University encourages students to cultivate such relationships for a better appreciation of the aims and purposes of higher education.

Academic advisers are available to assist students with registration, curriculum development, academic standards, and degree requirements. Advisers are usually located in a central advisory office within each college; however, the larger colleges often delegate certain advisory responsibilities to the individual departments. Students should consult advisers about official curriculum approval, contemplated changes in major or college, or, more generally, about any educational concerns.

The goals of advising are consistent with those of teaching. The relationship between student and adviser is intended to foster the development of a student's intellectual growth and his ability to make intelligent, critical judgments. Therefore, the student is expected to accept the primary responsibility in making his own informed decisions on all aspects of his University career where he has discretion.

The extent to which students should use advisory services becomes a matter of individual need. All students, of course, are required to have periodic reviews of their academic programs with advisers, but beyond this the use of such services depends upon individual interest and concern about one's educational development. Students will find that advisory services, both formal and informal, are available once sought.

Office of Student Affairs

The Office of Student Affairs is concerned with the general welfare of students in their extracurricular life and activities and provides various nonacademic services to assist them. It welcomes correspondence and conferences with both parents and students. This office works closely with the advisers of the colleges and schools, the Counseling Center, and other agencies to provide assistance with personal, social, and adjustment problems that may influence a student's academic performance.

Students are invited to contact the Office of Student Affairs for information about fraternities, sororities, special programs of living groups, student organizations, and special services for physically handicapped students.

International Services Office

Students from other countries may contact the Office of International Services for information or counsel

about immigration regulations, housing, social relationships, personal problems, minimum course requirements, employment opportunities, finances, and applications for scholarship aid (no scholarships are available for Summer Quarter). The Office also provides assistance in immigration matters to noncitizen faculty and staff and information for American students who are interested in study abroad.

The Foundation for International Understanding Through Students, a private community organization associated with this office, provides host families for foreign students and also arranges many activities for them and for Americans interested in foreign students.

Study Abroad

As a member of the Northwest Interinstitutional Study Abroad Council, the University of Washington cooperates with other Northwest institutions in offering a program of liberal arts study for the undergraduate in England, France, and Sweden. The program includes autumn, winter, and spring sessions in Avignon; spring, summer, and autumn sessions in London; and summer sessions in Paris and Stockholm. Students enroll in an interdisciplinary program of study and may pursue a specialized area on an intensive basis. The School of Art offers special courses in studio art and art history during the spring session in Avignon. Excursions complement the formal course work and "home stays" are arranged at each study locale.

The University of Washington Department of Germanic Languages and Literature offers a program of summer language study in Berlin and Marburg, Germany. Excursions and attendance at musical and theatrical performances supplement the academic program, and home stays are provided. A program covering a full academic year at Marburg is under consideration.

A spring and summer program in Kyoto, Japan, is offered by the Center for Asian Arts. Accompanied by University of Washington faculty members, graduates and undergraduates take courses in the language, geography, and visual theatre arts of the area.

The Department of Slavic Languages and Literature joins with other institutions in offering a summer Russian language program in Leningrad. The program is coordinated by the Council on International Educational Exchange in New York. Many University departments have specialized programs for their advanced students. The classics and Asian languages and literature departments recommend students who have passed competitive examinations for an academic year in Rome, Taipei, and Tokyo through interinstitutional programs administered by Stanford University. Selected art history students study in London during Spring Quarter

with a School of Art faculty member. A small number of students from the Graduate School of Business Administration may undertake special research projects in Japan and Western Europe. The Department of Architecture selects students to carry out special projects in various overseas locations.

Information on the University's Study Abroad Programs is available through the International Services Office. University of Washington programs in other academic fields and in other locations are announced as they develop.

Academic credit may also be awarded for satisfactory participation in many overseas study programs not directly sponsored by the University of Washington. Since study experience in another country can make a valuable contribution to the education of the serious student, the University maintains a counselor in the International Services Office to assist students interested in these programs or in study at a foreign university.

Counseling Center

The services of the Counseling Center are directed toward assisting the typical student to resolve the inevitable problems he encounters at the University in his effort to actualize his potential for intellectual, social, and emotional growth. A staff of psychologists and vocational counselors offer vocational, educational, and personal counseling to students without fee. The student is assisted to see himself and his situation more fully so that he better knows and accepts the resources he has available for resolving his indecisions or concerns. His attempts at self-appraisal may be facilitated by specially selected psychological tests which can help clarify the issues that have become identified as important to him. A library of occupational information is also provided for students' use.

Bureau of Testing

In addition to providing a variety of educational and psychological testing services for departments, the Bureau of Testing, with offices in Schmitz Hall, sponsors a number of testing programs of interest to prospective University entrants and to University students approaching graduation.

The Bureau provides for University participation in the Washington Pre-College Testing Program, administering and processing the battery of grade-prediction tests. Entrance placement testing in English, mathematics, and the foreign languages is also arranged by the Bureau staff. For the graduating University student, the Bureau offers a number of tests required either for admission to graduate, law, medical, and other professional schools or for the information of governmental and private prospective employers.

Health Services

The University operates the Hall Health Center as a medical care facility for students but not for their dependents.

Clinics, open from 8 a.m. to 5 p.m. Monday through Friday throughout the calendar year, offer general medical care and specialist consultation of several types.

A 35-bed hospital unit operates from about September 15 through June 15; night emergency service is also available during the regular school year.

There is no charge for professional services obtained through the Student Health Service. However, there is a \$2.00 per day charge for hospital confinement from the eighth day forward and students must pay for outpatient prescriptions. Major surgery and the occasional illness of exceptional severity will require treatment elsewhere, and the student should protect himself against the expenses of these by supplementary medical insurance. A low-cost group medical-surgical-hospital policy designed to meet these specific needs may be purchased at time of registration.

Career Planning and Placement

The University provides an extensive career planning and placement program to assist graduating students and alumni in finding suitable career opportunities, and to be of help to them in obtaining career oriented part-time and summer work while attending the University. Students and alumni wishing assistance or seeking information on vocations or employment should come to the Career Planning and Placement Services office, 301 Loew Hall where the Career Information Center is located. Students are encouraged to use the career planning and counseling service during their junior year, so that they can most effectively participate in the placement program services no later than the beginning of their last year in residence.

The career planning program centers about a Career Information Center which houses information relating the variety of occupations available to students in specific academic areas, providing insight into specific businesses, industries, and governmental work, and providing descriptions of specific employer organizations and employment opportunities. In addition, placement counselors are available to assist the student in exploring the world of work and to provide information concerning employment opportunities with specific employer organizations. Information on what happens to graduating students—the kinds of employment they accept, the locations and compensations—is available to students and members of the University staff.



The placement program serves primarily those students who are within a year of graduation and those alumni who are seeking new employment. Job-seeking assistance is provided throughout the year and specific job opportunities listed with the Placement Services are always available. Campus interviewing also provides the student with the opportunity to contact many potential employers easily and conveniently. However, since interviews do not take place throughout the school year, it is important that the student contact one of the following placement offices early in his last year in order that interviews can be arranged with employers in the fields in which he is interested.

Students and alumni interested in exploring employment opportunities in business, industry, or government should contact the Placement Services located at 301 Loew Hall. Most campus interviews are conducted between October and March.

Students and alumni interested in obtaining employment in educational fields should contact the Office of School and College Placement, 120 Miller Hall, where employment opportunities from the primary grades to university-level positions are maintained. Students who wish to use this service should contact the office at the beginning of their last year at the University and establish a permanent file of teaching credentials which will be made available to the *bona fide* employer upon request. Most employers are on campus between January and May.

Financial Aid

University students who are faced with serious financial problems should inquire about assistance at the University of Washington Office of Student Financial Aid, Schmitz Hall, Seattle, Washington 98105. The primary purpose of the Financial Aid Program is to provide financial assistance to students who, without such assistance, would find it impossible or difficult to enter or remain in college. Another important purpose is to provide financial assistance to students experiencing acute, temporary financial emergencies.

Students should apply at the Office of Student Financial Aid for Educational Opportunity Grants, undergraduate scholarships, federal and University long-term low-interest loans, University short-term emergency loans, and employment under the College Work-Study Program.

Graduate students may obtain loan and employment information through the Office of Student Financial Aid. Information on graduate fellowships, scholarships, and teaching and research assistantships may be obtained from the Graduate School and the *Graduate Study* section of this catalog.

The Office of Student Employment, Schmitz Hall, lists many part-time, temporary, and summer jobs available both on and off campus to University students and their spouses. A student may make application *only in person* after he is enrolled, or in the process of enrolling, with matriculated standing at the University.

Social Security and Railroad Retirement Benefits

Students who receive benefit payments from the Social Security administration or Railroad Retirement Board should inquire at the Registrar's Office, Schmitz Hall, regarding full-time eligibility requirements.

University Book Store

The University Book Store, in operation since 1900, is located at 4326 University Way N.E. The Text Book Department stocks required and recommended texts for all University courses plus technical and reference books and study aids. The Book Shop offers a wide selection in fiction, nonfiction, poetry, and 20,000 titles in paperback books for inexpensive supplementary reading. The Student Supplies Department carries art, science, engineering, and architecture materials as well as general supplies. There are also camera, typewriter, pen, sports, gift, and music shops.

An administrative-faculty-student board of trustees determines policies of the Book Store. Savings in operations are returned to students and staff through a Patronage Refund. ASUW membership makes students eligible to participate, and faculty and staff may make application for refund to the Book Store. For the convenience of students and staff a parking lot is available at the rear of the store.

Students will find a convenient supply of miscellaneous items and paperback books at the branch stores in the Student Union Building (HUB) and the Health Sciences Building, which also stock textbooks for evening classes.

Selective Service

The Registrar of the University is responsible for maintaining liaison with the Selective Service System. General information regarding Selective Service and student deferments may be obtained at the Registrar's Office. The Dean of Men in the Office of Student Affairs provides counseling and advice in regard to the different classifications under the Selective Service Act.

Parking

Self-operating parking areas on the periphery of the campus are available to students at a nominal cost. Physically handicapped students may apply to the Safety Division for assignment to available parking spaces in the central campus area.

FEES AND EXPENSES

See *Rules and Regulations* section for specific information regarding payment of fees, other fees charged by the University, and refund policies.

Resident Students

A resident is one who has been domiciled in Washington for at least a year immediately prior to registration. Examples of Autumn, Winter, or Spring Quarter fees for undergraduates and graduates, excluding medical-dental fees,¹ are listed below.

	<i>Resident</i>
Full-time Students (more than 6 credits) ²	\$133.00
Part-time Students (3½ to 6 credits, incl.) ²	\$ 97.00
Part-time Students (0 to 3 credits, inclusive) ²	\$ 56.00
Ex-Service Personnel of World Wars I and II (Chapter 46, Laws of 1947) ³	
Full-time Students (more than 6 credits) ²	\$ 98.00
Part-time Students (3½ to 6 credits) ²	\$ 62.00
Part-time Students (0 to 3 credits) ²	\$ 21.00
On-leave Students (for graduate students only) ⁴ \$	5.00

Nonresident Students

Prospective students are classified as nonresidents when their credentials come from schools outside the state of Washington. If they believe they are residents, they may petition the Residence Classification Office, Schmitz Hall, for a change of classification. Examples of Autumn, Winter, or Spring Quarter fees for undergraduates and graduates, excluding medical-dental fees,² are listed below. (There is no nonresident fee for Summer Quarter.)

	<i>Nonresident</i>
Full-time Students (more than 6 credits) ²	\$293.00
Part-time Students (3½ to 6 credits, incl.) ²	\$162.00
Part-time Students (0 to 3 credits, inclusive) ²	\$ 81.00
Ex-Service Personnel of World Wars I and II (Chapter 46, Laws of 1947) ³	
Full-time Students (more than 6 credits) ²	\$240.50
Part-time Students (3½ to 6 credits) ²	\$127.00
Part-time Students (0 to 3 credits) ²	\$ 63.50
On-leave Students (for graduate students only) ⁴ \$	5.00

Payment Schedule

Students living in University of Washington housing facilities must pay fees and board and room charges *in advance* (1) at the start of each quarter or (2) on a monthly basis.

Resident Status for Tuition Purposes

A *resident student* is one who has been domiciled in the state for a period of one year prior to the beginning of

the quarter for which he registers. If the student is a minor, his domicile is normally determined by that of his parents, who must fulfill the requirement of the one year of Washington domicile. For factors important in determining the legal domicile of the student see *Rules and Regulations* section.

A prospective student is *tentatively* classified as a *non-resident* when credentials are presented from an institution of learning not located in the state of Washington. A student is likewise *tentatively* classified as a *non-resident* if he has attended a school located in Washington but has subsequently resided in another state. If the student believes himself eligible for resident status, he should file an application for resident classification with the University of Washington Residence Classification Office, Schmitz Hall, Seattle, Washington 98105. Residential status may be cleared by mail and should be done at least thirty days in advance of registration in order to allow sufficient time for the determination of proper residential status prior to the date when fees must be paid. Application forms are available in the Residence Classification Office or will be mailed upon request.

The foregoing are the general rules followed in determining residential status for tuition purposes in accordance with the laws of the state of Washington. The facts and circumstances involved in each case must be set forth in full on the application for resident classification.

For further information, see *Rules and Regulations* section.

Estimated Expenses

Special fees and deposits are not included in these estimates. The actual costs of books and materials are dependent on the student's major, and it should be understood that actual personal expenses will vary according to individual needs and tastes. It is recommended that each student make careful estimates of his additional expenses, such as transportation, clothing, etc.

Note: All fees, extra service charges, and rentals are payable in United States dollars at the time of registration. The University reserves the right to change any of its fees and charges without notice. There is no reduction of fees for auditors.

Fee schedules for resident and nonresident students apply to the academic year (Autumn, Winter, and Spring Quarters). Summer fees are listed in the *Summer Quarter Bulletin*.

¹ Students working toward advanced degrees in dentistry and surgery pay the regular tuition for the Schools of Dentistry and Medicine, and miscellaneous fees.

² Load hour equivalents of noncredit courses must be counted in the total credits. Lower division ROTC courses are excluded from the credit count in determining a student's full- or part-time status.

³ See *Veterans Information* section to determine eligibility.

⁴ See *Graduate Study* section for an explanation of fee.

**Estimate of Living Expenses for Academic Year****FULL-TIME RESIDENT STUDENT**

Expenses	Men's, Women's, and Coeducational Residence Halls	Living at Home	In Fraternity or Sorority	
			Living at Home	Living in House
Tuition, Fees	\$399.00	\$399.00	\$ 399.00	\$ 399.00
Athletic Admission Ticket (optional)	8.50*	8.50*	8.50*	8.50*
Health and Accident Insurance (optional)	34.60	34.60	34.60	34.60
Life Insurance (optional)	17.00	17.00	17.00	17.00
Books and Supplies	150.00	150.00	150.00	150.00
Room and Meals (average)	945.00	***	400.00	1,000.00
Personal Expenses†	450.00	450.00	450.00	450.00
TOTAL	\$2,004.10	\$1,059.10	\$1,459.10	\$2,059.10

* For years with five scheduled home football games. For years with six scheduled home football games, \$10.00.

† It should be recognized that personal expenses for such items as clothing, laundry, recreation, and transportation may vary widely as do the interests and needs of individual students. The parents of students living at home sometimes assume responsibility for many of these expenses in addition to room and board.



UNDERGRADUATE EDUCATION

The University of Washington admits an undergraduate when, in the judgment of the Board of Admissions, he is able to pursue a degree program "with a reasonable probability of success." The acceptance and registration of admissible students is contingent on the availability of space.

Whether or not he chooses an academic major when he enrolls, the student is required to enroll in one of the University's colleges or schools. If he elects to choose a major from among the more than a hundred courses of study available, he enrolls in the particular school or college offering the program. If, on the other hand, he prefers to sample from the rich variety of disciplines offered, or wishes to undertake a preprofessional curriculum, he enters the premajor program in the College of Arts and Sciences.

Certain courses are required by all University colleges and schools, although they vary in kind and number from one to another, but the student can also explore his own interests and abilities through electives. In special cases, courses may be substituted for those specified in a program.

Honors programs, allowing opportunities for study in depth, are available to qualified students through special tests. Other examinations define proficiency in language, mathematics, and other areas, and determine advanced credit and the student's assignment to the appropriate class.

For a complete list of programs of study, degrees offered, and the organization of the instructional departments, schools, and colleges, see the *General Information* section of this catalog.

ADMISSION TO THE UNIVERSITY

Eligibility for admission is determined by the Board of Admissions according to policies established by the University faculty. The criterion is evidence of the applicant's apparent ability, as decided by the University, to progress satisfactorily in a degree program. The adequacy of an applicant's preparation is always an important factor, but so also are aptitude as measured by test scores, recommendations, and, of course, indications of strong motivation. These latter criteria are especially helpful in considering the applications of disadvantaged students. The University considers all available evidence of a candidate's promise, and endeavors to give students the best possible counseling through its admission decisions.

The criteria described below represent *minimums* and not the average preparation of students entering the University. Satisfaction of these minimum standards assures consideration. It does not necessarily guarantee acceptance.

Should there be more applicants than the University can accommodate, preference must be given to those



with the greater probability of success, according to the date on which complete credentials are filed in the Office of Admissions.

Admission of Freshmen (Residents of Washington)

Minimum high school preparation for admission to all undergraduate colleges and schools of the University should include graduation from an accredited high school with a diploma representing completion of a college preparatory program of at least 16 units to include the following:*

- | | |
|---|------------------|
| (a) English | at least 3 units |
| (b) One foreign language (for all colleges and schools) | at least 2 units |
| (c) College preparatory mathematics | at least 2 units |
| (d) One laboratory science | at least 1 unit |
| (e) Social science | at least 2 units |
| (f) Electives from the above subjects | at least 2 units |

Additional electives may be chosen from any subjects acceptable for high school graduation. The student is advised to select additional courses that not only reflect his academic and vocational interests, but also increase his cultural awareness. The University gives the same careful attention to the total elective pattern as it does to the student's other qualifications.

In addition to the above requirements, the student applying directly from a Washington State high school ordinarily is expected to present a grade-point average of at least 2.50 (C+) in high school courses. Students from disadvantaged backgrounds whose grade-point average is below this level should communicate with the office of the Special Education Program.

The talented student is urged to take advantage of the accelerated, honors, and advanced placement courses when offered by his high school. These special opportunities not only provide superior academic preparation for University work, but also help identify students most likely to profit from University-level honors courses. In addition, proficiency in English, mathematics, and foreign language can often satisfy, either wholly or in part, the requirements in some University degree programs (See "Graduation Requirements" in the *Arts and Sciences* section.) The well-prepared high school student who scores high on placement examinations will need only a minimum of college work to complete such requirements.

Since incomplete preparation can delay progress toward a college degree, the student is advised to complete all *standard* courses offered by his high school, particularly if he is sure of his specific educational objectives.

Admission of Transfer Students (Residents of Washington)

A student who has fulfilled the criteria listed below may be assured of consideration. Should the University be unable to accommodate all who meet these minimum standards, preference will be given to those with the better scholastic records and the more advanced class standings with consideration of their date of application.

1. Completion of the specified high school-college preparatory program or equivalent introductory college courses.†
2. Satisfactory progress, as indicated below, in a program of study which parallels a University degree curriculum and includes basic lower-division courses required for graduation:
 - a. A high school grade-point average of at least 2.50 and a grade-point average of at least 2.00 in any college-level work completed, or
 - b. A college grade-point average of at least 2.50 in no less than 45 transferable quarter credits of college-level work, or
 - c. A college grade-point average of at least 2.00 in no less than 75 transferable quarter credits of college-level work.

For additional information concerning the transfer of credits, see the section of this catalog on *Rules and Regulations*.

Admission of Nonresidents of Washington

The University recognizes the academic and educational benefits derived from a cosmopolitan student body and accepts highly qualified nonresidents who are able to meet significantly higher scholastic standards and who have very special reasons for needing to come to the University of Washington. As a state institution, preference must be given to residents of Washington and to sons and daughters of Washington alumni, who are accepted according to resident standards, although they are required to pay the regular nonresident fees.

Admissibility of nonresident applicants for admission with undergraduate standing is considered largely in terms of the following criteria:

Nonresident Applicants for Admission With Freshman Standing

- (a) The adequacy of the college preparatory program completed by the applicant in high school.

* A unit is defined as one year, or two semesters.

† It is generally considered that 5 quarter or 3 semester credits are equivalent to 1 unit (one year) of high school study.

(b) A high school grade-point average of at least 3.50 (B+).

(c) Scores on the Scholastic Aptitude Test of the College Entrance Examination Board. These scores are *required* of all out-of-state students and high school seniors are advised to take the test in December.

(d) Scores on the College Entrance Examination Board achievement tests are very desirable.

(e) Counselors' letters of recommendation and other supplementary information which may be helpful in evaluating the applicant's promise as a University student.

Nonresident Applicants for Admission With Advanced Standing

(a) The adequacy of the applicant's total educational background, both in college and high school, as preparation for University study.

(b) A grade-point average of at least 3.00 (B) in college-level work.

(c) Scores on the Scholastic Aptitude and Achievement Tests of the College Entrance Examination Board are very desirable.

(d) Other supplementary information.

Admission of Unclassified-5 Students

Students holding baccalaureate degrees may be admitted to one of the undergraduate colleges in an Unclassified-5 status to pursue the following objectives:

1. To qualify for a second bachelor's degree
2. To qualify for a teaching certificate
3. To take additional undergraduate courses for some other purpose approved by the University

Former students of the University who have not attended since receiving their baccalaureate degrees, as well as new students must make application and be accepted by one of the undergraduate colleges. In selecting students for this classification, careful consideration is given to their scholastic records during the junior and senior years of undergraduate study as an indication of probable success in achieving educational objectives. Ordinarily, residents of Washington are expected to present grade-point averages of at least 2.50, and out-of-state applicants averages of at least 3.00 in the junior and senior years of their baccalaureate degree program. Final acceptance is contingent on the availability of space and on acceptance by the department concerned.

Such students are not in the Graduate School and ordinarily may not register for courses numbered 500 and

above. Courses completed while in the Unclassified-5 status may not be applied later to an advanced degree in the Graduate School.

Admission of Foreign Students and Students Educated Abroad

The University of Washington believes that its greatest contribution to international education can be made in fields of advanced study. Since its facilities for such studies in some fields are limited, the University must select those applicants who are, on the evidence of previous academic records, best prepared to benefit from available facilities. Preference is given, therefore, to the mature student who has received a first degree, or is well advanced in such a degree program, at a university in his own country. In addition, the foreign applicant must show that he has made fully satisfactory arrangements for financing all his expenses at the University for at least one year, and he must also demonstrate proficiency in the English language. The most acceptable evidence of English proficiency is a satisfactory score on the Test of English as a Foreign Language. This test is administered at centers throughout the world by the Educational Testing Service and arrangements for taking it may be made by writing to the Educational Testing Service, Princeton, New Jersey 08540.

Foreign students are admitted for the school year beginning in mid-September and an application should be initiated the previous year. Completed credentials are considered in the order received and qualified applicants accepted until the quota for foreign students has been filled.

Admission of Veterans and Children of Deceased or Totally Disabled Veterans

Information on the admission procedure for these applicants is contained in the *Rules and Regulations* section of this catalog.

Nonmatriculated Standing

A nonmatriculated student is one whose educational goals are limited and who has been permitted, by the Board of Admissions, to enroll for credit in day or evening classes to the extent facilities are available. Such students are not engaged in a program of studies which leads to a University of Washington degree or teaching credential. Permission to enroll with nonmatriculated standing implies no commitment on the part of the University regarding later admission to a degree program.

If a student is later admitted as a matriculated undergraduate, the scholastic standing achieved and appro-



prate credits earned in the nonmatriculated status may apply toward the requirement for the baccalaureate degree. However, at least 45 credits must be earned in a matriculated status in order to meet graduation requirements.

Auditors

Individuals who wish only to audit courses should apply for nonmatriculated standing. Attendance in courses as an auditor is by consent of the instructor involved and is conditioned by the extent to which space is available. Permission to audit is ordinarily granted for lecture classes only. Auditors may not participate in class discussion or laboratory work, and their registration may be cancelled by the instructor of the course if attendance is not satisfactory.

To receive credit for an audited course, the student must register for the class for credit in a subsequent quarter.

Admission by the Board of Admissions

If, for some reason, the prospective student has not fulfilled all of the admission criteria, the Board of Admissions will consider his application on the basis of additional evidence. When, in the judgment of the Board of Admissions, he has a reasonable chance of success in the University, he may be admitted, provided the University can accommodate additional students, by special action of the Board with the understanding that he will comply with any conditions specified at the time of his acceptance.

ADMISSION PROCEDURE

Application

A request for an Application for Admission form and all correspondence regarding admission to any college or school of the University should be addressed to the University of Washington Office of Admissions, Schmitz Hall, Seattle, Washington 98105. The application form should be completed and the high school and/or college transcripts requested according to instructions on the form.

Tentative admission decisions can be made frequently on preliminary records with final acceptance contingent on satisfactory completion of work in progress. For this reason, applicants for admission with freshman standing are advised to file an application form and a preliminary transcript showing their record through the junior year of high school. Applicants for transfer from other colleges should file an application and preliminary transcripts at the beginning of their final term in the school where they are currently enrolled. In any case,

complete credentials must be filed prior to the following dates in order to be assured of consideration for admission in the quarter for which application is being made: June 1 for Autumn Quarter, November 1 for Winter Quarter, February 1 for Spring Quarter, May 1 for Summer Quarter.

The foregoing application deadlines do not apply to foreign students since students from foreign countries are admitted for the school year beginning in mid-September. (See "Admission of Foreign Students and Students Educated Abroad" which appeared earlier in this section.)

Notification of Admission Status

Applicants are notified officially of their admission status after complete credentials have been reviewed, and students accepted will also receive instructions regarding registration and the payment of fees. The University assumes no responsibility for students who do not comply with the procedures or observe the instructions in the registration leaflet, or for applicants who come to the campus before they have been officially notified of their admission.

The Notice of Admission is valid only for the quarter indicated and the qualifications of students whose enrollment is delayed are subject to re-evaluation. Applicants who wish to be considered for a subsequent quarter should request a renewal application form.

Retention of Records

The credentials of applicants who do not register for the quarter to which they have been admitted are normally retained in the Office of Admissions for a period of one year from the date of application. At the end of this time, credentials on file are discarded unless the applicant has notified the Office of his continued interest in attending the University or of his enrollment in Correspondence Study programs.

Credentials submitted to the Office of Admissions become the property of the University and may not be returned to the student or duplicated for any purpose.

Campus Visitation

The University encourages prospective students to visit the campus either singly or in groups. Arrangements should be made through the Office of New-Student Services at least one week prior to the date of the visit. Students who wish to visit the University and view its facilities on their own may request a copy of a tour booklet.

Visits may include one or all of the following: tours of the campus and specialized facilities, conferences

with pre-entrance counselors and departmental representatives, and visits to classes. Requests to visit classes should include specific information on the areas or classes desired. Students wishing to meet with departmental representatives should prepare themselves by having specific questions in mind.

Requests should be addressed to: University of Washington, Office of New-Student Services, Schmitz Hall, Seattle 98105.

Housing Reservations

Admission to the University does not assure assignment to living quarters and, therefore, housing arrangements must be made separately. Application for University residence halls may be made prior to acceptance for admission but not before February 15. Early application is encouraged. Application for housing for married students may also be submitted prior to admission but no earlier than nine months prior to actual enrollment.

Student Medical Examination

All new students, and former students who return following an absence of one calendar year, are required to submit a medical history and medical examination report, according to instructions appearing on the form, prior to registration. Forms for submitting the report are mailed to the applicant when the Notice of Admission is issued.

PRE-ENROLLMENT EXAMINATIONS AND TESTS

Most entering undergraduates will be required to take examinations for counseling and placement purposes at some time prior to their first registration. These examinations should be completed before the student meets with an adviser.

Examinations

Washington Pre-College Testing Program

The Washington Pre-College Test (WPCT) is used by advisers for guidance and counseling and in assigning students to appropriate sections in English and mathematics. Students attending high schools in the state of Washington are urged to take this examination during the spring of their junior year. A copy of the WPCT Data Report should be sent with the application form to the University of Washington Office of Admissions. Out-of-state students will take the test battery when they come to campus to register; it is not possible to arrange for the test to be taken elsewhere.

The WPCT is required of (1) all entering freshmen; (2) transfer students with fewer than 45 credits, exclu-

sive of physical education and military training; and (3) students entering the University with no acceptable transfer credits equivalent to Introductory English 101 and/or Intermediate Algebra 101, or Introduction to Logic (Philosophy 120). Foreign and blind students are exempt from the WPCT. Students over twenty-three years of age are generally exempt, but may be required by an adviser or department to take portions of the WPCT or other examinations for placement purposes.

Mathematics Placement Tests

Students who expect to take mathematics courses at the University are required to obtain a score of 55 or more on the Mathematics Achievement section of the Washington Pre-College Test or to complete Mathematics 101 (Intermediate Algebra). (Students entering the School of Nursing should consult their adviser about that School's basic mathematics proficiency requirement.) The Mathematics Achievement Test covers two and one-half years of high school algebra and geometry (three semesters of algebra, two semesters of geometry).

In regard to satisfying prerequisites for advanced mathematics courses, a score of 65 or higher in Mathematics Achievement exempts a student from College Algebra (Mathematics 105) and permits enrollment in Elements of Calculus (Mathematics 157) or Calculus with Analytic Geometry (Mathematics 124). If a student who has taken mathematics through trigonometry, mathematical analysis, or calculus in high school does not obtain a score of 65 and intends to take advanced mathematics at the University, he should take the Advanced Algebra Test to determine his appropriate level of placement. Anyone who earned a grade of C or better in high-school trigonometry will not be required to take a trigonometry test to be exempt from plane trigonometry (Mathematics 104). Any student whose test scores and previous work in mathematics suggest eligibility for advanced placement in calculus should take one or both parts of the Calculus Placement Tests.

Transfer students continuing mathematics sequences begun at other colleges normally continue with the next appropriate course without taking placement examinations, but should confer with an adviser before registration regarding proper placement.

On the basis of these examinations, an entering student can qualify for advanced placement or advanced placement and credit.

Freshman English Placement Test

The Washington Pre-College Test also evaluates the student's preparation in English, and he is initially placed in Introductory English (English 101 or 101H) according to his test scores.



Foreign Language Placement Examination

If a student is entering the College of Arts and Sciences, unless he is continuing language study begun at another college or university, he must take a placement examination *in the language studied in high school*. On the basis of the test, he may be awarded advanced placement or advanced placement and credit, or if he wishes to continue with that language, he will be placed at a level appropriate to his preparation.

Transfer students and nonmatriculated students who have taken college-level language courses should consult their advisers about appropriate courses if they wish to continue language study. Matriculated students and nonmatriculated students entering schools or colleges other than Arts and Sciences should take placement examinations if they intend to continue language study begun in high school.

Entering freshmen who take the Foreign Language Placement Examination during the spring testing program for Washington high school seniors are not required to engage in further language placement testing before registration.

Credit Examinations

To receive credit by examination in courses offered by the University, the regularly enrolled student is required to pass examinations on his independent study, work done by private study, or in class work for which no credit has been granted by an institution of either secondary or collegiate grade.

For rules governing the granting of credit by examinations, consult the section of this catalog which deals with *Rules and Regulations*.

Health Examinations

Prior to registration, the student entering University classes for the first time (disregarding previous attendance in Evening Classes or Summer Quarter), or returning after an absence of more than one calendar year, is required to submit a physician's report of a physical examination and a health history, and take a chest X ray.

The Health History and Medical Examination form, sent by the Office of Admissions to new students, and to returning former students by the Registrar, must be completed by the student and his physician and returned to the University before the specified deadline, since registration cannot be completed without medical clearance.

Chest X rays are given free of charge at the Hall Health Center before the student's registration date or on that day; but, this requirement must be met before clearance for registration will be given.

Foreign students (except Canadians) will be taken to Hall Health Center for the required physical examination and chest X ray when they arrive on campus.

Physical Education

All students must enroll in, and satisfactorily complete a physical education activity course each quarter for three quarters. Physical education courses do not count toward the all-University graduation requirement of 180 credits.

(a) Unless otherwise exempted, all first-quarter freshmen must enroll in one physical education activity each quarter for the first three quarters of residence.

(b) In fulfilling the foregoing requirement, all students must pass a swimming test or satisfactorily complete one quarter of swimming. No activity course may be repeated for credit.

(c) Any student for whom limited physical activity is recommended by his physician, or who has a marked physical handicap, should consult with the Student Health Service (Hall Health Center) for exemption or assignment to special courses with modified activity.

(d) Students enrolled in the activity courses are required (1) to furnish suitable clothing for the activity; (2) to pay the physical education fees for lockers, as well as towels (see section on *Fees and Charges*); and (3) to furnish all, or some, of the equipment in certain courses.

(See "Physical Education Requirements" under the *Rules and Regulations* section.)

HONORS

High scholastic achievement is encouraged and recognized in many ways at the University of Washington. A major effort is made to place the student at an academic level in keeping with his ability and preparation.

Honors programs are available to academically talented students in the College of Arts and Sciences, the College of Forest Resources, the School of Business Administration, and the College of Engineering. (See appropriate sections for details.)

Special Honors Sections

Some colleges provide special courses and special sections of other courses for the unusually talented. Though primarily intended for those enrolled in formal honors programs, some sections are open to other qualified students. For example, students who place high on qualifying tests may enroll in honors sections of English composition and mathematics.

Quarterly Scholarship Lists

These lists include the names of regular undergraduate students who have attained a grade-point average, non-cumulative, of 3.50 in the final grades for at least 12 graded hours exclusive of pass/fail courses, and of lower-division physical education activity and lower-division ROTC courses.

Yearly Undergraduate Honors List

Names of all undergraduates who have achieved a cumulative grade-point average of 3.50 or better for at least 36 graded hours of resident instruction in three quarters or 46 graded hours of resident instruction in four quarters at the University of Washington during the preceding academic year, exclusive of pass/fail courses, lower-division physical education activity, and lower-division ROTC courses, are included on this list.

Certificates of High Scholarship

The University of Washington awards certificates of high scholarship to sophomores, juniors, and seniors who show excellence in scholarship during their freshman, sophomore, and junior years, respectively. These are presented each spring at the AMS-AWS Scholarship Banquet.

Sophomore Medal

Annually, the junior having the highest scholastic standing for the first two years of his program receives this medal from the President at the Scholarship Banquet.

Junior Medal

This award is presented annually by the President at the AMS-AWS Banquet to the senior having the highest scholastic standing for the first three years of his University program.

Baccalaureate and College Honors

Baccalaureate honors (*summa cum laude*, *magna cum laude*, *cum laude*) are awarded to recipients of a first bachelor's degree. These honors are based on the student's entire scholastic record. Transfer students must have completed at least 90 credits at the University of Washington.

Students successfully completing the College of Arts and Sciences Honors Program or the College of Engineering Honors Program are awarded a bachelor's degree "With College Honors" in the major field. Arts and Sciences students completing the honors curriculum in a single department are graduated "With Distinction" in the major field.

Graduation honors, which are awarded once a year, appear in the *Commencement Program*, are inscribed on the student's diploma, and are recorded on his record.

President's Medal

Conferred at Commencement, the President's Medal recognizes the graduating senior who has the most distinguished academic record. A transfer student who has earned at least 90 credits at the University of Washington may be considered.

ENROLLMENT

If the entering student is relatively sure of his objectives, and has perhaps taken advantage of high school career days or received specialized vocational counseling, he enrolls in the college which offers the curriculum in which he intends to major.

If he wishes to pursue a preprofessional program (dental hygiene, dentistry, law, medical technology, medicine, occupational therapy, or physical therapy), he enrolls in the College of Arts and Sciences. Here the premajor program is designed to provide a coherent, broad, academic program. The student in this status can satisfy certain graduation requirements and, through the judicious choice of electives, explore possible majors.

The student who is undecided about his career and has not chosen a major will find special facilities available for his use.

He can make use of the Counseling Center, which provides career counseling in the areas of vocational and educational choice. This service is free of charge to any registered University of Washington student. In addition, the University Placement Office maintains a library of career information, and staff counselors are available to provide first-hand information concerning hiring trends in business and industry.

Survey courses, for both majors and nonmajors in various academic departments, can acquaint the student with a particular subject or area.

Graduate Enrollment

University of Washington students who are within 6 credits of completing their undergraduate work and who otherwise meet the requirements for admission to the Graduate School may register the quarter just prior to admission to the Graduate School for as many as 6 credits in graduate courses in addition to their 6 credits of undergraduate work. These arrangements must receive prior approval by the Graduate School.

Change of College or Major

As the student matures and gains experience, he may shift his goal accordingly. Recognizing this, the University imposes no conditions upon a student who wishes to transfer from one college or major to another,



provided he meets the qualifications of the major or college he wishes to enter.

The student who wishes to transfer from one college to another must obtain approval from the deans of the two colleges concerned. Forms for change of college can be obtained at the advisory office of the college the student is leaving.

To change majors within a college, the student should consult his academic adviser or the central advising office of his college.

Anyone considering a change of major or college is urged to discuss the matter thoroughly with his academic adviser and other knowledgeable persons.

ACADEMIC REQUIREMENTS

Credit Load

A full-time student at the University is expected to carry the normal number of 15 credits per quarter, exclusive of physical education activity courses and ROTC. If he carries 15 credits for each of the twelve quarters and passes them, he will have the minimum 180 credits necessary for graduation. In practice, students carry more or less than the usual number of credits, depending on personal circumstances and chosen programs.

In order to be eligible for participation in intercollegiate athletics, freshmen must carry at least 12 academic credits (including Physical Education Activity), and sophomores, juniors, and seniors must carry at least 12 academic credits (excluding physical education activity). In order to hold office in student governmental bodies, the student must carry a minimum of 10 credits each quarter.

Minimum Grade Points

The student is expected to maintain a reasonable level of academic performance consistent with University standards.

RESERVE OFFICERS TRAINING PROGRAMS

The Departments of Military Science, Naval Science, and Aerospace Studies offer ROTC programs under agreements between the University and the United States Army, Navy, and Air Force. Eligible male freshman students may enroll in any one of the ROTC programs. Transfer or currently enrolled students who plan to attend the University at least six more quarters (excluding summer sessions) may apply for enrollment in ROTC. Participation in ROTC is elective.

The Department of Military Science offers a traditional four-year, a modified three-year, and a special but limited two-year program each of which leads to a commission as a Second Lieutenant in the U.S. Army.

The primary program offered by the Department of Naval Science is a four-year program augmented by a limited two-year Advanced Contract Program. Both lead to a commission in the Navy or Marine Corps.

The Air Force program consists of a two-year General Military Course and a two-year Professional Officer Course, which lead to a commission as a Second Lieutenant in the United States Air Force. Any qualified male student may enroll in the General Military Course. Each qualified entering male freshman may register for Air Force ROTC and will be enrolled in the four-year program. Students to be given financial assistance will be advised accordingly. Transfer students having eleven or more quarters remaining in school may also enroll in the four-year program. Transfer students with at least two full years remaining in school may apply for the two-year non-grant program. AFROTC counselors are available at all times in the Aerospace Studies Department.

Students given financial assistance and entering the advanced or upper-division ROTC program must agree in writing to complete the program and accept a commission in the service for which they are educated.

The specific courses and requirements for each service are described in the following sections. The courses are taught by regular officers assigned to the University by the Army, Navy, and Air Force.

Air Force

Professor of Aerospace Studies
Col. John T. Burke, USAF
Physics Annex 3

Assistant Professors

Cleo L. Hill, Jr., Russell A. Ambroziak, Larry W. Slessler

The Air Force ROTC program is designed to provide for the development of skills and attitudes vital to the career professional Air Force officer. The graduate qualifies for a commission and enters upon active duty in the United States Air Force.

The four-year Air Force ROTC program consists of a two-year General Military Course, and a two-year Professional Officer Course. Any qualified male student may enroll in the General Military Course. This program consists of one classroom hour and one Corps Training hour per week during the freshman and sophomore years. Uniforms and textbooks are furnished.

After completing the General Military Course, cadets must apply for entrance to the Professional Officer Course. Entrance is competitive.

Cadets selected for enrollment in the Professional Officer Course are enlisted in the Air Force Reserve, receive subsistence pay of \$50.00 per month. They are furnished texts and uniforms, and are required to attend three class periods and one Corps Training hour each week. Between the junior and senior year, each cadet is required to attend a four-week Field Training Course at an Air Force base, for which he receives pay. Travel costs are paid by the Air Force.

Financial Assistance Grant Program

Each year a number of selected cadets in the four-year program are awarded Air Force Financial Assistance Grants. These cadets are enlisted in the Air Force Reserve and receive tuition, fees, books, uniforms, and \$50.00 subsistence per month. Course requirements are as described above.

Two-Year Air Force ROTC Program

To provide for those students who are unable to participate in the four-year Air Force ROTC program, a two-year Professional Officer Course is available on a competitive basis. Students in this program are required to attend a six-week Field Training Course at an Air Force base during the summer preceding entry into this program. The student is paid during the six-week period. Course requirements, upon return to the campus, are as listed for the Professional Officer Course except that the four-week Field Training Course between the junior and senior year is not required. Uniform, texts, and \$50.00 subsistence per month are provided.

Flight Training

Flight training is available to physically qualified cadets during their senior year. The Air Force pays the costs incident to this training. Successful completion results in a private pilot's license and further flight training after being commissioned, leading finally to becoming an Air Force pilot.

Inquiries about enrollment or other information should be addressed to the University of Washington, Professor of Aerospace Studies, Physics Annex 3, Seattle, Washington 98105.

Military Science

Professor of Military Science
Col. James H. Cawthra
149 Savery Hall

Assistant Professors

Kenneth D. Cooper, Rene J. Emond, Paul R. Kringle, Howard T. Nixon, Gary L. Paxton, William W. Sherrill, Paul J. Sousa

The Department of Military Science offers the college student five elective options, through Army ROTC, for the attainment of an army officer's commission while pursuing the academic degree of his choice.

Traditional Four-Year Program

Open to incoming freshman students, this program leads to a commission in either the Regular Army or the Army Reserve. Academic studies include courses in military history and tactics, principles of leadership, techniques of instruction, management and staff procedures, logistics, and military law. All military textbooks and uniform items, plus a subsistence allowance during the junior and senior years of \$50.00 per month for a maximum of 20 months, are provided by the U.S. Army. Four years of academic study on campus are required, as well as a six-week summer camp training period between the junior and senior years, for which the cadet is paid for both his time at camp and travel expenses to and from the camp location. The program is divided into two courses: the Basic (first and second years) and the Advanced (third and fourth years). Enrollment in the Advanced Course requires selection by the Professor of Military Science. A student chosen for the Advanced Course must sign a contract (with the consent of parents, if under twenty-one years of age) wherein he agrees to complete the course, enlist in the Army Reserve, accept a commission, if offered, and serve on active duty for a period of two years after commissioning.

Modified Three-Year Program

This program is open to students of sophomore standing. The program is the same as that for the Four-Year Program, except the basic course (first and second years) is compressed into one year. It is primarily for students who attend another school during their first year.

Special Two-Year Program

This program is open to upper-division students presently enrolled at the University or to upper-division transfer students from colleges where ROTC was not available. This program requires attendance at a Basic Summer Camp for six weeks between the sophomore and junior years in lieu of the basic (first and second years) course. The student receives pay while at camp, plus travel pay to and from the camp location. Academic subjects covered in the Two-Year Program are the same as those covered in the Advanced Course of the Four-Year Program. The obligations are the same in both programs.

Two-Year Scholarship Program

This program is open to sophomore students enrolled in the basic course. Selection will be made on a local



level by the Professor of Military Science. The Two-Year Scholarship Program provides financial assistance during the Advanced Course (third and fourth years). Each scholarship pays for tuition, books, and laboratory expenses and provides, in addition, \$50.00 per month. All other advantages and obligations are the same as for the Four-Year Scholarship Program.

Four-Year Scholarship Program

Applications for this program should be made while the student is still in high school. Selection of students is made on a nation-wide competitive basis. This program leads to a commission in the Regular Army or the Army Reserve. All tuition, laboratory fees, textbooks, and uniform items, plus retainer pay of \$50.00 per month for a maximum of four years, are provided by the U.S. Army. Four years of academic study on campus are required, as well as a six-week summer camp training period between the junior and senior years, for which the cadet is paid for both his time and travel expense to and from the camp location. Academic studies are identical to those of the traditional Four-Year Program. The student must sign a contract (with the consent of parents, if under twenty-one years of age), wherein he agrees to complete the program, enlist in the Army Reserve, accept a commission, if offered, and serve on active duty for four years after commissioning.

Flight Training

Flight training is available to interested cadets after completion of the first year of the advanced course. Successful completion of this training may lead to a private pilot's license and assignment as an Army aviator.

Students in the basic program are provided uniforms which are turned in at the completion of the basic course. Students in the advanced program are provided new uniforms which become their personal property when commissioned. Uniforms are worn at all Leadership Laboratory classes and when otherwise specified. At the time of registration all students, except those on scholarships, must make a \$25.00 deposit, which is refunded when the uniform and textbooks are returned undamaged.

Inquiries about enrollment or other information should be addressed to the University of Washington, Professor of Military Science, 149 Savary Hall, Seattle, Washington 98105.

Naval Science

Professor of Naval Science

Capt. Richard B. McNees, USN
309 Clark Hall

Associate Professor

Lt. Col. Robert G. Williams, USMC
303 Clark Hall

Assistant Professors

Donald G. Austin, James H. Dynes, Myron P. Gray,
Weston G. Moir, Carter P. Swenson

The Department of Naval Science offers college students the opportunity to engage in study leading to a commission in the United States Navy or Marine Corps while working toward a baccalaureate degree in an academic field. Three programs are offered.

Naval ROTC Contract Program

Just prior to the beginning of Autumn Quarter each year, the Professor of Naval Science selects approximately fifty students to enter the four-year Naval ROTC Contract Program.

Contract Naval ROTC students must agree to complete the four-year course, to accept a commission in the U.S. Naval Reserve or U.S. Marine Corps Reserve if offered, and to serve on active duty for a period of three years.

Naval ROTC students must have the following general qualifications:

- (1) Be admitted to the University.
- (2) Be male citizens of the United States between the ages of seventeen and twenty-one on June 30 of the year of entrance.
- (3) Meet physical requirements.

Naval ROTC Two-Year Contract Program

Early in the Spring Quarter each year, male students completing their sophomore year (or third year in an established five-year curriculum) in an accredited college or junior college or graduate students who have two years remaining to obtain their advanced degrees, who are enrolled in or accepted for enrollment in the University of Washington, may apply for the two-year Naval ROTC Contract Program. Contract requirements and other qualifications are generally similar to those required of candidates for the four-year Contract Program except that the age limits are eighteen to not more than twenty-two years of age on June 30 of the year of entrance. Quotas for this program are extremely limited.

Applicants selected for the two-year NROTC Contract Program will be required to attend a six-week Naval Science Institute at a designated NROTC University, not necessarily the University of Washington, during the summer prior to entrance into the Program. The costs incident to attendance at the Institute are defrayed by the Navy. Upon successful completion of

the course of instruction at the Institute the students may be enrolled in the junior year of the standard Naval ROTC Contract Program.

Both two- and four-year NROTC Contract students pay their own college expenses but receive subsistence pay of \$50.00 per month during their junior and senior years, including the intervening summer. The Navy furnishes the uniforms and textbooks used in Naval Science courses.

NROTC Contract students may be enrolled in any University curriculum leading to the receipt of a baccalaureate or advanced degree.

Two periods of summer training of approximately six weeks' duration are part of the contract NROTC program.

Naval ROTC Regular Program (Midshipmen, USNR)

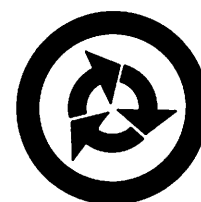
Each year a limited number of young men are accepted for the four-year Naval ROTC Regular Program, following nation-wide examination and selection by a state selection committee. They are appointed as Midshipmen, USNR, and are provided a four-year college edu-

cation subsidy by the Navy as well as all tuition, fees, textbooks, uniforms, and \$50.00 per month subsistence pay. Upon graduation, Midshipmen, USNR, are commissioned as regular officers in the United States Navy or Marine Corps.

Application must be made in November for entrance into the program the following autumn. Qualifications are, in general, as listed above for the four-year Naval ROTC Contract Program.

All Naval ROTC students take the same naval science courses during the first two years. Two-year Naval ROTC Contract students complete the same curriculum in an intensified manner during their summer session at the Naval Science Institute. Students who plan to be commissioned in the Marine Corps take Marine Corps subjects as Naval Science during their third and fourth years.

Further information about the regular Naval ROTC Programs may be obtained by writing the University of Washington, Professor of Naval Science, Clark Hall, Seattle, Washington 98105, or by visiting the NROTC Unit on campus.



GRADUATE STUDY THE GRADUATE SCHOOL AND RESEARCH

Officers of the Graduate School

Joseph L. McCarthy, Ph.D.
Dean of the Graduate School

Thelma T. Kennedy, Ph.D.
Associate Dean of the Graduate School

R. W. Moulton, Ph.D.
Associate Dean of the Graduate School

Morgan D. Thomas, Ph.D.
Associate Dean of the Graduate School

Henrietta Wilson, M. A.
Special Assistant

Herman McKinney, M.S.W.
Assistant to the Dean

James D. Linse, B.A.
Administrator

Executive Committee of the Graduate School

Joseph L. McCarthy, *Chairman*

R. D. Stevick, *Group I*

G. Kechley, *Group II*

M. N. McDermott, *Group III*

R. Warren, *Group IV*

F. E. Kast, *Group V*

T. F. Archbold, *Group VI*

J. W. Prothero, *Group VII*

A. C. Huitric, *Group VIII*

Graduate Faculty Council and Group Operating Committees

(The combined membership of the eight Group Operating Committees comprises the Graduate Faculty Council—Joseph L. McCarthy, *Chairman*)

Group I

G. Baumgaertel, L. H. Legters, J. B. McDiarmid,
R. D. Stevick (*Chairman*), F. J. Warnke

Group II

B. Baskerville, G. A. Falls, N. J. Johnston, G. Kechley
(*Chairman*), S. Moseley

Group III

A. G. Anderson, A. Gorbman, J. P. Jans, M. N.
McDermott (*Chairman*), R. J. Reed

Group IV

P. Dietrichson, A. L. Edwards, S. Ottenberg, D. W.
Treadgold, R. Warren (*Chairman*)

Group V

D. F. Henderson, F. E. Kast (*Chairman*), J. E. Kittel, R. W. Little, G. G. Mueller

Group VI

T. F. Archbold (*Chairman*), I. M. Fyfe, A. H. Mattock, M. A. Robkin, D. R. M. Scott

Group VII

E. W. Davie, A. M. Gordon, N. B. Groman, D. E. Kelley, J. W. Prothero (*Chairman*)

Group VIII

M. R. Broer, J. A. Goodman, K. J. Hoffman, A. C. Huitric (*Chairman*), P. J. Keller

GRADUATE STUDY

Graduate study has been offered at the University of Washington for three-quarters of a century. Over the years it has grown steadily in quality, scope, and size.

The Graduate School, which was formally established in 1911, is administratively responsible for graduate study in whatever division of the University such study is undertaken. This involves supervision of student programs that go beyond formal undergraduate work or the work of the professional schools, into areas of advanced training, education, research, and scholarship.

Programs leading to master's and doctor's degrees are offered in seventy-six departments or other organizational units within twelve schools and colleges of the University. Graduate instruction and the supervision of the research of graduate students are conducted by a Graduate Faculty of more than eleven hundred senior professors. About sixty-seven hundred graduate students are now in residence, seeking their master's or doctor's degrees in the Graduate School at the University of Washington. There are, in addition, some three hundred postdoctoral students in residence.

In addition to its primary role in relation to graduate students, graduate faculty, and graduate study programs and degrees, the Graduate School is also responsible for the administration of certain academic or research activities and facilities of general significance in all or many fields of knowledge throughout the University. The Graduate School is administered through the Office of the Dean, the Executive Committee of the Graduate School, Group Operating Committees, and the Graduate Faculty Council. The Graduate Faculty Council is composed of representatives elected to eight Group Operating Committees by the members of the graduate faculty, and it and the Executive Committee of the Graduate School serve as the legislative and policy-making bodies of the graduate faculty. The Executive Committee consists of the Dean of the Graduate School

and the elected chairman of each of the eight group Operating Committees; it acts as an advisory Group to the Dean and as an administrative committee for the Graduate Faculty Council.

The University of Washington Graduate School recognizes major responsibilities in three closely related fields: teaching, research, and public service.

Highly able students who have completed baccalaureate programs are offered the opportunity to further improve their knowledge, understanding, and ability to create and to practice in their chosen fields. Their achievements may be recognized by the award of the master's degree at the end of one or two years of study, or the doctor's degree at the end of three or more years of study. Students who have completed advanced degree programs usually serve as teachers, research or administrative leaders, or professional practitioners in their respective fields.

In contrast with undergraduate work, graduate study is ordinarily focused quite sharply on some specific field, and the student is expected to develop and demonstrate substantial initiative, mature judgment, and creativeness. Often the graduate student carries on his program in close association with his chosen professor in a tutorial-type relationship.

Many diverse programs of graduate study are available. In nearly all of these, two objectives can be distinguished, although their relative importance may differ. In many programs particular emphasis is placed on leading the student to excellence in his ability to teach and to create new knowledge by research; his achievements are recognized by the award of the Master of Arts, Master of Arts for Teachers, or the Master of Science degree, or the Doctor of Philosophy degree. In other programs emphasis is placed on leading the student to excellence in his ability to practice the art of his field or profession; in these cases his achievements are recognized by the award of a more specifically designated degree, such as Master of Nursing or Master of Science in Electrical Engineering or of Doctor of Education.

A program of graduate study normally includes advanced class work and lectures but is particularly characterized by the independent study and research that the graduate student is expected to conduct. The results of this independent study and research are set forth in a master's thesis or a doctoral dissertation. A master's thesis is a modest contribution to knowledge, or a review or a report on knowledge, or a design, or a composition in the student's field. A doctoral dissertation should set forth a significant contribution to knowledge in the student's field; should be presented in



scholarly form; and should demonstrate that he is now competent to conduct reliable, important, and independent research.

The Graduate School is concerned basically with the fundamental and applied research activities conducted throughout the University, and endeavors to assist in the development of arrangements, funds, and facilities needed to encourage and support the research activities of the professors, students, and other scholars and scientists engaged in investigational work. The Graduate School is also concerned with the maintenance and steady improvement of the public service provided by the University to the state, the region, and the nation. The Graduate School is especially interested in furthering research cooperation with other institutions and with business and industry.

The primary contributions from the University's Graduate School to the community are to be found in those students who have achieved high levels of competence as evidenced by their completion of programs of advanced study, and in the significant research results obtained by these students, their professors, and other scholars and scientists associated with the University.

The Graduate Programs and Graduate Degree Policies

Graduate programs leading to master's and/or doctor's degrees are offered in seventy-six departments or other organizational units of the University and the names of these programs, the graduate degrees offered, and the names of the Graduate Program Advisers are given in this catalog.

The Graduate Program Adviser

The graduate student is guided in his initial work at the University by the Graduate Program Adviser in his field. This adviser is a senior member of the faculty who provides or arranges for the provision of responsible advice, guidance, and assistance to students working for advanced degrees in the program or programs offered by the faculty in his department, school, or University unit. He maintains close familiarity with policies and procedures in the Graduate School and provides overall coordination for the activities within his department. In his absence, these responsibilities are carried by an Alternate Program Adviser.

Courses for Graduate Students

Courses numbered 500 and above are intended for and restricted to graduate students. Some courses numbered in the 300's and 400's are open both to graduates and to upper-division undergraduates. Such courses, when acceptable to the Supervisory Committee and the Graduate Dean, may be part of the graduate program. The Graduate School accepts credit in approved 300-level

courses for the minor or supporting fields only; approved 400-level courses are accepted as part of the major.

Undergraduate students of senior standing who wish to register for a 500-level course must obtain permission from both the instructor of the class and the Dean of the Graduate School.

Pass/Fail Grading for Graduate Students

The following procedures were established, beginning with registration for Spring Quarter 1969, to encourage graduate students to take courses in a field of interest offered outside their major academic units and to provide maximum flexibility in grading for graduate students who have achieved Candidate status.

Pass/Fail Grading at the Student's Option

1. With the approval of his Graduate Program Adviser or Supervisory Committee Chairman, a graduate student may elect to take any course for which he is eligible offered outside of his major academic unit on the pass/fail system (S,E). The major academic unit is that unit which is authorized to offer graduate degree programs (e.g., Department of History, School of Music, College of Fisheries, Biomathematics Group). In the case of interdisciplinary groups in the Graduate School (e.g., Biomathematics, Drama Arts, Comparative Literature), the faculty of each group will define which courses comprise the major field of the graduate students formally identified with that group.
2. With the approval of their Supervisory Committee Chairman, graduate students who have achieved Candidate status may elect to take any course for which they are eligible on the pass/fail system, beginning the quarter after they become Candidates.
3. For courses in which graduate students elect pass/fail grading, the instructor will record and submit a letter grade (A,B,C,D,E) to the Registrar at the end of the quarter. The Registrar will routinely convert passing letter grades (A,B,C,D) to S for students enrolled on the pass/fail system.
4. Students must indicate at the time of registration whether they wish to take particular courses on the pass/fail system. Students will not be permitted to change their registration from pass/fail to the letter system, nor vice versa, after the normal change of registration period. Once an S grade is given, it may not later be changed except in the case of instructor error.
5. Students may not take courses on the pass/fail system if a letter grade is required in these courses for professional certification (e.g., courses in the College of Education taken for teacher certification).

Graduate Degree Programs Offered and Names of Graduate Program Advisers

Field	Graduate Degrees	Graduate Program Adviser	Alternate Graduate Program Adviser
Aeronautics and Astronautics	M.S.A.&A., M.A.&A., M.S.E., Ph.D.	E. H. Dill	R. J. Bollard
Anthropology	M.A., Ph.D.	Kenneth E. Read	Isabel S. Caro
Architecture	M.Arch.	R. Alden	G. Hildebrand
Art	M.A., M.F.A., M.A.T.	Wendell Brazeau	C. L. Hafermehl
Art History	Ph.D.	M. Rogers	C. Christofides
Asian Languages and Literature	M.A., Ph.D.	T. V. Wylie	G. Beckmann
Asian Studies	M.A.	J. Dull	K. H. Bohm
Astronomy	M.S., Ph.D.	G. Wallerstein	James R. Holton
Atmospheric Sciences	M.S., Ph.D.	R. G. Fleagle	M. P. Gordon
Biochemistry	M.S., Ph.D.	D. R. Morris	R. J. Blandau
Biological Structure	M.S., Ph.D.	J. W. Prothero	R. Olstad
Biology	M.A.T.	I. D. Olsen	Douglas G. Chapman
Biomathematics	M.S., Ph.D.	E. B. Perrin	
Biomedical History	M.A.	C. Bodemer	
Botany	M.S., Ph.D.	Richard B. Walker	H. W. Blaser
Business Administration	M.A., M.B.A., D.B.A.	B. O. Saxberg	D. L. McDonald
Chemical Engineering	M.S.Ch.E., M.S.E., Ph.D.	R. W. Moulton	C. A. Sleicher, Jr.
Chemistry	M.S., M.A.T., Ph.D.	Verner Schomaker	B. Rabinovich
Civil Engineering	M.S., M.S.C.E., M.S.E., Ph.D.	B. J. Hartz	H. P. Mittet
Classics	M.A., Ph.D.	J. B. McDiarmid	W. C. Grummel
Communications	M.A., M.C., Ph.D.	R. F. Carter	M. Samuelson
Comparative Literature	M.A., Ph.D.	F. Jones	E. Behler
Comparative Physiology	M.S., Ph.D.	A. W. Martin	A. L. Towe
Computer Science	M.S., Ph.D.	D. Dekker	H. Golde
Dentistry	M.S.Den., M.S.	Saul Schluger	A. W. Moore
Drama	M.A.	Gregory A. Falls	J. R. Crider
Drama Arts	Ph.D.	Gregory A. Falls	R. B. Loper
Economics	M.A., Ph.D.	E. Silberberg	J. E. Floyd
Education	M.A., M.Ed., Ed.D., Ph.D.	R. G. Olstad	Frederic T. Giles
Electrical Engineering	M.S.E.E., M.E.E., M.S.E., Ph.D.	R. Bergseth	R. N. Clark
English	M.A., M.A.T., Ph.D.	R. D. Stevick	E. Alexander
Fisheries	M.S., Ph.D.	R. Van Cleve	A. C. DeLacy
Forest Resources	M.S., M.F.R., Ph.D.	R. D. Taber	Stanley P. Gessel
Genetics	M.S., Ph.D.	H. L. Roman	W. L. Fangman
Geography	M.A., Ph.D.	G. H. Kakiuchi	J. C. Sherman
Geological Sciences	M.S., Ph.D.	E. S. Cheney	R. L. Gresens
Geophysics	M.S., Ph.D.	R. Crosson	
Germanic Languages and Literature	M.A., Ph.D.	E. Loeb	F. von Kries
History	M.A., Ph.D.	G. Griffiths	D. H. Pinkney
Home Economics	M.A., M.S., M.A.H.Ec., M.S.H.Ec.	Mary L. Johnson	Florence T. Hall
Law	L.L.M., M.C.L., Ph.D.	W. L. Shattuck	D. F. Henderson
Librarianship	M.Lib., M.Law Lib.	Irving Lieberman	L. D. Bevis
Linguistics	M.A., Ph.D.	Sol Saporta	H. Contreras
Mathematics	M.A., M.S., M.S. Math.Stat., M.A.T., Ph.D.	C. R. Hobby	R. T. Moore
Mechanical Engineering	M.S.M.E., M.S.E., Ph.D.	E. E. Day	D. E. McFeron
Microbiology	M.S., Ph.D.	Howard C. Douglas	E. Nester
Mining, Metallurgical, and Ceramic Engineering	M.S.Min.E., M.S.Met.E., M.S.Met., M.S.Cer.E., M.S.Cer., M.S.E., Ph.D.	D. H. Polonis	D. L. Anderson,
Music	M.A., M.A.T., M.Mus., D.Mus.Arts, Ph.D.	J. T. Moore	J. Verrall
Near Eastern Studies	M.A.	F. J. Ziadeh	N. L. Heer
Nuclear Engineering	M.S.E., Ph.D.	Albert L. Babb	K. L. Garlid
Nursing	M.A., M.Nur.	Edith Metz	Katherine J. Hoffman
Oceanography	M.S., Ph.D.	L. K. Coachman	J. C. Lewin
Pathology	M.S., Ph.D.	E. A. Smuckler	R. E. Bulger
Pharmacology	M.S., Ph.D.	Akira Horita	J. M. Dille
Pharmacy	M.S., Ph.D.	Jack E. Orr	A. C. Huitric
Philosophy	M.A., Ph.D.	J. Mish'alani	J. F. Boler
Physical and Health Education (Men)	M.S., M.S.Phy.Ed.	G. S. Reeves	J. A. Torney, Jr.
Physical and Health Education (Women)	M.S., M.S.Phy.Ed.	Ruth M. Wilson	R. Abernathy
Physical Medicine and Rehabilitation	M.S., M.Occup. Therapy	J. F. Lehmann	W. E. Fordyce
Physics	M.S., Ph.D.	D. Bodansky	R. L. Ingalls
Physiology and Biophysics	M.S., Ph.D.	Julia G. Skahen	H. D. Patton
Physiology Psychology	Ph.D.	M. H. Smith, Jr.	E. S. Luschei
Political Science	M.A., Ph.D.	C. W. Cassinelli	D. W. Minar
Preventive Medicine	M.S.Prev.Med., Ph.D.	J. T. Grayston	R. P. Beasley
Psychology	M.S., Ph.D.	R. C. Bolles	E. Stotland
Public Affairs	M.Pub.Admin.	Brewster C. Denny	
Radiological Sciences	M.S.Rad.Sci.	Kenneth Jackson	G. Christensen
Romance Languages and Literature	M.A., Ph.D.	E. Kern	M. Penuelas
Russian and East European Studies	M.A.	E. H. Swayze	W. A. D. Jackson
Scandinavian Languages and Literature	M.A., Ph.D.	Walter Johnson	S. Arestad
Slavic Languages and Literature	M.A., Ph.D.	L. Micklesen	E. H. Swayze
Social Work	M.Soc.Wk.	C. J. MacDonald	
Sociology	M.A., Ph.D.	S. Miyamoto	E. T. Barth
Speech	M.A., M.Sp.Path.&Aud., Ph.D.	T. R. Nilsen	P. A. Yantis
Surgery	M.S.	David H. Dillard	L. C. Wintersheid
Urban Planning	M.UrbanPlan., Ph.D.	T. J. Norton	H. C. Hightower
Zoology	M.S., Ph.D.	R. T. Paine	D. S. Farnar



Pass/Fail Grading at the Instructor's Option

6. Any 500-level course may be graded on the pass/fail system at the instructor's option after consultation with appropriate officers of his academic unit. If such option is elected, *the decision should be made prior to the time of registration and noted on time schedule work sheets*. When such option is elected, the instructor will submit a pass/fail grade to the Registrar for each student in the class at the end of the quarter. The letter system and the pass/fail system should not be mixed in the same class at the instructor's option.

Pass/Fail Grading and Use of the N Grade for 600 (Independent Study or Research) and 700 (Thesis or Dissertation) Enrollments

7. It is recommended that Supervisory Committee Chairmen and instructors assign pass/fail system grades for 600 (Independent Study or Research) and 700 (Thesis or Dissertation) enrollments, except when a series of course registrations from quarter to quarter is involved.

8. When a series of 600- or 700-course registrations from quarter to quarter is involved, an N grade should be given. The N grade signifies that satisfactory progress is apparently being made. N grades should continue to be given until the research, thesis, or dissertation is satisfactorily finished, or until sponsorship of the graduate student has been withdrawn by formal action through the Graduate School. Then the N grade or grades should be changed to the appropriate grade in the pass/fail system.

9. In special circumstances, as determined by the Supervisory Committee Chairman or instructor, the final grade for 600 and 700 enrollments may be in the letter system.

10. Regardless of the grading system used, grades given for 600 (Independent Study or Research) and 700 (Thesis or Dissertation) enrollments will not be considered in computing a student's grade-point average.

Computation of Grade-Point Averages

11. In computing a student's grade-point average, letter system grades (and E grades obtained on the pass/fail system) are considered for 300-, 400-, and 500-level courses. However, S and N grades are not considered, nor are letter system grades (nor E grades obtained on the pass/fail system) for 100- and 200-level courses, nor for 600 (Independent Study or Research) and 700 (Thesis or Dissertation) enrollments.

Right to Petition

12. When an individual situation appears to warrant modification of these procedures, the student should prepare an appropriate petition addressed to the Dean of the Graduate School, and transmit it for comment

and/or recommendation to his Graduate Program Adviser or Supervisory Committee Chairman.

Scholarship

To be eligible for a degree in the Graduate School, a student must have an average of B (3.00) in *all* courses numbered 300 and above. Students whose work is not of approved quality may be asked by the Dean of the Graduate School to withdraw. On the Quarterly Grade Report and on each student's permanent transcript, all courses numbered 100 through 700, with the grades earned, are listed. However, *grade points* are *not* extended for 100- and 200-level courses and such courses are *not* included in quarter or cumulative grade-point averages. In computing a student's grade-point average, letter system grades (and E grades obtained on the pass/fail system) are considered for 300-, 400-, and 500-level courses. However, S and N grades are not considered, nor are letter system grades (nor E grades obtained on the pass/fail system) for 100- and 200-level courses, nor for 600 (Independent Study or Research) and 700 (Thesis or Dissertation) enrollments.

Language Competence Requirements and Examinations

Communication by use of languages and in other ways is basically important in scholarly work and research. Thus it is expected that each student admitted to the Graduate School has achieved superior competence in the English language; for students coming from non-English speaking countries, this competence is specifically tested.

Competence in languages other than English is also expected by the Graduate Faculty in most graduate degree programs. Statements concerning the language requirements follow:

1. *As a minimum*, aspirants for the degrees of Doctor of Philosophy, Master of Arts, and Master of Science must demonstrate reading competence in at least *one* foreign language that, in the opinion of the faculty of the department or academic unit offering the graduate program, is important in the graduate student's field of scholarship.

2. The faculty in a particular graduate academic unit may require, for graduate programs in that unit, competence in an additional language or languages, and/or other special language proficiency.

3. For graduate degree programs other than those leading to the Ph.D., M.A., or M.S., foreign language competence requirements are those established by the Graduate Faculty in the unit offering the program and reported to the Dean of the Graduate School.

Each student should consult with the Graduate Program Adviser in the department or academic unit of his grad-

uate study for information and advice about the foreign language competence required for his program.

To provide for satisfaction of language competence requirements for advanced degrees, the University uses the Educational Testing Service standardized examination in French, German, Russian, and Spanish. These standardized examinations will be given five times yearly at the University and at about 200 other ETS Centers throughout the United States and Canada. *Students are urged to acquire and use foreign language competence as undergraduates or as early as possible in their graduate career. The ETS examination may be written and passed by undergraduates who are urged to establish their foreign language competence before entering the Graduate School.*

For languages other than French, German, Russian, and Spanish, foreign language examinations will be given in Seattle at the University on the day prior to the ETS examinations.

Residence

The residence requirement for the master's degree is one year (three full-time quarters). For the doctor's degree it is three years, two of them at the University of Washington, and one of the two years must be spent in continuous full-time residence (three out of four consecutive quarters). The residence requirement for the doctor's degree cannot be met solely with summer study.

A full quarter of residence is granted for any quarter in which at least 9 credits in graduate course, research, thesis or dissertation work are acceptably completed.

Residence credit for students carrying less than 9 credits per quarter is figured on the basis of a total of 12 credits or more for the part-time quarters, *combined* to make a full residence quarter equivalent.

Only courses numbered 400, 500, and 600 can be applied to residence and course credit in the major field for advanced degrees. Courses numbered 300 are not applicable to residence or course credit toward advanced degrees except when applied by permission toward the graduate minor or supporting courses. Courses numbered below 300 are not applicable to residence or course credit for advanced degrees.

Final Quarter Registration

A student must be registered as a full-time or part-time student at the University during the quarter the master's or doctor's degree is to be conferred, with the exceptions listed below.

1. A student who has been approved for the Tentative Degree List for a particular quarter but who does not

complete the requirements by the published deadlines (two weeks prior to the end of the quarter), but who does complete all the requirements by the last day of that quarter, receives the degree the following quarter without further registration.

2. A student who has been approved for the Tentative Degree List for a particular quarter, who has completed all requirements for the degree, including the Final Examination, by the last day of a quarter in which he is registered as a full-time or part-time student, and who turns in his thesis or dissertation at the Graduate School Office before the first day of the immediately following quarter, will receive the degree the following quarter without further registration. This would apply also to the nonthesis student who may remove an Incomplete before the first day of the immediately following quarter.

3. A student who has completed all requirements for the degree, including the thesis or dissertation and the Final Examination, during the quarter in which he is registered as a full-time or a part-time student, but who for some reason, i.e., required revisions, delay in final typing, etc., delays turning in his thesis or dissertation until some later quarter, may fill out in the Graduate School Office a petition card requesting to receive the degree that quarter without registration. If it can be verified that all of the requirements were indeed completed during the quarter he was duly registered, and if he has maintained continuous enrollment, the student will receive the degree the quarter of the petition without further registration.

Continuous Enrollment

A graduate student, from the time of his first enrollment in the Graduate School of the University of Washington, is required to enroll and be registered each quarter, including Summer Quarter, until the completion of all requirements for the graduate degree for which he is working, including the filing of the thesis or dissertation, the passing of the master's or doctor's final examination, and the awarding of the degree. A graduate student must be enrolled and registered as a full-time student or as a part-time student, or enrolled as an on-leave student. Registration for extension or correspondence courses at the University does not satisfy the continuous enrollment requirement. Failure to maintain continuous enrollment as a full-time, a part-time, or an on-leave student will be taken by the University to signify the student's resignation from the Graduate School. Should he later wish to resume his studies, he must file an application for readmission to the Graduate School in person or by mail, in accordance with the regularly published deadlines for the quarter, and must register during the usual registration



period. If he has attended any other institution during the period when he was not registered at the University of Washington, official transcripts in duplicate of his work must be submitted. An application for readmission will carry no preference and will be treated in the same manner as an application for initial admission, including the requirement of payment of the \$5.00 application fee.

A student must be registered as a regular full-time or part-time student at the University for the quarter in which the degree is conferred. (See "Final Quarter Registration" information.)

If a graduate student is enrolled and registered as a full-time student or a part-time student, he pays the usual fees and is ordinarily engaged in course and/or research work on the campus as a regular student supervised by the Graduate Program Adviser or his representative in his field, or by the chairman of his Supervisory Committee.

In unusual cases, a graduate student may need to work *in absentia* at a place distant from the campus and yet actively continue in correspondence or conferences with his professors and proceed with his thesis or dissertation research. In this situation he enrolls and registers as a full-time student *in absentia* or a part-time student *in absentia* and pays the usual fees for a full-time student or a part-time student, after previously having had his petition for *in absentia* work approved by his Graduate Program Adviser or his Supervisory Committee Chairman, and by the Dean of the Graduate School. Periods of *in absentia* registration are not counted toward completion of the requirements for residence by graduate students on the campus of the University of Washington.

If a graduate student in good standing plans to be away from the University and out of contact with the University faculty and facilities for a period of time, usually not to exceed four successive quarters, he must enroll and register as an on-leave student after he has had his petition for on-leave status approved by his Graduate Program Adviser or his Supervisory Committee Chairman, and by the Dean of the Graduate School. This type of enrollment maintains a place for the student as a member of the Graduate School and permits him to use the University Library and to sit for foreign language competence examinations, but does *not* entitle him to any of the other University privileges of a regularly enrolled full-time student or part-time student. An on-leave student petitions for on-leave no-credit status, and he pays a nonrefundable fee of \$5.00 (except for Summer Quarter only) for enrollment as an

on-leave student; this fee covers four successive academic quarters or any single part thereof.

A graduate student who is registered as a full-time or part-time student for *Spring Quarter* will be put automatically into on-leave status for Summer Quarter *only*; and a graduate student who is officially on-leave for *Spring Quarter* will automatically have his on-leave status extended for Summer Quarter *only*. (The above applies only to a graduate student not registered as a full-time or part-time student for summer quarter.) However, a student in either case set forth above must be registered at the University as a full-time or part-time student for the following Autumn Quarter or he must officially petition for on-leave status for Autumn Quarter; otherwise, he will be considered resigned from the Graduate School.

On-leave students returning to the University on or before the termination of the period of their leave should register in the usual way as full-time students or part-time students and by this registration will cancel any remaining leave period. If circumstances require a later leave of absence, the student must petition and proceed again in the same manner as for an initial leave of absence. It is recommended that returning on-leave students contact the University for current procedures relative to advance fee payment deadlines and other pertinent enrollment policies.

Graduate Student Classifications

The following system classifies graduate and postdoctorate students into four categories based upon the extent of their advancement toward or completion of graduate degrees:

Category Number	Title	Description
1	Premaster	Admitted to the Graduate School, but has not yet completed a master's degree or the equivalent, i.e., 36 quarter credits or more of course or research work applicable to an advanced degree
2	Intermediate	Completed a master's degree or the equivalent, but has not yet been admitted as a Candidate for a doctor's degree, i.e., has not yet completed the General Examinations
3	Candidate	Admitted as a Candidate, but has not yet completed a doctor's degree
4	Postdoctorate	Has completed a doctor's degree

When a graduate student is first admitted to the Graduate School, he is placed in the classification appropriate

in recognition of the highest academic degree which he then holds. When a graduate student officially completes his master's degree, or General Examinations, his classification is changed appropriately by actions in the offices of the Graduate School and the Registrar.

When a Premaster graduate student officially completes 36 quarter credits or more of course or research work applicable to an advanced degree, he is ordinarily considered to have completed graduate work equivalent to the master's degree and his classification is changed to Intermediate, usually after recommendation made by his Graduate Program Adviser followed by actions in the offices of the Graduate School and the Registrar.

When an Intermediate graduate student satisfactorily completes the doctoral General Examinations, his classification is changed to Candidate by actions in the offices of the Graduate School and the Registrar.

The Master's Degree

Summary of Requirements

All aspirants for the master's degree must meet the following requirements:

1. Under a thesis program, a minimum of 36 credits (27 course credits and ordinarily at least 9 credits of thesis) must be presented. Under a nonthesis program, a minimum of 36 credits of course work is required.
2. At least 18 of the minimum 36 credits for the master's degree must be for work numbered 500 or above. (In a thesis program, 9 of the 18 must be course credits and 9 may be for thesis 700.)
3. A minimum of three full-time quarters of residence credit must be earned. (Part-time quarters may be accumulated to meet this requirement.)
4. A certificate of proficiency in a foreign language is required (unless specifically excepted for a particular degree). The language presented normally should be one related to the student's field of study.
5. A thesis, approved by the Supervisory Committee, must be prepared (unless specifically excepted in a particular program). Students must register for thesis.
6. A final master's examination, either oral or written, as determined by the student's Supervisory Committee, must be passed.
7. Any additional requirements imposed by the Graduate Program Adviser in the student's major department or by his Supervisory Committee must be satisfied.

While every master's student is expected to take some work outside his major department, the Graduate Program Adviser in his major department or his Supervisory Committee determines the requirements for supporting

courses. The student should consult with his Supervisory Committee in planning requirements for the minor.

8. The graduate student must make application for the master's degree at the Graduate School Office within the first two weeks of the quarter in which he expects the degree to be conferred, in accordance with "Application for the Master's Degree" as described below.

9. The graduate student must be registered as a full-time or part-time student at the University for the quarter in which the degree is to be conferred. (See detailed information under "Final Quarter Registration.")

10. All work for the master's degree must be completed within six years. This includes applicable work transferred from other institutions.

11. Students must satisfy the requirements for the degree that are in force at the time the degree is to be awarded.

Preparation and Advising

Graduate students are expected to be appropriately prepared for the graduate program into which they are admitted and should confer with the Graduate Program Adviser in their field, or with his representative, in planning their program and frequently thereafter during the course of their graduate study.

Transfer and Extension Credit

A student pursuing a graduate program leading to the master's degree may transmit a written petition to the Dean of the Graduate School requesting permission to transfer up to 9 graduate quarter credits taken while a graduate student in another recognized Graduate School to be applied toward the master's degree here. His petition must be accompanied by a written recommendation from his Graduate Program Adviser.

In the same manner, the student may petition the Dean of the Graduate School for permission to apply up to 6 credits of work taken in Extension Classes, *but only if taken at the University of Washington and if taken after the student has been officially admitted to the Graduate School here.*

If approved, then 9 credits of transfer work *or* 6 credits of University of Washington extension credit *or a combination* of transfer and extension credits not exceeding 9 credits may be applied to the master's degree. The minimum residence requirement of three quarters at the University of Washington may not be reduced by transfer and/or extension credit.

Neither credit by Correspondence nor by Advanced Credit Examinations is acceptable.

Examination

As soon as is appropriate, but not later than the time when the student's application for the degree has been



approved, the faculty in his major department appoints a Supervisory Committee ordinarily consisting of two or three members but not more than four. The chairman of this committee arranges the time and place of the final examination, the results of which must be reported by the Graduate Program Adviser to the Graduate School Office at least two weeks before the date on which the degree is to be conferred. The examination may be oral or written, and all members of the Supervisory Committee must certify its results. If the examination is not satisfactory, the Committee may recommend to the Dean of the Graduate School that the student be allowed to take another examination after an interval of further study.

Thesis

The master's thesis should be evidence of the graduate student's ability to carry out independent investigation and to present the results in clear and systematic form. Two copies of the thesis, normally written in the English language, along with forms signed by the members of the Supervisory Committee from the major department, must be deposited in the Graduate School Office at least two weeks before the end of the quarter in which the degree is to be conferred. The faculty in the department may require the student to present an additional copy for its own use. Instructions for the preparation of theses in acceptable form may be obtained at the Graduate School Office.

Nonthesis Programs

Some departmental faculties have arranged programs for the master's degree that do not require the preparation of a thesis. These programs normally include a more comprehensive plan of course work or more extensive examinations than thesis programs, or they may include some approved research activity in lieu of a thesis.

A student seeking a nonthesis master's degree who has completed all requirements for the degree with the exception of (1) the removal of an Incomplete or (2) the taking of the master's final examination, and who plans no other course registration must register for "Degree Final" for 3 credits and pay the regular part-time fees the quarter the degree is to be awarded. Credits for Degree Final carry no grade and do not apply to residence or toward satisfaction of the total credit requirements for the particular degree.

Application for the Master's Degree

The student must make application for the master's degree at the Graduate School Office *within the first two weeks of the quarter in which he expects the degree to be conferred*. The filing of the application is the responsibility solely of the student. When the applica-

tion is received, the student's record will be reviewed in the Graduate School Office. The previous work taken by the student, together with his current registration as planned with the approval of the Graduate Program Adviser in his department, must meet the requirement for the degree if the application is to be approved. The applicant will be notified promptly as to whether or not he will have satisfied the general requirements for the degree at the end of the quarter and, if approved, the application will be forwarded to the departmental Graduate Program Adviser.

Applications after the regular two-week period in a particular quarter may be accepted when individual situations appear to warrant exception. In such a case the student should prepare an appropriate petition addressed to the Dean of the Graduate School and transmit it with the comment and/or recommendation of his Graduate Program Adviser or Supervisory Committee Chairman. Such applications when approved will be processed during that particular quarter. *No applications will be accepted for a particular quarter during the last 30 calendar days of that quarter.*

The master's application, reporting the final examination results, and signed by the student's Supervisory Committee certifying that all departmental requirements have been met, must be returned by the Graduate Program Adviser to the Graduate School Office at least two weeks before the end of the quarter of the initial application, if the degree is to be conferred that quarter.

Master's applications are valid for *two consecutive quarters* and if requirements for the degree are not completed during the quarter of the initial application, the student's application may be retained by the Graduate Program Adviser for the quarter *immediately* following (e.g., Autumn to Winter, Winter to Spring, Spring to Summer, Summer to Autumn) and returned to the Graduate School Office two weeks before the end of the second quarter. Thereafter, the application will be void and the student must fill out a *new* application for the degree in the Graduate School Office during the first two weeks of the quarter in which the degree is to be completed.

The student and his departmental Graduate Program Adviser should be thoroughly acquainted with the requirements for the particular degree.

Master's Degrees for Teachers

It has become increasingly apparent that there is need for master's degree programs for experienced teachers that would focus upon the fields of knowledge normally taught in the common schools and in the community colleges, and that would provide alternatives to the

Master of Arts or Master of Science degree programs emphasizing particular fields of knowledge and an introduction to research, and to the Master of Education degree program emphasizing some specialization in education.

In an effort to satisfy this need, two special opportunities for graduate study emphasizing school and community college subject matter fields are now available at the University—a second pattern for the Master of Education degree program, and programs leading to the degree of Master of Arts for Teachers. (M.A.T. programs are now offered in Art, Biology, Chemistry, English, Mathematics and Music; see index under “Master of Arts for Teachers” for reference to program descriptions).

The types of programs now available for teachers at the University of Washington may be described briefly as follows:

The *Master of Arts* and the *Master of Science* programs provide for a concentration upon a subject matter field and for an introductory experience in creative scholarship and research. Two patterns are now to be offered under the *Master of Education* program, one designed to provide for concentration upon such subjects as elementary education, educational administration, and others within the field of education; the second, designed for specialized study of a teaching field along with appropriate additional work within the field of education. Programs leading to the degree of *Master of Arts for Teachers* are intended to provide experienced teachers with additional avenues for broad, continuing study in, and related to, one of the fields of knowledge.

The Candidate's Certificate

The candidate's certificate gives formal recognition of the successful completion of a very significant step toward the doctor's degrees awarded through the Graduate School: Doctor of Philosophy, Doctor of Business Administration, Doctor of Education, and Doctor of Musical Arts.

Aspirants for these degrees who have passed the General Examinations for admission to candidacy and who have completed all requirements for the degree except the dissertation and the Final Examination are awarded the appropriate candidate's certificate: Candidate in Philosophy (Ph.C.), Candidate in Business Administration (C.B.A.), Candidate in Education (Ed.C.), and Candidate in Musical Arts (C.M.A.).

When an aspirant for the doctor's degree has been officially admitted to candidacy as described in the following section. under the heading “Admission to Can-

didacy for the Doctor's Degree,” a candidate's certificate signed by the President of the University and the Dean of the Graduate School will be transmitted to the aspirant in recognition of the achievement of the status of Candidate.

The Doctor's Degree

The doctor's degree is by nature and tradition the highest certificate of membership in the academic community. As such, it is meant to indicate the presence of superior qualities of mind and intellectual interests and of high attainments in a chosen field. It is not conferred merely as a certificate to a prescribed course of study and research, no matter how long or how faithfully pursued. All requirements and regulations leading to the doctor's degree are devices whereby the student may demonstrate his present capacities and future promise for scholarly work.

Summary of Requirements

In order to qualify for the doctor's degree, the student must meet the following *minimum* requirements:

1. Complete a program of study and research as planned by the Graduate Program Adviser in his major department or college, and his Supervisory Committee. Half of the total program, including the dissertation, must be credits numbered 500 or above. Every student is expected to take some work outside his major field, and the Supervisory Committee determines the requirements for minors and supporting courses.
2. Present a minimum of three academic years of resident study, two of them at the University of Washington with at least one year in continuous full-time residence. (The continuous year may be satisfied with three out of four consecutive full-time quarters completed at the University of Washington and normally is completed prior to the General Examination.)
3. Demonstrate a reading knowledge of one foreign language related to the major field of study. (The student should consult with the Graduate Program Adviser in his academic unit or the chairman of his Supervisory Committee for information and advice about the foreign language competence required for his program.)
4. Pass creditably a General Examination in the major field and, when a part of the program, in the minor field with which it is concerned.
5. Prepare a dissertation that is a significant contribution to knowledge and which clearly indicates training in research. Credit for the dissertation ordinarily should be at least one-third of the total credit.
6. Pass creditably a Final Examination, which is usually devoted to the dissertation and the field with which it is concerned.



7. Complete all work for the doctor's degree within ten years. This includes applicable work from the master's degree and work transferred from other institutions.
8. Register as a regular full-time or part-time student at the University for the quarter in which the degree is to be conferred. (See detailed information under "Final Quarter Registration.")
9. Satisfy the requirements that are in force at the time the degree is to be awarded.

Preparation and Advising

Graduate students are expected to be appropriately prepared for the graduate program into which they are admitted.

On initial admission to the Graduate School, a graduate student should confer immediately with the Graduate Program Adviser in his field or with his representative in planning his program. Frequent conferences should be held thereafter during the course of his graduate study.

Special Individual Ph.D. Programs

The University, through special individual Ph.D. programs in the Graduate School, makes provision for exceptionally able students whose objectives for study toward the Ph.D. degree do not fall within the offering of any one academic unit authorized to offer a Ph.D. program.

An unusually well-qualified graduate student, who has already been admitted to an academic unit of the University and is enrolled therein and who takes the initiative to carefully plan an appropriate program of studies, may request permission to pursue such an individual Ph.D. program.

An interested graduate student may approach a graduate faculty member qualified to give him guidance. The professor, if he agrees that the program is feasible and desirable, then gathers a Special Advisory Committee consisting of at least three, but usually not more than five, other members of the graduate faculty who represent the student's various fields of interest. This committee must include professors from at least two academic units of the University. Before the student is permitted to embark on the program, he must obtain the approval of the Dean of the Graduate School.

The student addresses a special individual Ph.D. program proposal, accompanied by the endorsement of the Special Advisory Committee, to the Dean of the Graduate School. A proposal form may be obtained at the Graduate School Office.

Appointment of Doctoral Supervisory Committee

As soon as is appropriate, but not later than two quarters prior to the time the warrant for the General Ex-

amination is presented for approval to the Dean of the Graduate School, the Graduate Program Adviser will request the Dean of the Graduate School to appoint a Supervisory Committee, which will include a Graduate Faculty Representative, to assume general sponsorship of the graduate student. All members of the Supervisory Committee shall be members of the University of Washington Graduate Faculty, except that one person who does not belong to the University of Washington Graduate Faculty may be appointed as a regular voting member but may not serve as Chairman. Establishment of a doctoral Supervisory Committee is taken to mean that, in the opinion of the faculty in the graduate student's field, the graduate student's background of study and preparation and achievement is sufficient now to justify his entering into the program of doctoral study and research.

Admission to Candidacy for the Doctor's Degree

At the end of two years of graduate study, and after a successful demonstration of proficiency in at least one foreign language, the Chairman of the Supervisory Committee may present to the Dean of the Graduate School for approval a warrant permitting the student to take the General Examinations for admission to candidacy for the doctor's degree. This means that, in the opinion of the Committee, the student's background of study and preparation is sufficient to justify his undertaking the examinations. The warrant should indicate the time, place, and manner of examination, and must be received at least two weeks prior to the proposed examination date. The warrant is approved by the Dean of the Graduate School only after the prescribed requirements of residence and study have been met. If the examination is oral, a majority of the examining committee must be present during the entire examination.

If the student's performance in his General Examinations is judged by his Supervisory Committee to be satisfactory, then a warrant certifying the successful completion of his General Examinations is filed in the Graduate School Office by the Chairman of his Supervisory Committee.

Thereafter, the student is identified and designated as a Candidate for the appropriate doctor's degree and is awarded the Candidate's certificate described earlier in this section. After achieving Candidate status, the student ordinarily devotes his time primarily to the completion of research for his dissertation and to preparation for his Final Examination.

Normally, a student must be registered at least two quarters at the University of Washington after he passes

his General Examinations and before a warrant is authorized for the Final Examination.

Dissertation and Final Examination

The Candidate must present a dissertation demonstrating original and independent investigation and achievement. The dissertation, normally written in the English language, should reflect not only his mastery of research techniques but also his ability to select an important problem for investigation and to deal with it competently. Requirements for the preparation of the dissertation in acceptable form may be obtained from the Graduate School Office.

When the Supervisory Committee believes that the doctoral candidate is prepared to take his Final Examination, the Dean of the Graduate School is asked to designate a Reading Committee from among the members of the Supervisory Committee. Using forms provided by the Graduate School, the Reading Committee prepares a report briefly summarizing the distinctive achievement of the research, the methods used, and the results. If the report is favorable and is presented at the Graduate School Office two weeks before the Final Examination date, and if the Candidate has met all other requirements, a warrant authorizing the Final Examination is issued by the Dean of the Graduate School.

The Reading Committee report is not binding upon the Supervisory Committee, but is intended to ensure that, except for minor alterations, the dissertation is ready for final presentation. The Dean of the Graduate School returns the Reading Committee report to the Supervisory Committee, together with the warrant for the Final Examination, and, upon approval by the Supervisory Committee at the time of the Final Examination, it is bound with the dissertation.

If the Final Examination is satisfactory, the Supervisory Committee signs the Graduate School's warrant and returns it at least two weeks before the end of the quarter in which the degree is to be conferred. If the examination is unsatisfactory, the Supervisory Committee may recommend that the Dean of the Graduate School permit a second examination after a period of further study.

Publication of Doctoral Dissertations

All doctoral dissertations are published in full on microfilm. Two weeks before the end of the quarter in which the degree is to be conferred, the Candidate must present two copies of his dissertation at the Graduate School Office. Each copy is to be accompanied by a copy of the Reading Committee report and an abstract, not exceeding 600 words in length, which has been

approved by the Supervisory Committee at the time of the Final Examination. A receipt for the \$25.00 publication charge must be shown when the dissertation is presented.

Abstracts are published in full in the publication *Microfilm Abstracts*, and the manuscript copies of the dissertations are kept on file in the University Library. A positive of each microfilmed dissertation is sent to the Library of Congress to be entered in its subject and author file, and the negative is retained by University Microfilm of Ann Arbor, Michigan, which provides additional microfilm copies on order.

The Candidate signs the necessary publication agreement at the time he presents his dissertation at the Graduate School Office, and if he wishes he may apply for a copyright. Publication in microfilm does not preclude other forms of publication.

Admission to the Graduate School

Regular Graduate Student Status

In general, properly qualified students who are graduates of the University of Washington or of other colleges or universities of recognized rank are eligible to apply to the Graduate School. However, all current and prospective students should realize that the University is now operating under a policy of restricted enrollment, and registration is contingent on available space and facilities.

The primary criterion for admission to the Graduate School is the applicant's apparent ability, as decided by the University, to progress satisfactorily in a graduate degree program. The applicant's scholastic record is of major importance and, ordinarily, the applicant should have at least a B or 3.00 grade-point average for the courses taken during the junior and senior years of his undergraduate study. He should also show completion of an undergraduate program appropriate as preparation for graduate study in his chosen field. Consideration will also be given to other evidence that may be available.

In some cases, an applicant may give promise of making satisfactory progress in graduate work although his undergraduate grade average may be less than B or 3.00 or his undergraduate preparation may be inadequate. In these cases and other unusual cases an applicant may be admitted to the Graduate School on the favorable written recommendation of the appropriate University of Washington Departmental Chairman or Graduate Program Adviser with approval by the Dean of the Graduate School. Disadvantaged students who believe they may qualify under this provision are encouraged to apply.



In all cases, the University will be able to grant admission only if sufficient faculty and facilities are available to provide for the applicant's program.

Admission to the Graduate School usually signifies admission into a particular program of graduate study leading to a master's degree or the equivalent, or into post-master's study if the student admitted has already received a master's degree or successfully completed equivalent graduate study. Acceptance of a graduate student into a program of study leading to a doctor's degree is *not* implied by admission to the Graduate School but is usually signified by the appointment of a doctoral Supervisory Committee for a graduate student who has been previously admitted to the Graduate School and has demonstrated the apparent ability, as decided by the University, to progress satisfactorily in a doctor's degree program.

Ordinarily, only students who have been admitted to the Graduate School are permitted to enroll in courses numbered 500 or above and to gain credits applicable to the fulfillment of advanced degree programs.

Students are urged to acquire foreign language competence as undergraduates. The Educational Testing Service (ETS) examination may be written and passed by undergraduates and used to establish their foreign language competence before entering the Graduate School.

Admission to the Graduate School provides the opportunity for continuance of graduate study and research only for the period during which the graduate student maintains satisfactory performance and progress toward completion of his graduate degree program, along with a status of physical and mental health approved by the University. The Dean of the Graduate School may alter the status of a graduate student.

Visiting Graduate Student Status

A student who wishes to enroll for a single summer session or a single quarter in the Graduate School at the University of Washington, and who intends thereafter to return to the graduate school in which he is carrying forward his program of studies for an advanced degree, may be admitted as a Visiting Graduate Student. This admission is contingent on available space and facilities.

He must have been officially admitted to another recognized graduate school and be in good standing and actively pursuing a graduate program at present or during the past ten years at that institution. He need not submit a full transcript of his credits, but must apply for admission, pay the \$5.00 admission application fee, and ask the dean of his graduate school to

certify as to his status on a special form titled "Visiting Graduate Student—Certificate of Status," which may be obtained by writing to the Dean of the Graduate School or the Director of Admissions at the University of Washington, Seattle, Washington 98105.

Admission to the University of Washington as a Visiting Graduate Student *does not guarantee* admission to any particular course of study. A visiting graduate student will be permitted to register only in those courses for which he is judged to be eligible by a faculty adviser or the instructor in the course, and if space is available to accommodate his registration.

For any student admitted on these bases, it is understood that his registration shall terminate at the end of the single quarter or the single summer session for which he is enrolled. If at any later time he wishes to apply for admission to the Graduate School of this University to work toward a degree, he must make formal application and submit complete credentials. If a visiting graduate student is later given formal admission and enters upon work toward a degree at the University of Washington, he may petition the Dean of the Graduate School for allowance of credit for courses taken as a visiting graduate student to apply to the work for such a degree.

Admission Procedures

Requests for the form "Application for Admission to the Graduate School" should be addressed to the Graduate Program Adviser of the department in which the student expects to pursue a program of study. Other correspondence relative to admission procedures should be addressed to the University of Washington, Office of Graduate Admissions, Administration Building, Seattle, Washington 98105.

Each application for admission to the Graduate School as a regular graduate student or as a visiting graduate student is subject to an application fee of \$5.00. Payment must accompany the application (U.S. dollars only). This fee is not refundable and is not credited against any other fees charged by the University.

Regular Graduate Student

The application for admission form, the required transcripts in duplicate, and the \$5.00 admission application fee must be filed, in accordance with instructions appearing on the application form prior to the following dates, in order to be assured of consideration for admission to the quarter for which application is being made: June 1 for Autumn Quarter; November 1 for Winter Quarter; February 1 for Spring Quarter; May 1 for Summer Quarter. These dates are subject to change by the University and an early application is advised. The

foregoing dates apply to new students as well as to former students of the University who have not attended since receiving their baccalaureate degrees. Former students must apply as new students for admission to the Graduate School or for admission to an undergraduate college as an Unclassified-5 student. In some cases, departments have an earlier admission deadline that must be observed. (Please note in this catalog the section pertaining to the appropriate department.)

When the required application forms, official credentials, and the \$5.00 admission application fee have been received, an evaluation will be made and the applicant will be notified of his admission status.

All records become a part of the official file and can be neither returned nor duplicated for any purpose. A student should obtain an additional copy of his official credentials to keep in his possession for advisory purposes. Failure to submit complete credentials will be considered a serious breach of honor and may result in permanent dismissal from the University.

General information and instructions for registration are mailed to new students with the notice of admission. In the event of a discrepancy, these instructions supersede those found in earlier publications. *The University assumes no responsibility for students who do not apply the information or observe the instructions or for applicants who come to the campus before they have been officially notified of their admission.*

The admissions credentials of applicants who do not register for the quarter to which they had been admitted are normally retained in the Office of Graduate Admissions for a period of one year from the date of application. At the end of this period, credentials on file are discarded unless the applicant has notified the Admissions Office of his continued interest in attending the University. Should a student wish to renew his application after the one-year lapse, he must submit a new application and new credentials and pay the \$5.00 admission application fee in advance of the dates given above for the quarter desired.

University of Washington students who are within 6 credits of completing their undergraduate work and who otherwise meet the requirements for admission to the Graduate School may register the quarter just prior to admission to the Graduate School for as many as 6 credits in graduate courses in addition to their 6 credits of undergraduate work. This registration and these arrangements must receive prior approval by the Graduate School; however, students concerned will not be reclassified as graduates until the bachelor's degree has been granted and after their official admission to

the Graduate School. Only under these circumstances may graduate work taken as an undergraduate be applied toward an advanced degree. Further registration for graduate work is contingent upon completion of the requirements for the bachelor's degree.

Foreign Students

Students educated abroad are expected to meet the same general requirements as all other applicants educated in American schools. However, a special Application for Admission form is used by students whose entire education has been outside the United States. This form is obtained from the Office of Admissions rather than from the department concerned. The admission application form, official credentials, and the \$5.00 admission application fee must be received in the Office of Admissions at the University of Washington before February 1 to be considered for admission to the following Autumn Quarter. In addition, applicants must demonstrate a satisfactory command of English and must have sufficient funds available in the United States to meet their expenses. The \$5.00 fee which must accompany the admission application must be payable in United States currency in the form of an International Postal Money Order, a bank draft on a United States Bank, or an American Express Check.

Veterans

Veterans and children of deceased or totally disabled veterans must meet the general admission criteria and follow the general procedures outlined for all applicants. Applications for and questions about government aid should be addressed to a Veterans Administration Regional Office.

Visiting Graduate Students

The "Application for Admission to the Graduate School" form, the "Visiting Graduate Student—Certificate of Status" form, appropriately completed and signed by the dean of the applicant's "home" graduate school, and the \$5.00 admission application fee must be filed with the Office of Admissions prior to the following dates: June 1 for Autumn Quarter, November 1 for Winter Quarter, February 1 for Spring Quarter. For Summer Quarter, the final date for filing applications for admission with nonmatriculated standing is announced in the *Summer Quarter Bulletin*.

University of Washington Seniors

University of Washington students who are within 6 credits of completing their undergraduate work and who otherwise meet the requirements for admission to the Graduate School may register the quarter just prior to admission to the Graduate School for as many as 6 credits in graduate courses in addition to their 6 credits



of undergraduate work. These arrangements must receive *prior* approval by the Graduate School.

Second Bachelor's Degree and/or Standard Teaching Certificate

Students who wish to obtain a second bachelor's degree and/or Standard Teaching Certificate register as Un-classified-5 students in the appropriate undergraduate college, not in the Graduate School.

Registration in the Graduate School

A regular graduate student is a student who fulfills the following requirements: (1) He has been granted regular admission to the Graduate School; (2) his current program of studies is satisfactory to his Graduate Program Adviser; (3) he has received medical clearance from the Student Health Service; and (4) he has completed all of the required steps for registration, including the depositing of registration materials at Sections and the payment of tuition and fees.

Graduate students are required to maintain continuous enrollment from the time of their first registration until completion of the advanced degree. (See section on *Continuous Enrollment*.)

Visiting Graduate Students follow regular registration procedures.

Registration Procedure

All students currently attending the University who wish to attend a succeeding quarter must participate in advance registration and pay fees by the stated deadline. This would include students registered for Spring Quarter who wish to attend Summer Quarter and/or Autumn Quarter. Students are held responsible for knowing and observing the registration procedures, dates, and deadlines which appear in this catalog, in *Official Notices*, in the *University of Washington Daily*, and on campus bulletin boards.

New students are given appointments and directions for registering when they are notified of admission.

Advising

After notification of admission and before registration, the student should confer with his departmental Graduate Program Adviser about the program for his current registration, which must be approved by the Graduate Program Adviser before it is presented at Sections.

As soon as the student's Supervisory Committee is appointed, he should meet with this committee and work out plans for his entire graduate program. It is primarily to this committee, and especially the chairman of his Supervisory Committee and to the Graduate Program Adviser in his department, that the student must look for individual counsel, guidance, and instruction in the scholarly study and research which characterize

graduate work. The programs of students employed in the University or elsewhere will be limited. Students who are employed full time may not register for more than 6 credits.

Changes in Registration

After students have registered, they cannot change their schedules except with permission of the appropriate Graduate Program Adviser or Supervisory Committee Chairman. No student is permitted to make a registration change that involves entering a new course after the first calendar week of the quarter.

Financial Aids: Assistantships, Associateships, Fellowships, Loans, and Employment

Students applying for fellowships, traineeships, and assistantships or associateships must make certain that complete transcripts and other credentials are on file by February 15 (earlier submission of applications and supporting documents is urged by all and required by some departments). Application forms may be secured by writing to the Graduate Program Adviser of the appropriate department.

Assistantships and Associateships

The University provides for the employment of many graduate students as research and teaching assistants, predoctoral associates, predoctoral instructors, and predoctoral lecturers. Nearly two thousand such appointments were made during the past year.

Appointments are granted only to graduate students of high intellectual competence and attainment whose educational goals are clearly defined. An appointment is made only when it is reasonably certain that it will help the student toward the attainment of his goal. Succeeding appointments may be made if the student's progress toward the degree is satisfactory. Maintenance of high scholarship will also be a condition of reappointment.

Graduate appointments are granted to graduate students only. An initial appointment may be offered to a student before he has been admitted formally to the Graduate School but such an appointment is contingent upon the student's admission to graduate status prior to the beginning of his tenure under the appointment.

The tabulation appearing below sets forth a three-level appointment structure providing for specific correlation between the student's eligibility for the higher appointment categories and his progress toward an advanced degree. This structure also provides for a range of stipends for students at various levels of merit and achievement. A graduate student's classification, depending on his stage of progress at the University, is defined in the footnotes following the table.

GRADUATE STUDENT APPOINTMENTS

Title of Appointment	*Stipend for Half-time Service (20 hours per week)		**Graduate Student Classification for Eligibility
	One Month	Academic Year	
Teaching Assistant	\$360	\$3,240	} Premaster or Intermediate or Candidate
Research Assistant	\$335	\$3,015	
Graduate Staff Assistant	\$335	\$3,015	
Predoctoral Teaching Associate I	\$390	\$3,510	} Intermediate or Candidate
Predoctoral Research Associate I	\$360	\$3,240	
Predoctoral Staff Associate I	\$360	\$3,240	
Predoctoral Teaching Associate II	\$425	\$3,825	} Candidate
Predoctoral Research Associate II	\$395	\$3,555	
Predoctoral Staff Associate II	\$395	\$3,555	

Graduate students appointed to the beginning level of graduate teaching appointments will not be permitted to be in overall charge of a course but will be given an appropriate degree of responsibility and supervision of laboratory or classroom work so that they may be introduced to teaching activities gradually and effectively. Student appointees may also serve as assistants in research activities for which a faculty member is responsible.

Two special categories for teaching appointments are provided above the predoctoral associate level: Predoctoral instructor, for the graduate student who has achieved Candidate status and is ready for increased teaching responsibility, and predoctoral lecturer, for a mature and competent graduate student who, though he need not be a Candidate, has had exceptional previous teaching or other professional experience. For the 1969-70 academic year these appointments carry a minimum stipend of \$425 per month (half time) and with no designated maximum so that the stipend may be adjusted to a level appropriate to the appointee's experience and his teaching responsibilities.

An additional series of appointments titled Graduate Staff Assistant and Predoctoral Staff Associates I and II, is provided for University service activities which are not appropriately described as teaching or research but which are closely related to the student's field of advanced study. Appointments of specific graduate students to these positions may not be made until after the position itself has been specifically approved.

* These stipends prevail for 1969-70.

** *Premaster*, indicates admission to the Graduate School but not completion of the master's degree or the equivalent. *Intermediate*, indicates completion of the master's degree or the equivalent but not designation as a Candidate. *Candidate*, indicates successful completion of the General Examination and designation as a Candidate for the doctor's degree but not completion of the doctor's degree.

Stipends for these appointments for the 1969-70 academic year range from \$335 per month to \$395 per month.

Students holding any of the above appointments are required to render 20 hours of service per week to the University. The appointments may be on a nine-month basis and ordinarily cover the period running from September 16 through June 15. A significant number of these appointments may be extended to 11 or 12 months. Graduate student appointments do not provide for paid vacations or sick leave.

Students who accept these University service appointments must confine their employment to such appointments.

Spouses of graduate students holding assistantship or associateship appointments described in this section, that require at least 20 hours of service to the University, are permitted to register for classes at resident tuition rates.

During tenure under one of the above appointments, a graduate appointee must register for and carry throughout each quarter a minimum of 9 credits in formal courses or in research, thesis, or dissertation work. These credits must be in courses which are applicable toward an advanced degree.

Students holding any of the above appointments pay resident tuition and fees. They may not also hold foreign student tuition scholarships.

Under highly exceptional circumstances and with the prior approval of the Dean of the Graduate School, the above graduate appointments may be made on an hourly basis. Other hourly appointments for graduate students not employed on any of the above appointments are also available to assist faculty members in teaching and research. Readers are so classified, as are students who give routine assistance in research.

Fellowships, Traineeships, and Scholarships

Fellowships carrying stipends ranging from \$300 to \$2,800 are available through the Graduate School or graduate departments to outstanding graduate students in fields of study leading to advanced degrees. Application should be made by February 15. Information and the application form may be obtained by writing to the Graduate Program Adviser of the appropriate department.

National Defense Education Act Fellowships are awarded in a number of areas each year. Applications for Title IV Programs must be received by February 15. Title VI Modern Foreign Language Fellowship applications must be received in early January.



National Science Foundation Fellowships are available through the University of Washington under the Program of Summer Fellowships for Graduate Teaching Assistants. The University also participates in the National Science Foundation Graduate Fellowship Program.

National Science Foundation Traineeships are also offered through many departments.

Other fellowships and traineeships are available through participation of the University of Washington in the programs of the Woodrow Wilson National Fellowship Foundation, the National Institutes of Health, the Atomic Energy Commission, and other agencies, foundations, and institutes. Special fellowships are awarded under the terms of specific grants and bequests to the University.

Foreign Student Scholarships are awarded by the University of Washington each academic year to 100 worthy students from other countries. These scholarships are not available for the Summer Quarter. The awards are made on the basis of the academic record of the student, recommendations from his professors, his need for such assistance, and the availability of such openings in his department at the University. These scholarships cover tuition only and are administered by the Foreign Exchange Scholarship Committee, International Services Office, University of Washington, Seattle, Washington 98105, U.S.A. Application must be made by March 1 for the following academic year.

Loans

Federal and University long-term loans are available through the Office of Student Financial Aid. Applications for these should be submitted well before the money is needed. Short-term loans can be made available on short notice to students faced with school-related financial emergencies.

Employment

There are many job opportunities on the campus for graduate students. Students may apply directly to the department in which they hope to work or to the Personnel Services Department.

Single graduate students interested in part-time positions as Resident Advisers in one of the University residence halls may write to the Director of Student Residences for an application and further details.

Working students must be sure to correlate their employment with Graduate School regulations governing study loads (see under *Registration*).

The University offers a number of full-time and part-time employment opportunities in the secretarial, cler-

ical, and technical fields for spouses of married students. These positions offer pay comparable to the prevailing salaries in the community and carry fringe benefits such as vacations, sick leave, and opportunities to enroll in University courses. In addition, nonresident students may receive waiver of the nonresident portion of fees if their spouses are full-time employees of the University. Students seeking part-time employment must be on campus before they may secure jobs from one of the University's personnel offices. For information concerning part-time and full-time work, see the *General Information* section.

UNIVERSITY RESEARCH

Research is of particular concern to the Graduate School since the advanced instruction of graduate students is largely guidance in research and since the continuing effectiveness of professors in instruction of graduate students rests largely upon continuation of the scholarly research activities of these professors.

Statement on University Research Policy

The University of Washington is committed to a large and varied program of research. In common with all other institutions of higher learning, it recognizes that its mission of service to society in the modern age will not be fulfilled unless its programs of teaching and research at all levels are fully integrated and vigorously executed. It believes that it is only through combined teaching and research that society maintains effective contact with the frontier of knowledge, adds new knowledge from time to time to that which we already have, and trains new students in the continuation of these processes. Thus, we find in research the common ingredient essential to the advancement of knowledge, the enrichment of teaching, and the rendering of services to the community.

The principle of indivisibility of teaching and research has been clearly enunciated on many occasions and in both scholarly and political documents. As an example of the latter, we have the statement in the report of the President's Science Advisory Committee of 1960¹ to the effect that research and the graduate education of young scientists are intimately related. On page 11 of that report one finds the specific conclusion "Basic research and graduate education, . . . are the very essence of the fundamental purposes of the American University." In a similar vein the recent report of the National

¹ *Scientific Progress, the Universities and the Federal Government*, Statement by the President's Science Advisory Committee, November 15, 1960, U.S. Government Printing Office, Washington, D.C.

Academy of Sciences Committee on Science and Public Policy² characterizes the central purpose of American universities by the statement that this purpose is "the advanced education of American youth integrated with the scholarly activities of teachers; in the natural sciences these activities take primarily the form of scientific research."

It is the aim of the University to adhere closely to these principles, thus executing programs of research and teaching in a large variety of fields of learning in the sciences, humanities, social studies, and engineering. Since it is not possible in any one institution to emphasize all of the vast field of learning uniformly, the emphases on the different fields of learning must vary considerably, as is the case also in all other institutions of higher learning. Complete coverage is not a practical, nor would it perhaps be a desirable, objective. On the national scale there is confidence that such coverage is achieved. On the regional scale the University's aim is, and should be, the vigorous development of those areas of learning in which the University has special competence. These areas of special competence are the areas for which it has been most fully prepared by its history of development as a university. It is believed that these are also the areas best suited to its particular geography and the special interests, as well as the needs and potentials of the state of Washington.

Intra-University Scholarly and Research Support

The Graduate School Research Fund provides modest funds available through the University to aid in the support of research activities of the faculty and graduate students. These monies are allocated by the Dean of the Graduate School with the advice of the Graduate School Research Fund Committee, appointed by the Dean, which reviews proposals for research support, formulates regulations concerning personnel and use of funds, and stimulates interest in investigative activities. The Committee is concerned with allocations of the Initiative 171 monies, which help to support research in medicine and biology, and of the other funds of the Graduate School.

The Agnes H. Anderson Research Fund for the support of research was formed from the proceeds of a very generous gift donated by two anonymous friends of the University. Accepted by the Board of Regents in 1943, the fund is named in memory of the donor of Alfred H. Anderson Hall and the *Agnes Healy Anderson Forestry Trust Fund*. The selection of research projects and allocation of funds for their support is the responsibility

of the Dean of the Graduate School after consultation with the Graduate School Research Fund Committee.

The Graduate School Consultants Fund provides modest funds to assist in bringing distinguished scholars and scientists in the vicinity to the University for a day or for short periods for consultations and seminar discussions to assist members of the faculty and graduate students in carrying forward their research. For information relating to the Consultants Fund, communications may be addressed to the Dean of the Graduate School.

Gift, Grant, and Contract Research Funds may provide assistance to University faculty, graduate students, and staff in carrying out significant research and other activities. Research requiring substantial amounts of faculty, graduate student or other staff time, or significant use of University facilities may be undertaken by the University under arrangements specified in a gift, grant, or contract agreement between the research sponsor and the University.

Grants are often made by foundations, industries, and other agencies for basic research in designated fields without explicit definition of projects or goals. Grants of this kind contribute in an especially important way to the advancement of knowledge through basic research.

Special Lectureships and Professorships

The Walker-Ames Fund was founded in 1931 by Maud Walker Ames and her husband, Edwin Gardner Ames. Its purpose was to enable the University of Washington "to guarantee to the state of Washington the scholarly and educational services of the most distinguished minds available in this and other countries . . ." Since the first Walker-Ames visiting professor was appointed in 1936, well over one hundred notable scholars have come to the University as temporary members of the faculty and have enriched the intellectual life of the University community.

The John Danz Fund was established in 1961 by a gift to the University from the late Mr. John Danz and Mrs. John Danz. The funds, in part, are used to bring to the University one or more distinguished scholars "of national and international reputation who have concerned themselves with the impact of science and philosophy on man's perception of the rational universe." The first John Danz Lecturer was Sir Julian Huxley who came to the University from London during Spring Quarter, 1962.

Communications relating to the Walker-Ames Fund and the John Danz Fund should be addressed to: University of Washington, The Dean of the Graduate School, Seattle, Washington 98105.

² *Federal Support of Basic Research in Institutions of Higher Learning*, NAS Study, March, 1964, Printing and Publishing Office, National Academy of Sciences, Washington, D.C.



RESEARCH AND SPECIAL FACILITIES

Some academic or research activities and facilities are of general significance in all or many fields of knowledge throughout the University. A listing of these is set out below with some of them described in greater detail.

Accelerator, Cyclotron, and Nuclear Reactor

Albert L. Babb, Ph.D., *Director*

Gene L. Woodruff, Ph.D., *Assistant Director*

Nuclear Reactor Building

Research in physics, nuclear engineering, and allied fields is facilitated here.

The Arboretum

Brian O. Mulligan, *Director*

Joseph A. Witt, *Assistant Director*

The Arboretum maintains propagation of plants from all over the world.

Botanical and Drug Plant Gardens

L. R. Brady, Ph.D., *Director*

Gerard C. Vreeburg, M.S., *Supervisor*

Drug Plant Laboratories

These two areas cover three acres of experimental and growing gardens.

Institute of Governmental Research

Robert H. Pealy, Ph.D., *Director*

Ernest H. Campbell, Ph.D., *Associate Director*

3935 University Way N.E.

The Institute of Governmental Research is an interdisciplinary University-wide institute responsible for research on a wide range of governmental policy problems with particular emphasis on urban affairs. Faculty members and graduate students from all parts of the University campus participate in its programs. The research policies of the Institute are developed by a faculty advisory committee representing a full range of University disciplines and professional schools and by a public advisory committee from appropriate governmental organizations.

Center for Asian Arts

Millard B. Rogers, Ph.D., *Director*

Richard McKinnon, Ph.D., *Assistant Director*

131 Art

The Center promotes the study and performance of Asian music, art, and drama.

Center for Research in Oral Biology

Leo M. Sreebny, D.D.S., Ph.D., *Director*

Dan G. Middaugh, D.D.S., *Assistant Director*

B122 Health Sciences Building

The central goal of the Center is to assist in the national effort to reduce the toll of oral disease and to promote the general level of oral health.

Center for Studies in Demography and Ecology

Stanley Lieberman, Ph.D., *Director*

This office conducts basic research on population and ecological problems, primarily in the Pacific Northwest, and serves as a training center for graduate students in the social sciences.

Center for Education in Politics

Alex Gottfried, Ph.D., *Director*

Engineering Annex

Workshops, seminars, and various other political education programs for faculty and students are sponsored by the Center.

Developmental Psychology Laboratory

Halbert B. Robinson, Ph.D., *Director*

208 Developmental Psychology Laboratory

Graduate training in child clinical psychology is provided by this Laboratory.

Fisheries Research Institute

Robert L. Burgner, Ph.D., *Director*

260 Fisheries Center

Coordinates major research in fisheries biology, both on campus and on the seas and in Alaska.

Henry Art Gallery

Spencer Moseley, M.F.A., *Acting Director*

LaMar Harrington, *Assistant Director*

Exhibits of painting, sculpture, print making, photography, and craft media are supplemented by film exchanges, musicales, and other special events in the Henry Gallery.

Institute of Forest Products

David P. Thomas, M.F., *Director*

Richard D. Taber, Ph.D., *Associate Director*

206 Anderson

The Institute encourages multi-discipline approach to forestry and wood research.

Institute for Sociological Research

Robert K. Leik, Ph.D., *Director*
119 Guthrie

Besides supporting research activities of the faculty in sociology, the Institute trains students in field investigations and other phases of research.

Laboratory of Radiation Ecology

Allyn H. Seymour, Ph.D., *Director*
104 Fisheries Center

This research unit is supported by the U.S. Atomic Energy Commission which conducts long-term investigations on effects of radiation.

Oceanographic Research Vessels

Maurice Rattray, Ph.D., *Chairman*
123 Oceanographic Teaching Building

These vessels are used for field studies in Puget Sound and the Pacific Ocean.

Organization for Tropical Studies

James S. Bethel, Ph.D., *Dean of College of Forest Resources*

Marion E. Marts, Ph.D., *Dean of Summer Quarter*
208 Anderson

The University of Washington is a member of this consortium of 25 leading United States and Latin American educational and research institutions. Opportunities are offered for graduate education and student and faculty field research in the Central American tropics.

Pacific Northwest Bibliographic Center

Mollie Hollreigh, B.A., *Director*
253 Library

This Center acts as a cooperative agency for maintaining a union catalog of books in libraries of Pacific Northwest colleges.

Quaternary Research Center

A. L. Washburn, Ph.D., *Director*
S. C. Porter, Ph.D., *Associate Director*
42 Johnson Hall

This Center fosters interdisciplinary study of processes and environments of the Quaternary Period with emphasis on biological and physical influences and interactions.

Radio Station KUOW and KCTS-TV Station

Kenneth Kager, *Manager, KUOW*
325 Communications

Loren B. Stone, *Manager, KCTS-TV*
154 Drama-TV

Besides providing a public service, these stations train students in communications.

Speech and Hearing Clinic

Phillip A. Yantis, Ph.D., *Director*
1320 N.E. Campus Parkway

The Clinic serves as a teaching and research center for the training of speech and hearing therapists.

Thomas Burke Memorial Washington State Museum

George I. Quimby, M.A., *Director*

The museum is an educational and cultural center serving the needs of the University of Washington and all Pacific Northwest schools.

University Hospital

L. S. Rambeck, *Director of Hospitals*
David Jeppson, *Hospital Administrator*
BB361 University Hospital

This 320-bed hospital contains a Rehabilitation Center, large outpatient clinics, a center for care of premature infants, a psychiatric department, and an emergency unit. It also serves as a teaching center for physicians, nurses, and fourteen allied health professions.

Wind Tunnel

William H. Rae, Jr., M.S. in A.E., *Director*
206 Guggenheim Hall

This is a research center for aeronautics and astronautics. It provides a practical industrial experience and a public service to industry.

Joint Center for Graduate Study

Wayne A. Cassatt, Ph.D., *Acting Director*
R. Wells Moulton, Ph.D., *Executive Director*
Richland, Washington
University office: 3 Administration Building

The Joint Center for Graduate Study, located at Richland, Washington, is an off-campus facility operated by the University of Washington, Washington State University, and Oregon State University. The facility is available for graduate study and research to students associated with these universities, as well as other colleges and universities in the Pacific Northwest and elsewhere. Course work completed through the Joint Center and research performed in laboratories of contractors to the Atomic Energy Commission, upon approval in advance, may be applied toward the fulfill-



ment of the requirements for certain advanced degrees offered by the University of Washington.

Currently, graduate-level and upper-division courses are available in business administration, chemistry, librarianship, mathematics, physics, radiology, and in chemical, electrical, mechanical, metallurgical, and nuclear engineering. Atomic Energy Commission-owned laboratory facilities, operated by Battelle Northwest and other contractors to the AEC, are available for research purposes on an individual basis and provide an exceptional opportunity to do research work requiring facilities not available at most colleges and universities. A limited amount of financial support is available through the Richland Graduate Fellowship program for students of advanced standing in support of M.S. thesis or doctoral dissertation research to be performed at Richland.

Most of the students and faculty of the Joint Center are employees of the Atomic Energy Commission or its contractors, although such employment is not a prerequisite for enrollment at the Joint Center or for appointment to the faculty. Classes at the Joint Center are usually held in the evening or late afternoon. Employment with contractors to the AEC and access to its laboratories are generally available only to citizens of the United States.

All requests for information concerning the activities and the programs of study and research at the Joint Center, availability of facilities, admission to activities, and for copies of the *Joint Center for Graduate Study Bulletin*, containing general information and course offerings, should be addressed to: The Director, Joint Center for Graduate Study, 100 Sprout Road, Richland, Washington 99352.

Child Development and Mental Retardation Center

Charles R. Strother, Ph.D., *Director*

Robert W. Deisher, M.D., *Associate Director*

Robert L. Van Citters, M.D., *Associate Director*

CD405 Child Development and Mental Retardation Center

The Child Development and Mental Retardation Center provides facilities for teaching and research programs relating to mental retardation and child development. The Center consists of four units: a medical research unit, a behavioral research unit, a clinical training unit, and an experimental education unit. The facilities include biological, medical, and behavioral research laboratories; a large multidisciplinary diagnostic clinic; a short-term residential building equipped to house families during diagnostic evaluation or while

participating in family research projects; and an experimental school containing twelve classrooms.

Laboratories and other facilities are staffed by the various participating departments, schools, and colleges of the University. The programs and activities of the Center are coordinated by an executive committee. Research and training programs of the Center are closely related to the programs of the State Departments of Public Instruction, Health, Institutions, and Public Assistance.

Requests for information concerning specific research and training programs should be addressed to the appropriate academic department. Requests for information concerning the Center should be addressed to the Director, CD405 Child Development and Mental Retardation Center, University of Washington, Seattle, Washington 98105.

Friday Harbor Laboratories

Robert L. Fernald, Ph.D., *Director*

Eugene N. Kozloff, Ph.D., *Resident Associate Director*
Friday Harbor, Washington

University office: 212 Johnson Hall

The Friday Harbor Laboratories, a component of the Division of Marine Resources, comprise the principal marine science station of the University of Washington. The staff includes professors from various departments of the University including Botany, Fisheries, Oceanography, and Zoology, as well as visiting professors from other institutions.

The Friday Harbor Laboratories are located approximately eighty miles north of Seattle near the town of Friday Harbor on San Juan Island, on a state game preserve of 484 acres of wooded land with about two miles of shore line. The island is one of the largest of the 172 that make up the San Juan Archipelago located in the northwest section of the state of Washington between Vancouver Island and the United States mainland.

The Laboratories are close to sea waters varying from oceanic to those highly diluted by streams, with depths to 1,000 feet, bottoms varying from mud to rock, and water movements ranging from those of quiet bays and lagoons to those of swift tideways. The waters about the San Juan Archipelago abound in varied marine flora and fauna.

During spring and summer, the Laboratories offer an opportunity for independent and supervised research, as well as a varied program of instruction primarily oriented to graduate students (exceptional, advanced undergraduates are occasionally admitted). Throughout

the year, use of the facilities of the Laboratories for research in various areas of marine science is encouraged.

Requests for information on the summer program and for general information concerning study and research, availability of facilities, and admission to the Laboratories should be addressed to the Director, Friday Harbor Laboratories, 212 Johnson Hall, University of Washington, Seattle, Washington, 98105.

Office of Scholarly Journals

Emily Johnson, B.A., *Director*
Parrington Annex 7

The University maintains an Office of Scholarly Journals in association with the Graduate School. The function of the Office is to provide assistance to members of the University faculty who have editorial responsibilities in relation to the publication of the many scholarly journals now associated with the University of Washington.

Requests for information concerning the activities and facilities of the Office should be addressed to the Director, Office of Scholarly Journals, University of Washington, Seattle, Washington 98105.

Computer Center

Robert G. Gillespie, B.A., *Director*
William L. Clark, M.S.E., *Assistant Director*
Hellmut Golde, Ph.D., *Assistant Director*
Roberts Hall Addition

The Computer Center, established in 1956, provides computer services for the University of Washington and the community for education, research, and administrative uses. The principal computers now installed include a Burroughs 5500 and a Control Data Corporation-6400. Also available are key-punch/EAM, auxiliary card-handling equipment with service provided for self-service use; graphics equipment, including mechanical plotting equipment allowing automatic plotting of information and a digital recording system capable of reading coordinates from maps, graphs, film, etc., and recording them on magnetic tape; and terminals which make possible text editing from teletypes directly connected to the B5500.

The Center offers specialized training through non-credit classes in programming languages and operating systems needed to use the computer systems in the Computer Center. Other services available are consultation; an information center that includes reference materials, computer manuals, and special program libraries; and professional programming.

Cost accounting and reporting is provided to the users for all computer services. The staff of the Center, in liaison with campus users, plans for special hardware and software requirements and develops general purpose computer programs satisfying major user requirements.

The Center is administered through the Office of the Vice President for Research.

Requests for the *Computer Center Newsletter* or for information concerning the facilities should be addressed to the Director, Computer Center, University of Washington, Seattle, Washington, 98105.

Computer Science Laboratory

Earl B. Hunt, Ph.D., *Director*
43 Roberts Hall

The Computer Science Laboratory (CSL) is the research and teaching laboratory for the Computer Science Group. It is used for studies of operating systems and other computing project studies which, if done on Computer Center equipment, might impede the job flow; and for studies which require specialized equipment (e.g. graphics terminals) which are not supported by the Computer Center.

The operation of the Computer Science Laboratory is integrated with the graduate training program of the Computer Science Group in order to provide practical experience for those Computer Science students interested in the engineering and applied aspects of computer science. A large amount of time is reserved for open-shop operation for experimental studies.

The Laboratory contains a Xerox Data Systems Sigma 5 Computer with a disc-oriented operating system. A second component is the remote terminal system for interactive computing. The Laboratory also has facilities for computer graphics studies.

Division of Marine Resources

Stanley R. Murphy, Ph.D., *Director*
John Dermody, B.S., *Assistant Director for Operations*
3716 Brooklyn N.E., Apt. 3

The Division of Marine Resources promotes the University's interest in the exploration, development, and the use of the resources of the seas and oceans. It coordinates and supplements the teaching, research, development, and advisory service programs in marine science and engineering and cooperates in similar activities with outside agencies and institutions. Interdisciplinary in nature, the Division is concerned with the development and the use of the physical, chemical, geological, and biological resources of the marine en-



vironment; marine commerce and engineering; and the economic, legal, biomedical, and sociological problems arising out of the management and utilization of marine resources.

The Division is responsible for the administration of the Friday Harbor Laboratories, and for the coordination and administration of the interdisciplinary Sea Grant Institutional Program. It also represents the University in such cooperative ventures as Project Sea Use, and the Cobb Seamount Program which involves Battelle-Northwest, Honeywell, and other participants under sponsorship of the Oceanographic Commission of Washington.

Requests for information should be addressed to the Director, Division of Marine Resources, 3716 Brooklyn N.E., Apt. 3, University of Washington, Seattle, Washington 98105.

Regional Primate Research Center

Theodore C. Ruch, Ph.D., *Director*

Orville A. Smith, Jr., Ph.D., *Associate Director*

I-421 Health Sciences Building

The Regional Primate Research Center, located in a wing of the Health Sciences Building, was established by the National Institutes of Health in 1961. Its activities are University-wide, regional and national, with the University of Washington serving as the "host" institution.

The purpose of the Center is to conduct biomedical and psychological research on nonhuman primates. At the Center, one of seven throughout the nation, the emphasis is on cardiovascular, neurophysiological, behavioral, and dental research. The Center maintains a large breeding facility near Spokane.

The Center develops and uses advanced instrumentation (transducers, telemetry) and high-speed on-line data acquisition systems.

A worldwide bibliographic and information service is also maintained, based on analysis of primate research literature. It circulates a weekly list of current primate literature, prepares retrospective bibliographies on request, and compiles normative data.

Staff at the Center includes research faculty from many different disciplines within the University as well as visiting scientists. The Center provides research training to graduate students and to postdoctoral fellows.

Requests for information should be addressed to the Director, Regional Primate Research Center, I-421 Health Sciences Building, University of Washington, Seattle, Washington 98105.

University of Washington Press

Donald R. Ellegood, M.A., *Director*

University of Washington Press Building

1416 N.E. 41st

The University of Washington Press is the book publishing division of the University. Like many of the older scholarly presses, it grew out of the tradition of University publishing and printing. The Press imprint dates from 1909 when the University acquired typesetting equipment and a printing press for the campus newspaper. In 1911 the Press began to issue the *Washington Historical Quarterly*, now called *Pacific Northwest Quarterly*, and between 1915 and 1920 several monograph series were inaugurated. The first full-length book to bear the Press imprint appeared in 1920. In 1950 the Press was separated from the Printing Department and established as the book publishing division of the University.

The Press backlist now includes about five hundred fifty titles in print, with special emphasis on art, anthropology, Asian studies, biology, ethnology, history and government, language and literature, oceanography, and regional subjects. The Press publishes about fifty new books each year, both by members of the University faculty and by scholars outside the University. The Press has a paperback reprint series called Washington paperbacks; a continuing clothbound reprint program, including the Americana Library series, to make available again standard out-of-print works of scholarship; and an import program, the purpose of which is to make known to American scholarship important books in English published abroad. The Press is also publisher of the American Ethnological Society Monographs, which now number about fifty volumes. The Press also publishes a variety of audio-visual educational materials, most of which grew out of original research on campus. These materials include film strips, disc recordings, and language tapes.

The Press staff manages all details of editing, design, and marketing of its books, and buys its printing and binding on a contract basis. In cooperation with several other university presses, the Press has a nation-wide sales staff to sell and distribute its books throughout the United States and maintains its own sales office and warehouse in Great Britain. It is also represented by an international distribution network covering Latin America, Africa, the Middle East, and Southeast Asia. The Press is a member of the Association of American University Presses and the American Book Publishers Council, and is active in a variety of international scholarly book publishing activities.

Editorial control of the imprint of the Press is vested in the Committee on the University Press, of which the Dean of the Graduate School is Chairman. The Committee formulates policy, reviews manuscripts, authorizes the use of the Press imprint, and promotes the interests of the Press.

The Press invites members of the faculty to bring to it manuscripts and publishing proposals at an early stage in their development, and welcomes suggestions of books to reprint in either cloth or paperback. The Press

also urges that, whenever possible, grants for research likely to result in publication in book form also include funds specifically earmarked for publication. The Director and his staff will be glad to advise members of the faculty concerning estimated publication costs at the time a research grant application is being prepared.

All inquiries and requests for information should be addressed to the Director, University of Washington Press Building, 1146 N.E. 41st, Seattle, Washington 98105.



CONTINUING EDUCATION

Dean

Lloyd W. Schram

Because learning is a lifelong activity rather than a terminal process, the University of Washington carries on a sustained continuing education program for adults. This program has three primary and interrelated objectives: (1) to encourage the personal development and self-realization of the individual; (2) to assist him in becoming a more effective citizen; and (3) to strengthen the economic, cultural, and political aspects of society through direct communication with the research and scholarship of the University world. Because the University seeks to be responsive to community needs for continuing higher education, it is concerned not only with already established programs, but also with projects of an innovative nature. Hence, it is continuously expanding and changing to accommodate these needs.

There are four divisions that comprise Continuing Education at the University: the Division of Evening Classes, the Division of Independent Study, the Division of Extension Services, and the Division of Continuing Studies. All of the divisions work closely with the various academic departments. Programs include both credit and noncredit classes of direct interest to undergraduates as well as to graduates and other adults.

In 1966 the University of Washington Senate approved the establishment of a new category of courses that carry Continuing Studies credit. These courses are

designed to supplement and update the knowledge of individuals already possessing baccalaureate degrees, particularly those engaged in the various professions. Such courses, while not considered a part of any regular undergraduate or graduate degree curriculum, require a level of student participation and achievement similar to that expected for courses in degree programs. Participants successfully completing Continuing Studies courses receive a Certificate of Course Completion, as well as a predetermined number of hours of Continuing Studies credit that is recorded on official University transcripts. Courses in Continuing Studies are initiated by a sponsoring department, school, or college, in cooperation with the Office of the Dean of Continuing Education, and must meet the standards for review and approval required for regular academic courses.

Division of Evening Classes

A variety of regular University courses are offered for credit by the Division of Evening Classes, and are open to all regularly admitted students. Students may be admitted into either matriculated or nonmatriculated status. Matriculated students are those with degree objectives who satisfy the University's entrance requirements. Nonmatriculated students are those not having a degree or certificate objective.

Although the evening program is primarily intended for persons unable to attend during the day, evening sections are also available to day students who wish to

supplement their schedules. Under a single tuition schedule, a student may elect to register for courses offered at any hour from 7:30 a.m. to 8:00 p.m. Enrollment for all credit courses requires an application for admission accompanied by appropriate transcripts.

Postbaccalaureate students may enroll with nonmatriculated standing, as unclassified students, or as graduate students upon admission to the Graduate School, if an advanced degree is the objective.

For further information, please consult the University of Washington Evening Classes Administrative Office, 219 Lewis Hall, Seattle, Washington 98105.

Division of Independent Study

Director

Richard F. Wilkie
203 Lewis Hall

This program is designed to meet the needs of those individuals who wish to take college-level courses but find it difficult or impossible to attend formal day or evening classes. Anyone over eighteen who is not attending high school or anyone under eighteen who is a high school graduate is eligible. Certain qualified high school students may also be permitted to enroll upon recommendation of their high school counselors or principals and the approval of the University. In many instances, Independent Study is useful to the undergraduate who may wish to pursue a part of his course of study by this method.

Since a student may enroll in a course at any time of the year and proceed as rapidly or as slowly as he wishes, Independent Study offers the individual an opportunity to educate himself at his convenience. Most courses are prepared by regular members of the faculty and carry extension credit which may be applied toward a bachelor's degree or teaching certificate. Each course offered for credit parallels the similarly numbered course taught in the residence program. Certain noncredit courses required for University entrance are available to adults wishing to qualify for admission.

Annually, over four thousand students enroll in the Independent Study program. Courses currently are offered in 22 academic fields, ranging from business and education to oceanography, mathematics, and foreign languages.

A bulletin describing courses and enrollment procedures may be obtained from the University of Washington, Director of Independent Study, 203 Lewis Hall, Seattle, Washington 98105.

Division of Extension Services

Director's Office

322 Lewis Hall

This Division encompasses a great variety of educational opportunities, with programs available to undergraduates, graduate and professional students, and the community at large. Many of the activities are conducted on a state-wide basis.

Bureau of Community Development

The primary purpose of the Bureau of Community Development is to provide an educational service to state communities in order that they may use citizen resources more fully to solve public problems. It also offers opportunities for enrolled students to work on actual field problems in collaboration with community groups. As of January 1970, 105 communities had requested and received assistance from the Bureau since its inception in 1950.

Civil Defense Training Program

This office conducts exercises for public officials, business, industry, and other civic leaders in order to furnish them with Civil Defense information. It also trains instructors to teach local Civil Defense skills courses. Programs are conducted throughout the state and are geared to the individual needs of the communities.

Lectures and Concerts

Musical events and lectures are made available to both students and the general public through this office. Noted instrumental groups, operas, foreign language dramatic productions, and both student and faculty presentations are included in the program, and offer many opportunities for enrichment of the student's cultural background.

Radio Broadcast Services and KUOW

Radio KUOW-FM broadcasts programs of an educational, cultural, or scientific nature and communicates information concerning University affairs to students, alumni, and the general public. The station also supplies students in the School of Communications with actual experience for careers in radio. In addition, there is opportunity for experimental programs designed to test and develop new broadcasting techniques, sometimes in combination with other media. Effective radiated power of 86 kw carries the signal to most of Western Washington on a frequency of 94.9 MHz.

Short Courses and Conferences

The staff of this Department works cooperatively with University faculty to explore the feasibility of and to assist in the planning, development, staffing, promotion, conduct, and evaluation of educationally effective conferences and short courses of an appropriate level and



content. Some programs are especially designed to help keep people up to date in their fields, while others are for those who wish to acquire knowledge in a field new to them.

The office also operates the University of Washington Continuing Education Center at Lake Wilderness.

Statewide Arts

At the request of communities within the state, the Statewide Arts consultant works with the Office of Lectures and Concerts, the Bureau of Community Development, and the four fine arts departments of the University in setting up seminars and workshops dealing with the cultural arts and arranging for faculty and performing arts appearances. This service to the communities of the state was added to Extension Services in May of 1966 and the office is now becoming a central resource center, often serving in an advisory or coordinating capacity, utilizing talent from different institutions and the communities themselves.

Telecourses

Telecourses provide an opportunity for everyone with access to a television set to obtain college-level instruction for information and enrichment. Embracing a wide range of topics, a number of televised lecture series are prepared each quarter by members of the University faculty and are presented on the educational station, KCTS-TV, and on commercial stations in Seattle. Kinescope or videotape recordings are also released to stations throughout Washington as well as to stations in other parts of the country. Study guides prepared by the instructor may be purchased.

Information about any of the preceding activities may be obtained from the University of Washington, Director of Extension Services, 322 Lewis Hall, Seattle, Washington 98105.

Division of Continuing Studies

Director

Franklyn L. Hruza
212 Lewis Hall

Through its programs the Division extends the extensive resources of the University to the community. Each course, workshop, lecture series, or seminar is planned to serve the continuing education interests of adults with

varied educational backgrounds. Most programs are held on campus, but an increasing number are being moved into the community. There are no prerequisites for registration in Continuing Studies offerings, and no academic credit is given. There are no grades or examinations, and the extent of study outside the classroom is determined by the student himself.

A bulletin giving information and listing courses may be obtained from the University of Washington, Office of Noncredit Programs, 212 Lewis Hall, Seattle, Washington 98105.

Lecture-Discussion Series

Lecture-Discussion Series present faculty members and guest lecturers speaking on a single topic or interdisciplinary concern, approaching it from a variety of positions. Each participant deals with the subject according to his own expertise. Members of the audience have ample opportunity to raise questions and exchange ideas with the lecturers.

Courses, Workshops, and Seminars

Courses, workshops, and seminars present university-level material in a noncompetitive, informal atmosphere where learning is the central consideration. Some offerings are identical to those in the University's credit program; others are experimental or innovative; and still others survey a specialized field from a broad perspective. Midday seminars are planned for registrants who prefer to attend during daytime hours. They are characteristically informal, often taking place over a lunch period.

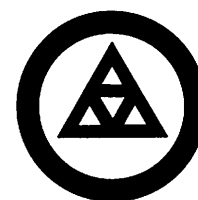
Programs for Women

Cosponsored by the Office of Women's Continuing Education, these programs are concerned with subject matter and issues of particular interest to women.

Residential Seminars

This program of informal, weekend residential seminars brings together University faculty members and interested adults for an intensive free exchange of ideas on significant social and cultural topics. Previously known as Liberal Arts Seminars, this program has been broadened to include, often on an interdisciplinary basis, a number of academic and professional subject matter areas as well as the traditional liberal arts. In addition to the adult seminars, a number of seminars for high school students are presented annually.





ARCHITECTURE AND URBAN PLANNING

Dean

Robert H. Dietz

206 Architecture

Associate Dean

Norman J. Johnston

206 Architecture

Professors

Harold L. Amoss, Thomas L. Bosworth, Robert H. Dietz, Arthur L. Grey, Jr., Arthur P. Hermann (emeritus), Edgar M. Horwood, Alfred Jensen, Norman J. Johnston, Charles M. Kelley, Wendell H. Lovett, Marion E. Marts, Omer L. Mithun, Victor Steinbrueck, Warren R. Seyfried, Daniel M. Streissguth, Philip Thiel, Morgan D. Thomas, Myer R. Wolfe

Affiliate Professor

Richard H. Slavin, Jr.

Associate Professors

Robert G. Albrecht, Richard S. Alden, David L. Bonsteel, Robert A. Chervenak, Lee G. Copeland, J. William Curtis, Richard Haag, John L. Hancock, Henry C. Hightower, Grant Hildebrand, George R. Hutchinson, Phillip L. Jacobson, Frank D. James, Keith R. Kolb, Thomas J. Norton, Hermann G. Pundt, Donald G. Radcliffe, John A. Rohrer, Arnold S. Rosner, Raymond C. Schneider, Claus Seligmann, Robert E. Small, John R. Sproule, Gerard R. Torrence, Gordon B. Varey, William C. Wherrette

Assistant Professors

Richard Berteaux, James J. Donnette, Ernst L. Gayden, Rainer Hasenstab, Ibrahim M. Jammal, Edgar G.

Lebert, Huck Rorick, Donald K. Sakuma, James Sanders, Robert Sasanoff, Jerry B. Schneider, R. Duane Shinn, Murray S. Silverstein, Christian Staub

Instructor

Douglas R. Zuberbuhler

Lecturers

L. Franklin Carroll, Richard Congdon, Richard L. Eberharter, David K. Ernst, Marvin J. Flaherty, Robert L. Harlan, Einar H. Hendrickson, Franklyn L. Hruza, Charles L. Jansen, Jr., Vetle W. Jorgensen, Daniel Lyons, Charles A. Mgebroff, Barry S. Onouye, Gerald C. Pomeroy, John L. Robertson, Leonard M. Shaw, W. Gene Skirvin, Carl L. Timpe, Robin M. Towne, Todd C. Warmington.

Man shapes his physical environment toward beauty and order . . . using the land, buildings, and his urban framework to realize his concept of livable growth. His tools are forms and spaces and technology.

The College of Architecture and Urban Planning deals with the physical context in which we live, particularly the city and its surrounding areas. Within the college are four areas of study: architecture, landscape architecture, urban planning, and building construction.

Architecture is concerned with buildings and groups of buildings, comfortable to live with, satisfying to the eye. Frequently it uses new and unexpected materials, art forms, different structural concepts to achieve simplicity within physical and psychological complexity.

Landscape architecture plans for the human use and enjoyment of the land, combining the disciplines of architecture and art with engineering principles of earthwork, grading and surveying, and with the conservation of natural resources.

Urban planning deals with metropolitan problems: population, development, regulatory measures, community facilities, transportation, slum clearance . . . the total urban complex and its enormous needs.

Finally, building construction translates ideas into reality. The designer and the developer become effective through the synchronized and dynamic functioning of the building industry at all levels.

The University grounds, located in the heart of a major urban area, comprise a laboratory for study. The College works closely with both the academic and professional worlds to build the curriculums and faculty best suited to the needs of the student who will one day be responsible for interpreting our environmental needs. The four professional areas of the College are an acknowledgment of the mutual interests of these fields in the creation of an appropriate contemporary environment.

Architecture was originally founded as a department in 1914, and from 1935 to 1957 it was a school in the College of Arts and Sciences. Urban Planning was initiated in 1941, Landscape Architecture in 1960, and Building Technology and Administration (now the Department of Building Construction) in 1963. Architecture and Urban Planning became one of the colleges of the University in July, 1957.

The architectural program of the College is accredited by the National Architectural Accrediting Board. The College has been a member of the Association of Collegiate Schools of Architecture since 1925. The Department of Urban Planning is a member of the Association of Collegiate Schools of Planning and has been granted recognition by the American Institute of Planners. The Department of Building Construction is a member of the Associated Schools of Construction.

The College offers work leading to the four-year degrees of Bachelor of Arts in Environmental Design, Bachelor of Arts in Urban Planning, and Bachelor of Science in Building Construction. It also offers the five-year professional degree of Bachelor of Landscape Architecture. At the graduate level are the Master of Architecture and, in Urban Planning, the master and doctoral degrees.

College Facilities and Services

Architecture Hall was built in 1909 for the Alaska-Yukon-Pacific Exposition, and is one of the few Exposi-

tion buildings remaining on campus. Designed as a permanent structure, it was used as the art gallery for the Exposition. In addition to classrooms and staff offices, Architecture Hall has drafting rooms, seminar rooms, and a library (a branch of the Henry Suzzallo Library) with an extensive collection of materials related to the College's programs. Included are approximately 11,000 volumes, 9,500 pamphlets, 360 current periodicals, and 21,600 35-millimeter slides, as well as a large file of manufacturers' catalogs and brochures. A new architecture hall is now in the planning stage, with occupancy expected in 1971 or 1972.

Honorary and Professional Societies

Iota chapter of *Tau Sigma Delta* was organized at the University of Washington in 1924. An international honorary and professional fraternity in architecture and the allied arts, the organization promotes scholarship and professional excellence. Membership is selective and is based on scholastic achievement.

Atelier is a social organization and student society that schedules special lectures and events. It was formed at the inception of the school to encourage students to discuss professional problems, to unite them as a group, and to promote an increased awareness of the ethics and high standards of the professions.

Sigma Lambda Chi, a local chapter of the national honorary fraternity, was formed in 1966. It gives recognition to outstanding students in building construction as well as furthers relationships between campus and industry and campus and the public.

Building Construction Association is open to all students in building construction. The Association sponsors lectures and meetings of interest to its members and forms an effective link between the program and the building industry.

Urban Planning Students Association is open to all urban planning students. As a professional society, the Association sponsors lectures and meetings of interest to planners, and presents several social functions during the school year.

Scholarships and Financial Aids

A number of undergraduate scholarships are awarded annually to students who demonstrate outstanding scholastic ability and general excellence. Medals are presented by the American Institute of Architects, Alpha Rho Chi (national social fraternity of architecture), and the faculty of the College to top-ranking students in architecture. Several teaching assistantships are available for graduate students in architecture. A series of fellowships and scholarships is also awarded to graduate students in urban planning.



Undergraduate Programs

Associate Dean

Norman J. Johnston

206 Architecture Hall

To prepare for normal progress in the College of Architecture and Urban Planning, the student must complete, in high school, three semesters of algebra and two of plane geometry and one of trigonometry. Physics should be selected as the laboratory science. Freehand drawing, humanities, and social sciences are strongly recommended as electives.

A student on entering the University enrolls in one of its several colleges or schools, whether or not he has chosen an academic major at the time of his admittance. If he chooses to major in landscape architecture, or building construction, he enrolls in the College of Architecture and Urban Planning. If, on the other hand, he wishes to become an architect or urban planner, he begins his first two years as a premajor in the College of Arts and Sciences, and, upon successful completion, applies for admission to the College of Architecture and Urban Planning.

Since admission to the College is competitive, in filling enrollment quotas preference will be given to those applicants who, in the judgment of the University, are best qualified to undertake its programs.

Admission to the Preprofessional Years

Students expecting to major in architecture or urban planning, who have completed their premajor requirements in the College of Arts and Sciences, apply for admission to the College of Architecture and Urban Planning where they will be expected to complete two years of preprofessional study in their respective departments. Admission is selective and is based upon the recommendation of the admission committees of the Department.

Graduation Requirements

For graduation with a Bachelor of Arts in Environmental Design, Bachelor of Arts in Urban Planning, or Bachelor of Science in Building Construction, satisfactory completion of the respective four-year curriculum and three quarters of physical education activity are required. Receipt of the Bachelor of Landscape Architecture degree requires satisfactory completion of a five-year curriculum and three quarters of physical education activity.

Students majoring in urban planning or building construction must maintain a yearly 2.30 grade-point average in the last two years of the program and a 2.50 grade-point average in all urban planning or building construction courses. Architecture majors in the pre-professional third and fourth years of the curriculum

must demonstrate what the faculty considers to be promising performance in the design studio as well as maintain a yearly cumulative 2.30 grade-point average. Majors in landscape architecture are expected, in the last three years of the curriculum, to maintain a 2.30 grade-point average and must also demonstrate what the faculty considers to be promising performance in the design studio.

Senior Year Residence

Senior standing is attained when 135 credits, plus the required quarters of physical education activity, have been earned. In the senior year, at least 35 credits of the required 45 must be earned in three quarters of residence. The remaining 10 credits may be earned either in residence or in the evening classes or correspondence courses offered by the University of Washington.

Graduate Programs

The College also offers programs leading to the Master of Architecture, Master of Urban Planning, and Doctor of Philosophy in the field of Urban Planning.

Students who intend to work toward one of these degrees must apply for admission to the College of Architecture and Urban Planning and to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

ARCHITECTURE

Chairman

Thomas L. Bosworth

206F Architecture Hall

Assistant Chairman

James J. Donnette

Study is offered in architecture at the undergraduate and graduate levels leading to the Bachelor of Arts in Environmental Design and Master of Architecture respectively. Architecture majors take the first two years of their program in the College of Arts and Sciences or must take its equivalent on some other campus. Upon successful completion of these premajor years, a student may apply for admission to the College of Architecture and Urban Planning as a regular or transfer student for the two-year preprofessional architecture undergraduate program. Students successfully completing this two-year period will graduate with the degree of Bachelor of Arts in Environmental Design. At this point, a student may elect to continue his formal education by applying for admission to the Graduate School where he may enter the two-year professional program leading to the Master of Architecture degree. Application must be made both to the Graduate School and to the Graduate Program Adviser in Architecture.

Students with equivalent baccalaureate degrees in architecture or related fields granted by accredited institutions are encouraged to apply for graduate study in architecture at the University of Washington. Those with five-year Bachelor of Architecture degrees can reasonably expect to complete requirements for the Master of Architecture degree in four additional quarters. Students with four-year bachelor degrees in other fields may expect completion in approximately three academic years and one quarter. Such students ordinarily apply to the Graduate School and the graduate program in architecture and, on admission, complete any preprofessional course requirements. They then continue on for their concluding two years of study, receiving the Master of Architecture upon successful completion of the program.

Within the curriculum, history provides a perspective of man's development and a reference base for an appreciation of its future implications. Theory and environmental awareness are stressed to understand the total effect that changing space and urban forms will have on man's environment. Knowledge of the humanities and social sciences enables the student to adjust to his working world and contributes to society through his acquired professional competence.

Methods and procedures are presented to engender ideas and stimulate the creative process, its new tools and programming techniques, both graphic and quantitative. Communications are stressed. Mathematics, the natural and physical sciences, and structures are covered in formal courses designed to foster the understanding and implementation of new forms for a new era.

The resulting premajor, preprofessional, and professional programs in architecture are designed to encourage the architect, through his creative ability and knowledge of the arts and sciences, toward providing a physical environment conducive to the fulfillment of man's greatest aspirations.

Undergraduate Program

Director

Daniel M. Streissguth
206F Architecture Hall

The four-year curriculum leading to the Bachelor of Arts in Environmental Design is listed here.

REQUIREMENTS FOR PREMAJORS

(College of Arts and Sciences)

Premajors in the College of Arts and Sciences must plan their programs to satisfy the proficiency requirements of that College. To meet the requirements for architecture premajors, such planning includes the following:

First and Second Years		CREDITS
MATH 105, 124, 125	COLLEGE ALGEBRA, CALCULUS WITH ANALYTIC GEOMETRY	15
NATURAL SCIENCE, LECTURE AND LABORATORY (PHYSICS RECOMMENDED)		15
SOCIAL AND BEHAVIORAL SCIENCES, SELECTED FROM LIST OF RECOMMENDED COURSES AND SEQUENCES*		20
HUMANITIES (TOTAL CREDITS MAY INCLUDE UP TO 9 IN ART LABORATORY ELECTIVES; ALL COURSES TO BE CHOSEN FROM LIST OF RECOMMENDED COURSES AND SEQUENCES*)		25
FOREIGN LANGUAGE OR CREDITS EARNED IN ADDITION TO MINIMUMS ABOVE IN NATURAL, SOCIAL, AND BEHAVIORAL SCIENCES, OR IN HUMANITIES (EXCEPT ART LABORATORY CREDITS), THESE CREDITS TO BE DRAWN FROM ONE SELECTED SUBJECT AREA AND TO REPRESENT A STUDY IN DEPTH THEREIN*		15
PHYSICAL EDUCATION ACTIVITY		3
		<u>93</u>

PREPROFESSIONAL REQUIREMENTS

Third Year

ARCH 300, 301, 302	INTRODUCTION TO DESIGN—LABORATORY	12
ARCH 305, 306, 307	INTRODUCTION TO DESIGN	3
ARCH 310, 311, 312	INTRODUCTION TO DESIGN GRAPHICS	3
ARCH 320, 321, 322	INTRODUCTION TO STRUCTURAL THEORY I, II, III	9
ARCH 330, 331, 332	INTRODUCTION TO BUILDING METHODS, MATERIALS, AND ASSEMBLIES I, II, III	6
ARCH 340, 341, 342	ENVIRONMENTAL AWARENESS: ECOSYSTEMS, APPRECIATION, PROGNOSTICS	9
ARCH 350, 351, 352	SURVEY OF ENVIRONMENTAL ARTS I, II, III	9
		<u>51</u>

Fourth Year

ARCH 400, 401, 402	INTRODUCTION TO ARCHITECTURAL DESIGN LABORATORY	12
ARCH 405, 406, 407	INTRODUCTION TO ARCHITECTURAL DESIGN	3
ARCH 410, 411, 412	ARCHITECTURAL GRAPHICS	3
ARCH 460	DESIGN THEORY AND ANALYSIS	3
ELECTIVES (SELECTED FROM LIST OF RECOMMENDED COURSES AND SEQUENCES)		
	ENVIRONMENTAL HISTORY	3
	PREPROFESSIONAL	9
	OTHER (PREPROFESSIONAL OR NONPROFESSIONAL)	12
		<u>45</u>

Graduate Program

Graduate Program Adviser

R. Alden

206 Architecture Hall

The program leading to the degree of Master of Architecture stresses professional consultation with emphasis on the analysis of the forces which shape architecture, such as economics, structure, history, mechanical and electrical equipment, aesthetics, and social and psychological influences. The student selects his study in various areas of interest with special emphasis on urban design, housing and redevelopment, perception, and educational facilities programming and design. The faculty works with each student in the selection and development of studies to complement the student's investigation. In addition, graduate seminars are offered in theory of esthetics, human behavior in relationship to environmental design, decision theory, research methodology, and visual design.

The graduate program is offered to individuals of substantial educational achievement who desire concen-



CREDITS

trated individual study. Its objective is to provide the graduate student with the scholarly and professional means to evaluate and implement his role of complex responsibilities and opportunities in the rapidly changing architectural profession.

Within the framework of this general objective, various program options are available, depending on the student's academic and professional background and his special interests. The following are suggested possibilities in advanced architectural studies:

Design

Educational facilities
Health facilities
Community facilities
Housing

Research

Programming
Design process
Perception
Visual design
Structures
History
Design decision theory
Environmental psychology
Industrialized building systems
Computer applications in design
Building economics

Special Study

A student may, with the permission of the Graduate Program Adviser, pursue a special study in any area for which he is suitably prepared and in which the faculty can provide adequate guidance.

Students are encouraged to select areas of their own interest within the resources represented by the College, the University, and the community under the guidance of the Graduate Program Adviser. All students, regardless of their areas of study, are encouraged to enroll in a seminar sequence relating to environmental issues.

Fifth and Sixth Years

(Normally following receipt of the Bachelor of Arts in Environmental Design and admission to the Graduate School)

	CREDITS
ARCH 500, 501 ARCHITECTURAL DESIGN LABORATORY	12
ARCH 502 ARCHITECTURAL STUDIES OPTIONS	6
ARCH 503, 504, 505 ARCHITECTURAL STUDIES OPTIONS	18
ARCHITECTURAL STUDIES ELECTIVES (SELECTED FROM LIST OF RECOMMENDED SECTIONS IN SPECIAL STUDIES IN ARCHITECTURAL RESEARCH; SOME REQUIRE CONCURRENT REGISTRATION IN ALLIED PROFESSIONAL COURSES)	
ARCHITECTURAL STUDIES AND PROFESSIONAL ELECTIVES (CHOSEN WITH APPROVAL OF THE GRADUATE PROGRAM ADVISER FROM LIST OF RECOMMENDED COURSES AND SEQUENCES IN THE FOLLOWING FIELDS):	51

- (a) ADVANCED STUDIES IN ARCHITECTURE AND ARCHITECTURAL RESEARCH, SOME REQUIRING CONCURRENT REGISTRATION IN ALLIED PROFESSIONAL COURSES
 - (b) ADVANCED STUDIES IN PROFESSIONAL FIELDS ALLIED TO ARCHITECTURE: URBAN PLANNING, LANDSCAPE ARCHITECTURE, BUILDING CONSTRUCTION
 - (c) ENVIRONMENTAL HISTORY AND THEORY
 - (d) ENVIRONMENTAL TECHNOLOGY: ADVANCED STRUCTURAL DESIGN, DESIGN OF BUILDING EQUIPMENT, BUILDING CONSTRUCTION, ARCHITECTURAL ADMINISTRATION
 - (e) HUMAN, SOCIAL, AND BEHAVIORAL IMPLICATIONS IN ENVIRONMENTAL STUDIES
 - (f) VISUAL DESIGN, LIGHT, AND COLOR
 - (g) ARCHITECTURAL GRAPHICS
 - (h) BUILDING ECONOMICS
 - (i) ADVANCED DESIGN METHODS
 - (j) OTHER DEPARTMENT OF ARCHITECTURE PROGRAMS
 - (k) OFFERINGS OF OTHER UNIVERSITY DEPARTMENTS
- THESIS (TOPIC OPTIONS ARE AVAILABLE; SEE YOUR ADVISER) 9

90

A student who has a five-year Bachelor of Architecture degree from an approved institution may be admitted to this program with advanced standing upon application to the College of Architecture and Urban Planning and to the Graduate School.

LANDSCAPE ARCHITECTURE

Acting Chairman

Richard Haag

106 Architecture Hall

A degree of Bachelor of Landscape Architecture is offered in a five-year program. The first two years are devoted to general education with emphasis on the natural sciences and basic approaches to design. The final three years are built around a core of landscape design reinforced by service courses in botany, engineering, forest resources, etc.

The case-study method is used in such projects as the design of public areas, urban redevelopment projects, and individual residences. The curriculum is concerned with the restoration and the re-creation of new environments where the natural one has been damaged, but a major emphasis will be on the conservation of natural landscape values.

Program of Study

The five-year curriculum leading to the degree of Bachelor of Landscape Architecture is outlined below.

TWO-YEAR PREPROFESSIONAL REQUIREMENTS

First Year	CREDITS
ARCH 152 ENVIRONMENTAL DESIGN PROFESSIONS	3
ART 105, 106 DRAWING	6
ART ELECTIVE	3
BOT 113 ELEMENTARY PLANT CLASSIFICATION	5
ENGL 101, 102 OR 103 INTRODUCTORY ENGLISH	6
MATH 104, 105 PLANE TRIGONOMETRY, COLLEGE ALGEBRA	8

*In the humanities, social sciences, and natural sciences, choices are to be made from courses included in the College of Arts and Sciences *College List* and *Special List* or their equivalent, excluding only those titled "architecture" or "mathematics."

	CREDITS
SOC 110 SURVEY OF SOCIOLOGY	5
APPROVED ELECTIVES	6
PHYSICAL EDUCATION ACTIVITY	3
	<u>45</u>

Second Year

ARCH 300, 301, 302 INTRODUCTION TO DESIGN—LABORATORY	12
ARCH 305, 306, 307 INTRODUCTION TO DESIGN	3
ARCH 310, 311, 312 INTRODUCTION TO DESIGN GRAPHICS	3
ART 258 PAINTING	3
ART 272 BEGINNING SCULPTURE COMPOSITION	3
*BIOL 101-102 GENERAL BIOLOGY	10
G E 121 PLANE SURVEYING AND MEASUREMENTS	3
GEOL 101 PHYSICAL GEOLOGY	5
GEOL 308 GEOLOGY OF THE NORTHWEST	5
APPROVED ELECTIVE	2
	<u>49</u>

THREE-YEAR PROFESSIONAL REQUIREMENTS

Third Year

ARCH 340, 341 ENVIRONMENTAL AWARENESS:	
ECOSYSTEMS, APPRECIATION	6
ARCH 350, 351, 352 SURVEY OF ENVIRONMENTAL ARTS	9
ARCH 400, 401 INTRODUCTION TO ARCHITECTURAL DESIGN—	
LABORATORY	8
ARCH 405, 406 INTRODUCTION TO ARCHITECTURAL DESIGN	2
L ARC 242 DESIGN BASICS	6
L ARC 330 THEORY AND PERCEPTION OF LANDSCAPE	
ARCHITECTURE	3
URB P 400 INTRODUCTION TO URBAN PLANNING	3
FOR R 204 DENDROLOGY	5
APPROVED ELECTIVES	3
	<u>47</u>

Fourth Year

L ARC 331 HISTORY OF LANDSCAPE ARCHITECTURE	3
L ARC 334, 335, 336 CONSTRUCTION	12
L ARC 350, 351, 352 LANDSCAPE DESIGN, GRADE III	18
L ARC 410, 411, 412 LANDSCAPE ARCHITECTURE	
GRAPHICS I, II, III	3
BOT 331 ORNAMENTAL PLANTS	3
GEOG 302 THE PACIFIC NORTHWEST	3
APPROVED ELECTIVES	9
	<u>48</u>

Fifth Year

L ARC 460, 461, 462 LANDSCAPE DESIGN, GRADE IV	18
L ARC 465 PLANTING DESIGN	4
L ARC 470 OFFICE PROCEDURE	3
URB P 479 THE URBAN FORM	3
FOR R 450 RECREATIONAL USE OF WILDLANDS	3
GEOG 370 CONSERVATION OF NATURAL RESOURCES	5
SOC 330 HUMAN ECOLOGY	5
APPROVED ELECTIVES	8
	<u>49</u>

* 10 credits in a physical science may be substituted for Biology 101-102.

URBAN PLANNING

Chairman

Arthur L. Grey, Jr.
202 Architecture

The making of plans for cities has a long history. The development of urban planning as a distinct profession and field of study is, however, of recent origin. This development is a consequence of several factors. One is the rapid growth of population and its concentration in increasingly large urban agglomerations. Another is the rapid development and spread of technological in-

novation. The third factor is the specialization of knowledge and division of responsibility for the setting in which man works and dwells. Urban planning is a response to these trends. It endeavors to draw together ideas and information concerning man's interactions with his surroundings.

Urban planning is concerned with the rational organization and use of man-made environments, and is based upon an understanding of institutions, technology, and man's aspirations and opportunities. Urban planning makes its contribution in the integrated application of knowledge from diverse fields. Its own specialized concern is with the improvement of existing environments and design of new physical surroundings. Planners conduct research on the nature of man-made environment and the processes and directions of change. They formulate alternatives, propose solutions to environmental and community problems, and develop and apply methods for evaluating alternatives. Planners also exercise responsibilities for the administration of programs to prepare plans and carry them into effect.

The Department of Urban Planning offers three degree programs. The undergraduate curriculum leading to the Bachelor of Arts degree with a major in urban planning is intended to provide a general education in the urban field as well as to provide preprofessional emphasis for the student contemplating a career in urban planning. Such students take the first two years of their programs in the College of Arts and Sciences at the University of Washington, or take an equivalent program on some other campus. Upon successful completion of these premajor years, students may apply for admission to the College of Architecture and Urban Planning as regular or transfer students for the two-year pre-professional urban planning program. Students successfully completing this two-year period will graduate with the degree of Bachelor of Arts in Urban Planning.

The Master of Urban Planning degree is the normal educational qualification for professional practice of city or regional planning, including specialized research and design positions as well as generalist planning and administrative positions in a wide variety of public agencies and consulting firms. The Master of Urban Planning degree is a two-year (six-quarter) program.

The Doctor of Philosophy degree is awarded in recognition of education and ability which should lead to distinction in scholarly teaching, research, and community service activities. This program normally requires two to three years, depending on previous education and experience following completion of the master's degree or its equivalent in planning or related fields.



All three of the degree programs in this Department are recognized for purposes of corporate membership by the American Institute of Planners.

Special Facilities

There are opportunities for direct involvement in current research programs of the Department. In addition, the Department of Urban Planning has a close affiliation with the Urban Data Center situated in the Department of Civil Engineering, which provides specialized facilities and services the general area of urban information systems. The Department is also associated with the Center for Urban and Regional Research of the University's Graduate School and with the Bureau of Community Development.

Undergraduate Program

Adviser

Ernst L. Gayden

202 Architecture Hall

Bachelor of Arts in Urban Planning

REQUIREMENTS FOR PREMAJORS

(College of Arts and Sciences)

First and Second Years

Premajors spend their first and second years in the College of Arts and Sciences where they must plan their programs to satisfy the proficiency requirements (90 credits minimum) of that College.

Preprofessional Requirements

Third Year	CREDITS
*SOCIAL STRUCTURE CORE AREA	12
**ENVIRONMENTAL STRUCTURE CORE AREA	12
†DECISION PROCESSES CORE AREA	12
URB P 400 INTRODUCTION TO URBAN PLANNING	3
URB P 479 THE URBAN FORM	3
URB P 489 HISTORY OF CITY DEVELOPMENT	3
	<u>45</u>

Fourth Year

ARCH 300, 301 INTRODUCTION TO DESIGN LABORATORY	8
ARCH 305, 306 INTRODUCTION TO DESIGN	2
ARCH 310, 311 INTRODUCTION TO DESIGN GRAPHICS	2
URB P 475 DIRECTED SOCIAL CHANGE	3
URB P 480 URBAN PLANNING ANALYSIS I	3
URB P 482 URBAN COMMUNITY FACILITIES	3
URB P 485 HOUSING	3
URB P 499 SPECIAL PROJECTS IN URBAN PLANNING	5
APPROVED PROFESSIONAL ELECTIVES	16
	<u>45</u>

Graduate Programs

Graduate Program Adviser

Thomas J. Norton

202 Architecture Hall

Master of Urban Planning

The master's degree program is professionally oriented. This program draws students from a variety of backgrounds such as sociology, economics, geography, political science, civil engineering, and architecture. Selective urban study and technique courses are taken to provide a basis for professional courses.

The degree of Master of Urban Planning will be awarded upon satisfactory completion of the course requirements, a thesis, and an oral examination. The varied background of study and experience found among students working for this degree requires some adjustment of the student's program to meet individual needs and objectives.

Further details on the program, the requirements, the emphases, and current course offerings, and information on the variety of financial aids available may be obtained by writing to the Graduate Program Adviser of the Department of Urban Planning.

Although the concerns of urban planning are synoptic, in order to cope with specialization in other fields, it is necessary within urban planning to develop special competencies. Several different lines of interest are represented in the activities of the Department: metropolitan and regional planning, urban development and housing, urban design, urban information systems and quantitative methods, transportation planning, and social resources planning. The student working toward a master's degree is presented with opportunities to concentrate his work in one of these fields while pursuing the general program.

The urban design subcurriculum is for students with an architectural or landscape-architectural background. This is conducted in conjunction with the Department of Architecture.

There is no preferred major field of undergraduate study in preparation for graduate education in the Department of Urban Planning. By giving some prior attention to the organization of his undergraduate program, the student may better prepare himself to pursue a specialty in the master's program without extending his period of study beyond the normal two years. Such preparation will include course work in a social science, urban study, and background courses, and, when available, courses specifically oriented to urban planning, such as those undergraduate courses offered by the Department of Urban Planning.

Course requirements stated below fall into four main categories: related courses, foundation courses, ad-

*Social Structure Core Area: Courses, usually at the 300 and 400 level, draw from such backgrounds as sociology, anthropology, history, psychology, and philosophy, and deal with the nature, structure, and functioning of social groups and organizations.

**Environmental Structure Core Area: Courses, usually at the 300 or 400 level, draw from such areas as geography, biology, forest resources, civil engineering, and environmental health sciences, dealing with the nature, structure, and functioning of predominantly natural systems.

†Decision Processes Core Area: Courses, usually at the 300 and 400 level, draw from such disciplines as economics, political science, business administration, law and government, public administration, and operations management, dealing with the analytic, descriptive and/or administrative facets of social decision making.

vanced courses, and specialized electives. Total credits required: 72 (an average of 12 per quarter).

RELATED COURSES

In the course of the master's program, not less than 15 credits are to be completed in related courses in other departments. There is no set pattern to be followed as subject matter needs will vary depending upon individual interests and prior preparation.

FOUNDATION COURSES

Students must take Urban Planning 430, 500, 501, 580, or equivalents, and no less than 6 credits of other 400-numbered preprofessional courses in the Department.

Students who have already completed all or part of these requirements are asked to pursue other work for equivalent credits in this or another department.

ADVANCED COURSES

Students must take all of the following courses:

	CREDITS
URB P 521 COMPREHENSIVE PLANNING ANALYSIS	2
URB P 522 METROPOLITAN PLANNING ANALYSIS	2
OR	
URB P 523 URBAN DESIGN ANALYSIS	2
URB P 540 LABORATORY IN URBAN PLANNING METHODS AND TECHNIQUES	5
URB P 541 LABORATORY IN COMPREHENSIVE PLANNING	5
URB P 542 LABORATORY IN METROPOLITAN PLANNING	5
OR	
URB P 543 LABORATORY IN URBAN DESIGN	5
URB P 550 RESEARCH SEMINAR	2
URB P 700 THESIS	9

SPECIALIZED ELECTIVES

The main groupings of professional electives now offered encompass the following courses. Ordinarily, each student will wish to concentrate his electives in one of these fields, but some of these courses can be combined to advantage with other offerings.

Students desiring to complete the urban design specialty should confer with the adviser for that subcurriculum concerning detailed requirements.

In addition to courses already specified above (Urban Planning 522, 542 or 523, and 543), students must complete 9 credits in one of the following groupings:

Urban Development

URB P 505 URBAN RENEWAL	3
URB P 512 FISCAL RESOURCES AND ECONOMIC ACTIVITY	2
URB P 579 COMPARATIVE URBANISM	3
URB P 581 THEORIES AND METHODOLOGY OF PLANNING II	4
GEOG 510 RESEARCH SEMINAR: SETTLEMENT AND URBAN GEOGRAPHY	3
GEOG 577 RESEARCH SEMINAR: INTERNAL SPATIAL STRUCTURE OF CITIES	3
U D 520 URBAN DEVELOPMENT ECONOMICS	3

Metropolitan and Regional Planning

URB P 512 FISCAL RESOURCES AND ECONOMIC ACTIVITY	2
URB P 522 METROPOLITAN PLANNING ANALYSIS	*
URB P 525 TRANSPORTATION AND LAND USE PLANNING MODELS	3
URB P 542 LABORATORY IN METROPOLITAN PLANNING	5
URB P 551 REGIONAL PLANNING SEMINAR	3
URB P 425 INTRODUCTION TO URBAN TRANSPORTATION	3
GEOG 516 SEMINAR IN URBAN-REGIONAL ECONOMICS	3
GEOG 530 RESEARCH SEMINAR: GEOGRAPHY AND DEVELOPMENT	3

Urban Design

	CREDITS
ARCH 442 SOCIAL IMPLICATIONS OF ARCHITECTURE	3
ARCH 507 GRAPHIC REPRESENTATION AND SIMULATION	2
ARCH 575 GRADUATE SEMINAR, RESEARCH AND ANALYSIS I	3
URB P 523 URBAN DESIGN ANALYSIS	2
URB P 524 SEMINAR IN URBAN DESIGN	2
URB P 543 LABORATORY IN URBAN DESIGN	5
PHIL 446 DEVELOPMENT OF AESTHETIC THEORY	5

Urban Information Systems and Quantitative Methods

ARCH 577 GRADUATE SEMINAR, RESEARCH AND ANALYSIS III	3
URB P 527 INFORMATION SYSTEMS FOR PLANNING AND RESEARCH	3
URB P 528 AUTOMATED MAPPING AND GRAPHING	3
URB P 529 COMPUTER APPLICATIONS TO URBAN AND REGIONAL ANALYSIS	3
GEOG 526 RESEARCH SEMINAR: QUANTITATIVE METHODS IN GEOGRAPHY	3

Other Approved Electives

Students intending to specialize in the Urban Transportation Planning or Social Resources Planning options should consult the Graduate Program Adviser.

Doctor of Philosophy

The Ph.D. degree in the urban planning field indicates scholarly abilities, long-term intellectual interests, and substantial achievements related to the discipline of planning. The requirements leading to this degree are devices through which the student may demonstrate that he has these qualities and is capable of independent work worthy of the attention of his peers in the academic and professional planning communities. This doctoral program is not viewed as an additional level of training for professional practice.

This program has a minimum of fixed requirements in the Department of Urban Planning additional to those of the Graduate School. A preliminary examination may be required before a Supervisory Committee is appointed to direct the student's specialized preparation for the General Examination. A demonstrated reading knowledge of one appropriate foreign language is a prerequisite to the General Examination. The first of two major requirements is the passing with distinction of a set of written and oral examinations that will evaluate the student's preparation in four areas: (1) The specialized area of urban planning in which he expects to make his major contribution, including but not limited to the topic of his proposed dissertation; (2) the theory, methods, and processes of planning; (3) the management and use of quantitative data for planning research and analysis; (4) the methods and major theories of some discipline outside of planning, relevant to the specialized area chosen.

The second major requirement is completion of a satisfactory dissertation and the Final Examination.

Students interested in this program are invited to consult the Doctoral Program Adviser about their specific



academic interests and admission and program requirements.

BUILDING CONSTRUCTION

Chairman

George R. Hutchinson

106 Architecture Hall

The Building Construction Program of the College has the objective of developing individuals for management, business, and technical positions within the building industry. This comprises five general areas of activity: development, design, construction, supporting industries, and government. Within each of these areas there is need for individuals with a basic knowledge and concern for architecture and building and with a more detailed technical competence.

Development: The developer has need for individuals skilled in areas such as project promotion, building finance and design, and construction liaison.

Design: The design professions—architecture and engineering—are steadily expanding the scope and variety of their services, involving personnel skilled in areas that include business management and development, construction financing, construction supervision, and building economics.

Construction: The construction industry is becoming more specialized and demanding, creating a need for individuals competent in areas such as construction management and supervision, estimating, quantity surveying, and business management.

Supporting industries: Mass demand and a revolution in building techniques are greatly expanding the industrial base of building, and there is need in this area for individuals skilled in areas that include materials and product research, material distribution and sales, and material and product production.

Government: The government, at local, state, and federal levels, is playing an expanding role in the building industry and, consequently, is requiring more personnel in areas such as design and construction liaison, building and contract document analysis, building finance, and code establishment and enforcement.

In order to meet the Building Construction program's diverse requirements, the curriculum is divided into three main areas:

Required courses: These include architectural theory and appreciation, structural design, building construc-

tion, mechanical equipment of buildings, urban planning, the humanities, physics, mathematics, business administration, economics, and general University requirements.

General elective courses: Such courses are elected by the student, with the help of his adviser, to broaden his knowledge and appreciation of the society in which he lives.

Recommended elective courses: The student similarly elects courses to complement and strengthen his specific area of interest within the field of his major. He is required to earn a specific number of quarter credits in each of the above three areas in order to ensure a proper academic balance.

The program is of four years duration and leads to the degree of Bachelor of Science in Building Construction.

Program of Study

The following four-year curriculum leads to the degree of Bachelor of Science in Building Construction.

First Year	CREDITS
CHEM 100 CHEMICAL SCIENCE	5
ENGL 101, 102 OR 103 INTRODUCTORY ENGLISH	6
MATH 105, 124, 125 COLLEGE ALGEBRA, CALCULUS WITH ANALYTIC GEOMETRY	15
PHIL 100 INTRODUCTION TO PHILOSOPHY	5
PSYCH 100 GENERAL PSYCHOLOGY	5
SOC 110 SURVEY OF SOCIOLOGY	5
APPROVED ELECTIVES	6
PHYSICAL EDUCATION ACTIVITY	3
	<hr/> 50

Second Year	
ARCH 320, 321, 322 INTRODUCTION TO STRUCTURAL THEORY I, II, III	9
ARCH 330, 331, 332 INTRODUCTION TO BUILDING METHODS, MATERIALS, AND ASSEMBLIES I, II, III	6
ACCT 210, 220, 230 FUNDAMENTALS OF ACCOUNTING, BASIC ACCOUNTING ANALYSIS	9
PHYS 114, 115, 116 GENERAL PHYSICS	12
PHYS 117, 118, 119 GENERAL PHYSICS LABORATORY	3
APPROVED ELECTIVES	9
	<hr/> 48

Third Year	
ARCH 420, 421, 422 STRUCTURAL DESIGN I, II, III	12
ARCH 430, 431, 432 ENVIRONMENTAL CONTROL SYSTEMS I, INTEGRATED BUILDING SYSTEMS I, II	8
ARCH 470 PRODUCTION MANAGEMENT I	2
B CON 301, 302 BUILDING INDUSTRY	6
B CON 310 HISTORY OF BUILDING	3
BG&S 307 BUSINESS LAW FOR ENGINEERS	3
CETC 405 CRITICAL PATH METHODS OF PROJECT SCHEDULING	3
ECON 211 GENERAL ECONOMICS	3
ECON 340 LABOR ECONOMICS	5
Q METH 200 COMPUTER PROGRAMMING	1
APPROVED ELECTIVES	4
	<hr/> 47

Fourth Year	
B CON 401, 402 BUILDING ESTIMATING	8
B CON 410 SENIOR STUDY	4
B CON 420 BUILDING FINANCING	2
CIVE 366 SOILS ENGINEERING	4
G E 121 PLANE SURVEYING AND MEASUREMENTS	3
O MGT 301 PRINCIPLES OF OPERATIONS MANAGEMENT	3

	CREDITS
Q METH 201 STATISTICAL ANALYSIS	4
U D 310 URBAN DEVELOPMENT ECONOMICS	4
APPROVED ELECTIVES	11
	<hr/> 47

Note: Building Construction majors who plan to take their first two years at a college or university other than the University of Washington will find a rearrangement of the above sequence permits them to defer taking certain specialized courses until their third and fourth years at this University, without altering the content of the Building Construction curriculum. In these circumstances the following adjustments would be made in the curriculum:

From the second year *delete* these courses:

Arch 320, 321, 322 (9)

Arch 330, 331, 332 (6)

and *add* the following courses or their equivalent to the first two years:

BG&S 307, Building Law for Engineers (3) (BG&S 200, Introduction to Law (5) may be substituted)

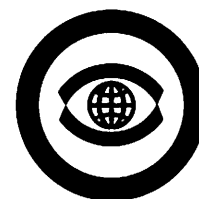
Econ 211, General Economics (3) (Econ 200, Introduction to Economics (5) may be substituted)

GE 121, Plane Surveying (3)

Q Meth 200, Computer Programming (1)

Q Meth 201, Statistical Analysis (4)

The delected courses will subsequently be added by adjustments made in the student's third and fourth years at the University of Washington.



ARTS AND SCIENCES

Dean

Philip W. Cartwright
B110 Padelford Hall

Associate Deans

Aldon D. Bell
Joe S. Creager
Morton Kroll
William L. Phillips
Walter L. Riley

Director of Honors

Julian D. Barksdale

A liberal education shapes man toward informed judgment and participation in a democratic society. The individual's acquaintance with both past and contemporary thought in the arts and sciences, his exploration of abstract ideas and their relationships, and his ability to manipulate them are the primary concern of the College of Arts and Sciences.

To the student bent on exploring his own potential, the College offers breadth and depth in the intellectual experience unlimited by vocational or professional considerations. The departments and schools offer nearly one hundred curricula leading to the degrees of either Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Science, as well as graduate study leading to master's and doctor's degrees.

Included within the subject matter areas are the Departments of Anthropology, Asian Languages and

Literature, Astronomy, Atmospheric Sciences, Botany, Chemistry, Classics, Economics, English, Genetics, Geography, Geological Sciences, Germanic Languages and Literature, History, Linguistics, Mathematics, Oceanography, Philosophy, Physics, Political Science, Psychology, Romance Languages and Literature, Scandinavian Languages and Literature, Slavic Languages and Literature, Sociology, Speech, and Zoology; the Schools of Art, Communications, Drama, Home Economics, Music, and Physical and Health Education; the Far Eastern and Russian Institute, Geophysics and other programs which offer interdepartmental courses and curricula.

Although some common patterns of study are required of all students, the objectives of the College permit a wide variability in education aims. Certain units of the College combine professional training with general study, but any special goals of a professional or vocational nature are regarded as extensions of the basic bachelor's program.

The first courses offered by the University when it opened on November 4, 1861, were in fields now included within the College of Arts and Sciences. A law of 1863 provided that the University should consist of at least four departments, namely (1) literature, science, and arts, (2) law, (3) medicine, and (4) military science.

As the University grew, the study of the basic arts and sciences was organized within a college, first called the

College of Literature, Science, and Arts, and later called successively the College of Liberal Arts, University College, and since 1939, the College of Arts and Sciences. Some former departments of the College have, from time to time, developed into separate colleges dealing with particular professions.

Today the College provides instruction to students in every unit of the University. Preprofessional programs are designed to enrich the general education of students who will enter the College of Architecture and Urban Planning, or the Schools of Business Administration, Law, Medicine, Dentistry, Public Affairs, Social Work, or Librarianship. Students enrolled in undergraduate colleges of the University are often required to take a large part of their work in courses given in the College of Arts and Sciences, and may elect additional courses as their degree programs permit.

College Facilities and Services

The College of Arts and Sciences offers a number of study, research, and cultural facilities associated with one or more units of the College which have uses beyond that of the College or department itself.

The Henry M. Suzzallo Library is described under the *General Information* section. Twenty branch libraries for special academic subjects are located in other buildings.

The Thomas Burke Memorial Washington State Museum contains natural history collections and anthropological collections of the Pacific Northwest, Oceania, and the Far East. Three University theatres, the Showboat, the Penthouse, and the Glenn Hughes Playhouse, are used throughout the year in the School of Drama program. Radio Station KUOW, an FM station operated by the University, and television station KCTS-TV, a community-sponsored project with studios located on campus, are used by students in the School of Communications. The Henry Art Gallery offers a program of exhibitions of recent painting, sculpture, printmaking, photography, and the craft media, film programs, musicales, and other special events. The Center for Asian Arts promotes the study and performance of the music, art, and drama of the Orient. The Center gives performances, arranges exhibits, and encourages work in the creation of actual works of art.

Service-research organizations include the Developmental Psychology Laboratory of the Department of Psychology, which provides clinical training for graduate students, conducts research, and offers consultative service; and the Laboratory Pre-school, which is maintained for teacher training, observations, and demonstrations. The Institute for Economic Research is a research organization affiliated with the Department

of Economics. The Institute for Sociological Research and the Center for Studies in Demography and Ecology are maintained by the Department of Sociology.

The Language Laboratory, with 350 individual units for students to practice hearing and speaking foreign languages; the Speech and Hearing Clinic, which offers remedial service to students and others with speech and hearing defects; and the English for Foreign Students program, administered by the Department of Linguistics, assist the student in developing his skills in oral communication.

Excellent teaching and research facilities in the physical and biological sciences are provided for students in the College. Of special interest are the Friday Harbor Laboratories, which offer unusual opportunities for work in the marine sciences; the 267-acre Arboretum, maintained for propagation of plants from all over the world; the cyclotron, Cosmic Ray Laboratory, and Van de Graaff accelerator of the Department of Physics; the three high-speed computing machines in the Computer Center, and the oceanographic research vessels which make field surveys and studies in Puget Sound and the Pacific.

UNDERGRADUATE PROGRAMS

Admission to the College

Admission with Freshman Standing

For general University admission requirements, see *Undergraduate Education* section.

High School Electives

Students who expect to enter the College of Arts and Sciences should plan their high school electives carefully, both to lay the foundation for their general education which will be continued at the college level, and to ensure that they are adequately prepared to begin their study in the College. Students should select subjects in English, languages, social sciences, natural sciences, mathematics, and fine arts which will provide a well-rounded preparation for college study.

Students who include four years of English, at least three years of a single foreign language, and at least three years of college preparatory mathematics in their high school programs meet the basic proficiency requirement of the College degree program upon entrance to the University. Thus, high school students may wish to take courses in these areas beyond the minimum required for admission, as a means of satisfying the proficiency requirement before coming to the University.

In addition, intensive preparation in an academic area may be appropriate for students who have specific



educational objectives. For example, students who expect to complete a major in mathematics or the physical sciences are generally urged to complete all of the standard mathematics courses offered by their high schools in order to avoid unnecessary delays in their progress toward a degree. Students expecting to complete major programs in botany, chemistry, communications, foreign languages, mathematics, music, oceanography, and physics should examine the recommendations of these departments.

GRADUATION REQUIREMENTS

Present requirements for all bachelor's degrees awarded by the College of Arts and Sciences were instituted in Autumn Quarter, 1969. They apply to all students entering the College in autumn, 1969, and thereafter, and apply retroactively to students enrolled in the College during the 1968-69 academic year. Other students should consult with the associate dean of the College, B10 Padelford Hall, concerning requirements which they will be expected to meet.

In addition to the University requirements for the bachelor's degree, students in the College must fulfill a basic proficiency requirement, a distribution requirement, and a major requirement.

Basic Proficiencies

Students of the College are expected to have developed, either in their high school study or early in their college study, fundamental proficiencies in the use of English and one foreign language and ability in quantitative reasoning. These abilities will make advanced study more efficient and meaningful for the student, and requiring competence in them from all students will enable the faculty to assume a minimum level of verbal and mathematical abilities in their courses. Although achievement in these skills is made a part of the degree requirements, many students will have demonstrated an acceptable level of achievement in their high school study. Students whose high school preparation included four years of English, three years of a single foreign language, and three years of college preparatory mathematics are considered to have satisfied the basic proficiency requirements. They may, of course, wish to take additional courses in these fields as electives.

A student who does not satisfy the basic proficiency requirement in this way will be expected during the first year in residence to complete fifteen credits in the areas of verbal and mathematical skills which he and his adviser consider most appropriate to his needs and interests. He may choose to emphasize one skill or refurbish more than one skill, as his assessment of his own capabilities may dictate. Ordinarily, courses used

to satisfy this requirement will be chosen from English composition, foreign language, and mathematics, but certain other courses may be substituted with the approval of his adviser. Advanced credit awarded in English, foreign languages, or mathematics on the basis of entrance or placement examinations may be used in the satisfaction of this requirement.

Students entering the College with junior standing (90 or more acceptable transfer credits) and students who have completed the general education requirements of other accredited colleges or universities will be considered to have satisfied the basic proficiency requirement.

Distribution Requirement

The College reserves approximately half of the student's four undergraduate years to develop in him a breadth of knowledge and appreciation and to enable him to explore subjects different in content and method from the one in which he will pursue a special competence. A distribution requirement has the effect of giving some structure to that exploration.

Most of the courses offered in the College, and certain courses offered in other units of the University as well, have been divided into three large fields of knowledge—the Humanities, the Social Sciences, and the Natural Sciences. Each student must select, with the approval of his adviser, at least 20 credits in courses from each of the three fields on the following list (the College List). No course from the department in which the student is pursuing his major field of study may be used to satisfy this requirement. Courses presented to satisfy the basic proficiency requirement may not be counted within the distribution requirement.

The student is urged to study the descriptions of the courses on the College List and to choose, with the help of his adviser, sequences of courses which will enable him to extend his present interests and inclinations and to acquire others.

Major Requirement

Among the characteristics of thought which the College attempts to develop in a student are the abilities to manipulate abstract ideas and to explore relationships deeply, confidence in the power of his own intellect, and an awakened intellectual curiosity. These attributes come from thorough study of a subject selected for its fundamental character and its richness of content, which aims at developing a depth of knowledge. This study leads the student to both empirical and theoretical considerations, develops in him a method of independent study, and exposes him to significant problems as yet unsolved. The College provides through a "major"

THE COLLEGE LIST

Humanities

Anthropology 333, 334, 335, 429, 430, 455, 459, 493
Architecture and Urban Planning: Architecture 150, 151, 340, 341, 342, 350, 351, 352, 450; Landscape Architecture 230, 231; Urban Planning 400, 479

Art and Art History: all undergraduate courses except Art 490

"Arts and Sciences" courses as designated

Asian Languages and Literature: all undergraduate courses

Biomedical History 401, 419, 420, 421, 425, 430

Classics: all undergraduate courses except Latin 475

Communications 321, 324, 326, 370, 373

Comparative Literature: all undergraduate courses

Dance 251, 252, 253, 256, 257, 258, 351, 352, 353, 490

Drama 101, 102, 103, 146, 151, 152, 153, 230, 275, 276, 277, 331, 338, 351, 352, 353, 414, 416, 455, 460, 461, 462, 474, 476, 477, 478, 479, 492, 495

English: all undergraduate courses

Far Eastern and Russian Institute 240, 242, 243, 281, 295, 302, 482, 483, 495

Germanic Languages and Literature: all undergraduate courses

History: Ancient and Medieval History 452, 453; Asian History 401, 402; History 311, 312, 411, 412, 413, 414; History of the Americas 402, 405-406, 454; Modern European History 401, 421

Home Economics 240 or 347; 321, 322, 329, 429, 432, 433

Humanities 101, 102, 103, 201

Librarianship 451 or 453; 470

Linguistics 101, 102, 103, 200, 201, 400, 404, 405, 406, 443, 455

Music: all undergraduate courses except 136, 137, 138, 139, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 236, 237, 320, 321, 322, 323, 324, 325, 326, 327, 328, 383, 384, 431, 432, 433, 434, 435, 436

Philosophy: all undergraduate courses except 110, 113, 120, 230, 231, 370, 410, 460, 463, 465, 470

Physical and Health Education: Dance 283, 364

Romance Languages and Literature: all undergraduate courses

Scandinavian Languages and Literature: all undergraduate courses except 380, 381

Slavic Languages and Literature: all undergraduate courses

Speech 100, 101, 103, 140, 220, 240, 320, 345, 347, 349, 400, 420, 421, 440, 442, 444

Social Sciences

Anthropology: all undergraduate Archaeology courses, and all undergraduate Anthropology courses except 333, 334, 335, 429, 430, 455, 459, 493, and except Physical Anthropology courses

Architecture and Urban Planning: Urban Planning 482, 485

"Arts and Sciences" courses as designated

Business Administration: Business, Government and Society 101, 200, 444; Administrative Theory and Organizational Behavior 440, 460; International Business 310
Communications 150, 200, 201, 202, 203, 220, 226, 314, 338, 400, 402, 406, 411, 414, 443, 470, 480, 485
Economics: all undergraduate courses
Education: Education History, Philosophy, Sociology 479, 480

Far Eastern and Russian Institute: all undergraduate courses except 240, 242, 243, 281, 295, 302, 482, 483, 495

General Studies 455, 456

Geography: all undergraduate courses

History: all undergraduate courses except Ancient and Medieval History 452, 453; Asian History 401, 402; History 311, 312, 411, 412, 413, 414; History of the Americas 402, 405-406, 454; Modern European History 401, 421

Home Economics 350, 354, 356, 409, 454, 457

Linguistics 451, 452, 453, 461, 462, 463

Philosophy 110, 113, 120, 230, 231, 410, 460, 463, 465

Physical and Health Education: Health Education 250; Recreation Education 304

Political Science: all undergraduate courses

Psychology: all undergraduate courses except 201, 202, 203, 222, 302, 303, 406, 416, 421, 422, 423, 425

Psychiatry 267, 450, 451, 452

Scandinavian Languages and Literature 380, 381

Social Science 150

Sociology: all undergraduate courses except 223

Speech 230, 235, 329, 335, 339, 373, 425, 426, 428, 473

Natural Sciences

Anthropology: all undergraduate Physical Anthropology courses

"Arts and Sciences" courses as designated

Astronomy: all undergraduate courses

Atmospheric Sciences: all undergraduate courses

Biochemistry: all undergraduate courses

Biological Structure 301

Biology: all undergraduate courses

Botany: all undergraduate courses

Chemistry: all undergraduate courses

Fisheries 101

Genetics: all undergraduate courses

Geological Sciences: all undergraduate courses

Home Economics 307, 407, 408, 415

Mathematics: all undergraduate courses except 114, 497

Microbiology 101, 301, 400

Oceanography: all undergraduate courses except 110-111-112

Philosophy 370, 470

Physical Education 293, 322, 331, 332, 333, 480

Physics: all undergraduate courses

Psychology 201, 202, 203, 222, 302, 303, 406, 416, 421, 422, 423, 425

Speech 300, 301, 415

Zoology: all undergraduate courses



THE SPECIAL LIST

The College List from which the student selects courses to fulfill the distribution requirement includes several thousand courses, reflecting the broad scope of the offerings available to a student in the College. To guide the student into courses which are most useful for introducing him to fundamental aspects of a subject and into courses especially designed for his general education, the faculty has selected a number of courses from the College List. This "Special List," which the student should consult in planning his degree program, includes alternative combinations of courses in many departments. The "Arts and Sciences" courses, experimental general education courses which are often interdisciplinary in nature, are also recommended.

Humanities

Fine Arts

Architecture 150, 151, 340, 341, 342, 350, 351, 352, 450

Art and Art History: Art 105, 106, 107 (Drawing); Art 109, 110, 129 (Design); Art History 201, 202, 203, 301

Drama 101, 146, 151

Humanities 102

Music 110, 111, 112 or 116, 117, 118; 120 or 121; 122, 123, 124, 125, 126, 127, 128; 316, 317, 318, 331

Languages and Literature

Arabic 401, 402, 403

Chinese 361, 362

Classics 210, 426, 427, 428, 430

Danish 220, 221, 222

English 257, 258, 259 (Introduction to Poetry, Fiction, Modern Drama); 264, 265, 266, 267 (Masterpieces); 324; Humanities 101, 201

French 304, 305, 306, 350, 351, 352

German 310, 311, 312

Greek 201, 202, 203

Indic 320

Italian 304, 305, 306

Japanese 421, 423

Korean 320

Latin 305, 306, 307

Linguistics 200

Near East 210, 420, 422, 424, 430, 432, 434, 440

Norwegian 220, 221, 222

Russian 320, 421

Spanish 304, 305, 306

Speech 103, 140, 220

Swedish 220, 221, 222

Philosophy

Philosophy 100

Social Sciences

History

Asian History 201; History 301, 302, 303; History of the Americas 201

Philosophy

Philosophy 110

Behavioral Sciences

Anthropology and Archaeology: Anthropology 100, 202, 301; Archaeology 205

Business, Government, and Society 200

Economics 200, 201, 260

Far Eastern 210, 280

Geography 100, 207, 277, 375

Political Science 201, 203, 311

Psychology 100 or 190; 205, 306, 345

Psychiatry 267, 450, 451

Sociology 110, 240, 270

Natural Sciences

Physical Sciences

Astronomy 101, 102, or 301

Chemistry 100, 101, 102; 140, 150, 151, 160; 145, 155, 165; 145H, 147H, 155H, 157H, 165H, 167H; or 101, 231, 232, 241, 242

Physics 110, 111, 112 or 440; 114, 115, 116, 117, 118, 119; or 121, 122, 123, 131, 132, 133

Earth Sciences

Atmospheric Sciences 101 or 301

Geological Sciences 101, 103, 106, 205

Oceanography 101, or 109H, or 203

Biological Sciences

Biology 101-102; or 210, 211, 212

Botany 111, 112, 113

Microbiology 101, 301

Physical Anthropology 201

Zoology 111-112, 114; 118 or 208

Mathematics

Mathematics 105, 124, 125, 126, 134H, 135H, 136H, 201H, 202H, 203H

requirement the means to satisfy these liberal purposes as well as the desire of students to become proficient in some field. This part of the student's program is determined by the department, school, or faculty committee with which he does his major study. Measured in academic credits, the "major" required of each student consists of a minimum of 50 prescribed credits in a department of the College or a closely related group of departments. Descriptions of major programs are to be found under *Departmental Programs* and *Interdepartmental Programs*.

So that the student will not be tempted to specialize prematurely, the College limits to 90 the number of credits from a single department which may be counted in the 180 credits required for the degree. A department may prescribe no more than 70 credits of its own courses, and no more than 90 credits of supporting courses in other departments as a major, unless it elects to require credits in addition to the 180 minimum for graduation. Certain curricula in art, chemistry, music, oceanography, and zoology require more than the 180 minimum.

To be eligible for the bachelor's degree, the student must achieve at least a 2.00 cumulative grade-point average in his major, as well as a 2.00 cumulative grade-point average overall.

General Information

Students should apply for the bachelor degree during the first quarter of the senior year. A student may choose to graduate under the graduation requirements of the catalog published most recently before the date of his entry into the College, provided that no more than ten years have elapsed since that date and that he has the approval of his major department. As an alternative, he may choose to fulfill the graduation requirements as outlined in the catalog published most recently before the anticipated date of his graduation. All responsibility for fulfilling graduation requirements rests with the student concerned. A student graduating from another college of the University who wishes to receive a degree simultaneously from the College of Arts and Sciences must receive approval from the Associate Dean of the College of Arts and Sciences (B10 Padelford Hall) at least three quarters before completing the requirements for the degree from this College. No student may graduate from the College of Arts and Sciences without a minimum of three quarters of attendance in the College.

College Honors Program

In recognition of its special responsibility to students of superior ability, the College has established a four-year

program offering opportunities for greater depth of study and culminating in an honors degree at graduation. Among the features of this program are special counseling, honors courses, honors sections of regular courses, faculty-student colloquia, and opportunities for independent study.

Students are admitted to the College Honors Program upon invitation by the Honors Council. In order to be considered for admission at entrance, a student must submit an application to the Director of Honors during his final high school semester. Approximately 5 per cent of the entering freshmen are selected on the basis of their high school records and scores on such examinations as those administered by the College Entrance Examination Board, National Merit, and the Washington Pre-College Testing Program. A periodic reclassification based on academic performance at the University makes possible the later admission of students not invited to membership at entrance.

Honors students are counseled by special Honors Advisers. During the freshman and sophomore years they are expected to arrange approximately one-half their schedules in honors courses in a variety of academic disciplines. A student may not become a candidate for an honors degree until he has been accepted (usually during the junior year) by a department which offers an honors curriculum (for departmental honors curricula see section on *Departmental Programs*). Students successfully completing a program approved by the Honors Council and the major department are graduated "With College Honors" in the appropriate discipline. Other students, not members of the College Honors Program, who demonstrate superior abilities in a single field of study, may, with the approval of the department, participate in a departmental honors curriculum and receive a departmental honors degree, "With Distinction" in the major field.

The College Honors Program is under the supervision of an Honors Council. The Office of the Director is in C18 Padelford Hall.

CERTIFICATION FOR TEACHING

Students following programs leading to a bachelor's degree in the College of Arts and Sciences may qualify for Provisional Certification for public school teaching in the state of Washington by including in their degree programs the courses required for certification as determined by the faculty of the College of Education. The similarity of the bachelor's degree programs of the two Colleges makes it possible for students in their first two years to transfer easily from one College to the other,



while the differences between the programs provide opportunities for students to select the program which best fits their general educational interests and which best prepares them for the level at which they seek to be qualified for teaching.

Students preparing for certification in elementary education must fulfill a preprofessional elementary education minor as well as the professional education sequence of courses; they ordinarily should, therefore, enroll in the College of Education before the junior year. Students preparing for teaching in a high school or junior college may transfer to the College of Education as juniors, or may continue in the College of Arts and Sciences, including as electives the courses listed in the "Professional Education Sequence (Secondary Emphasis)" described in the *College of Education* section.

Students in either College must make formal application to be admitted into the Teacher Education program through the College of Education Advisory Office, 207 Miller Hall. Students seeking acceptance in the Teacher Education program should examine the *College of Education* section. In general, acceptance requires a minimum of 45 approved credits, a cumulative grade-point average of 2.50, satisfactory completion of Education 288, and evidence of good physical and mental health.

GRADUATE PROGRAMS

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the general requirements outlined in the *Graduate Study* section of this Catalog, as well as the requirements established by the graduate faculty in the department or unit offering the degree program. Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded.

Graduate programs leading to the master's degree are available in the fields of anthropology, art, Asian languages and literature, astronomy, atmospheric sciences, botany, chemistry, classics, communications, drama, economics, English, genetics, geography, geological sciences, geophysics, Germanic languages and literature, history, home economics, linguistics, mathematics, music, oceanography, philosophy, physical education, physics, political science, psychology, Romance languages and literature, Scandinavian languages and literature, Slavic languages and literature, sociology, speech, and zoology, as well as in several interdisciplinary fields. (See section on *Interdisciplinary Graduate Degree Programs* in this catalog.)

Graduate programs leading to the degree of Doctor of Philosophy are available in the fields of anthropology, Asian languages and literature, astronomy, atmospheric sciences, botany, chemistry, classics, communications, economics, English, genetics, geography, geological sciences, geophysics, Germanic languages and literature, history, linguistics, mathematics, music, oceanography, philosophy, physics, political science, psychology, Romance languages and literature, Scandinavian languages and literature, Slavic languages and literature, sociology, speech, and zoology, as well as in several interdisciplinary fields. (See section on *Interdisciplinary Graduate Degree Programs* in this catalog.)

A graduate program leading to the degree of Doctor of Musical Arts is offered through the School of Music.

PREMAJOR AND PREPROFESSIONAL PROGRAMS

Advisory Office
B10 Padelford Hall

Although many students entering the College will have chosen a department in which to pursue concentrated study, others will enter with objectives less precisely focused and will be enrolled in the premajor program.

For those students who would like to follow a basic course of study in preparation for training in professional schools, the College provides an advisory service in the following preprofessional programs: architecture, business, dental hygiene, dentistry, medical technology, medicine, occupational therapy, physical therapy, prosthetics-orthotics, and urban planning.

Premajor Program

Those students in the first or second year who did not make a definite choice of major before entering the University are designated as premajor students. They may select, in consultation with an adviser, a program of studies which will meet the general requirements of the College and at the same time provide opportunity for experimentation and exploration in its many subject areas. Each program is planned according to the individual needs of the student. Because an important part of the program leading to the bachelor's degree is the major concentration, the student is urged to make a selection of major whenever he is reasonably confident of his educational objectives. Ordinarily, he will want to select a major by the end of his sophomore year in

order to be assured of completing his degree in the normal period.

Students preparing to enter schools of business administration or schools of law or other graduate professional schools may, upon admission to the College, select a department in which to follow a major program, or may follow a premajor program. For information concerning the requirements of various graduate and professional schools at the University of Washington, see the various sections of this catalog.

Dental Hygiene, Preprofessional Program

The two-year pre dental hygiene program is designed to prepare women students for admission to the major in dental hygiene in the School of Dentistry, described in the *School of Dentistry* section.

In this program, the applicant will complete 90 quarter credits in the College of Arts and Sciences together with the required quarters of physical education activity. She will be expected to meet the basic proficiency and distribution requirements of the College and will include in her program courses in biological sciences, chemistry, psychology, sociology, and speech.

A dental hygiene aptitude test is required prior to application. Information is available from the Department of Dental Hygiene in the School of Dentistry.

Dentistry, Preprofessional Program

This program is designed for students in the College of Arts and Sciences who plan to enter a dental school when their preprofessional training is completed.

The *minimum* requirement for admission to most dental schools is completion of one year each of biology, English, inorganic chemistry, and physics; 10 credits in organic chemistry; and the required quarters of physical education activity. Most dental schools prefer to admit students who have had three or four years of college.

Students who are interested in attending a particular dental school should choose electives to meet the requirements of that school. The adviser should be consulted about the dental aptitude test which is taken prior to filing applications.

The student is advised to select a major as soon as possible. First-year University of Washington School of Dentistry courses may be applied as general upper-division elective credits toward a bachelor's degree in the College of Arts and Sciences, provided the student has met the general College requirements and the requirements of his major department.

Medical Technology, Preprofessional Program

The medical technology program is designed to train young men and women for professional work in hos-

pital, clinic, public health, and medical research laboratories. The prescribed preparatory program consists of two years of preprofessional training in the College of Arts and Sciences with an emphasis upon certain courses in chemistry, biological sciences, and mathematics. At the end of the second year, students may apply for admission to the curriculum in Medical Technology in the School of Medicine. Details of the program in medical technology are listed in the *School of Medicine* section.

Medicine, Preprofessional Program

This program is designed for students in the College of Arts and Sciences who plan to enter a medical school when their preprofessional training is completed.

The *minimum* requirement for admission to most medical schools is three years of college training (135 academic quarter credits) with a grade-point average of at least 2.50. As recommended by the Association of American Medical Colleges, the course should include freshman English composition, 12 credits in inorganic chemistry, 6 credits in organic chemistry, 12 credits in physics, 12 credits in biology, and the required quarters of physical education activity. Many schools require a knowledge of a modern foreign language, and some require a bachelor's degree. A student may follow a major in any department in the College.

Students who are interested in attending a particular medical school should choose electives to meet the requirements of that school. In general, medical school admissions committees favor a broad program of studies with the inclusion of as much as possible in the humanities and social sciences. Students who have an aptitude for and an interest in the sciences, especially those who plan to do medical research or to become specialists in certain branches of medicine, are advised to take thorough training in a science such as chemistry, zoology, physics, or microbiology.

All students in this program are urged to select a major by the end of their first year and in no case later than the end of the second year. Each student, with an adviser in his major department and a premedical adviser, then plans a program that will enable him to complete the requirements for entrance into medical school and for the bachelor's degree. First-year University of Washington School of Medicine courses may be applied as general upper-division elective credits toward a bachelor's degree in the College of Arts and Sciences, provided the student has met the general College requirements and the requirements of his major department.

During the second year, a premedical adviser should be consulted about taking a medical admissions test



and applying for admission to medical school. Students must arrange for the medical admissions test well in advance of their application to a medical school.

Occupational Therapy, Preprofessional Program

This two-year preprofessional program is designed to prepare students for admission to the curriculum in Occupational Therapy in the School of Medicine, which confers the degree of Bachelor of Science in Occupational Therapy. Students are expected to meet the basic proficiency and distribution requirements of the College, with minor modifications. A complete description of the occupational therapy curriculum is found in the *School of Medicine* section.

Physical Therapy, Preprofessional Program

The two-year physical therapy preprofessional program in the College of Arts and Sciences prepares students for admission to the curriculum in Physical Therapy in the School of Medicine, which confers the degree of Bachelor of Science in Physical Therapy. The curriculum is fully approved by the American Physical Therapy Association and by the Council on Medical Education and Hospitals of the American Medical Association. A complete description of the four-year program in physical therapy is given in the *School of Medicine* section.

Prosthetics-Orthotics, Preprofessional Program

The two-year preprofessional program is designed to prepare students for admission to the curriculum in Prosthetics-Orthotics in the School of Medicine. This program confers a Bachelor of Science degree. A complete description of the Prosthetic-Orthotics curriculum is given in the *School of Medicine* section.

INTERDEPARTMENTAL PROGRAMS

GENERAL AND INTERDISCIPLINARY STUDIES

Director
Aldon D. Bell
B108 Padelford Hall

The faculty of the College of Arts and Sciences authorized in June 1969 the establishment of the Division of General and Interdisciplinary Studies in order to develop for undergraduate students a wider range of educational opportunities. The Division encourages and supports both curricular and other educational innovation. The Division itself initiates such innovation, and

does whatever is possible to support faculty and students interested in new opportunities.

Arts and Sciences and General Studies courses are sponsored by the Division. One opportunity which has been available to undergraduates for several years has been the "atypical major," especially devised for those students who find that their individual educational objectives cannot be achieved through one of the conventional departmental major programs of the College of Arts and Sciences. The student, in conjunction with the Director of the Division and with interested faculty members, constructs his own major program, and the Division appoints a faculty advisory committee to counsel and supervise the student to graduation. The atypical major allows any student to devise from the rich resources of the University a curriculum which will suit his own educational goals. Some recent individual majors, most of which have a decided interdepartmental flavor, are ethnomusicology, history and comparison of religions, humanities in the twentieth century, oriental philosophy and literature, natural resources, the creative arts and elementary education, conflict studies, the creative arts and psychology, and the twentieth-century technological revolution.

Since the individual major is not following a precise set of requirements leading to a conventional major, a specially constructed program places considerable responsibility upon the student himself. While this is precisely the goal of higher education, the immediate responsibility of such a program may not at all suit the attitudes and needs of most students. In general, a student who is interested in the individual major is expected to have a cumulative grade-point average of approximately 2.50. He is also expected to fulfill the general requirements for a degree in the College of Arts and Sciences, unless there is some special educational reason why exceptions might be made.

The Bachelor of Arts degree is awarded when the major is clearly in the humanities or social sciences, and the Bachelor of Science degree when the major is clearly in the natural sciences.

Students interested in discussing the possibility of an individual major should talk with the Director of the Division or some other appropriate person.

Honors in General Studies

Adviser
Aldon D. Bell
B108 Padelford Hall

Members of the College Honors Program who have successfully completed an individual major curriculum approved by the student's faculty supervisory commit-

tee, may receive a bachelor's degree "With College Honors in General Studies," providing the following conditions have been met:

1. Completion of the lower-division honors requirements specified for all honors candidates.
2. Completion of not less than 10 credits in an upper-division program of honors courses specified by the Director of General Studies, the program to consist of one or more honors courses in at least two fields which play significant roles in the student's particular program.
3. Honors credit earned for the required undergraduate thesis.
4. A grade-point average of at least 3.00 maintained for the upper-division years.

AFRICAN STUDIES

Committee

Simon Ottenberg, Chairman (Anthropology), Rene Bravmann (Art), James Crutchfield (Economics), Carol Eastman (Anthropology, Linguistics), Frederick Fletcher (Political Science), Robert Kauffman (Music), Abraham Mariare (Music), Oliver Osborne (Psychiatric Nursing and Anthropology), David Spain (Anthropology), Pierre van den Berghe (Sociology), Edgar Winans (Anthropology)

The University offers a series of courses on traditional and modern-day Africa at both the undergraduate and graduate levels. These provide a student with an areal focus to his academic training, offering him the chance to develop an interdisciplinary interest centered on a continent rapidly gaining world importance. For the graduate student, these courses afford the opportunity to prepare for a professional career in the African field.

Courses on Africa offered at the University include Anthropology 213, 401, 402, 513, 569; Art History 436, 437, 438; Comparative Literature 261, 262, 263; General History (HST) 421, 422; Humanities 103; Music 427; Physical Anthropology 281; Political Science 439, 539; Sociology 459, 569. Courses in Swahili and Bantu linguistics are offered in the Department of Anthropology and courses in Arabic are offered in the Department of Classics. Individual study with members of the Committee on African Studies can be arranged. Undergraduate students with strong interests in Africa may follow an individual major in General Studies.

AMERICAN STUDIES

Committee

Roger Stein, Chairman (English), Arthur Bestor (History), Vernon Carstensen (History), Robert Hudspeth

(English), William Phillips (English), Thomas Pressly (History), Robert Scholz (History), Robert Stanton (English)

The interdisciplinary approach to the study of American civilization is a tradition of long standing at the University of Washington, dating back to the pioneering work of Prof. Vernon L. Parrington. The research and teaching of many members of the faculty, in a variety of departments, represent present-day contributions to the field of American studies. The University is an institutional member of the American Studies Association. A standing Committee on American Studies coordinates the work in the field both on the campus and overseas.

The College of Arts and Sciences does not offer degrees in American Studies. Students following undergraduate or graduate programs in the departments of the College may, however, plan their programs to include courses in many aspects of American civilization. Such courses include:

Anthropology 333, 334, 335, 416; Drama 476; Economics 200, 201, 260, 330, 442, 462, 463; English 267, 361, 362, 363, 364, 365, 369, 434, 435; Geography 301, 302, 325, 402, 444, 448, 477; History of the Americas 201, 301, 311, 331, 401, 402, 405-406, 411, 412, 431, 432, 443, 444, 451, 452, 453, 454, 455, 458, 459, 461, 462; Music 330, 331; Philosophy 424; Physical Anthropology 284, 285; Political Science 202, 210, 351, 370, 418, 450, 451, 460; Sociology 352, 362, 365, 371, 450, 455, 463; Speech 425, 426.

Members of the Committee on American Studies are available to assist departmental advisers in the preparation of programs.

BIOLOGY

Committee

Robert Cleland (Botany, Chairman), Robert Cahn (Zoology), Jonathan Gallant (Genetics), Neal Groman (Microbiology), Stephen Hauschka (Biochemistry), Douglas Kelly (Biological Structure), Gordon Orians (Zoology)

Adviser

Robert E. Cleland
318 Johnson Hall

An interdisciplinary curriculum in biology leads to the degree of Bachelor of Science, and supplements the undergraduate curriculums offered by several biology departments. This curriculum, which emphasizes cellular and molecular aspects of biology, consists of the



following required courses: Mathematics 124, 125, 126; Chemistry 140, 150, 151, 160, 335, 336, 337; Physics 114, 115, 116, or 121, 122, 123; Biology 210, 211, 212; Biochemistry 440, 441, 442 or 405, 406; Genetics 451; 15 credits in advanced biology chosen from a broad list of electives. Chemistry 350, 351 or 455, 456, 457, are recommended. Members of the Committee serve as advisers to individual students.

BLACK STUDIES

Executive Committee

David Llorens, Chairman (English), Jimmie Franklin (History), Robert Garfias (Music), James Goodman (Social Work and Sociology), Simon Ottenberg (Anthropology), Oliver Osborne (Nursing), Charles Watkins (English)

Affiliated Faculty

E.A.T. Barth (Sociology), Rene Bravemann (Art), Joe Brazil (Music), Carol Eastman (Anthropology), Jean Hundley (English), E. L. Jones (Arts and Sciences), Robert A. Kauffman (Music), Mary Agnes Lewis (Anthropology), Earl Miller (Art), Otis Pease (History), Nathaniel Wagner (Psychology)

Adviser

Marilyn Bentz
B103 Padelford Hall

The college recognizes the importance of widespread understanding of the history and culture of the American Negro. It offers to all students the opportunity to understand and appreciate the social, economic, historical, and aesthetic aspects of Afro-American culture. A program in Black Studies is conducted by faculty drawn from several departments of the College.

Bachelor of Arts

Students who wish to organize their undergraduate study in this field may follow an interdisciplinary major in Black Studies leading to the degree of Bachelor of Arts. The requirements are 20 credits in "core" courses in Black Studies; 30 credits in a single department offering courses relevant to Black Studies; and 15 credits in upper-division Black Studies courses.

Courses with content of interest to the student of Afro-American culture and history include Anthropology 111, 212, 213, 401, 402, 456, 457, 458, 464, 466, 467, 468, 513; Art History 331, 432, 436, 437, 438; English 369; Geography 227; History of the Americas 443, 444; Humanities 103; Music 129, 331; Philosophy 113; Physical Anthropology 281, 282; Political Science 210; Psychology 250, 260, 443; Social Science 150; Sociology 105, 362, 459, 463.

COMPARATIVE LITERATURE

Faculty

Frank J. Warnke (English, Chairman), Sverre Arestad (Scandinavian), Gerhard Baumgaertel (Germanics), Ernst Behler (Germanics), Elizabeth Dipple (English), Robert J. Ellrich (Romance), Edwin Gerow (Asian), William C. Grummel (Classics), Karl-Ivar Hildeman (Scandinavian), Antonin Hruby (Germanics), Frank W. Jones (English), Frank J. Kearful (English), Edith Kern (Romance), Willis A. Konick (Slavic), Wolfgang Leiner (Romance), Michael Loraine (Classics), Pierre A. MacKay (Classics), Richard N. McKinnon (Asian), Otto Reinert (English), Maureen Robertson (Asian), Roman S. Struc (Germanics), Hellmut Wilhelm (Asian)

Comparative literature is the study of literature in its essential nature, which is independent of ethnic, cultural, and linguistic differences.

The undergraduate program provides, first, a survey of classics which have formed literary taste over the centuries; second, an arrangement of works under three generic aspects: epic, drama, lyric. Both groups of courses stress the constant, unifying factors which underlie national differences and historical change.

In the graduate program, the comparative task proceeds by means of concentration on two or more national literatures, studied in their original languages.

The program is conducted by an interdepartmental faculty drawn from the departments of Asian Languages and Literature, Classics, English, Germanic Languages and Literature, Romance Languages and Literature, Scandinavian Languages and Literature, and Slavic Languages and Literature.

Undergraduate Program

Adviser

Frank J. Warnke
B436 Padelford Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

The minimum course requirement for this degree is 50 credits. The following courses must be taken: Classics 210 or any upper-level course in Classics; Comparative Literature 300, 301, 302; and at least one course in a literature other than English, studied in the original tongue. The remaining credits are earned in 300- and 400-level literature courses chosen, in consultation with the student adviser, from among the offerings of Comparative Literature and the several departments. Departmental courses in foreign literature in English translation are listed under Asian Languages and Literature, Classics, English, Germanic Languages and Literature, Romance Languages and Literature, Scandinavian Lan-

guages and Literature, and Slavic Languages and Literature.

Graduate Program

The Graduate program in Comparative Literature is described in the section on *Interdisciplinary Graduate Degree Programs* in this catalog.

DANCE

Courses in the performance of ballet, contemporary dance, and folk and ethnic dance; choreography; and the history of dance are offered by faculty of the School of Drama and the School of Physical and Health Education.

Physical education activities courses in the dance are intended primarily for beginning students. Other courses may be elected by students who are interested in the serious study of the art of dance as a major emphasis or as preparation for a career in performance, choreography, teaching, or dance therapy. Students in dance classes may participate in lecture-demonstrations and performances on campus and in the community, in performances of opera and musical comedy produced by the Schools of Music and Drama, and in programs of folk dance. See *Description of Courses* section under "Dance" and "Physical and Health Education."

Inquiries concerning the program should be addressed to Ruthanna Boris, Associate Professor and Director of Dance, School of Drama, or Joan Skinner, Associate Professor of Dance, School of Physical and Health Education.

GEOPHYSICS PROGRAM

Chairman

Stewart W. Smith

204 Atmospheric Sciences-Geophysics Building

Graduate Program Adviser

Robert S. Crosson

224 Atmospheric Sciences-Geophysics Building

Alternate Graduate Program Adviser

Ronald T. Merrill

208 Marine Sciences Building

Professors

Robert C. Bostrom (Geological Sciences), Joost A. Businger (Atmospheric Sciences), Kenneth C. Clark (Physics), Arthur W. Fairhall (Chemistry), Paul W. Hodge (Astronomy), Jere J. Lord (Physics), Stewart W. Smith, H. Myron Swarm (Electrical Engineering), Norbert Untersteiner (Atmospheric Sciences)

Associate Professors

Nikolas I. Christensen (Geological Sciences), William

O. Criminale (Oceanography), Edward R. LaChapelle, Conway B. Leovy (Atmospheric Sciences)

Assistant Professors

Lee C. Bennett, Jr. (Oceanography), Robert S. Crosson, Ward J. Helms (Electrical Engineering), Clive R. B. Lister (Oceanography), Ronald T. Merrill (Oceanography), Charles F. Raymond, J. Dungan Smith (Oceanography)

Visiting Professor

Franklin I. Roach

Visiting Associate Professor

Harold B. Liemohn

Research Professor

Mark F. Meier

Research Associate Professor

Victor Vali

Research Associates

John T. Ely (Physics), Gary A. Maykut (Atmospheric Sciences)

Cooperating Faculty

Professors: Arnold B. Arons (Physics), Franklin I. Badgley (Atmospheric Sciences), Konrad J. K. Buettner (Atmospheric Sciences), Howard A. Coombs (Geological Sciences), Joe S. Creager (Oceanography), Robert G. Fleagle (Atmospheric Sciences), Peter Misch (Geological Sciences), Maurice Rattray, Jr. (Oceanography), Richard J. Reed (Atmospheric Sciences), A. L. Washburn (Geological Sciences), Lawrence Wilets (Physics)

Associate Professors: Robert J. Charlson (Civil Engineering), Lawrence K. Coachman (Oceanography), Peter V. Hobbs (Atmospheric Sciences)

Assistant Professors: Roger J. Evans (Civil Engineering), John M. Wallace (Atmospheric Sciences)

Research Assistant Professor: Lawrence N. Larsen (Oceanography)

Senior Research Associate: Robert E. Burns (Oceanography)

The geophysics program at the University is administered by an interdisciplinary faculty who cover a variety of interdisciplinary areas in geophysics. Forty-four professors participate in the program, and its administration is handled by a full-time chairman and an executive committee. Presently the faculty members in Geophysics are drawn from the Departments of Astronomy, Atmospheric Sciences, Chemistry, Civil Engineering, Electrical Engineering, Geological Sciences, Oceanography, and Physics, with some faculty carrying full-time affiliation with Geophysics. Graduate students work toward either or both of the degrees of Master of Science and Doctor of Philosophy in Geophysics.



Geophysics is concerned with the nature and behavior of the earth and its environment. It rests directly on physical laws, and its study uses many different mathematical and observational methods. It seeks to apply these laws and methods to the complex phenomena and enormous energy sources of the geophysical system. In these investigations a mixture of experimental and theoretical approaches usually is necessary. Although it is anticipated that a student entering the field of geophysics may come from one of various undergraduate major fields, his minimum preparation for embarking on a graduate program in geophysics should include mathematics through differential equations, mechanics, modern physics, electricity and magnetism at the introductory level, and general chemistry. It is desirable that the student has had some laboratory experience in physics or chemistry.

ADMISSION

The minimum undergraduate preparation for embarking on the graduate program in geophysics should include the following courses or their equivalents:

Mathematics 438 (Principles of Differential Equations, 3 credits); Physics 221, 222, 223 (Quantum, Statistical, and Elementary Mathematical Physics, 9 credits); Physics 231, 232 (Electric Circuits Laboratory, 6 credits); Physics 327 (Introduction to Nuclear Physics, 3 credits); Physics 321, 322, 323 (Electromagnetism, 9 credits); Physics 331 (Optics Laboratory, 3 credits); Chemistry 140, 150, 160 (General Chemistry, 9 credits); Chemistry 151 (General Chemistry Laboratory, 2 credits); Chemistry 170 (Qualitative Analysis, 3 credits).

Depending upon a student's proposed specialization within the geophysics program, competence in the material of additional undergraduate courses will often be required.

PROGRAMS OF STUDY

A student who is suitably prepared is expected to begin a program of studies that will lead him to a general knowledge of geophysics and a more detailed knowledge of one of the following areas of specialization:

Particle properties: those areas of geophysics dealing with astrophysics, solar physics, aeronomy, crystalline state, isotope geophysics, and geochemistry.

Continuous media: those areas of geophysics dealing with fluid mechanics or solid mechanics, including glaciology.

Electromagnetics: those areas of geophysics dealing with geomagnetism, radio astronomy, and investigations of the ionosphere and magnetosphere. Individual plans of specialization may involve much mixing of these areas.

To accomplish these ends, all students will be expected to take the introductory sequence, Introduction to Geophysics: The Atmosphere (Geophysics 403), 5 credits; and The Earth (Geophysics 405) 5 credits. Note: A one-year interdisciplinary graduate geophysics course will be presented for the first time in 1970, although it is not presently listed. The sequence, Geophysics 451, 452, 453 (3, 3, 3 credits), Fundamentals of Solid-Earth Geophysics, offers intensive preparation for those planning to concentrate in this field. Concurrently, the student must broaden his knowledge of mathematics by selecting courses from among several in advanced calculus. He should become familiar with the use of computers through a computer programming course or its equivalent.

In addition to the introductory sequence, students will take further courses in geophysics and related subjects. These normally include 9 credits from advanced courses in the area of particle properties (physical chemistry or advanced atomic and nuclear physics), 6 credits from advanced courses in the area of continuous media (mechanics of continuous media, electrodynamics and thermodynamics of continuous media, dynamic meteorology, or marine hydrodynamics), and 4 credits from advanced courses in the area of electromagnetics (field theory or advanced electricity and magnetism). All course requirements are subject to fulfillment through prior studies.

Toward the end of his first year the student will take a qualifying examination that is designed to test his mastery of the fundamentals of physical sciences as they apply to geophysical phenomena and to assess his general knowledge of geophysics as summarized in the course sequence, Introduction to Geophysics. An important part of his general education in geophysics is provided through participation in the regular interdisciplinary program of seminars in geophysics. Those who pass the examination with distinction may proceed with a course of study leading to the M.S. or Ph.D. degree in the field of geophysics.

The student will be assigned a Supervisory Committee, who will assist in the planning of the remainder of his program, which may include additional advanced courses in the student's area of specialization, and the selection of a suitable research topic. Current areas of research that can involve geophysics students include: micrometeorites, solar effects on cosmic rays, solar plasma theory, radiophysics of the ionosphere, electromagnetic wave propagation, theory of nuclear and atomic processes, atmospheric collisional excitation, aurora and airglow, isotope geophysics, geochemistry, laser probing of atmospheric motions, fluid mechanics

of air and ocean, glaciology, elasticity and physical properties of rocks and minerals, seismic wave propagation, earthquake source mechanisms, structure of the crust and upper mantle, suboceanic heat flow, geomagnetic and rock magnetism, and seismic studies of the continental shelf.

Master of Science

Although the geophysics program is designed primarily for study toward the Ph.D. degree, a student may elect to take a program leading to the M.S. degree. The principal requirements for this degree are 27 course credits, and an acceptable master's thesis.

The thesis must represent a problem of substantial scientific importance and demonstrate the student's ability to use research methods. Prospective candidates for the degree of Master of Science must pass the qualifying examination. Those who fail may, upon recommendation of the examining committee, be permitted to take the examination again within one calendar year.

Doctor of Philosophy

A student who passes the qualifying examination with distinction or has shown outstanding ability while fulfilling the requirements for the Master of Science degree may become an aspirant for the Doctor of Philosophy degree. He will be expected to complete the minimum requirements in each of the three areas described here. In most cases, students will be expected to take more than the minimum in at least two of the three areas or in the intermediate areas. Courses in the field of specialization will be chosen with the approval of the student's Supervisory Committee.

As soon as possible after the completion of his second year of residence (and after passing his foreign language competency examination) the student will be expected to take the General Examination. It includes a written examination to test his mastery of the general and theoretical foundations of geophysics and of the relevant mathematical methods and an oral examination to test the depth of his understanding of a topic within his field of specialization, which is selected in advance. A student who fails the General Examination may, upon the recommendation of his Supervisory Committee, be allowed to repeat the examination within one calendar year.

Students who pass the General Examination will become candidates for the Ph.D. degree. Normally, students will have begun a program of research before taking the General Examination. The dissertation is an important part of the Candidate's program and must present an original study of a problem of substantial scientific importance.

The Final Examination, conducted following an oral presentation of the dissertation, will be devoted mainly to the subject area of the dissertation.

LATIN AMERICAN STUDIES

Committee

Dauril Alden (History, Chairman), Rodney Bodden (Romance Languages), Judith Goetzinger (Romance Languages), Robert Greengo (Anthropology), Alex Krieger (Anthropology), Morton Kroll (Political Science), John Mathiason (Communications), Robert O. Myhr (Political Science), Michael G. Owen (Anthropology), Carl Solberg (History), Joseph Sommers (Romance Languages), Joan Ullman (History), Anibal Vargas-Barón (Romance Languages)

Adviser

Robert O. Myhr
310 Engineering Annex

The interdisciplinary undergraduate program in Latin American Studies, established at the University in 1941, has grown substantially in recent years as new faculty and specialties have been added. The program is intended to provide students with a broad understanding of the history, politics, and culture of Latin America from pre-Columbian and Peninsular origins to the present.

The major includes 48 to 50 credits of required courses as follows (see *Description of Courses* section): Anthropology 322 or 418 plus one elective; History of the Americas 381 and 382; Political Science 323 and 342; 9 credits in Spanish-American or Luso-Brazilian literature; General Studies 492 and 493; and one elective course. In addition, each undergraduate major will be expected to demonstrate basic language skills. Two options are open: (1) one year of Portuguese and 302 level in Spanish, or (2) two years of Portuguese and one year of Spanish. Except in unusual cases, for most students approximately one-half of the course credits needed to acquire these language skills will be satisfied prior to entrance to the University. Every effort will be made to speed up acquisition of language competence.

NEAR EASTERN STUDIES

Committee

Farhat J. Ziadeh (Classics, Chairman), Harold L. Amoss (Urban Planning), Walter G. Andrews (Classics), Jere L. Bacharach (History), Ilse D. Cirtautas (Asian Languages and Literature), John W. Clear (Classics), Tom Drury (Romance Languages and Literature), Nicholas L. Heer (Classics), Michael B. Loraine



(Classics), Pierre A. MacKay (Classics), John B. McDiarmid (Classics), John H. Mikhail (Political Science), Allen H. Podet (Classics), Sol Saporta (Linguistics), Peter F. Sugar (History)

An interdepartmental program in Near East Studies, leading to the Bachelor of Arts degree, is offered by an interdepartmental committee drawn from the departments of Anthropology, Asian Languages and Literature, Classics, History, Linguistics, Political Science, and Romance Languages and Literature. This program deals with the Near East, both as a factor in the modern world and as a subject for historical, cultural, and linguistic study. For courses in Arabic, Hebrew, Turkish, and Persian, and for Near East courses in English, see the Classics section of the *Description of Courses*. For other courses on the Near East, see the course descriptions under the cooperating departments.

A Near Eastern Studies program leading to the Master of Arts degree is described in the section on *Interdisciplinary Graduate Degree Programs* in this catalog.

Undergraduate Programs

Adviser

Walter G. Andrews
219 Denny Hall

Graduation Requirements

Bachelor of Arts

Graduation with the B.A. degree requires 45 credits (or equivalent) in one Near East language (Arabic, Hebrew, Persian, Turkish), and 25 credits in courses on the Near East offered by departments participating in the Near East undergraduate program (Anthropology, Asian Languages and Literature, Classics, History, Linguistics, and Political Science). Credits in a second Near East language may be substituted for 15 of these 25 credits.

REGIONAL STUDIES: ASIA, RUSSIA, AND EASTERN EUROPE

Far Eastern and Russian Institute

Director

George M. Beckmann
406 Thomson Hall

Associate Director, Russian and East European Program

W. A. Douglas Jackson
501 Thomson Hall

Associate Director, East and Inner Asia Program

Donald C. Hellmann
414 Thomson Hall

Associate Director, South and Southeast Asia Program

Edwin M. Gerow
408 Thomson Hall

LIBRARY

Peter Demery, Head, Acquisitions Division (South Asian Collection)

Karl Lo, Head, Asiatic Collections

Roger Miller, Librarian, Slavic Collections

RUSSIAN STUDIES GROUP

Faculty

Imre Boba, Herbert J. Ellison, Roger M. Hagglund, Jack V. Haney, W. A. Douglas Jackson, Willis A. Konick, Lyman H. Legters, Lew R. Micklesen, John Reshetar, E. Harold Swayze, Marc M. Szeftel, Judith G. Leber, Donald W. Treadgold

Faculty Associates

James E. Augerot, Ilse D. Cirtautas, Herbert Coats, Paul Gribanovsky, Hal Opperman

EAST EUROPEAN STUDIES GROUP

Faculty

Imre Boba, Judith G. Leber, Lyman H. Legters, Lew R. Micklesen, Zdzislaw Mikulski, Peter F. Sugar, Joseph Velikonja

Faculty Associates

James E. Augerot, Emil Kovtun, Jacek I. Romanowski, Alexandra Rudicina

CHINESE STUDIES GROUP

Faculty

Jack L. Dull, Michael Gasster, Feng-hwa Mah, James B. Palais, Paul L-M Serruys, Vincent Y. C. Shih, George E. Taylor, James R. Townsend, Hellmut Wilhelm, Isabella Yen

Faculty Associate

Donald W. Treadgold

JAPANESE STUDIES GROUP

Faculty

George M. Beckmann, Robert J. C. Butow, Donald C. Hellmann, Dan F. Henderson, Noburu Hiraga, George H. Kakiuchi, Richard M. McKinnon, Tamako Niwa, Kenneth B. Pyle, Ted Takaya

Faculty Associates

Robert Garfias, Richard J. Huber, Leon Hurvitz, Glenn T. Webb

KOREAN STUDIES GROUP

Faculty

Fred Lukoff, James B. Palais

SOUTH ASIAN STUDIES GROUP

Faculty

Paul R. Brass, Frank F. Conlon, Edwin M. Gerow, Edward B. Harper, Morris D. Morris, Harold F. Schiffman

Faculty Associates

Jacob W. Curtis, Peter Demery, Ram Prakash Dixit, Robert Garfias, Barron Holland, Leon Hurvitz, Millard B. Rogers

SOUTHEAST ASIAN STUDIES GROUP

Faculty

Joseph R. Cooke, Charles Keyes, Peter Kunstadter

INNER-ASIAN STUDIES GROUP

Faculty

Leon Hurvitz, Hidehiro Okada, Turrell V. Wylie

Faculty Associate

Ilse D. Cirtautas

Regional Programs of Study

Programs in Asian, Russian, and East European regional studies leading to the Bachelor of Arts and Master of Arts degrees are offered and supervised by interdisciplinary groups in the Far Eastern and Russian Institute, with the cooperation of the various departments. Each program is designed not only to meet general requirements, but also to conform to the peculiar needs and problems of a particular field. Each regional group within the Institute is responsible to supervise degree offerings in its field with options for concentration depending on the adequacy of faculty strength at a given moment.

The Regional Programs leading to the Master of Arts degree are described in the section on *Interdisciplinary Graduate Degree Programs* in this catalog.

Undergraduate Programs

Adviser

Ford R. Crull
403 Thomson

The regional studies curriculum combines training in a discipline with language and area specialization. Programs can be based on the following disciplines: anthropology, art, comparative literature, economics, geography, history, linguistics, music, philosophy, political science, or sociology. A double major can be arranged for students who wish to fulfill the requirements of both the Institute and a department responsible for programs in one of the disciplines listed above.

The course requirements in the regional studies curriculum are: an introductory survey course in history and culture (5 credits); at least 40 credits in one of the disciplines of the humanities or social sciences (excluding languages), including both basic courses in a discipline and courses in which the discipline is applied to the region; at least 15 credits in nonlanguage courses on Asia, Russia, or Eastern Europe in disciplines other than the discipline of concentration; and 30 credits (two

years or the equivalent) in one Asian, Slavic, or East European language.

For complete course listings refer to the Far Eastern and Russian Institute, the Department of Asian Languages and Literature, the Department of Slavic Languages and Literature, and the cooperating departments in the College of Arts and Sciences.

For students in the College of Education, the Institute offers major and minor academic fields in Asian and Russian regional studies. (See the *College of Education* section.)

Honors Programs

Undergraduate majors in the Far Eastern and Russian Institute, who are also members in the College of Arts and Sciences Honors Programs and who fulfill the requirements of the honors program during the freshman and sophomore years in addition to the honors requirements of the Institute, may receive a bachelor's degree "with College Honors." Students who enter the honors program of the Institute in their junior year and fulfill its requirements may receive a degree "with Distinction." For further information, consult the Honors Programs section of the catalog or contact the Honors Adviser, Far Eastern and Russian Institute.

The courses listed below, segregated by region, are called to the attention of undergraduate and graduate students who wish to plan regional studies programs:

China: Far Eastern 240, 290, 313 (in part), 336, 344, 414, 415, 416, 429, 432, 435, 443, 462, 465, 466, 467, 468, 476, 493, 500, 505, 511, 512, 513, 514, 516, 519, 521, 522, 523, 525, 526, 530, 532, 533, 556-557-558, 599; Anthropology 519; Art History 411, 412, 417, 418, 419; Asian History 451, 452, 453, 454, 476, 551, 552-553-554, 555, 556, 557, 558; Drama 477, 478, 479; Economics 493; Geography 313 (in part), 336, 435, 505; Law 592, 599; Music 318, 497; Philosophy 415, 416; Political Science 344, 414, 429, 432, 532, 533. See also Chinese language and literature.*

East Europe: Far Eastern 220, 305, 401, 402, 405, 406, 407, 426, 427-428, 489, 528, 548, 560-561-562; Ancient and Medieval History 426, 442; Geography 305, 405; Modern European History 447, 451-452, 551, 552, 553-554-555; Music 318; Political Science 347. See also Bulgarian, Czech, Hungarian, Polish, Serbo-Croatian, Romanian, and Slavic languages and literature.*

Far East (overall): Far Eastern 210, 302, 313, 429, 432, 456, 461, 462, 463, 472, 473, 495, 500, 501, 519, 521, 522, 523, 525, 526; Anthropology 519;



Asian History 443; Art History 301, 401; Comparative Literature 302; Drama 495; Geography 313; Music 159, 205, 318; Political Science 429, 432.

Inner Asia: Far Eastern 430, 431, 450, 464, 598; Anthropology 314; Music 318. See also Mongolian, Tibetan, and Turkic languages and literature.*

Japan: Far Eastern 295, 313 (in part), 429, 432, 437, 439, 452, 453, 454, 456, 463, 500, 504, 509, 545, 549, 550, 551-552, 554, 563, 564, 565; Art History 415, 416, 417, 418, 419, 420; Asian History 421, 422, 423, 443, 521, 522, 523, 524, 525, 526, 543, 544-545; Geography 313 (in part), 432, 437, 509; Law 548, 549, 595, 596, 597, 598, 620; Music 494, 495; Political Science 429, 432, 435, 504, 545. See also Japanese language and literature.*

Korea: Far Eastern 242, 313 (in part), 429, 432, 469, 470, 566, 567-568-569, 570; Asian History 421, 469, 470, 566, 570, 571-572-573; Geography 313 (in part); Music 426; Political Science 429, 432. See also Korean language and literature.*

South Asia: Far Eastern 280, 281, 385, 412, 461, 465, 472, 473, 482, 483, 484, 485, 587; Anthropology 316, 412, 517; Archaeology 478; Art History 421; Asian History 201, 202, 401, 402, 403, 404, 501; Economics 465; Indic 320; Law 615; Linguistics 404, 405, 406; Music 316, 428; Philosophy 412; Political Science 434, 440, 540. See also Hindi-Urdu, Sanskrit, Indian, and Indic literature in English, and Tamil.*

Southeast Asia: Far Eastern 332 (in part), 343, 434, 444-445-446, 461, 462, 463, 478, 506, 521, 522, 523, 525, 526, 578; Anthropology 317, 404, 516; Geography 332 (in part), 434, 506; Linguistics 478, 578; Music 316, 439; Political Science 343, 426, 429, 433, 531. See also Thai and Vietnamese languages and literature.*

Russia and East Europe: Far Eastern 220, 243, 305, 324, 333, 378, 401, 402, 405, 406, 407, 420, 421, 422, 423, 424, 426, 427-428, 433, 438, 441, 448, 449, 476, 489, 496H, 503, 507, 510, 520, 528, 534, 535-536-537, 539, 541, 546-547, 548, 560-561-562, 583, 595; Ancient and Medieval History 426; Asian History 476; Economics 390, 495, 595; Geography 305, 333, 405, 433, 438, 507; Modern European History 441, 442, 443, 444, 445, 446, 447, 451-452, 541, 542-543, 544, 545-546-547, 551, 552, 553-554-555, 583; Music 318; Political Science 347, 420, 441, 520. See also Bulgarian, Czech, Hungarian, Polish, Romanian, Russian, Serbo-Croatian, and Slavic languages and literature.*

*These courses are listed under the Departments of Asian Languages and Literature or Slavic Languages and Literature.

RELIGION

The College does not offer an organized curriculum in the study of religion, although religion as an important aspect of human experience is examined in courses offered by several departments. Students following undergraduate programs in the departments of the College or in General Studies may elect those which provide opportunities for historical and comparative study of religious thought and expression. Such courses include Ancient and Medieval History 441; Anthropology 436; Classics 430; English 390; Far Eastern 412, 415, 416, 461, 462, 463, 464, 472, 473; Hebrew 201, 202, 203, 401, 402, 403; History of the Americas 405-406; Modern European History 401, 402; Near East 210, 220, 420; Philosophy 267, 321, 412, 415, 416, 467, 469; and Scandinavian 230.

SOCIAL WELFARE

Committee

William Berleman, Chairman (Social Work), Helen Bee (Psychology), Robert Bish (Economics), William Catton (Sociology), Moya Duplica (Social Work), Jerry Kelley (Social Work), Rino Patti (Social Work), David Spain (Anthropology)

Faculty of the School of Social Work cooperate with the faculty of the College of Arts and Sciences in offering an interdepartmental organized major program for students whose field of major interest is that of social welfare, or who anticipate graduate study in the School of Social Work. The educational objectives of this curriculum are to integrate selected courses in psychology, sociology, anthropology, and economics in order to achieve a broader and deeper understanding of human nature and human needs; to study, through philosophy, suggestions made by the most profound thinkers in our cultural heritage, concerning social ideals; to become aware, through courses in labor economics, abnormal psychology, social disorganization, the family, and race relations, of the problems shared by members of modern society; and, finally, through courses in social work, including relevant field experience and preparation of an undergraduate thesis, to examine critically the systems and structures of social welfare institutions and the manner in which these institutions meet the needs of society. The program leads to a bachelor's degree in the College of Arts and Sciences.

Freshman and sophomores following their major program are advised in the College Advisory Office, B10 Padelford Hall. Juniors and seniors are advised in the School of Social Work, Eagleson Hall.

DEPARTMENTAL PROGRAMS

ANTHROPOLOGY

Chairman

Kenneth E. Read
345 Savery Hall

Professors

Viola E. Garfield, Melville Jacobs, Alex D. Krieger, Marshall T. Newman, Simon Ottenberg, George I. Quimby, Kenneth E. Read, Daris R. Swindler, James B. Watson, Edgar V. Winans

Associate Professors

Vern Carroll, Robert Garfias, Robert E. Greengo, Edward B. Harper, Charles F. Keyes, Richard G. Klein, Peter Kunstadter (visiting), Lewis L. Langness

Assistant Professors

John R. Atkins, John A. Brim (acting), Robert C. Dunnell, Carol M. Eastman, Michael D. Lieber, Laura L. Newell, Michael G. Owen, David H. Spain

Lecturers

Isabel S. Caro, Madeleine M. Leininger, Oliver H. Osborne

Anthropology—the “study of man and his works”—ranges over a wide and diverse field of inquiry, bridging the biological and social sciences as well as the humanities. It seeks to understand the observable differences and similarities in physical form, in social behavior, and in customs and beliefs found among the peoples of the world, past and present. Through systematic comparison and historical investigation, it attempts to substitute a body of objective, testable knowledge for the folklore and dogma that surround our conceptions of “human nature.” These aims require the cooperation of many specialists. The field of anthropology includes a number of subfields. The programs, faculty, and curriculum of the Department fall into three principal subfields: (1) archaeology, (2) physical anthropology, and (3) socio-cultural anthropology.

Archaeology is the reconstruction of past cultures through the study of surviving material remains, and the tracing of man’s cultural evolution during the vast periods preceding written documents.

Physical anthropology covers the study of man as a biological organism, including the evolution of man, racial differentiation, the biological significance of race, population genetics, and the biological basis of human behavior.

Sociocultural anthropology—includes ethnology, social anthropology, and anthropological linguistics. Ethnology is the study of the cultures of living peoples, their institutions, customs, arts, beliefs, and traditions; their

geographic distribution, and their historical relationships. Social anthropology (sometimes included under ethnology) is interested in defining types of social and cultural systems and in formulating valid generalizations about human behavior. Anthropological linguistics is the scientific study of languages, including the analysis of the sound systems, grammar, and vocabulary of spoken languages, the historical relationships between languages, and the relation of language to other aspects of culture. (The Department of Anthropology and the Department of Linguistics offer a joint program in this field. For the full linguistic curriculum, see “Linguistics,” *College of Arts and Sciences* section.)

In the interests of a general liberal education, undergraduate majors are expected to acquire a broad understanding of the three principal subfields mentioned above and the relationships between them. The student is thus given a comparative view of human variation in time and space. He sees the wide range of cultural solutions men have devised to meet the problems posed by the physical environment and by man’s biological, psychological, and social nature. He also becomes aware of the fundamental similarities shared by these apparently diverse physical and cultural forms.

The study of anthropology, therefore, fosters a better understanding of the world in which we live and a critical awareness of our own culture. A second aim of the undergraduate program is to provide a theoretical and factual background for those who wish to pursue a professional career in anthropology through graduate study.

At the graduate level, students are expected to acquire the special knowledge and competencies of their elected subfield of specialization. For a full professional career, involving teaching and research at the university level, the Ph.D. degree is a necessary qualification. At this professional level there are many opportunities for the application and advancement of theoretical anthropology in teaching and research, and for its practical application in industry and government.

The Department of Anthropology offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see *College of Education* section.

Undergraduate Programs

Advisory Office
345 Savery Hall

For the Bachelor of Arts degree in this curriculum, 50 credits in anthropology are required, including Physical



Anthropology 201, Anthropology 202, and Archaeology 205. At least 30 of the 50 credits must be at the 400 level. A major will typically take one or more of the undergraduate seminars and perform some individual research. Majors must also complete a five-credit course in statistics. The Department does not encourage its majors to take more than the 50 required credits in anthropology, but instead encourages them to work in related fields as much as possible.

A 2.50 grade-point average in anthropology is required in order to continue major studies in the Department. If graduate work is contemplated, electives should include one foreign language.

HONORS IN ANTHROPOLOGY

Adviser

Kenneth E. Read
345 Savery Hall

Members of the College of Arts and Sciences Honors Program who wish to qualify for a bachelor's degree "With College Honors in Anthropology" must fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements outlined below. With the approval of the departmental honors adviser, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Anthropology." These latter students may be selected from among those anthropology majors who have demonstrated, during their junior year, superior abilities in the field of anthropology. They will be required to meet the same grade requirements for their junior and senior years as those set forth below for honors students and, in addition to fulfilling the course requirements for undergraduate majors in anthropology, must be prepared to do such additional work as the honors adviser will require.

Students desiring to become candidates for honors in anthropology should normally elect to major in anthropology prior to the beginning of their junior year and must fulfill the following departmental requirements:

- (1) Complete a minimum of 50 credits in anthropology, including the courses required of all undergraduate majors.
- (2) Maintain a grade-point average of 3.50 in all anthropology courses, and 3.00 in all other courses taken during their junior and senior years.
- (3) Register in the special honors quiz sections in Physical Anthropology 201, Anthropology 202, and Archaeology 205. Those students who have not fulfilled these

lower-division requirements, on electing their major in anthropology, may be required to pass an advanced credit examination, or do such additional work as the departmental honors adviser may recommend.

- (4) Register for 3 credits in Anthropology 499 (Undergraduate Research) in each quarter of their junior and senior years. During the junior year, this work will be directed by a designated member of the faculty and will be equivalent to an undergraduate proseminar. The work of the senior year will be carried out under the direction and supervision of a thesis committee appointed by the Department; all honors students will be required to submit a satisfactory senior thesis.

Graduate Programs

Graduate Program Adviser

Kenneth E. Read
345 Savery Hall

All applications for admission to the graduate program in anthropology are considered by the Department as well as by the Graduate School of the University. In addition to the completed application form and the transcripts of record required by the Office of Graduate Admissions and which should be sent directly to that Office, the Department requires that each applicant complete a supplementary information form and secure recommendations from three faculty members under whom he has studied. The supplementary information form and the recommendations should be mailed directly to the Department of Anthropology. All materials requested by the Office of Graduate Admissions and the Department must be on file *February 1* for admission to the following Autumn Quarter. New students will normally be admitted only to the Autumn Quarter of an academic year. In considering applications for admission, the Department gives greater weight to a student's promise for a creative professional career than to previous background in anthropology. An undergraduate major in anthropology is not, therefore, required for admission to the graduate program. Students lacking an adequate background in the subfield in which they elect to specialize will be required to remedy their deficiencies in accordance with departmental requirements and recommendations of their advisers. Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section.

The following is a brief summary of departmental requirements. A more complete description of the graduate program and requirements, set forth in a departmental brochure, may be obtained by writing to the Graduate Program Adviser, Department of Anthropology.

Graduate students are permitted to specialize in one of the three principal subfields of anthropology from the beginning of their graduate studies. Each of these subfields—archaeology, physical anthropology, and socio-cultural anthropology—has its own program and requirements within the general departmental requirements for advanced degrees.

The student selects the subfield, and the particular problems within it, upon which he wishes to concentrate. Under the guidance of a faculty Supervisory Committee selected from the elected subfield, the student's program is shaped to his individual needs.

A student may, if he desires, elect a program that cuts across the boundaries of two or more subfields, in which case his Supervisory Committee will include representatives from each of the subfields. Graduate students are advised to take supportive work in other disciplines when this seems necessary or desirable.

The Department offers a joint program with the faculty members associated with the Far Eastern and Russian Institute for students who wish to undertake, as an additional field of concentration, area studies in the following regions: China, South Asia, Southeast Asia. In such cases the additional field will consist of a combination of language, history, and social science courses in the selected area as planned by a joint advisory committee comprised of faculty members from the Department and the Institute.

The Department also participates with the Departments of Art, Linguistics, Music, Political Science, and Sociology in the interdisciplinary African Studies Program and the Black Studies Program.

Master of Arts

The Department offers a thesis and a nonthesis program leading to the Master of Arts degree. In both, the student must complete an approved program of courses and readings, demonstrate a reading knowledge of one foreign language approved by his Supervisory Committee, and fulfill the Graduate School requirements for residence and course credits. In the thesis program, the student must present an acceptable thesis which demonstrates his ability to pursue independent research and to present the results in a clear and systematic manner. Upon acceptance of the thesis the student must pass an oral examination covering the thesis and his subfield of specialization. In the nonthesis program, the student must pass a written comprehensive examination in his subfield of specialization, and must demonstrate competence in carrying out independent research, and must submit a written report embodying the results of his research. In both the thesis and nonthesis programs the

required research must be approved in advance by the Supervisory Committee.

The departmental faculty regards the master's degree as a stage in the progress toward the doctoral degree rather than as a terminal degree, and the graduate program is primarily designed for students who intend to continue through the doctoral requirements.

Doctor of Philosophy

For the degree of Doctor of Philosophy, students must:

- (1) Present a master's degree in anthropology or its equivalent.
- (2) Pass an approved course in statistics with a grade of B or better or demonstrate competence in formal analysis, quantitative analysis, or computer programming, as determined by the Supervisory Committee.
- (3) Satisfactorily complete any course and/or reading programs recommended by the Supervisory Committee in the field of specialization or in a supporting field.
- (4) Demonstrate reading proficiency in one foreign language, except that students specializing in sociocultural anthropology are required to obtain a knowledge of the language used in the area where they intend to do doctoral field research and, if it is not a written, scholarly language, this may constitute a second foreign language requirement.
- (5) Be formally admitted to candidacy for the doctorate by creditably passing the General Examinations, consisting of a written comprehensive examination and an oral examination, covering the student's subfield of specialization and such topics as the Supervisory Committee considers relevant to that field. The student must also complete any additional assignment required by his subfield of specialization as part of the General Examinations.
- (6) Demonstrate competence in field work or laboratory work, depending on the subfield of specialization.
- (7) Present an acceptable dissertation.
- (8) Pass the oral Final Examination devoted to the dissertation and general field of which it is a part.

The Ph.D. degree program usually requires three years beyond the master's degree or its equivalent.

Minor in Anthropology

The requirements for a minor in anthropology for the master's degree are 18 credits in courses numbered 400 or above, to be chosen in consultation with the anthropology adviser. The course of study pursued by the student must be directed toward the attainment of a minimal degree of competence in one of the three



principal subfields of anthropology: archaeology, physical anthropology, or sociocultural anthropology.

The requirements for a minor in anthropology for the doctoral degree include, in addition to the requirements for the master's degree, a program of study worked out in consultation with the anthropology adviser resulting in the acquisition of an areal or topical specialization in one of the three subfields of anthropology. Thus, the Ph.D. graduate student who minors in anthropology will be expected to attain a minimal competence in one of the subfields of anthropology and in a topical or areal specialization within that subfield.

ART

Director

Spencer A. Moseley
102 Art Building

Associate Director

John W. Erickson
102 Art Building

Professors

Glen E. Alps, Frederick N. Anderson, Wendell P. Brazeau, Everett G. Du Pen, Hope L. Foote (emeritus), Boyer Gonzales, Friederich G. Grossmann, Raymond L. Hill (emeritus), William J. Hixon, Pauline Johnson, Alden C. Mason, Spencer A. Moseley, Ruth E. Penington, Robert Sperry, George Tsutakawa

Associate Professors

Francis Celentano, Richard F. Dahn, Michael D. Dailey, John W. Erickson, Steven D. Fuller, C. Louis Hafermehl, Warren T. Hill, Robert C. Jones, Hazel Koenig, Howard Kottler, Norman K. Lundin, Earl Miller, Viola H. Patterson (emeritus), Eugene C. Pizuto, Peter M. Raven, Millard B. Rogers, Charles W. Smith, Romona Solberg, Valentine S. Welman

Assistant Professors

Fred J. Bauer, Rene Bravmann, Ronald Carraher, Elizabeth L. Curtis (emeritus), Paul R. Jenkins, Richard Kehl, Martha Kingsbury, Hal Opperman, Kenneth J. Pawula, Edward Praczukowski, Richard M. Proctor, William H. Ritchie, Myra Rosenfeld, Michael C. Spafford, Robert W. Speier, Glenn T. Webb

Instructor

Norman Taylor

Lecturers

Irwin S. Caplan, Frank Del Giudice, Stephen Dunthorne, Ann O'Keefe, Theodore L. Rand, T. Gervais Reed, Stephen Soreff

The School of Art serves a dual role within the educational structure of the University of Washington. It is

both a professional school and an academic department. As a professional school it trains students for active careers in the graphic and plastic arts; as a school of the College of Arts and Sciences it offers studio and lecture courses which are open to all students, as well as a major in Art within the College's regular Bachelor of Arts program. All of its course offerings and its curriculum requirements are based on the underlying philosophy that an awareness and understanding of the visual arts are necessary to a liberal education, and that liberal education is necessary to the training of a professional artist.

The School of Art offers courses leading to the degrees of Bachelor of Arts, Bachelor of Fine Arts, Master of Arts, Master of Fine Arts, and Master of Arts for Teachers.

The School reserves the right to retain student work for temporary or permanent exhibition.

Undergraduate Programs

Advisers

Stephen Dunthorne, Ann O'Keefe
104 Art Building

For undergraduate students, the School provides curricula in general art, art education, and art history which lead to a Bachelor of Arts degree, and curricula in ceramic art, graphic design, industrial design, interior design, metal design, painting, printmaking, and sculpture which lead to a Bachelor of Fine Arts degree. The School also offers a major academic field (for elementary education majors) in the College of Education; see *College of Education* section.

Advanced standing in the School of Art is granted only on presentation of credentials from, and samples of work done in, art schools or university art departments whose standards are recognized by this School.

Transfer students are required to submit samples of studio work to the School of Art for placement evaluation. The work should be left at the Art Advisory Office at least a week before the transfer student's appointment with an art adviser. Slides and/or photographs of work may be submitted when the work itself is too bulky or inconvenient to handle.

All transfer students entering the School of Art are required to have a minimum cumulative grade point of 2.50. Students not meeting this requirement may petition for a review of their work, which, if approved would permit the waiver of this rule in exceptional cases.

The work and record of accomplishment in the freshman and sophomore years of candidates for the Bachelor of Fine Arts will be reviewed at the end of the

sophomore year to determine continuation in the program.

All majors in the School of Art must take the following art courses in the first year: Art 105, 106, 107, 109, 110, 129.

Prerequisites for all art courses must be strictly adhered to and in no case will auditors be allowed to take studio courses.

The School of Art offers Study-Abroad programs in France and in Japan. Information may be obtained from the Undergraduate Adviser, School of Art.

GRADUATION REQUIREMENTS

Bachelor of Arts

Requirements for candidates for this degree are listed below. Students following these curricula will be required to complete a minimum of 180 credits, combining stated College of Arts and Sciences requirements with requirements in the major.

CURRICULUM FOR THE GENERAL MAJOR

This curriculum provides some concentration in art, but allows a wide range of electives both in art and in other fields of study. The requirements are 70 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (the first-year program); Art History 201, 202, 203, and 3 elective credits in art history; and 41 credits chosen from the following optional fields so that the first option includes no more than 15 credits and the others no more than 9 credits: Art 300, 302, 303, 304, 305 (art education); all undergraduate art history courses except Art History 201, 202, 203; Art 201, 202, 203, 353, (ceramics); Art 250, 251, 252, 253, 254, 255, 340 (design); Art 265, 266, 267, 268 (drawing); Art 205 (graphics); Art 357, 358, 359, 457, 458, 459 (metal and jewelry); Art 256, 257, 258, 259, 307, 308, 360, 361 (painting); Art 350, 351, 352, 450, (printmaking); Art 272, 273, 274, 322, 323 (sculpture).

CURRICULUM IN ART EDUCATION

Students who wish to prepare for secondary school teaching should follow the curriculum prescribed below. The professional education requirements, as described in the *College of Education* section, must be fulfilled for certification to teach in the state of Washington.

The requirements are 70 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, and 3 elective credits in art history; 6 credits from Art 201, 205, 265, 272, 358; 12 credits from Art 250, 251, 252, 253, 254, 255; Art 256, 259; 12 credits from Art 300, 302, 303, 304, 305; EDC&I 340, 341; 20 approved art elective credits recommended.

CURRICULUM IN ART HISTORY

The requirements are 17 credits in art composed of Art 105, 106, 107, 109, 110, 129 (first-year program); 9 credits in Art History 201, 202, 203; plus 40 credits to be selected from offerings in the history, theory, and criticism of art; the history of architecture; and classical archaeology.

Students who plan to undertake graduate work in art history should acquire a reading knowledge of French or German. Those planning to do graduate work in oriental art should begin work in an oriental language as well.

Bachelor of Fine Arts

The requirements for the candidates for this degree are listed below. Professional curricula in the following fields are offered for students who wish a greater concentration in art than is provided in the General Art major. Students following these curricula will be required to complete a minimum of 225 credits, combining stated College of Arts and Sciences requirements with requirements in the major.

CURRICULUM IN CERAMIC ART

The requirements are 131 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 391, and 6 elective credits in art history; Art 201, 202, 203, 353, 354, 355, 485, 486, 487 (ceramics); 15 credits in one of the following fields: painting, sculpture, printmaking, or metal; 27 elective credits in art, with a minimum of 6 credits in studio courses; and 15 elective credits from art or academic areas.

CURRICULUM IN GRAPHIC DESIGN

The requirements are 130 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, and 3 elective credits in art history; Art 205, 366, 367, 368, 410, 466, 467, 468, 479, 480, and 15 credits in Art 495 (graphic design); Art 256, 257, 258, 259, 265, 266, 267, 268, 313, 314, 350, 360, 361, 362; and 6 elective credits in art; Psychology 100; Economics 200.

CURRICULUM IN INDUSTRIAL DESIGN

The requirements are 164 credits, composed of 95 credits in art, 18 credits in architecture, and 53 other credits. The following art courses are required: Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 381, 382 (art history); Art 316, 317, 318, 445, 446, 447 (industrial design); Art 201, 205, 251, 252, 253, 254, 272, 282, 313, 314, 357; Architecture 300, 301, 302, 305, 306, 307, 310, 311, 312; Mechanical Engineering 201, 202, 203, 342, 410; General Engineering 104, 351; Economics 200; Business, Government, and Society 307; Communications



226; Speech 103; 15 credits in physics; Psychology 100; Marketing 300.

CURRICULUM IN INTERIOR DESIGN

The requirements are 130 credits, composed of 79 credits in art, 24 credits in art or humanities, 22 credits in architecture, and 5 credits in home economics. The following art courses are required: Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 283; Art 259, 262, 280, 281, 310, 311, 312, 472, 473, 474; 24 elective credits in art or humanities; Architecture 150, 151, 300, 301, 302, 305, 306, 307, 310, 311, 312; Home Economics 125, 329.

CURRICULUM IN METAL DESIGN

The requirements are 127 credits composed of 107 credits in art. The following art courses are required: Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, and 9 elective credits in art history; Art 357, 358, 359, 457, 458, 459, and 15 credits in Art 498 (metal design); Art 205, 254, 256, 257, 272, 273, 274, 335; and 6 credits from Art 250, 251, 253, 255; 9 approved elective credits in art; Mechanical Engineering 201, 202, 203; General Engineering 104; and 14 elective credits.

CURRICULUM IN PAINTING

The requirements are 130 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 381, 382, and 3 elective credits in art history; Art 265, 266, 267 (drawing); Art 256, 257, 258, 259, 307, 308, 309, 360, 361, 362, 463, 464, 465, 475, 476, 477 (painting); Art 272, 273, 274, 350, 351, 352; and 22 elective credits in art.

CURRICULUM IN PRINTMAKING

The requirements are 131 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 392, and 2 elective credits in art history; Art 350, 351, 352, 450, 451, 452, and 15 credits in Art 498 (printmaking); Art 256, 257, 258, 265, 266, 267, 272, 273, 307, 308, 360, 361, 362; and 23 elective credits in art.

CURRICULUM IN SCULPTURE

The requirements are 126 credits in art, composed of Art 105, 106, 107, 109, 110, 129 (first-year program); Art History 201, 202, 203, 381, 382; Art 272, 273, 274, 322, 323, 324, 332, 333, 334, 335, 337, 436, 437, 438 (sculpture); Art 201, 202, 253, 256, 257, 265, 266, 268, 350, 351; and 18 elective credits in art.

Graduate Programs

Graduate Program Adviser

Wendell Brazeau
104 Art Building

The School of Art offers courses leading to the degrees of Master of Arts, Master of Fine Arts, and Master of

Arts for Teachers. Graduate standing in the School of Art is granted only on presentation of credentials from art schools or university art or art history departments whose standards are recognized by this School. Samples of work done in these schools or art departments must also be presented by applicants for admission to the Master of Fine Arts and Master of Arts for Teachers degree programs.

In addition to Graduate School general admission requirements, students desiring to pursue a course of study leading to the master's degree must have a grade average of B or better in the undergraduate art major and must have completed the equivalent of the undergraduate degree requirements in the School of Art, University of Washington. The School of Art may require additional undergraduate work beyond the basic minimum if it is necessary to make up deficiencies or inadequacies.

Master of Arts

Candidates for the degree Master of Arts in the field of art history must meet the requirements of the Graduate School, demonstrate competence in French or German, pass a comprehensive examination in art history at the level of a sound general survey, offer a minimum of 36 credits in the history of art numbered 400 or above, of which 27 are course credits and 9 are thesis credits (half of the 36 credits must be in courses numbered 500 or above), and present and defend a thesis. The thesis may be the extension of a seminar paper that demonstrates the student's familiarity with sources and his capacity for synthesis and critical evaluation.

Master of Fine Arts

Students accepted for admission will be required to complete a program of a minimum of 36 credits of scheduled class work and 9 credits of thesis for a total of 45 credits for the degree. No foreign language is required. The thesis is in the nature of a project, such as a series of paintings, prints, sculptures, ceramic objects, designs in metal or fabric, executed with a background of research.

A selection of the student's thesis may be reserved for inclusion in the annual exhibition of master's theses of the School of Art at the Henry Art Gallery.

Master of Arts for Teachers

Students accepted for admission into the M.A.T. program must have completed at least one year of successful teaching experience on the elementary, secondary, or college level, prior to initial entry. The program requires completion of a minimum of 36 credits, 9 of which may be a field-related thesis. Additional course work, including a research study, may be taken in lieu of the thesis. No foreign language is required.

More detailed information regarding the Master of Fine Arts, Master of Arts for Teachers, and Master of Arts in the field of history of art degrees may be obtained from the Graduate Program Adviser in Art.

ASIAN LANGUAGES AND LITERATURE

Chairman

Turrell V. Wylie
300 Thomson Hall

Professors

Edward J. D. Conze, Leon N. Hurvitz, Richard N. McKinnon, Vincent Y. C. Shih, Paul L-M Serruys, Hellmut Wilhelm, Turrell V. Wylie

Associate Professors

Ilse D. Cirtautus, Joseph R. Cooke, Edwin M. Gerow, Fred Lukoff, Tamako Niwa, Hidehiro Okada, Isabella Yen

Assistant Professors

Harold F. Schiffman, Ted Takaya

Lecturer

Noburu Hiraga

The Department of Asian Languages and Literature teaches languages and literatures of South, Southeast, East, and Inner Asia. The student becomes acquainted with cultural and political entities different from his own, which may be regarded as indispensable to a proper understanding of his own nation and culture, and the other nations and cultures of the West. Courses making up the Department curricula lead to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy.

This aim is furthered through the study of the main creative manifestation of these entities—their literature. Other aspects of these cultures, such as their history and geography, their social and political institutions, and their thought systems, are dealt with in courses offered by the Far Eastern and Russian Institute and its cooperating departments. The Department and the Institute work in close cooperation; most department faculty also hold membership in the Institute.

In addition to instruction in the history and structure of these languages *per se*, the Department, in close cooperation with the Department of Linguistics, provides an introduction into the methods and concepts of professional linguistics. Finally, the Department provides training in the handling of historical texts and textual criticism, and such related methods and concepts as are needed by the professional philologist.

Undergraduate Programs

Adviser

Turrell V. Wylie
300 Thomson Hall

Graduation requirements are: Far Eastern 210; at least 25 credits in language beyond the second-year level; and at least 20 credits in courses dealing with the literature and culture of the area of the major language, excluding 499. Literature courses in English count only as area courses. Language and literature majors may, at the invitation of the Department, register for a maximum of 15 credits of undergraduate research, (Asian Languages and Literature 499).

For students in the College of Education, the Department offers minor academic fields in Chinese and Japanese for those preparing to teach in secondary schools. (See *College of Education* section.)

Honors in Asian Languages and Literature

Undergraduate majors in the Department of Asian Languages and Literature who are also members in the College of Arts and Sciences Honors Program and who fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements, may receive a bachelor's degree "With College Honors." Students who enter the honors program of the Department in their junior year and fulfill its requirements may receive a degree "With Distinction." For further information, consult the Departmental Honors Adviser.

Graduate Programs

Graduate Program Adviser

Turrell V. Wylie
300 Thomson Hall

The Department of Asian Languages and Literature offers programs of study leading to the Master of Arts and Doctor of Philosophy degrees in the fields of Chinese, Japanese, Korean, and Tibetan language and literature. Students who intend to work for these degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Requests for applications for admission should be addressed to the Graduate Program Adviser, Department of Asian Languages and Literature. Applicants are required to submit with their application three letters of recommendation plus a statement of purpose (plan of study and advanced degree objective).

Master of Arts

Chinese Language and Literature. Admission to the M.A. program with specialization in Chinese language and literature requires that a student have strong undergraduate preparation in any of the following: Chinese



language and literature, another language and literature, Asian Regional Studies, Comparative Literature, Linguistics, English, Philosophy, or History. He will, in addition, be expected to have reached the 400-course level in modern Chinese. Students lacking such preparation may be admitted to the M.A. program; however, they should plan to remedy background deficiencies by adding as early as possible such courses as their academic adviser considers necessary.

Course requirements. The M.A. program in Chinese language and literature requires the successful completion of a carefully planned course program, a thesis, and a final oral examination based on the thesis. The course program will be established on an individual basis in discussions between the student and his adviser, and must be approved by his adviser, his Supervisory Committee, and the Graduate Program Adviser. The program will take into account the student's background and special interests; however, it must constitute a comprehensive and interrelated set of courses within the language and literature framework. The M.A. course program established should include, in each case, the following courses or their equivalents: Chinese Literature (Chinese 461, 462, 463); Studies in Chinese Literature (Chinese 561, 562, 563); Chinese Reference Works and Bibliography (Chinese 407); Chinese History (that of the period of special interest); Introduction to Texts in Ancient Script (Chinese 542, 543, 545, 546, or Classical Chinese (Chinese 451, 452, 453), for students with a language emphasis, and one course in Comparative Literature or literary criticism for students with a literature emphasis. At least 12 of the student's total credits should represent seminar work. Courses with seminar status are Chinese 540, 542, 543, 545, 546, 560, 572, 581, 585. With approval of his Graduate Program Adviser, the student may offer one seminar from another section of the Department toward fulfillment of this stipulation. Completion of this core curriculum or its equivalent will satisfy the course requirements for the M.A. degree. In no case will a student be permitted to present less than 45 course credits plus 9 thesis credits.

Prior to commencing his thesis work, the student will demonstrate to his adviser and his committee that he has attained a competence in the Chinese language, modern and classical, equivalent to that demanded at the levels of Chinese 413 and 453, respectively. In addition, the student is required to pass one foreign language examination scheduled by the Graduate School.

Although the concept of fields is not applied in the M.A. program, a student will usually, in the establishment of his course program, seek a special emphasis which reflects his particular interests. Most commonly the emphasis will be on either literature or language.

In either case, the other area cannot be neglected in the program. "Literature" is to be understood to mean polite literature. Other kinds of literature, such as philosophical or religious literature can, however, be accommodated in the program. Courses offered in other departments, such as Linguistics, Comparative Literature, or one of the other language and literature departments, may constitute valuable additions to the program where they support and enrich a special emphasis.

A thesis may not be submitted before the successful completion of the course program.

Japanese Language and Literature. For admission to the M.A. program with specialization in Japanese Language and Literature, a student must have strong undergraduate preparation in any of the following: Japanese language and literature, another language and literature, Asian Regional Studies, Comparative Literature, Linguistics, English, Philosophy, or History. He will, in addition, be expected to have reached the 300-course level in Modern Japanese. Students lacking such preparation may be admitted to the M.A. program; however, they should plan to remedy background deficiencies by adding, as early as possible, such courses as their academic adviser considers necessary.

Course requirements. This program requires a minimum of 54 credits which must include 9 credits devoted to thesis writing. The student's course of study must have at least two seminar-level courses. The following courses are normally required: Japanese 421, Japanese Literary Tradition; 422, Tokugawa Literary Tradition; 423, Modern Japanese Literature in English; 441, Studies in Japanese Poetry in English; 443, Studies in Japanese Drama in English; 461, 462, 463, Readings in Modern Japanese Literature (in Japanese). If the student's background is sufficiently broad, other courses may be substituted. Additional course work in related fields may be required to meet the needs of each program.

Other requirements. Each student is expected to pass a Japanese language examination demonstrating both a basic knowledge of the structure of the language and an ability to use Japanese materials in his field of concentration. The student must prepare a thesis, based upon original research, making use of Japanese literary materials, which forms the basis for his final oral examination after the completion of the thesis. It normally includes a critical analysis and translation.

Korean Language and Literature. In addition to meeting the requirements of the Graduate School, the student should have the following preparation: Language: two years of Korean language, or the equivalent of Korean 211, 212, 213, and 311, 312, 313. His back-

ground should consist of at least one course in Korean history, Korean civilization, and Korean literature in English translation; a survey course in linguistics equivalent to Linguistics 400 and at least the equivalent of Humanities 101 or 201 or a world classics series such as Comparative Literature 300, 301, 302.

Course requirements. A minimum of 54 credits is required, 45 course credits and 9 thesis credits. At least 12 of the 45 course credits must be in seminar work, and at least 18 must be in courses numbered 500 or above. The 45 course credits should be distributed as follows: 30 credits in Korean language and literature in courses numbered 400 and above and 15 credits in Comparative Literature or literary criticism or linguistics.

Other requirements. A thesis is required in addition to course work. The thesis proposal must be approved by the student's Supervisory Committee. An oral examination may follow the submission of the thesis at the discretion of the Supervisory Committee and, in addition, the student may be examined on the thesis and on any of the subject matter covered in his course work. The student is required to take one foreign language examination scheduled by the Graduate School. The student's faculty adviser will consult with him as to the choice of language.

Tibetan Language and Literature. The student is required to have an adequate background knowledge of Chinese and Indian cultural history, and to have the knowledge equivalent to Linguistics 400 and Far Eastern 472, Introduction to Buddhism.

Course requirements. The general requirements are a minimum of 45 credits (including at least 12 in seminar work) plus an additional 9 credits for thesis. Required courses (or equivalents): Far Eastern 431, Tibetan History (3); Far Eastern 464, Tibetan Buddhism (3); Far Eastern 598, Inner Asia Research Colloquium (seminar) (5, max. 15); Tibetan 401, 402, 403, Colloquial Tibetan (5,5,5); Tibetan 404, 405, 406, Literary Tibetan (3,3,3); Tibetan 500, Advanced Literary Tibetan (3, max. 9). Optional courses: Tibetan 414, Readings in Modern Tibetan (3, max. 9); Tibetan 421, 422, 423, Advanced Colloquial Tibetan (5,5,5); Tibetan 534, Buddhistic Tibetan (2, max. 6); Tibetan 544, Ancient Tibetan Documents (2, max. 6).

The student working for a master's degree must pass the graduate reading examination in literary Tibetan. Independent study or research in Tibetan language and literature is conducted under Tibetan 600; thesis credits are given under Tibetan 700.

Other requirements. In addition to writing a thesis, the student must take a written M.A. examination which

will cover the significant aspects of Tibetan literature, religion, and history. The reading committee will evaluate the written examination and the thesis to determine whether the student should be recommended for the Ph.D. program.

Doctor of Philosophy

Chinese Language and Literature. A student wishing to enter the Ph.D. program with specialization in Chinese language and literature shall, irrespective of his particular qualifications, submit a formal petition so stating and requiring the signatures of his adviser, the Graduate Program Adviser, and the Departmental Chairman, *only after the successful completion of three full quarters of graduate study in Chinese language and literature.*

The prospective candidate will ideally have completed the requirements for an M.A. degree in the field of Chinese language and literature prior to entering the program. If he has not received the M.A. in Chinese language and literature but has this degree in another language and literature, e.g., in Asian Regional Studies, Linguistics, Comparative Literature, Philosophy, or History, he need not earn the M.A. degree in Chinese language and literature but will be expected to satisfy curriculum requirements of the M.A. during the course of his study.

Upon admission to the program, the student should be entering at least 500-level courses in modern Chinese and should have studied classical Chinese for a minimum of one year.

A student who intends to go directly from the B.A. to the Ph.D. program must present an unusually strong background preparation in the disciplines of literary study or linguistics. He will be expected, in the course of his work, to satisfy all curriculum requirements for the M.A. He must petition the Department for permission to bypass the M.A.

A student admitted to the Ph.D. program shall, at the discretion of his adviser, add to his basic program any course considered necessary to remedy an insufficiency in background.

Course requirements. The student shall satisfy all curriculum and degree requirements for the M.A. degree in Chinese language and literature, with the exception of the M.A. thesis and the oral Final Examination, where this degree is not taken. Beyond this, his most important work will be done in seminars and other courses at the 500 level and above where he will be developing his four fields of specialization.

At some time prior to the General Examination, the student will demonstrate to his adviser an advanced



proficiency in both classical and modern Chinese and at least a reading knowledge in one other Asian language. Upon the successful completion of his individually established course program, members of the student's Supervisory Committee will administer to him the General Examination, in which he is expected to show preparedness in his chosen four fields of specialization. Knowledge both of original materials and of important scholarship pertaining to the fields is tested. Passing this examination, the student then writes his dissertation, under the direction of his appointed dissertation adviser. An oral Final Examination in defense of the finished dissertation, completes the degree requirements for this program.

In addition to his examination in Chinese, the student is expected to pass examinations in one Asian and one European language scheduled by the Graduate School. The student may apply the foreign language required for the M.A. in Chinese language and literature to this requirement.

Other requirements. A field is considered to be an area of knowledge within Chinese language and literature which is investigated in depth and in which the student shall familiarize himself widely with original materials and scholarship relevant to these materials. The student is expected, in addition, to indicate some potential for original and creative scholarship within the area of knowledge through his response to it, his awareness of its problems, and of approaches which may be used in treating them. The four fields of specialization offered by each student may be chosen from Chinese linguistics (e.g., Chinese phonology, dialectology, epigraphy) and from among the periods, schools, genres, or major figures of Chinese literature (e.g., pre-Han literature, the colloquial novel, Six Dynasties "palace-style" poetry). With the permission of his Advisory Committee, a student may offer, as one of his four fields, a field from the areas of general linguistics, literary criticism, a non-Chinese literature, Chinese philosophy, Chinese religion, or Chinese history (if specializing in modern literature). Should a field from outside the Chinese language and literature program be offered, it must be related in a helpful way to the student's other fields or to the acquisition of special disciplinary concepts and skills.

Japanese Language and Literature. In order to qualify for a doctoral degree with specialization in Japanese language and literature, the student must have an M.A., preferably in literature, the humanities, or the fine arts. By the time he is ready to take the General Examination, he will be expected to meet the basic course requirements necessary for an M.A. in this field or have its equivalent from another institution.

Course requirements. In addition to the minimum of 54 credits or its equivalent required for the master's program, the student must take at least 50 credits of course work on the graduate level, including a minimum of two seminar-level courses. He will also carry at least 27 credits under Japanese 700 for conducting advanced research under authorized supervision on his doctoral dissertation.

Each student must have completed all the Japanese 400 series or its equivalent as outlined in the master's program and must complete the following courses:

JAPANESE 501	READINGS IN BIBLIOGRAPHICAL MATERIALS . . .	5
JAPANESE 505, 506, 507	READINGS IN DOCUMENTARY JAPANESE . . .	15
JAPANESE 551, 552, 553	READINGS IN CLASSICAL JAPANESE LITERATURE . . .	15
JAPANESE 590	SEMINAR IN JAPANESE LITERATURE . . .	15
TOTAL		50

Additional course work in related fields may be required to meet the need of each program. In order to acquire the widest possible background, the student is encouraged to take related courses in history, intellectual history, religion, and the social sciences. Familiarity with Chinese literature and allied fields as well as comparative literature and linguistics is strongly recommended. Each student should consult with his adviser to work out a suitable program.

Other requirements. A written General Examination will be given on four separate fields which may include a period, genre, specific author and his work, or any other relevant topic to determine the student's extent of preparation in his major field and his ability to carry out advance research. The three-hour oral General Examination will be devoted to the student's course work and his proposal for a research program after his written examinations. The student must demonstrate his reading proficiency in two foreign languages, including Japanese, administered by the department, in which he must be familiar with both the modern and classical forms and indicate his ability to translate the given passages into good readable English. The other examination will be given by the Graduate Faculty.

Korean Language and Literature. Students may arrange a Ph.D. program with specialization in Korean language and literature when faculty, library resources, and course offerings meet Graduate School requirements for such a program. In general, the program should be arranged in conjunction with the faculty of the Department of Comparative Literature, or the Department of Linguistics.

Doctoral programs, where the major discipline is other than Korean language and literature, are granted by the department of the major discipline in cooperation with the Department of Asian Languages and Literature.

Tibetan Language and Literature. Completion of the master's program in Tibetan language and literature is required for admission. The student, having satisfied this requirement, must satisfy the following additional requirements: He must be able to pass the graduate reading examination in a second Asian language related to his field of Tibetan studies, and be familiar with the history and culture of the country of that second language. He is further required to have an adequate knowledge of Tibetan history and religion; but, if his research interests are in history he should offer either Chinese or Mongolian as the second language: those interested in Tibetan Buddhism should offer Sanskrit as the second language.

The student must present a program of study covering four fields, but not all four can be in Tibetan studies—two of the four should be in the second Asian language offered. The student may offer linguistics as a field, but this would not exclude him from offering at least one field in the second Asian language. Two of the fields must be in Tibetan studies. The following are suggested fields of study from which the student may select the required four: Tibetan language, literature, history, religion; Chinese language, literature, history, philosophy; Mongolian language, history, culture; Sanskrit language; Indian Buddhism; linguistics.

Other requirements. Upon completion of prescribed course work, the candidate must take his Ph.D. General Examination, which will consist of a four-hour written examination in each of the four fields of study selected, to be followed by a two-hour oral examination. One foreign language (in addition to the second Asian language) is required, and French, German, or Russian is suggested.

Dissertation. The Ph.D. dissertation should include research done in the second Asian language on materials relating to the Tibetan dissertation topic.

ASTRONOMY

Chairman

George Wallerstein

Professors

Karl-Heinz Böhm, Paul W. Hodge,
Theodor S. Jacobsen, George Wallerstein

Assistant Professor

James Bardeen

Research Professor

Erika Böhm-Vitense

Astronomy is the science of the physical contents, size, form, and natural laws of the stellar universe. Its main

branches deal with the positions, distances, motions, masses, composition, and form of the celestial bodies. The principal disciplines are divided into such specialties as celestial mechanics, solar system, stellar spectroscopy, stellar structure and evolution, interstellar matter, galactic structure, extragalactic nebulae, and cosmology.

Astronomy 101 is offered as an introductory description of astronomy for students in all fields. Astronomy 102 is the corresponding introduction for students with some background in physics. Astronomy 301 provides an introduction for students in the physical sciences, mathematics, and engineering with a good background in general physics and calculus. The courses 321, 322, 323 give a detailed survey of astronomy for physical scientists. The 400-level courses are to provide background for advanced work in astronomy and are recommended for students in the physical sciences and mathematics. Graduate courses in the solar system, stellar atmospheres and interiors, interstellar matter, stellar dynamics, and galactic and extragalactic astronomy are offered.

Undergraduates who are interested in advanced work in astronomy are urged to major in a related field such as physics and to take the 400-level as well as two or three 500-level courses in the senior year.

Graduate Programs

Graduate Program Adviser

K. H. Böhm

247 Physics Hall

The Department of Astronomy offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Specific requirements are described briefly below. More complete information can be obtained by writing the Graduate Program Adviser.

Undergraduate preparation for graduate work in astronomy is expected to include a strong background in physics and mathematics. The graduate courses provide a background for research which may be conducted in a wide variety of possible topics. The University presently owns a 16-inch telescope in Central Washington and graduate students have access as well to the optical telescopes at the Kitt Peak National Observatory, Cerro Tololo International Observatory, and the radio telescopes at the National Radio Astronomical Observatory. Theoretical research is conducted with the CDC 6400 and other equipment at the University's Computer Center.

PROGRAMS OF STUDY

Master of Science

A minimum of 36 credits must be completed of which at least 18 must be in courses numbered 500 and above. If a master's thesis is submitted, 27 course credits are



normally taken in addition to 9 credits of thesis. Of these 27 course credits a minimum of 12 must be 500-level astronomy courses. Where a nonthesis program is followed, at least 15 of the 36 course credits must be 500-level astronomy courses. The student must pass the departmental preliminary examination with a grade of A or B. Proficiency in one foreign language in which there is a substantial astronomical literature is required.

Doctor of Philosophy

The doctoral program is meant to give the student a broad background in astronomy and those aspects of physics and mathematics that have potential astrophysical applications. In addition, the student may take courses in related fields such as astronautics, atmospheric sciences, electrical engineering, and geophysics, depending upon his interests. Specifically, the Department of Astronomy expects a student either to take or to have equivalent knowledge of a minimum of 24 credits of physics at the 400 level or above. Of particular importance are atomic and nuclear physics and methods of mathematical physics. Students interested in theoretical astrophysics should plan on taking further physics and mathematics.

Near the end of the first year of graduate work, students will be examined by the Department in fields of general astronomy and undergraduate physics and mathematics. Near the end of the second year of graduate work a qualifying examination will be given that will emphasize the course work at the University of Washington. Upon the student's successful completion of this departmental qualifying examination, the Department of Astronomy will request the Dean of the Graduate School to appoint a Supervisory Committee to guide the student in accordance with the regulations of the Graduate School.

ATMOSPHERIC SCIENCES

Chairman

Robert G. Fleagle

408 Atmospheric Sciences Building

Professors

Franklin I. Badgley, Konrad J. Buettner, Joost A. Businger, Phil E. Church, Robert G. Fleagle, Richard J. Reed, Norbert Untersteiner

Associate Professors

Peter V. Hobbs, James R. Holton, Edward R. LaChapelle, Conway B. Leovy

Assistant Professors

Alistair B. Fraser, John M. Wallace

NCAR Affiliate Assistant Professor

Robert Dickinson

Lecturer

Leo J. Fritschen

Research Assistant Professors

Satya P. S. Arya, Clayton A. Paulson, W. D. Scott, Richard R. Weiss

Research Associates

Robert A. Brown, Kristina Katsaros, Gary A. Maykut, B. A. G. D. Prasad, Lawrence F. Radke

Atmospheric Sciences are concerned with applying the methods of theoretical and experimental physics to the study of the earth's atmosphere. The subject ranges from such topics as the microphysical processes involved in the formation of clouds and rain to a study of world-wide atmospheric circulations and the properties of the outer regions of the earth's atmosphere.

At the undergraduate level, the Department provides an elective curriculum which includes the branches of atmospheric physics, synoptic meteorology, and climatology. Students awarded a bachelor's degree by the Department are eligible for the rating of professional meteorologist given by the United States Civil Service Commission. Courses offered in the graduate program, leading to the Master of Science and Doctor of Philosophy degrees, emphasize more advanced aspects of the atmospheric sciences, including aeronomy, biometeorology, climatology, cloud physics, energy transfer, weather analysis and prediction.

Undergraduate Programs

Advisers

Franklin I. Badgley

418 Atmospheric Sciences Building

John M. Wallace

608 Atmospheric Sciences Building

GRADUATION REQUIREMENTS

Bachelor of Science

A minimum of 38 credits is required in atmospheric sciences courses numbered above 300, of which 20 credits must be earned in courses above 400. Mandatory courses are 301, 340, 351, 431, 441 and their prerequisites. Courses required from other departments are General Engineering 115, or equivalent; Mathematics 224; Physics 121, 122, 123, 131, 132, or equivalent; and two courses from the following: Mathematics 324, 325, Physics 221, 222, 223.

A grade of C or better must be earned in each of the required courses in mathematics and physics and in each of the mandatory courses in atmospheric sciences and their prerequisites. An over-all grade-point average of at least 2.20 must be obtained in all courses taken in atmospheric sciences.

Programs and requirements for honors students will be arranged on an individual basis, under staff supervision.

HONORS IN ATMOSPHERIC SCIENCES

Adviser

John M. Wallace

608 Atmospheric Sciences Building

The Department of Atmospheric Sciences offers an honors program at the junior and senior levels. Members of the College of Arts and Sciences Honors Program must fulfill the requirements of that program during the freshman and sophomore years. It is recommended, but not required, that prospective honors majors enroll in the honors sections of lower-division mathematics and physics courses listed as requirements for the degree in Atmospheric Sciences (Mathematics 134H, 135H, 136H, 235H, 236H, Physics 121H, 122H, 123H).

In order to obtain the bachelor's degree "With College Honors in Atmospheric Sciences," the candidate must satisfy all the regular degree requirements of the Department and must in addition earn a minimum of 6 credits in 390H (Tutorial in Atmospheric Sciences), and must successfully complete Physics 221, 222, and 223. Of the required 20 credits in Atmospheric Sciences courses above 400, a minimum of 10 must be earned in honors sections of the following courses: 431, 441, 442, 450.

The honors student is also required to take the graduate record examinations in mathematics and physics and at least one upper-division course outside the science group, preferably from among the following: General History 311 (Science in Civilization: Antiquity to 1600), 312 (Science in Civilization: Science in Modern Society), and 412 (Science and the Enlightenment); and Philosophy 456 (Metaphysics), 460 (Philosophy of Science), and 470 (Advanced Logic).

With the approval of the Department, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Atmospheric Sciences." Selection of candidates for departmental honors will be made by the staff at the beginning of the junior year.

Graduate Programs

Graduate Program Adviser

R. G. Fleagle

408 Atmospheric Sciences Building

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. A bachelor's degree in a physical science, engineering, or mathematics is required for admission to the graduate program. The complete program for an advanced degree must be approved by the staff.

Prospective candidates for advanced degrees must take the Qualifying Examination which tests understanding of the fundamental aspects of the atmospheric sciences and the relevant mathematics and physics. It is given after completion of two quarters of graduate study. Those who pass this examination with distinction are encouraged to work toward the Ph.D.; those who pass at a lower level may continue to work toward the M.S.

Master of Science

The minimum course requirements are: 27 graduate credits exclusive of research or thesis, of which 3 must be in applied mathematics or mathematical physics and 15 must be in Atmospheric Sciences courses numbered above 500.

A thesis is required. It must demonstrate the student's ability to use research methods in a limited area and to discuss critically his own and other investigators' work.

Doctor of Philosophy

A student who passes the qualifying examination with distinction may embark on the Ph.D. program under the supervision of a faculty committee. The General Examination, which is taken at the end of the second year of residence, normally is an oral examination which tests depth of understanding of a topic within the student's area of special interest which is selected in advance.

At least half of the credits earned prior to the General Examination should be in courses numbered above 500, and at least 21 credits should be earned in approved mathematics and physics courses numbered above 400. The dissertation is an important part of the student's program; it must represent an original contribution of substantial scientific importance.

BIOCHEMISTRY

Chairman

Hans Neurath

J405 Health Sciences Building

Biochemistry is a study of the chemistry of life processes and as such constitutes one of the rapidly expanding branches of biological sciences. There is no curriculum leading to an undergraduate degree in biochemistry, but students following the Bachelor of Science curriculum in biology or chemistry may include as part of their degree program courses offered by the Department of Biochemistry. Courses in biochemistry are of particular interest to undergraduate students in zoology, botany, genetics, microbiology, or chemistry.



Graduate Programs

Graduate Program Adviser

David R. Morris

J405 Health Sciences Building

Students who intend to work toward the Master of Science and Doctor of Philosophy degrees in biochemistry should consult the *Graduate Study* and *School of Medicine* sections.

BIOLOGY

Undergraduate and graduate courses and curricula in the biological sciences are offered by the departments of Botany, Genetics, and Zoology, as well as in several departments of the School of Medicine. Courses are listed in the *Description of Courses* under "Biology," as well as under the several departments. An interdepartmental program in biology leading to the bachelor's degree is described in the *Interdepartmental Programs* section of this catalog. The departments of Botany and Zoology jointly offer a major in biology for students in the College of Education. (See *College of Education* section.)

BOTANY

Chairman

Richard B. Walker

342 Johnson Hall

Professors

Robert E. Cleland, C. Leo Hitchcock, Bastiaan J. D. Meeuse, Richard E. Norris, Daniel E. Stuntz, Richard B. Walker, Arthur R. Kruckeberg

Associate Professors

H. Weston Blaser, Matsuo Tsukada, Howard C. Whisler

Assistant Professors

Walter Halperin, Edward F. Haskins, Roger del Moral, J. Robert Waaland

Lecturer

Clarence V. Muhlick

Botany includes in a broad sense all aspects of the study of plants. More specifically, study of the following are included: the structure, classification, and development of the various groups in the plant kingdom; reproduction, genetics, and evolution; the physiology and biochemistry of cells and of the multicellular plant; the relations of plants to their environments; the application of botanical information in landscaping, horticulture, pharmacy, forestry, and other fields. In this Department, general training in these various topics may be followed by more intensive study of plants in natural habitats on land and in the water, microscopic observations, experimental studies in the greenhouse and the

laboratory, herbarium studies, and biochemical experiments in growth and development.

Elementary courses in both general biology and general botany offer to the nonscience major an opportunity to learn general scientific principles as well as learn about the world of living plants in which he lives. Professional students in forestry, education, pharmacy, oceanography, and other fields may develop a knowledge of botany necessary or useful in their vocations. For others, their studies lead to a career as a professional botanist.

The Department of Botany offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. In conjunction with the Department of Zoology, a major academic field and a minor academic field in biology are offered for students in the College of Education; see *College of Education* section.

For students who do not expect to take more than 5 credits in this subject, 111 or 113 is recommended. For those who expect to take 10 credits, one of these sequences is recommended: 111 and 112, or 111 and 113. Students intending to become botany or biology majors should normally start with the Biology 210, 211, 212 sequence. All biology courses, Genetics 451, and Microbiology 301 or 400 may be used for botany credit.

Entering students with exceptional ability or preparation are encouraged to consider advanced placement examinations. The Department wishes to encourage the progress of students by allowing advanced standing where justified.

Undergraduate Programs

Adviser

C. Leo Hitchcock

343 Johnson Hall

Bachelor of Science: 40 credits are required for the Bachelor of Science degree. Courses must include 111, 112, 113, or 313, or Biology 210, 211, 212; Botany 371 or 472, Genetics 451 and Chemistry through organic chemistry. Chemistry 231, 232 are recommended for most students. Those who plan to work in areas of biochemistry are advised to take Chemistry 335, 336, 337.

Graduate Programs

Graduate Program Adviser

Richard B. Walker

342 Johnson Hall

Students who intend to work toward the degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined

in the *Graduate Study* section. Organic chemistry is a requirement for an advanced degree in the Department of Botany; Chemistry 231, 232, or 335, 336, 337 are recommended.

CHEMISTRY

Chairman

Verner Schomaker
200 Bagley Hall

Professors

Arthur G. Anderson, Jr., George H. Cady, Ernest R. Davidson, David F. Eggers, Jr., Arthur W. Fairhall, Martin P. Gouterman, Norman W. Gregory, George D. Halsey, Jr., Edward C. Lingafelter, Jr., Yeshayau Pocker, Benton S. Rabinovitch, David M. Ritter, Rex J. Robinson, Verner Schomaker, Wolfgang M. Schubert, Leon J. Slutsky, George H. Stout, Robert Vandebosch, Gershon Vincow

Associate Professors

William S. Chilton, Alden L. Crittenden, C. Beat Meyer, Norman J. Rose, Victorian Sivertz (emeritus), Boris Weinstein

Assistant Professors

Niels H. Andersen, Bruce E. Eichinger, John W. Macklin, J. Michael Schurr, Darrell J. Woodman

Chemistry is a branch of natural science that deals principally with the properties of substances, the changes they undergo, and the natural laws that describe these changes. A research chemist may work with the objective only of advancing the science or he may strive to accomplish a goal having economic value. Many different careers ranging from teaching or research in pure science to industrial research or administration are open to chemists.

Chemistry also supplies part of the essential background for medicine, engineering, and other scientific or technical subjects. Science is an important part of modern culture, and some of the courses serve as good natural science electives for students majoring in one of the humanities or social sciences.

The Department of Chemistry offers curricula leading to the degrees of Bachelor of Science, Bachelor of Arts, Master of Arts for Teachers, Master of Science (both with and without thesis), and Doctor of Philosophy.

Undergraduate Programs

Adviser

B. Weinstein
200 Bagley Hall

For undergraduate students, the Department provides two curricula leading to bachelor's degrees: a Bachelor

of Science curriculum with an intensive study of chemistry and related sciences in preparation for a professional career or for graduate study, and a Bachelor of Arts curriculum which provides a basic introduction to chemical science and allows a wider choice of electives in fields outside the physical sciences. In addition, the Department offers major and minor academic fields for students in the College of Education. (See the *College of Education* section in this catalog.)

Students planning to major in chemistry are advised to take in high school 3 units of German, at least 3 units of mathematics, including 1½ units of algebra and ½ unit of trigonometry, and 1 unit of physics.

Transfer students must present courses equivalent to those required of resident students and complete at least 9 credits in chemistry in this Department in order to receive a degree with a major in chemistry.

Programs leading to the Bachelor of Science are designed to prepare students for professional careers in such diverse fields as chemical physics, nuclear chemistry, instrumental analysis, industrial chemistry, biochemistry, and the chemistry of medicinals, as well as in analytical, inorganic, organic, and physical chemistry.

After the basic courses in general chemistry, physics, and mathematics, the student will take intermediate courses selected appropriately from the following groups: mathematics and physics; physical chemistry; analytical, inorganic, and nuclear chemistry; organic chemistry; and biochemistry (offered in the Department of Biochemistry, School of Medicine). He later will be encouraged to enroll in advanced courses, including undergraduate research, related to his intended area of specialization. Plans for the student's schedule will be developed in conferences with a departmental adviser.

GRADUATION REQUIREMENTS

Bachelor of Science

The departmental program for this degree includes mathematics through 224, one year of college physics, 48 credits in chemistry (chemistry majors are strongly advised not to take any of the foregoing required chemistry, mathematics, and physics courses on the pass/fail basis), and 21 credits of approved upper-division science electives which may include courses in biochemistry, physics, mathematics, etc. For graduation, the student must possess a reading knowledge of German, French, or Russian (the American Chemical Society recommends German), obtain a grade-point average of at least 2.50 in all Chemistry Department courses, with a C or better in each course, and achieve a total grade-point average of 2.50 or better.



During the first three years, the program generally includes Chemistry 140 or 145, 150 or 155, 151, 160 or 165, 170, 221, 335, 336, 337, 345, 346, 347, 455, 456, and 457; English 101 and 102; one year of physics, including laboratory; and mathematics through 224 or its equivalent. The preceding chemistry courses and 458 constitute the 48 credits of required chemistry courses. Students with outstanding records may, with permission in advance, substitute the honors courses 145H, 147H, 155H, 157H, 165H, and 167H for 140, 150, 151, 160, 170, and 221. Chemistry 198 and 199 are electives that majors are encouraged to take during their first two years.

The science electives usually include 414 (or 415 and 416) and 426. Additional chemistry electives may be chosen from 410, 412, 418, 425, 427, 428, 429, 436, 446, and 499. Other electives frequently chosen are Biochemistry 440, 441, 442, 444, 499; Mathematics and Physics courses at the 200 level or above; Electrical Engineering 400; Microbiology 301 and 400; Atmospheric Sciences 301; Genetics 451; and others.

Bachelor of Arts

The program leading to this degree provides the student a broad choice of electives in fields other than science. It is especially adapted to the needs of students in premedicine and education, and of those seeking a liberal education with some concentration in science.

Requirements in this curriculum are Chemistry 140 or 145, 150 or 155, 160 or 165, 170, 221, 231, 232, 241, 242 (the organic series 335, 336, 337, 345, 346 is recommended in place of the 231 series for those students whose program can accommodate it), at least 9 credits of physical chemistry lectures (455, 456, and 457 recommended, though with prior approval 350, 351, and 455 may be accepted), and 458; one year of physics, including laboratory, and mathematics through 126. Majors are strongly advised not to take any of the foregoing courses on a pass/fail basis. A grade of C or better should be obtained in each of the required chemistry courses.

Honors in Chemistry

Adviser

George D. Halsey, Jr.
200 Bagley Hall

Members of the College of Arts and Sciences Honors Program may receive a bachelor's degree "With College Honors in Chemistry" if they fulfill the requirements of that program and, in addition, the following departmental honors requirements. With the approval of the departmental honors adviser, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum during

their junior and senior years and receive a bachelor's degree "With Distinction in Chemistry."

Honors students in General Chemistry take 145H, 147H, 155H, 157H, 165H, and 167H in place of 140, 150, 151, 160, 170, and 221.

In addition to the regular requirements for a bachelor's degree in chemistry, a candidate for an honors degree must have a grade-point average above 3.25 in chemistry courses and above 3.00 in other courses and must present at least 15 credits selected from the following: (1) Honors work in 400-level chemistry courses, exclusive of 499, arranged by conference with the professor in charge; (2) any chemistry course numbered 500 or above in which an A or B grade is earned; (3) upper-division courses in other sciences or mathematics as approved by the chemistry honors adviser.

Candidates for a Bachelor of Science honors degree must complete a minimum of 6 credits in Chemistry 499 and submit copies of an acceptable senior thesis to the professor who supervises his work and to the honors adviser before the last day of instruction of the quarter in which the degree is to be granted.

Candidates for a Bachelor of Arts honors degree must complete the same basic 48-credit sequence of chemistry courses as that required of Bachelor of Science majors. Under (3) above, with prior approval of the chemistry honors adviser, upper-division courses outside the science group may be used. Candidates must prepare an honors paper on a topic selected in consultation with a member of the faculty and the chemistry honors adviser, each of whom must receive a copy before the last day of instruction of the quarter in which the degree is to be granted.

Graduate Programs

Graduate Program Adviser

Verner Schomaker
200 Bagley Hall

Prospective candidates for advanced degrees must meet the requirements outlined in the *Graduate Study* section of this catalog and be granted admission to the Graduate School.

A special program for teachers is offered. It assumes an undergraduate background equivalent to the requirements for the B.A. (College of Education) with a major in chemistry and which leads to a Master of Arts for Teachers (M.A.T.) degree.

Prospective candidates for Master of Science or Ph.D. degrees must take placement examinations when they begin graduate study. These examinations, designed to assess the student's knowledge and understanding of the material normally contained in an undergraduate

program with a major in chemistry, are usually given shortly before the opening of each Autumn, Winter, or Spring Quarter. If not passed outright, these examinations lead to a set of special requirements, usually in the form of a sequence of remedial courses or re-examination, which have to be satisfied within a year.

Students seeking the Master of Science degree usually present German as their foreign language.

Students wishing to pursue the doctor's degree also take a series of cumulative examinations. These are written examinations covering mainly the student's area of specialization (analytical, inorganic, organic, or physical chemistry) that are designed to stimulate independent study and thought; to evaluate the breadth of knowledge gained from courses, seminars, and the literature; and to test the student's ability to apply this knowledge to diverse problems. The General Examination requirement for the Ph.D. is considered to be satisfied when the performance on the cumulative examinations reaches a certain satisfactory level, when proficiency and diligence have been demonstrated in research, and when the language requirement has been met. This last requirement may be satisfied by passing the standard ETS examination in two languages, usually German and either Russian or French, or the ETS examination in one language and a special departmental examination to demonstrate superior reading competence in that language. ETS examinations may be taken at any convenient location before admission to Graduate School. Students are urged to complete this requirement while undergraduates.

In the Chemistry Department, teaching experience as a graduate teaching assistant or predoctoral teaching associate is a further requirement for all students working toward the doctor's degree.

CLASSICS

Chairman

John B. McDiarmid
218 Denny Hall

Professors

Harvey B. Densmore (emeritus), John B. McDiarmid,
William M. Read, Farhat J. Ziadeh

Associate Professors

Colin N. Edmonson, William C. Grummel, Nicholas L.
Heer, Pierre A. MacKay, Paul Pascal

Assistant Professors

Walter G. Andrews, John W. Clear, Daniel P. Harmon,
Michael B. Loraine, Allen H. Podet, Louis J. Vignoli

Classics is the study of ancient Greek and Roman civilization in all its aspects, from prehistoric times to the Middle Ages. It includes the Greek and Latin

languages; the many kinds of literature written in them, such as poetry, drama, history, philosophy, rhetoric, political theory; and ancient art and archaeology.

The Department of Classics offers programs leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. For the Provisional Teaching Certificate, it offers major and minor academic fields in Latin. Candidates for the Certificate may major in Latin in this Department, under the College of Arts and Sciences, or in the College of Education.

The undergraduate curriculum in Greek and Latin is designed to provide a general education through the reading of major literary works and to form a sound basis for teaching and further study. At the graduate level, courses and seminars are offered each quarter in both languages.

Archaeology courses survey and interpret the physical remains of antiquity in the light of modern archaeological methods and excavations. A knowledge of Greek and Latin is not needed for the undergraduate courses.

Classics courses in English are intended primarily for students who have not studied Greek and Latin. The lower-division courses in literature and word-derivation are general and introductory; each of the upper-division courses is concerned with a single literary type.

Students who are interested in taking courses in Latin or Greek should begin their study at the University as early as possible, since each advanced course in the literature is offered only once every two years. Those who are uncertain of their preparation for any course or who wish to review work done elsewhere should consult the Department before registering. The prerequisite for any course may be waived at the Department's discretion.

Interdepartmental undergraduate and graduate programs in Near Eastern Studies are associated with the Department. For a description of these programs, see "Near Eastern Studies" in the *Interdepartmental Programs* and *Interdisciplinary Graduate Degree Programs* sections of this catalog. For courses in Arabic, Hebrew, Turkish, and Persian, as well as for Near East courses in English, see the course descriptions under Classics in the *Description of Courses* section. For other courses on the Near East, see the course descriptions under Anthropology, Asian Languages and Literature, Comparative Literature, History, and Political Science.

Information about curriculum, requirements, undergraduate scholarships, and graduate appointments may be obtained from the Department.



Undergraduate Programs

Advisers

John B. McDiarmid, Eileen M. Niven
218 Denny Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

CLASSICS MAJOR

Requirements are: 18 approved credits in upper-division Greek courses; 18 approved credits in upper-division Latin courses.

GREEK MAJOR

27 approved credits in upper-division Greek courses, and 9 credits chosen with the approval of the Department from courses in Latin, upper-division Greek, classical archaeology, classics in English, ancient history, and the history of ancient philosophy.

LATIN MAJOR

27 approved credits in upper-division Latin courses, and 9 credits chosen with the approval of the Department from courses in Greek, upper-division Latin, classical archaeology, classics in English, ancient history, and the history of ancient philosophy.

Honors in Classics, Latin, or Greek

Adviser

William C. Grummel
224 Denny Hall

Members of the College Honors Program who wish to qualify for a bachelor's degree "With College Honors in Classics" or "... in Latin" or "... in Greek" must fulfill the requirements of that program during the freshman and sophomore years in addition to the departmental honors requirements shown below. With the approval of the Departmental Honors Committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Classics" or "... in Latin" or "... in Greek."

Requirements for admission to candidacy for an honors degree are: (1) a cumulative grade-point of 3.00 for the freshman and sophomore years, with an average of 3.50 for courses taken within the Department; (2) sufficient competence in either Latin or Greek to enter the upper-division courses in the languages.

Candidates for departmental honors "With Distinction" will be nominated by the Departmental Honors Committee in their sophomore or junior year.

The departmental honors curriculum follows:

Lower-division preparation

In addition to Latin and/or Greek courses, honors students are advised to take honors sections of General

History 111 or of Ancient and Medieval History 201 and 202.

Junior and senior years

In their junior year, honors students are assigned to a departmental adviser, under whose supervision they begin an independent reading project in either Latin or Greek. In the senior year, they write a senior thesis based on research in some subject of special interest to them. Normally 9 credits are earned in the reading list and senior thesis combined, under Latin or Greek 490H.

Graduate Programs

Graduate Program Adviser

John B. McDiarmid
218 Denny Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School.

Master of Arts

Requirements are a minimum of 27 credits in courses or seminars in Greek, Latin, and related subjects approved by the Department; a reading knowledge of either French or German; either an acceptable thesis or 9 additional credits in approved graduate courses and seminars.

Doctor of Philosophy

Requirements are a minimum of 72 credits in courses or seminars in Greek, Latin, and related subjects approved by the Department; four research papers; a reading knowledge of French and German; General Examinations for admission to candidacy; an acceptable dissertation and Final Examination on the dissertation.

Graduate students must have teaching experience before completing requirements for their terminal degrees.

COMMUNICATIONS

Acting Director

Henry Ladd Smith
129 Communications Building

Professors

Richard F. Carter, Byron H. Christian (emeritus), Alex S. Edelstein, Milo Ryan, Willard F. Shadel, Henry Ladd Smith, Daniel S. Warner (on leave), Fendall W. Yerxa

Associate Professors

William E. Ames, Peter Clarke, Pat Cranston, William F. Johnston, John T. Kinkel, Merrill Samuelson, Dwight Teeter (visiting)

Assistant Professors

John R. Mathiason, Don R. Pember, Ronald Pyszka, Lee Ruggels, Lawrence Schneider

Lecturer

Thomas F. Ris

Associate

Britt Nederhood

The School of Communications has a fundamental concern with processes of communication, the functions which these processes serve for individuals and societies, and the conditions that make such processes possible.

The School is primarily concerned with mass communication processes, focusing on the special roles of the mass media. These processes are studied in many contexts: the operation of democratic institutions, interpersonal relations, education, relations between nations, economic development, and the distribution of goods and services.

Through four professional sequences—editorial journalism, broadcast journalism, advertising, and radio-television—the School offers professional training; through a fifth sequence—communication—the School permits concentration on academic study of the communication processes. All five sequences lead to the degree of Bachelor of Arts.

The School also offers graduate programs leading to the degrees of Master of Communications, Master of Arts, and Doctor of Philosophy. Cooperation with other departments and schools provides courses to satisfy requirements for a Ph.D. minor.

The School maintains a research facility, the Communication Research Center, which contains a Graduate Student Center, reference materials, machine data-processing equipment, and a seminar room. The Center is designed to assist in the training of graduate students and to facilitate the research of the faculty of the School. The Center began its activities in 1956 and was established as a separate facility in 1964.

Undergraduate Programs**Adviser**

Don R. Pember

118 Communications Building

A student planning to enter the School of Communications must (1) present 90 credits; (2) have completed Communications 150, 200, and 220 (or their equivalents) with grades acceptable to the School faculty, and (3) present a University of Washington grade-point average of at least 2.50 (or, if transferring from an institution outside the University, a grade-point average of at least 3.00); to continue as a major in the School he must maintain an acceptable grade-point average for all courses in the School and an average of at least 2.00 for all courses outside the School.

GRADUATION REQUIREMENTS**Bachelor of Arts**

A major student in any sequence in the School of Communications may obtain the B.A. degree by:

- (1) Fulfilling the requirements of the University and the College of Arts and Sciences;
- (2) Completing at least 120 credits outside the School, to include 10 credits of literature and 35 credits in related social science courses (elected from those listed under "Social Sciences" in the College List in the following departments: Anthropology, Economics, Geography, History, Philosophy, Political Science, Psychology, and Sociology. At least 20 credits must be included from a single department and at least 20 credits must be taken in upper-division courses);
- (3) Completing at least 50 credits within the School to meet all requirements of a specified program of study (except that an honors student may, with the permission of his honors adviser, substitute other courses for program requirements); and
- (4) For the student in a professional sequence, demonstrating to the School faculty creditable competence as a beginning practitioner in one of the communications media.

Students are encouraged to plan a second major with Communications, as most sequences have flexible electives that facilitate the combination of two related programs.

Programs of Study

Courses designed to give breadth to the program and required of all majors within the School of Communications are as follows: Communications 150, 200, 220, a course in communications history and social institutions (Communications 402 or 414), and a course in international and political studies (Communications 406 or 480 or 485).

Before enrolling in required sequence courses, the student must complete the lower-division breadth requirements.

Editorial Journalism: In addition to the requirements for all Communications majors, students in the editorial sequence are required to take Communications 321, 322 or 323, and 324. The sequence in editorial journalism offers major and minor academic fields for students in the College of Education (See *College of Education* section in this catalog.)

Broadcast Journalism: In addition to the requirements for all Communications majors, students in the broadcast journalism sequence are required to take Communications 321, 322 or 323, 353, 354, 355, 356, 357, and 358.



Advertising: In addition to the requirements for all Communications majors, students in the advertising sequence are required to take Communications 340, 338 or 480, 341 or 447, and 348 or 349, and Marketing 300.

Radio-Television: In addition to the requirements for all Communications majors, students in the radio-television sequence are required to take Communications 349, 353, 360, 370, 361 or 371, 373 or 377 or 450, and 379 or 470.

Communication: As part of the requirements for all School of Communications majors, students in the communication sequence are required to take Communications 414 and 480. In addition to the requirements for all School of Communications majors, students in the communication sequence are required to take Communications 400, 406, 411, 402 or 348 or 470, and 485, and General History 443, Political Science 452, Psychology 345, and Sociology 443.

Honors in Communications

Adviser

William E. Ames

235 Communications Building

A student who is admitted to the College Honors Program and fulfills the requirements of the program during his freshman and sophomore years and completes the special requirements of the School of Communications listed below receives a bachelor's degree "With College Honors in Communications." A student who excels in his academic achievement may participate in the School's honors curriculum and receive a bachelor's degree "With Distinction in Communications."

The special requirements for the School of Communications include the completion of three 400-level communications courses (all of which have been designated for honors credit). In addition, an honors sequence, Communications 495, 496, and 497, is offered for seniors seeking either college honors or departmental distinction. A student seeking college honors must also complete at least 30 honors credits in either a behavioral science or a humanities area. These 30 credits may be spread over no more than three departments and at least half of these credits must be upper-division. A student seeking the degree with distinction must complete 15 honors credits in either a behavioral or a humanities area.

Graduate Programs

Graduate Program Adviser

Peter Clarke

236A Communications Building

Graduate work in communications is directed toward specialization within the general framework of scholar-

ship in communication. An applicant must have completed the equivalent of an undergraduate major in communications or, before admission to any program, undertake such course work as a Supervisory Committee may specify as necessary preparation for graduate work. Application for admission to a master's program must be made by February 15; matriculation must be in Autumn Quarter, except for remedial work.

An applicant for any program must submit evidence of undergraduate work, a statement of purpose relating to his specialization, results of required tests (the Graduate Record Examination and—for M.A. and Ph.D. programs—the Miller Analogies Test), and, where applicable, evidence of fluency in English. Only complete applications are considered. A Supervisory Committee is appointed for each graduate student admitted to one of the graduate programs. The committee will specify courses applicable to the student's program, and its chairman will be the student's adviser. A student enrolled in courses but not admitted to any program will be assigned a temporary adviser.

Programs of Study

Master of Communications

This program has two options: (A) a program for those seeking academic work beyond the bachelor's degree but who do not intend to pursue a doctorate; (B) a professional program for those seeking area specialization within the journalistic field.

Option A. This program requires work in two fields selected from social control, international communication, history, advertising, and communication theory and methodology. A field consists of at least 15 credits, including a minimum of two 500-level courses in the School of Communications. The student will prepare a research paper covering work in one or more fields, utilizing 9 credits for this purpose.

Option B. This program requires 25–27 credits in an area of concentration outside the School of Communications, 6–8 credits of general Communications studies, and 12 credits of seminar and practicum in the School of Communications in which the area specialization is to be represented in a journalistic production of professional quality.

Master of Arts

This program leads to work toward a doctorate, emphasizing research scholarship. The formal requirements leading to a Master of Arts degree parallel those for the *Option A* program except that the student shall prepare a thesis rather than a research paper. The student must also meet the University language requirement stipulated for the Master of Arts degree.

All programs for the master's degree require 45 credits of course work, to include at least 20 credits at the 500

level or above. All but the *Option B* program require a full academic year in residence within a four-quarter period (except for Summer Quarter); the *Option B* program requires three full quarters of residence within two calendar years.

Doctor of Philosophy

This degree requires a core of work in communication theory and methodology. All students take a sequence of courses in preparation for working with the concepts of communication at a level of methodological sophistication appropriate to the degree.

It is expected that the student specialize in one of three areas: communication theory and methodology, international communication, or history of communication. However, each student is expected to do some work in each of the other two fields, in addition to work outside the School of Communications. (The student's Supervisory Committee plans an individual program, consistent with these requirements, which reflects the requirements of his professional objectives.)

The language requirement for the degree has been set at competence in one foreign language, except for the international communication specialization, where two are required. (The student's Supervisory Committee will specify which languages can be taken—and, in some cases, may stipulate high levels of competence as required.)

A comprehensive General Examination is given each student prior to his acceptance as a candidate for the degree. The examination must be taken no later than seven quarters after matriculation from the master's degree (or its equivalent). It covers all fields of study, within and outside the School of Communications.

It is expected that the student will undertake his doctoral dissertation immediately after passing the General Examination, and that he will complete his dissertation in residence unless his Supervisory Committee finds that work is necessary at some other place. A proposal must be prepared for the dissertation prior to the collecting of data. The proposal will be subject to review by the Graduate Faculty of the School as well as by the student's Supervisory Committee.

The student specializing in theory and methodology is expected to undertake course work in social control and the mass media, international communications, theory of communication, functions of the mass media, computer applications to communication research, communication research, research seminars, statistical methods, social psychology, learning, theories of social psychology, and experimental design. Additional work is selected with the approval of the student's Supervisory Committee.

The student specializing in international communication is expected to include work in comparative communication systems, public opinion and propaganda, seminar in comparative communication systems, seminar in public opinion and propaganda, research seminar, theory of communication, communication research, computer applications in communication research, statistics, and a field of courses from one of the social sciences related to his specialization. Additional work is selected with the approval of his Supervisory Committee.

The student specializing in history of communication is expected to include course work in history of mass communications, seminars in history and communications, communication research, theory of communication, historiography, philosophy of history, seminars in American history, social psychology, and a field of courses from the history field. Additional work is selected with the approval of his Supervisory Committee.

COMPARATIVE LITERATURE

Chairman

Frank J. Warnke

B436 Padelford Hall

Both the undergraduate and graduate programs in Comparative Literature include courses in the major field conducted by an interdepartmental faculty, as well as courses in literature offered by the Departments of Asian Languages and Literature, Classics, English, Germanic Languages and Literature, Near Eastern, Romance Languages and Literature, Scandinavian Languages and Literature, and Slavic Languages and Literature.

The undergraduate program is described in the *Interdepartmental Programs* section of this catalog; departmental offerings in foreign literature in English translation are listed under the several departments named in the preceding paragraph.

Programs leading to graduate degrees are described in the *Interdisciplinary Graduate Degree Programs* section of this catalog.

DRAMA

Director

Gregory A. Falls

113 Drama-TV Building

Professors

Malcolm Black, John A. Conway, Gregory A. Falls, Agnes M. Haaga, Bertram L. Joseph, Robert B. Loper, Duncan Ross, Geraldine Brain Siks

**Associate Professors**

Ruthanna Boris, Kenneth M. Carr, James R. Crider,
Alanson B. Davis, Robert S. Gray, Warren C. Lounsbury

Assistant Professors

Vanick S. Galstaun, Benjamin Johnson, Aurora Valentini,
John R. Wolcott, Arne Zaslove

Instructors

Sara Farwell, Susan Revzan

Lecturer

Joan White

Associates

Eve Green, Julian Miller

The study of drama is concerned with the theatre arts: acting, directing, designing, and playwriting, together with theatre history, dramatic literature, and criticism. While the former are taught only in the School of Drama, many of the latter are taught in other departments. Since theatre is an ensemble art, an important part of its study is made through public and classroom productions of a great variety of plays: American and foreign, classical, and contemporary. Many courses are primarily studio courses involving lectures and theoretical materials plus direct, creative experience in the theatre arts.

Drama is one of the fine arts, and many students elect courses as an introduction to the arts. For other students it is a major subject in the humanities and suitable to a broad liberal education. Still others study drama as a beginning for a professional career, either in professional theatre or in educational theatre.

Faculty of the School of Drama offer courses in dance techniques, basic movement, and the structure of music in relation to dance for the general student as well as the drama or music major. Dance students appear in productions sponsored by the schools of Drama and Music.

The School of Drama offers courses leading to the degrees of Bachelor of Arts, Bachelor of Fine Arts, and Master of Arts.

Undergraduate Programs**Adviser**

James R. Crider
54 Drama-TV Building

For undergraduate students, the School provides a wide spectrum of courses from the field of drama and recommended courses of study in areas of interest covering acting, children's drama, design-technical, and directing, that lead to a Bachelor of Arts degree, and a professional curriculum in acting that leads to a Bachelor of Fine Arts degree. The School also offers a major academic

field (for secondary and elementary education majors) in the College of Education; see *College of Education* section.

Prerequisites for all drama courses must be strictly adhered to.

GRADUATION REQUIREMENTS**Bachelor of Arts**

Undergraduate drama majors are required to complete a minimum of 55 credits in drama courses in addition to the College of Arts and Sciences requirements.

Students must earn 32 credits in required courses: 6 credits in acting/speech (251, 252, or 146, 151, 152), plus 101, 102, 103, 275, 276, and 277. The balance of required credits may be earned in various areas of interest.

No student may exceed a maximum of 70 credits in School of Drama courses in his total degree program with the exception of the secondary teaching major/minor.

Faculty recommended courses of study for areas of interest include: Acting—(for students approved by the acting-directing faculty), 316, 351, 352, 353, 451, 452, and 453; Children's Drama—230, 316, 325 or 210, 211, 212, 460, and multiple options among 331, 336, 338, 431, 432, 436, 437, 438, and 492; Design-Technical—Art 105, 106, 107, 109, 110, 129; Art History 201, 202, 203, 283; Architecture 150, 151; General History 111, 112, 113, with multiple options among Drama 210, 211, 212, 410, 411, 412, 414, 415, 418, and 491; and Directing—210, 211, 212, 460, 461, 462; Art History 201, 202, 203 and General History 111, 112, 113.

Curriculum in Drama Education: Students who wish to prepare for secondary school teaching should follow the curriculum prescribed below.

The requirements are 70 credits in drama, composed of Drama 101, 102, 103, 146, 210, 211, 212; 251, 252 or 151, 152; 275, 276, 277, 316, 460, and 15 credits in drama or approved cognates in other fields. Contingent upon meeting of prerequisites, 6 additional credits in Drama 461 and 462 are recommended and students are advised to take the maximum courses possible in English or Speech.

Students who wish to prepare for elementary school teaching (College of Education) should follow the curriculum prescribed below.

The requirements are 46 credits in drama, composed of Drama 146, 151, 152 or 251, 252; 210, 211, 212 or 325; 230, 316, 331, 336, 338, 436, 438 and variable credits in drama electives and cognate courses approved by the drama adviser.

Bachelor of Fine Arts

The requirements for the candidates for this degree are listed below. A curriculum is offered for students who wish to train for the professional theatre as actors. Students will be required to complete a minimum of three years of study, combining certain College of Arts and Sciences courses with requirements in the major.

Admission

Official admission is made solely upon the results of an intensive audition. Students should have completed at least two years of college study, although this requirement may be waived for an exceptional student having only one year of college study.

First-year curriculum: Drama 121, 122, 123, 141, 142, 143, 155, 156, 157, 181, 182, 183, plus 15 credits from required cognate courses.

Second-year curriculum: Drama 221, 222, 223, 241, 242, 243, 255, 256, 257, 271, 272, 273, plus 15 credits from required cognates.

Third-year curriculum: Drama 371, 372, 373, 459 (3 quarters), plus 15 credits from required cognates.

Required cognates: General History 111, 112, 113; English 264, 265, 266; Zoology 118; Psychology 100; Speech 301; Art History 201, 202, 203, or approved substitutes.

Graduate Programs

Graduate Program Adviser

G. A. Falls

109 Drama-TV Building

It is assumed that all prospective candidates have completed the equivalent of the Department's undergraduate drama requirements. The School of Drama may require additional undergraduate work if it is necessary to make up deficiencies or inadequacies.

In addition to Graduate School general admission requirements, students electing the course of study in directing will submit in writing a directorial approach to a play of their choice.

Students electing a course of study in the area of design (costume or scenery) will submit a portfolio of designs, technical plots, or working drawings, etc.; two letters of recommendation about their artistic potential in design and their production capabilities; and a brief statement of purpose in acquiring a graduate degree.

Students electing a course of study in the area of children's drama will submit two letters of recommendation regarding background, experience, and ability in this area, and a brief statement of educational and professional objectives.

Master of Arts

In addition to the general requirements of the Graduate School, master's degree students are required to complete a minimum of 36 credits, including 501. Except in technical direction, a thesis production or a thesis (Drama 700) is expected and may be a part of this total. Further, a student will elect one area of emphasis and complete the requirements: Directing—463, 561 (3 quarters), 562, 563 (6 quarters) and 700; Children's Drama—530, multiple options among 431, 432, 435, 436, 437, 438, 492, and 599, and 700 with 461 or 561 and 462 or 563 recommended for those electing a thesis production in Children's Theatre; Design (costume)—411, 415, 416, 417, 510, 511, 517, 518, 519, 599 (2 quarters), and 700; Design (scenery)—410, 412, 414, 418, 419, 510, 511, 514, 517, 518, 519, 599 (2 quarters), and 700; and Technical Direction—410, 411, 413, 414, 418, 419, 510, 513 (3 quarters), and 599 (2 quarters).

All prospective candidates for the degree of Master of Arts in the fields of Design or Technical Theatre must perform equivalent working and teaching services. The salaries paid to Graduate Staff Assistants are for working and teaching services in Technical Theatre and these services are a part of the requirements for the degree.

Drama 700 (Thesis) may be either a production or a research thesis.

A program leading to the Doctor of Philosophy degree is offered through the interdisciplinary Drama Arts Group of the Graduate School. (See Drama Arts in the *Interdisciplinary Graduate Degree Programs* section of this catalog.)

ECONOMICS

Chairman

Douglass C. North

301 Guthrie Hall

Professors

Henry T. Buechel, Philip W. Cartwright, James A. Crutchfield, Jr., J. Richard Huber, Kenneth M. McCaffree, John S. McGee, Morris D. Morris, Vernon A. Mund, Douglass C. North, D. A. Worcester

Associate Professors

Yoram Barzel, Steven N. S. Cheung, Barney Dowdle, John E. Floyd, J. Benton Gillingham, Judith G. Leber, Feng-hwa Mah, Robert P. Thomas

Assistant Professors

Lowell R. Bassett, Robert L. Bish, Thomas E. Borcharding, Gardner Brown, Mary L. Eysenbach, Erroll Glustoff, Michael G. Hadjimichalakis, Robert L. Higgs, Allan Hynes, Roger L. Miller, Frank D. Mills, Norman



P. Obst, Judith C. Shapiro, Eugene Silberberg, Thomas A. Thompson

Economics is concerned with analysis of the ways in which societies organize the production of goods and services and the distribution of these goods and services among various functional groups and individuals within the society. It is a broad subject that includes such applied fields as economic history, public finance, international trade, comparative economic systems, development economics, natural resources economics, and labor economics.

Most of the undergraduate courses in economics are intended to serve the objectives of a liberal education rather than vocational objectives. A knowledge of economics has great value in contemporary society where the general economic welfare is increasingly affected by public policies. The development of sound public policies requires a reasonably competent and informed electorate.

Economics is useful in a vocational sense for students planning careers in business and an undergraduate major in economics is excellent preparation for graduate work in law, public administration, urban planning, social work, or business.

Appropriate programs of graduate study in economics are available for those students seeking careers as professional economists in government, private enterprise, or education.

Undergraduate Programs

Adviser
Henry T. Buechel
326 Savery Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

Requirements in the field of economics are: 200, 201, 281, 300, and 301, plus 25 additional credits. Of the 25 credits, 20 are to be taken in at least four fields other than theory, and the remaining 5 are to be taken in one of the chosen fields or in theory. Other requirements are: college algebra, one course (Mathematics 105, or equivalent); calculus, one course (Mathematics 124, 157, or equivalent); two other courses from logic (Philosophy 120, 370, 470, Mathematics 305, or equivalent), calculus (Mathematics 125, 126, or equivalent), or accounting (Accounting 210, or equivalent)—only one course may be chosen in accounting.

Honors in Economics

Adviser
Robert Paul Thomas
315 Savery Hall

Participants in the College of Arts and Sciences Honors Program who wish to qualify for a bachelor's degree

"With College Honors in Economics" must fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements listed below. With the approval of the department, qualified students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Economics."

HONORS REQUIREMENTS

(1) Complete the following courses (or their equivalent as defined by the Department of Economics) with a grade-point average of 3.00: Economics 200H, 201H, 300 and 301 with supplementary honors work, 496H Honors Seminar (senior year), 497H Honors Directed Study (senior year). In addition, honors students will be allowed to take some graduate courses for undergraduate credit.

(2) Maintain an average over-all grade point of 3.00.

(3) Complete all other requirements for a major in economics in the College of Arts and Sciences.

(4) Present a senior thesis (Economics 497H Honors Directed Study).

Graduate Programs

Graduate Program Adviser
Eugene Silberberg
301B Guthrie Hall

For admission to graduate study in economics, a "B" average in the junior and senior years is required. A beginning graduate student with a four-year degree (B.A., B.S., etc.), but with little training in economics, should expect to take Economics 300 and 301, and other preliminary work in each field selected as is deemed necessary to begin graduate work in that field.

Students may be allowed to substitute equivalent graduate work taken at other institutions for part of the course requirements. Students should consult the *Graduate Study* section for details of regulations concerning residence and languages.

PROGRAMS OF STUDY

The Department of Economics offers courses leading to the degrees of Master of Arts and Doctor of Philosophy. Requirements for both advanced degrees include work in the Graduate Core Program of the Department and in some of the following fields of specialization: (1) comparative economic development, (2) economic history, (3) mathematical economics, (4) government regulation, industrial organization, and natural resources, (5) international trade, (6) labor economics, (7) public finance, and (8) statistics and econometrics.

Master of Arts: Economics Major

Requirements for the Master of Arts degree may be satisfied in two ways. Each requires the Master's Core Program consisting of Economics 410, 500, 501, 502, 503, four courses or more at the 400 and 500 level, and one foreign language.

Thesis Program: The thesis program requires the above program of study plus a thesis for which 9 credits are earned.

Nonthesis Program: The nonthesis program requires the courses referred to above, plus a field of specialization consisting of 9 credits or more of course work in economics or a related field. The student must pass a written examination in the field of specialization.

Master of Arts: Economics Minor

The requirement for a Master's degree with a minor in economics is 8 credits in economics courses numbered 400 and 500.

Doctor of Philosophy: Economics

Prospective candidates must complete the Graduate Core Program consisting of: (a) theory (Economics 500, 501, 502, and 503); (b) mathematics (Economics 410, 411, 412); (c) statistics (Economics 481, 482). A satisfactory grade must be achieved on two Core examinations covering micro-economic and macro-economic theory.

Prospective Ph.D. candidates must pass a major field examination covering all or approved parts of the material in one of the eight fields offered by the Department. In addition, a distribution requirement must also be completed, consisting of four 500-level courses in at least three minor fields other than the student's major field, and four other graduate courses also outside his major field.

Through the cooperation of the Far Eastern and Russian Institute, a student may offer a Far Eastern areas study program as a substitute for part of the distribution requirement. The department may also accept work in other fields outside economics as satisfying part of this requirement.

The student must pass written examinations in one language and complete and orally defend a doctoral dissertation. In the case of a Far Eastern area study program, the student may choose a dissertation subject related to his Far Eastern specialty and have the dissertation jointly supervised by the Far Eastern and Russian Institute and the Department of Economics.

Doctor of Philosophy: Economics Minor

Doctoral students offering a minor in economics must pass the Core examinations in micro- and macro-theory,

and must take at least one graduate-level field course in economics.

Doctor of Philosophy: Field for Doctor of Business Administration

Prospective candidates for the degree of Doctor of Business Administration who elect to offer a field in economics will normally be required to pass the Core examinations in micro-and macro-theory, and to take at least one graduate-level course in economics.

ENGLISH**Chairman**

Robert B. Heilman

A101B Padelford Hall

Professors

Robert P. Adams, Edward Alexander, Edward E. Bossetter, Malcolm J. Brown, Wayne Burns, Donald Cornu (emeritus), E. Harold Eby (emeritus), Donald W. Emery, David C. Fowler, James W. Hall, Albert C. Hamilton, Robert B. Heilman, Andrew R. Hilen, Jr., William F. Irmischer, Helen A. Kaufman (emeritus), Jane S. Lawson (emeritus), William H. Matchett, Robert O. Payne, Angelo M. Pellegrini, Roger H. Sale, Harold P. Simonson, Arnold Stein, Robert D. Stevick, T. Brents Stirling, E. Ayers Taylor (emeritus), David Wagoner, Frank Joseph Warnke, Sophus K. Winther (emeritus), Lawrence J. Zillman

Associate Professors

G. Nelson Bentley, Harry H. Burns, Margaret R. Duckett, Garland O. Ethel (emeritus), Donna L. Gerstenberger, Florence J. Gould, Markham Harris, Glenn W. Hatfield, Frank W. Jones, Eric LaGuardia, Henry A. Person, William L. Phillips, Otto Reinert, Robert P. Shulman, Eugene H. Smith, Robert B. Stanton, Roger B. Stein, Margaret C. Walters (emeritus), Elinor M. Yaggy

Assistant Professors

Sylvia F. Anderson (emeritus), Richard E. Baldwin, Gerald J. Brenner, Jack A. Cady, Daniel G. Calder, Gerard H. Cox III, Elizabeth D. Dipple, Ben E. Drake, William M. Dunlop, Richard J. Dunn, D. Paul Farr, Alan S. Fisher, Lawrence D. Frank, John W. Griffith, Muriel L. Guberlet (emeritus), Richard Boyd Hauck, Lois P. Hudson, Robert N. Hudspeth, Jean S. Hundley, Donald M. Kartiganer, Frank J. Kearful, Bertha M. Kuhn (emeritus), Thomas F. Lockwood, Michael L. Magie, J. David McCracken, Richard L. McGuire, Robert L. Mortenson, Leonard Neufeldt, Martha J. Nix (emeritus), Arthur K. Oberg, John R. Pearson, Viola K. Rivenburgh (emeritus), William I. Siegmund, James E. Siemon, James W. Smith, Patrick J. Sullivan, Larry J. Swingle, Charles A. Watkins, Eugene Webb, William O. Willeford, Jr.

**Lecturers**

Lois G. Clemens, Leota G. S. Willis

Associates

Patricia A. Fisher, Donna Hoffman, Blanche Scott

The Department of English offers courses leading to the degrees of Bachelor of Arts, Master of Arts, Master of Arts for Teachers, and Doctor of Philosophy. Certain Comparative Literature courses may be taken for credit toward degrees in English.

The Department of English teaches elementary composition, advanced composition of various kinds, English literature, American literature, and, in the Comparative Literature courses, some of the literature of other countries. In recent years the Department has won distinction in poetry; the faculty includes several practicing poets, and various graduates of the poetry courses have gained recognition. English and American literature together make up one of the great bodies of material in the humanities, and they are taught, with considerable variety, by a staff that includes widely known scholars and critics.

Undergraduate Programs**Advisers**

Shelby Ann Pukas, Leota G. S. Willis
A2B Padelford Hall

For undergraduate students, the Department provides two elective curricula leading to the Bachelor of Arts degree, one in language and literature, the other in composition and advanced writing. In addition, it offers major and minor academic fields for prospective teachers on the secondary level and a major academic field for prospective teachers on the elementary level; see *College of Education* section.

GRADUATION REQUIREMENTS**Bachelor of Arts****Curriculum in Language and Literature**

At least 50 credits in English are required. Courses must include 264 and 265 or 266 or 267; any two courses from 324, 325, 326; three period courses in the 300 group (for the student taking 264 and 265, these are to include one course in the 341-347 group and one course in the 361-363 group; for the student taking 264 and 266, these are to include one course in the 331-337 group and one in the 361-363 group; for the student taking 264 and 267, these are to include one course in the 331-337 group and one course in the 341-347 group); two courses at the 400 level in literature (no more than 5 credits in the 430 group may count toward the major); and one 5-credit upper-division elective. Election of one of the following is recommended to majors: 387, 447, one advanced writing course.

Curriculum in Composition and Advanced Writing

At least 55 credits in English are required. Courses must include: any two courses from the 264-267 group; 324; two period courses at the 300 level (in periods other than those covered by the courses chosen from the 264-267 group); two literature courses at the 400 level (including 417 or 418 or 419); 20 credits in advanced writing courses (15 credits in upper-division courses in at least two forms; e.g., short story, novel, drama, poetry, expository writing). A more detailed statement of requirements is available at the English Advisory Office, and should be secured by all students majoring in English.

Honors in English**Adviser**

Otto Reinert
A105 Padelford Hall

Members of the College Honors Program who fulfill the requirements of that program during the freshman and sophomore years and complete the departmental honors requirements below receive a bachelor's degree "With College Honors in English." Superior students who are not members of the College Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in English."

Students can qualify for honors work at all levels. Freshmen are eligible for special sections in Freshman English. Freshmen and sophomores may apply for the College Honors Program and, if admitted, take special sections of the Masterpieces courses (264H, 265H, 266H, 267H). Students entering the departmental program from the College Program should have a 3.00 grade-point average over-all and in English. Other superior students are selected for the departmental program in the third quarter of the sophomore year or the first quarter of the junior year and usually have averages of 3.00 over-all and 3.30 in English.

Juniors and seniors in both programs take 15 of the 50 credits required for the major in courses especially designed for honor students. A total of 5 credits will be in supervised independent study (492H), with individual conferences and honors thesis; 10 credits will be in seminars on special subjects not offered as part of the regular curriculum (499H). Each seminar will have approximately 15 students.

The honors program in Freshman English is a two-quarter sequence. Students are admitted to the honors section on the basis of their performance in the English portion of the Washington Pre-College Testing Program or the Advanced Placement Examination of the College Entrance Board.

Graduate Programs

Graduate Program Adviser

Robert D. Stevick

A105 Padelford Hall

The purpose of graduate work in English is the acquisition of a body of learning and the development of critical skills and standards of judgment. Though having central objectives identical to all, the graduate English program can provide a background for different professional pursuits: some students may look forward to careers as scholars and college teachers; others to positions in the secondary school system; and still others to work in the fields of professional writing, editing, and publishing. The Department of English has sought, therefore, to keep its general requirements for advanced degrees sufficiently broad and flexible to permit the following emphases in courses and dissertations: classification and analysis of literary works in their historical context; theories of criticism, and the analysis and evaluation of literary works; descriptive and historical analysis of the language from Old English to the present; projects in imaginative writing, supported by courses in criticism and literary periods and types (for the Master of Arts only).

The graduate program is organized so as to permit completion of the master's degree in one calendar year, and the Ph.D. degree in three additional years (beyond the master's). In a typical four-year program, the student is encouraged to complete his course requirements (normally 60 credits) during the first two years, the General Examination for the Ph.D. in the third year, and the dissertation in the fourth year.

Each student's program will be planned in consultation with a graduate adviser in the Department and will emphasize his particular interests and abilities.

PROGRAMS OF STUDY

Students pursuing programs of study toward advanced degrees in English must present an undergraduate English major equivalent to that at the University of Washington, which requires 50 quarter credits.

Master of Arts

For the Master of Arts degree, a minimum of 35 credits is required, of which 25 must be in courses numbered 500 or above. Of these, 10 credits may be in courses in other departments. A maximum of 5 quarter transfer graduate credits may be accepted if taken while a graduate student in another recognized graduate school.

The student must show a reading knowledge of an approved foreign language before he is admitted to the Graduate Program. He must pass a written examination on four fields chosen by him in consultation with the chairman of Graduate Programs.

In the advanced creative writing program, the student must complete 35 credits, not more than 15 of which may be in advanced writing courses, and present, in addition, a piece of original imaginative writing (thesis, 10 credits).

Master of Arts for Teachers

A minimum of 39 or 40 credits is required, of which 24 or 25 must be in courses numbered 500 or above. English 535, 553, and 580 (or their equivalents) are required. In addition, each prospective candidate must present a concentration of three related courses (e.g., in criticism, literature, language, rhetoric or advanced writing, or courses outside the Department, subject to approval, not to exceed 15 credits). A maximum of 5 quarter credits may be transferred from an accredited institution.

The student must show a reading knowledge of one foreign language before he is admitted to the Graduate Program. The language chosen must be (a) relevant to the program of the student and (b) approved by the Graduate Studies Committee and the Graduate School if other than Latin, French, or German. The final examination for the M.A.T. will be adapted in each case to the experience, program, and record of the student.

Doctor of Philosophy

Admission to the Ph.D. program is granted only upon petition to the Graduate Studies Committee after the completion of a minimum of 30 credits of graduate course work. Teaching experience is required of all students as a part of the Ph.D. program. Students may meet this requirement by working as teaching assistants in the Department, or by gaining teaching experience elsewhere. A student pursuing a program of study toward the Ph.D. must complete a minimum of 60 credits in course work (of which 50 must be at the 500 or 600 level) before taking his General Examinations. As many as 15 credits may be in approved courses in other departments. English 505, 530, and 531 are required. Any credits accepted from another institution (not more than 30) must be from another recognized graduate school and are subject to review by the Graduate Studies Committee.

Before he is admitted to the Graduate Program the student must show a reading knowledge of two foreign languages (usually Latin or French, and German—though, upon approval of the Graduate Studies Committee and the Dean of the Graduate School, appropriate substitutes may be accepted).

A General Examination (not given during the Summer Quarter) is based on the assumption that the student's reading and study have prepared him for the following:



a preliminary written examination testing the student's knowledge of two of the six major literary fields, excluding his field of specialization; satisfactory completion of an advanced seminar in two other fields, and an oral examination in the two remaining fields. A student electing a major (or minor) in English language may substitute this field for one of the literary periods.

As soon as possible after he has passed his General Examination, which admits him to candidacy, the Candidate must submit for the approval of the Graduate Studies Committee a statement of the subject of his dissertation. On the basis of this statement, a dissertation committee will be recommended to the Dean of the Graduate School. The student must pass an oral Final Examination devoted to the dissertation and to the field with which it is concerned.

A more complete description of the graduate programs in English is contained in a departmental brochure.

Minors in English

The requirement for a minor in English for a master's degree is 20 credits in undergraduate and graduate work combined, plus 10 credits in graduate courses earned in residence.

The requirement for a minor in English for the doctor's degree is 20 credits in undergraduate and graduate work combined, plus 20 credits in graduate courses. At least half the credits must be in courses numbered 500 or above and at least 10 must be earned in residence.

FAR EASTERN AND RUSSIAN INSTITUTE

Director

George M. Beckmann
406 Thomson Hall

Associate Director

Russian and East European Program
W. A. Douglas Jackson
501 Thomson Hall

Associate Director

South and Southeast Asia Program
Edwin M. Gerow
408 Thomson Hall

Associate Director

East and Inner Asia Program
Donald C. Hellmann
414 Thomson Hall

(For list of Institute faculty and cooperating faculty, see Regional Studies: Asia, Russia, and Eastern Europe in the *Interdepartmental Programs* section.)

The Far Eastern and Russian Institute integrates undergraduate and graduate instruction and research in Asian,

Russian, and East European studies, provides special library facilities, and cooperates in research with other institutes in America and abroad.

Programs in Asian, Russian, and East European regional studies leading to the Bachelor of Arts and Master of Arts degrees are offered and supervised by the interdisciplinary groups in the Far Eastern and Russian Institute with the cooperation of the various departments. Each program is designed to meet general requirements, as well as to conform to the peculiar needs and problems of a particular field. For descriptions of these programs and the interdisciplinary faculty groups which supervise them, see the *Interdepartmental Programs* section on Regional Studies: Asia, Russia, and Eastern Europe. The Institute sponsors supporting courses in the humanities and social sciences offered by the cooperating departments in the College of Arts and Sciences. In the social sciences, graduate programs are offered in cooperation with the departments of Anthropology, Economics, Geography, History, Philosophy, Political Science, and Sociology. In the joint programs leading to the Ph.D. degree in these departments, graduate students receive training in their respective disciplines which they apply to their study of Asia, Russia, or East Europe. Such joint programs are described in the curricular announcements of the respective departments.

The Far Eastern and Russian Institute administers the following faculty research seminars: the Modern Chinese History Project; the Modern Japan Seminar; the Inner Asia Project, which deals with Mongolia, Tibet, and Turkestan; the Russian and East European Seminar, and the South Asia Seminar. In each of these research seminars, faculty members from different disciplines meet regularly for discussion and criticism of their individual work. On occasion, graduate students are given the opportunity to participate in the seminars. The Institute has a limited number of research assistants which are given to qualified graduate students.

GENERAL STUDIES

For the program offered under General Studies, see *Interdepartmental Programs* section.

GENETICS

Chairman and Graduate Program Adviser

Herschel L. Roman
J205 Biochemistry-Genetics Building

Professors

August H. Doermann, Howard C. Douglas, Stanley M. Gartler, Benjamin D. Hall, Brian J. McCarthy, Arno G.

Motulsky, Herschel L. Roman, Laurence M. Sandler, David B. Stadler

Associate Professors

Philip J. Fialkow, Jonathan A. Gallant, Leland H. Hartwell, Eugene W. Nester, Reinhard F. Stettler

Assistant Professors

Walton L. Fangman, Joseph Felsenstein, Elton T. Young

Research Associate Professor

Donald C. Hawthorne

The Department of Genetics offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. In addition, courses are given by the Department for undergraduates majoring in the biological sciences and in related areas. The Department does not offer an undergraduate major in genetics. However, it is suggested that students who foresee the possibility of graduate work in genetics consult with the Chairman of the Department concerning an undergraduate curriculum best suited for this purpose.

GEOGRAPHY

Chairman

John C. Sherman
406 Smith Hall

Professors

Phillip Bacon, G. Donald Hudson (emeritus), W. A. Douglas Jackson, Marion E. Marts, Richard L. Morrill, John C. Sherman, Morgan D. Thomas, Edward L. Ullman

Associate Professors

Ronald R. Boyce, Kuei-sheng Chang, Richard A. Cooley, Frances M. Earle (emeritus), Willis R. Heath, George H. Kakiuchi, Joseph Velikonja

Assistant Professors

William B. Beyers, Douglas K. Fleming, Phillip C. Muehrcke, Jacek I. Romanowski

Geography is the study of the distribution of man and his works on the earth—the location of activities and the development of regions. Some of the topics studied both systematically and in regional combination are: the location of industries and cities and their support, urban patterns, agricultural regions, transport flows and facilities, trade areas, political units, natural resources and land use, and the expression of these characteristics in cartographic form. Basic to geography is the development of theories of spatial location and interaction in order to interpret the order on the earth's surface and to aid in understanding and prediction.

The Department of Geography offers programs of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the De-

partment offers major and minor academic fields for students in the College of Education. (See *College of Education* section.)

Undergraduate Programs

Adviser

John C. Sherman
406 Smith Hall

The program each student follows, including 50 credits in geography, is developed jointly by himself and the departmental adviser. The primary objective is to serve the student's broad intellectual interests in geography and in other fields including those allied to geography. The undergraduate program also prepares the student for professional training appropriate to advanced degrees. A secondary objective is to prepare those students who plan careers in cartography.

Bachelor of Arts

The general pattern of programs leading to the Bachelor of Arts degree is: (1) Geography 100; three courses on the 200 level including Geography 207; three courses on the 300 level (Geography 360, one systematic and one regional); and three courses on the 400 level (two systematic and one regional); and (2) a minimum of three courses in two fields related to geography, mainly the social sciences, earth sciences, or mathematics.

Graduate Programs

Graduate Program Adviser

G. H. Kakiuchi
408B Smith Hall

PROGRAMS OF STUDY

Programs of study leading to the degrees of Master of Arts and Doctor of Philosophy are developed jointly by each student and the Graduate Program Adviser. These programs are flexible, each taking into account the student's preparation, professional objectives, and scholarly interests. Within this framework, the Department offers some areas of special competence:

Urban, Transportation, and Industrial Geography; Regional Development and Theory and Method in Economic Geography; Social and Political Geography; Resource Conservation and Use; The Geography of the Far East, especially China and Japan, and the Soviet Union and Eastern Europe; Cartography; and Quantitative Methods.

Graduate students are expected to acquire competence in fields allied to their center of interest. These include, for example, competence in economic theory, mathematics, and statistics, an appropriate foreign language such as Russian or a Far Eastern language, and an appropriate social science.



Advantage is made of close relationships with other units within the University. These include the Far Eastern and Russian Institute, the Center for Urban and Regional Research, the Graduate School of Public Affairs, the Transportation Research Group, and the Bureau of Community Development.

Doctoral students, who wish to specialize in the geography of the Soviet Union or Eastern Europe, China, Japan, or other areas which are represented in the Department of Geography and the Far Eastern and Russian Institute, must take courses relevant to the individual's area of interest in at least three fields. One of these fields must include a graduate seminar. A working knowledge of the language(s) appropriate to the individual's area of interest must be attained. Programs of study in the Department will be arranged in cooperation with the faculty in the Far Eastern and Russian Institute.

Courses and seminars pertinent to graduate study in the Department are offered in other departments of the College of Arts and Sciences and in professional schools or colleges such as Business Administration and Engineering. With regard to the Far East and the Soviet Union, opportunities for studies supplementary to geography are unique. Representative fields are history, economics, and political science. Language instruction includes Chinese, Japanese, Korean, Mongolian, Tibetan, Turkic, Russian, and other Asiatic and Slavic languages.

In economic geography, pertinent offerings are available in such fields as economics, political science, sociology, mathematics, civil engineering (transportation, data processing), and urban planning. Training in cartography draws on instruction in mathematics, civil engineering (photogrammetry, geodesy, data processing), sociology, psychology, and art.

Admission, residence credit, and other requirements for the Master of Arts degree and the degree of Doctor of Philosophy are set forth in the *Graduate Study* section of this catalog.

GEOLOGICAL SCIENCES

Chairman

John T. Whetten
57 Johnson Hall

Associate Chairman

Bates McKee
46 Johnson Hall

Professors

Julian D. Barksdale, Robert C. Bostrom, Howard A. Coombs, Bernard W. Evans, George E. Goodspeed

(emeritus), V. Standish Mallory, Mark F. Meier, Peter H. Misch, Minze Stuiver, A. Lincoln Washburn, Harry F. Wheeler

Associate Professors

Eric S. Cheney, Nikolas I. Christensen, Bates McKee, Stephen C. Porter, Joseph A. Vance, John T. Whetten

Assistant Professors

Robert S. Crosson, Randall L. Gresens, James C. Kelley, John M. Rensberger, Richard J. Stewart

Research Assistant Professors

Richard R. Green, Robert R. Hiltabrand

Associate

Larry G. Hanson

Geological Sciences is the study of the earth—an organized body of knowledge about the globe on which we live. The geologist is concerned with the earth in terms of materials which compose it, the nature of its interior, the shape of its surface, the natural processes acting upon it, and its history. The historical aspect sets it apart most distinctly from other physical sciences.

Geologists as a group are engaged in research and teaching at universities, research with governmental agencies, research with petroleum companies, the successful planning and construction of modern engineering structures, and in the discovery and exploitation of petroleum and mineral resources.

A basic knowledge of chemistry, physics, and mathematics is fundamental to the study of geologic phenomena. Botany and zoology are essential to the study of fossil plants and animals. Geology thus involves the application of all science and scientific methods in the study of the earth and its resources.

The Department of Geological Sciences offers programs leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see the *College of Education* section.

Undergraduate Programs

Adviser

Julian D. Barksdale
15 Johnson Hall

GRADUATION REQUIREMENTS

Bachelor of Science

Candidates must meet the requirements of the College of Arts and Sciences and elect one of the following departmental programs:

General Geology Option: Chemistry 140, 150, 151, 160, 170; Mathematics 124, 125, 126; Physics 121, 122, 123; Geological Sciences 205 (or 101), 320, 321,

322, 330, 340, 362, 461 and 10 additional credits in 400-level geological sciences courses.

Paleontology Option: Chemistry 140, 150, 151, 160, 170; Mathematics 124, 125, 281; Zoology 111-112; Geological Sciences 205 (or 101), 320, 321, 322, 330, 340, 362, 461, and 10 additional credits in 400-level geological sciences courses. In addition, one of the following courses: Mathematics 126; Physics 123; Zoology 330 or 362; Botany 112.

Geophysics Option: Mathematics 124, 125, 126, 224, 324, 325; Physics 121, 122, 123, 221, 222, 223; Geological Sciences 205 (or 101), 320, 321, 322, 340. In addition, 20 credits from the following: Electrical Engineering 441; Physics 321, 322, 323; Geological Sciences 330, 362, 405, 443, 450, 461, 472, 498, 499.

Graduate Programs

Graduate Program Adviser
Eric S. Cheney
31 Johnson Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. All prospective candidates for advanced degrees in geological sciences must have completed essentially the same academic work as outlined in one of the Bachelor of Science options.

PROGRAMS OF STUDY

All students must present an approved field course such as 401-402 or other field experience which is approved by the Department. All graduate students take a departmental qualifying examination during their first or second year of residence.

Master of Science

A thesis or research paper demonstrating original and independent research in a limited area is required of all master's degree students. For the thesis program, 36 credits must be submitted. A total of 45 credits, with a minimum of 36 credits in work other than field geology, are required for the nonthesis program. The language requirement for this degree must be met with either French, German or Russian.

Doctor of Philosophy

All prospective candidates must have either an M.S. or M.A. degree. For the Doctor of Philosophy degree the student must demonstrate a knowledge of one of the following languages: French, German, Russian. The Ph.D. General Examinations are administered by a Supervisory Committee appointed by the Dean of the Graduate School and, when successfully passed, signify admission to candidacy.

GERMANIC LANGUAGES AND LITERATURE

Chairman

William H. Rey
340 Denny Hall

Professors

Ernst Behler, Antonin Hruby, Raymond Immerwahr, Ernst Loeb, William H. Rey

Associate Professors

Gerhard Baumgaertel, George C. Buck, Joachim Dyck, Gunter H. Hertling, Herman C. Meyer (emeritus), Annemarie M. Sauerlander, Roman S. Struc, Joseph B. Voyles, Richard F. Wilkie

Assistant Professors

Francis X. Allard, Hellmut Ammerlahn, Felice Ankele (emeritus), Charles M. Barrack, Diana E. Behler, Willi W. Fischer, Alan Galt, Heinz Graber, Friedrich von Kries, Kathrin Maloof, Sammy McLean, Horst Rabura, Marie-Luise Sacks South, Elenora M. Wesner (emeritus)

Lecturer

Elsa W. Sherwin

The departmental program is concerned, in part, with the development of the skills of speaking, comprehending, reading, and writing the German language. Instruction also aims to clarify the historical development of German in its relationship to English and other European languages, and to develop an awareness of the differences in thought patterns reflected in the divergent structure, syntax, and idioms between the native and foreign language.

The program stresses present-day Germany, its history, and its role in Western civilization, with particular emphasis on the study of the literature and the intellectual, philosophical, and artistic movements which it represents.

The expanding importance of foreign languages in elementary, secondary, and higher education has created an urgent need for qualified teachers of German; there are also growing vocational opportunities for students competent in German in governmental, industrial, and commercial positions.

The Department of Germanic Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, the Department offers major and minor academic fields for students in the College of Education; see *College of Education* section. Students who have studied German in high school are placed in first- or second-year courses according to the level of their



achievement in high school work, which is measured by their performance on placement examinations.

Undergraduate Programs

Adviser

Charles M. Barrack
349 Denny Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

In this curriculum, at least 45 credits are required for the major and 27 credits for the minor. First- and second-year German courses, scientific German, and courses in English translation are not counted toward the major or minor.

In order to do justice to the various student interests in German, this Department offers two tracks of instruction on the lower-division level. In Track I the student is trained in the basic language skills through the oral-aural approach. The careful development of his vocabulary will help the student in achieving a high degree of fluency and accuracy in reading, speaking, and writing. The program of the Track II, on the other hand, is designed to satisfy the needs of those students who do not wish to major in German but who take an active interest in German civilization in general or German science in particular. Here, therefore, the primary objective is acquirement of a reading knowledge of German which will allow the student to familiarize himself with German publications in his own field. Special courses in scientific German cater to the student in the natural sciences. Thus, the second and third quarter of second-year German allows the student to avail himself of three opportunities—to acquire an active knowledge of German, to concentrate on a passive knowledge of German, or to specialize in scientific German.

Upper-division courses emphasize conversation and composition with a series in each year (301, 302, 303, 401, 402, 403; [3 credits each]). In addition, the sequence in literature (310, 311, 312; [3 credits each]) introduces juniors to the study of contemporary German literature, the German novella of the nineteenth century, Goethe's *Faust* (I), and a selection of his poetry. This is followed in the senior year by the sequence 410, 411, 412, which is devoted to Modern German Literature and Civilization, and by 413, 414, 415, dealing with the older period and the eighteenth century.

The following courses are required for a major in German: 301, 302, 303, 310, 311, 312, 401, 402, 413 or 414. The total number of required credits is 27. The rest of the 45 credits can be taken from the following courses: 403, 404, 405, 410, 411, 412, 414 or 413

(see requirements), 415, 490, 491, 492, 495. A grade of C or better must be earned in each of these upper-division courses. A 2.50 grade-point average is required in German courses beyond the second year.

Honors in Germanics

Adviser

Annemarie Sauerlander
343 Denny Hall

The German Department offers an honors program from the first through the fourth year. Honors sections are available in-102, 103, 201, 202, 203, 207, 301, 302, 303, 310, 311, 312, 401, 402, 403; furthermore honor students can be accommodated in German 490, 491, and 492.

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, are eligible to receive a bachelor's degree "With College Honors in German." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in German." Departmental honors requirements are: (1) a cumulative grade-point average of 3.00 and a grade-point average of 3.50 in German courses; (2) a minimum of 20 credits in upper-division German honors courses; and (3) a senior thesis developed in the senior honors colloquium.

Graduate Programs

Graduate Program Advisers

Ernst Loeb
345 Denny Hall

Horst M. Rabura
340A Denny Hall

Admission

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School. Prospective candidates for advanced degrees in Germanics must have the equivalent of an undergraduate major in German.

PROGRAMS OF STUDY

Master of Arts

This department offers two one-year programs leading to the M.A. degree. Program I demands a high specialization of the student in either literature or philology and thus serves as a preparation for the study towards the Ph.D. degree. Program II, on the other hand, provides the participants with a broad background in all fields pertinent to the teaching not only of the

German language but also of German civilization on the junior college and college levels. Requirements for the two programs are identical. Students must earn 36 credits and must write two term papers in lieu of a thesis. At the end of the M.A. year, the student must pass a written comprehensive examination.

M.A. Program I is designed for three quarters and consists of a compact schedule of courses, which are repeated every year. The courses are carefully coordinated with the upper-division program so that junior, senior, and M.A. year form a well-integrated unit. Under this comprehensive study plan, a student with a major in German will normally obtain his M.A. degree three years after attaining the upper-division level. The courses in the modern field are devoted to Lessing (531), Schiller (538), Goethe I, II (534, 535), Romanticism (515), Nineteenth-Century Drama (516), Nineteenth-Century Prose (517), Twentieth-Century Literature (518), and Contemporary German Literature (520). They are complemented by courses in Middle High German (556) and Middle High German Literature (557), Bibliography (501), and Linguistic Analysis of German (405). In Program II, the 36 required credits are to be earned in stylistics, in linguistics, in methods of language and literature instruction, and in German civilization. The civilization courses present German literature from the eighteenth century to the twentieth century within the context of that country's political, social, and cultural developments. The equivalent of M.A. Program II is also offered as a rotating Summer Program designed mainly for the needs of high school teachers. Its requirements can be fulfilled in three consecutive summers.

In exceptional cases, advanced students who have taken courses of the M.A. program before their graduation may receive permission from the head of the Department to obtain at least 9 of the 36 required credits by writing a thesis, which should give proof of their superior experience and qualifications.

For a minor in Germanics, a minimum of 12 credits in advanced graduate courses is required. The student must have the equivalent of a baccalaureate degree in German at this University.

Doctor of Philosophy

For a major in Germanics, the student must complete all of the stated requirements of the Graduate School, pursue his studies for at least three graduate years, pass General Examinations on the field, and submit a satisfactory dissertation which demonstrates a mastery of scholarly procedure and is an acceptable contribution to knowledge. The student must complete a minimum of 90 credits in course work after admission to the

Graduate School (54 credits beyond the M.A.) before taking his General Examinations. If he minors in another department, he may elect a minimum of 36 credits in Germanics. If his entire program lies within the field of Germanics, he must elect 36 credits in modern literature (since 1500) and 18 credits in philology and the older literature or vice versa. The General Examinations, which are both written and oral, will not be confined to courses taken at the University or elsewhere, but will endeavor to demonstrate the student's breadth of knowledge, which he has acquired by independent reading and study. His intensive training in areas of special interest and his abilities in critical evaluation will also be tested.

For a minor in Germanics, a minimum of 18 credits in advanced graduate courses is required. The student must have the equivalent of a baccalaureate degree in German at this University.

HISTORY

Chairman

Otis A. Pease
308 Smith Hall

Professors

Dauril Alden, Arthur Bestor, Robert E. Burke, Robert J. C. Butow, Vernon Carstensen, Giovanni Costigan, Edith Dobie (emeritus), Herbert J. Ellison, Gordon Griffiths, W. Stull Holt (emeritus), Howard Kaminsky, Solomon Katz, Otis A. Pease, David H. Pinkney, Thomas J. Pressly, Max Savelle (emeritus), Peter Sugar, Marc Szeftel, Donald W. Treadgold

Associate Professors

Aldon D. Bell, Imre Boba, Donald E. Emerson, Arthur L. Ferrill, Wilton B. Fowler, Michael Gasster, Thomas L. Hankins, Fred J. Levy, Scott H. Lytle, Kenneth B. Pyle, Lewis O. Saum, Joan Connelly Ullman

Assistant Professors

Jere L. Bacharach, Jon M. Bridgman, Frank F. Conlon, Jack L. Dull, Lancelot L. Farrar, Jr., Jimmie L. Franklin, Paul Mosher, Robert F. Scholz, Carl E. Solberg, Carol G. Thomas

History is a discipline requiring the study of human affairs at many different periods of time and in various parts of the world. It is significant not only for those preparing for a professional career in law or government or teaching, but also for those who wish a deeper comprehension of world affairs and an understanding of events.

Nihil humanum alienum. There is no human activity which is not a proper subject for the historian. It is the



nature of the evidence rather than its subject which has provided the traditional boundary to "history." Most historians have limited themselves to the evidence of the written record, though they have been forced to recognize that there are vast ranges of the human past and present which must be elucidated by other kinds of evidence, by methods which their colleagues in the other social sciences have succeeded in developing.

The study of history may be useful to the person preparing for a career in law or government or teaching, but its chief claim to a place in the curriculum rests upon the hope that the person who studies it may gain in his capacity to see himself in relation to his society, and his own society in historical perspective.

The Department of History offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. History majors in the College of Arts and Sciences may take the courses in the College of Education required for the teaching certificate. In addition, the Department of History offers major and minor academic fields for secondary education majors, and a major academic field for elementary education majors in the College of Education. See the *College of Education* section.

Undergraduate Programs

Advisers

308 Smith Hall

The undergraduate majoring in history will be encouraged, with the help of an adviser, to plan a program of history courses providing both depth and breadth—an intensive exploration of one country, region, or period combined with an extensive introduction to other countries, regions, and periods, and a study of the appropriate foreign languages. He should take course work in the other social sciences and in the humanities that are best suited to provide perspective suggested by his own developing interests.

GRADUATION REQUIREMENTS

Bachelor of Arts

For a Bachelor of Arts degree, 50 credits in history are required, with the exception of those students who are working for honors in history who need 60 credits, including General History (HST) 391H-392H or 491H-492H. Courses must include HST 111, 112, 113, or the equivalent in the more advanced courses; any 5-credit course in United States history; and at least 25 credits in upper-division history courses.

Students who plan to undertake graduate work in history should begin to acquire a reading knowledge of foreign languages, especially French and German.

Honors In History

Adviser

Dauril Alden

108B Smith

The Department of History offers honors sections in General History (HST) 111, 112, 113, in Ancient and Medieval History (HSTAM) 201, 202; a sophomore honors course, General History (HST) 291H and two honors sequences open only to juniors and seniors. General History (HST) 391H-392H and 491H-492H, both involving a special essay. General History (HST) 491H-492H and the honors sections in the lower-division courses are open to any member in good standing in the College of Arts and Sciences Honors Program, and to other superior students with permission of the instructor. All applicants for General History (HST) 391H-392H must obtain permission of the instructor.

There are two forms of honors degrees. Students enrolled in the College Honors Program become candidates for the bachelor's degree "With College Honors in History." Other qualified students may participate in the departmental honors program and become candidates for the bachelor's degree "With Distinction in History."

In order to graduate with either honors degree, a student must complete at least one of the two upper-division honors sequences—General History (HST) 391H-392H and General History (HST) 491H-492H, and achieve distinction in the major essay written for it; attain a cumulative grade-point average of 3.00; and complete at least 60 credits in history courses with a grade-point average of 3.30. A member of the College Honors Program must fulfill that program's other requirements as well.

Graduate Programs

Graduate Program Advisory Office

204 Smith Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Before beginning graduate work, students should have completed an undergraduate history major or the equivalent. It is expected that students specializing in Far Eastern history will have had sound undergraduate preparation in history.

Applicants for admission to graduate degree programs in history are required to submit (1) three letters of recommendation from instructors acquainted with their academic qualifications; (2) a sample of written work, such as an honor thesis or other history paper; (3) evi-

dence of reasonable competence in at least one foreign language. They will be expected to take the examination in this language at the beginning of their first quarter at the University. Failure to pass such examination will result in reducing the academic program in history by at least one course to allow further language study. Applicants failing the language examination will repeat the examination in subsequent quarters, and continue with a reduced program until the language requirement is satisfied. Additional languages may be required for the Ph.D. degree, depending upon the program chosen; which languages will be decided upon by the thesis supervisor in consultation with the candidate.

Students wishing to enter graduate study in history are expected to submit their applications and supporting documents prior to February 1. All applications will then be considered by the Department as well as by the Graduate School of the University and the applicant will be informed as soon as possible. Later applications and applications for admission to other than the Autumn Quarter will be considered, but the applicants must recognize that all available space may be taken. Full information may be obtained from the Graduate Program Adviser, Department of History.

PROGRAMS OF STUDY

The requirements for both advanced degrees include work in selected fields of history. Each field is a brief period or a restricted topic which is part of a general subject in one of the major divisions of history. These divisions are: (1) ancient history, (2) medieval and Byzantine history, (3) history of Europe 1450-1789, (4) history of Europe since 1789, (5) history of the United States (including the colonial period), (6) history of the Americas (other than the United States), (7) history of England and of the British Empire and Commonwealth, (8) history of Russia and Eastern Europe, (9) history of Asia before 1600, (10) history of Asia since 1600, (11) history of science, (12) expansion of Europe, (13) intellectual history (including historiography and philosophy of history), (14) diplomatic history, (15) Islamic history.

Field courses that can be classified alternatively in different divisions may be counted in either, provided the spirit of the requirement of distribution is not violated. Subjects within divisions 10 and 11 may be violated. Students may petition the Graduate Studies Committee of the Department of History for recognition of a division different from those specified above.

Master of Arts

In history there are two programs leading to the degree of Master of Arts. The professional program is planned as the first year of a scholar's career, and the assumption

is that the student expects to continue working for the degree of Doctor of Philosophy. The second or general program is designed to meet the interests and purposes of secondary school teachers and other students who think of the M.A. as a terminal degree. The major emphasis is placed upon reading and lecture courses which will enrich and broaden the student's knowledge of history rather than upon technical problems of research and original scholarship.

A student in the professional program must complete graduate courses in two fields selected for special study. The subjects from which the student selects the fields should be in different divisions of history as described above. He and his adviser must also decide which of two options the student will take: one seminar, followed by a thesis; or two seminars, for each of which the student must complete a paper. In addition, he must have a reading knowledge of one foreign language.

A student in the general program must complete one seminar and three courses numbered in the 400's. In addition, he must have a reading knowledge of a foreign language and must submit an acceptable thesis.

The prerequisite for a minor in history for the master's degree is an undergraduate program in history or such preparation as the Department deems satisfactory. For this minor, 15 credits in history courses numbered 400 and 500 are required, subject to the approval of the Department.

Doctor of Philosophy

Prospective candidates must complete at least one year of seminar work, and prepare at least four fields from subjects in the divisions of history described above. (Only in a single division may students choose two fields.) In addition, they must have a reading knowledge of a foreign language related to their major fields of study.

A history minor for the doctor's degree should be arranged by the student, in consultation with the Department's graduate adviser.

HOME ECONOMICS

Director

Mary Louise Johnson
201 Raitt Hall

Professors

Grace G. Denny (emeritus), Mary L. Johnson, Blanche Payne (emeritus), Jennie I. Rowntree (emeritus), Margaret E. Terrell

Associate Professors

Doris J. Brockway, Florence T. Hall, Laura E. McAdams

**Assistant Professors**

Marian Arlin, Elsie Bakken, Virginia A. Campbell, Moira C. Feeney, Grace G. Granberg, Doris Katz, Elaine R. Monsen, Marguerite P. Schroeder

Instructors

Carmen Andersen, Joanne Ekenes, Alice W. Sandstrom, Patricia P. Wilson

Lecturers

Jeanette Crum, Charlene Martinsen, Margaret B. Murdoch, Mabel K. Shigaya, Dorothy J. Smith, Carol M. Stone

Home Economics synthesizes knowledge drawn from its own research, from the physical, biological, and social sciences, and from the arts, and applies this knowledge for the purpose of improving the lives of families and individuals.

The educational objectives of the degree programs in the School of Home Economics are to provide a liberal education, to develop competence and creativeness in extending, applying, and disseminating knowledge related to personal and family living, and to allow sufficient specialization for a student to prepare for a profession or graduate work.

The School of Home Economics offers five curricula leading to the bachelor's degree for students in the College of Arts and Sciences, as well as major and minor academic fields for students in the College of Education (see *College of Education* section). The School also offers courses leading to the degrees of Master of Arts, Master of Science, Master of Arts in Home Economics, and Master of Science in Home Economics.

Special Facilities

The School maintains a Home-Management House in which home economics students spend five weeks gaining practical experience in management and group living.

Undergraduate Programs**Advisers**

Margaret Murdoch
202 Raitt Hall

Nancy J. Olson
202 Raitt Hall

PROGRAMS OF STUDY**Bachelor of Science**

Candidates for this degree may choose one of the following:

**CURRICULUM IN INSTITUTION ADMINISTRATION,
A—DIETETICS**

The following courses are required for students who plan careers as dietitians or nutritionists: *Home Eco-*

nomics 125, 148, 216, 307, 315, 347, 372, 407, 408, 415, 457, 472, 473, 474, 475. *Other:* Art 109 or 129, or equivalent; Chemistry 140, 150, 151, 231, 232, 241, 242; Economics 200 or equivalent; Education Curriculum and Instruction (EDC&I) 328; Mathematics 101; Microbiology 301; Zoology 208. Students who wish to prepare for a hospital internship must take Biochemistry 405 and 406. A bachelor's degree, completion of academic course requirements, and an approved internship are required for American Dietetic Association membership.

**CURRICULUM IN INSTITUTION ADMINISTRATION,
B—EXECUTIVE HOUSEKEEPING**

This curriculum is designed for students who plan careers as executive housekeepers in hospitals, hotels, or other institutions. A year's internship following this program qualifies the student for membership in the National Executive Housekeepers Association. The following courses are required: *Home Economics* 125, 134, 148, 216, 307, 347, 354, 356, 457, 473, 474, 475, upper-division elective (2 credits). *Other:* Art 109 or 129, or equivalent; Chemistry 101 and 102, or equivalent; Economics 200 or equivalent; Education Curriculum and Instruction (EDC&I) 328; Microbiology 301; Physics 110 and 111; Speech 103 or 230, or equivalent; Zoology 118 or 208, or equivalent.

Bachelor of Arts

Candidates for the Bachelor of Arts degree may choose one of the following:

CURRICULUM IN TEXTILES, CLOTHING, AND ART

This curriculum is designed for students whose primary professional interest is in costume design and construction. The following courses are required: *Home Economics* 125, 134, 234, 300, 334, 347, 354, 356, 425, 432, 433, 434, 435, 436. *Other:* Art 105, 106, 109, 110, 129, 369, 370, Chemistry 101 and 102, or equivalent; Economics 200 or equivalent; General History (HST) 111 and 112, or equivalent.

OPTION IN DESIGN FOR APPAREL MANUFACTURING

Open to qualified students who have special aptitude for designing. Practical experience in factories is required (*Home Economics* 380). Interested students may apply for this option at the end of the second quarter of the junior year. Applicants are selected on the basis of interest in designing as a profession, successful completion of major courses with emphasis on demonstrated ability in design, and adaptability. The following courses are required: *Home Economics* 125, 134, 234, 334, 347, 380, 425, 432, 433, 434, 435, 436, approved elective. *Other:* Art 105, 106, 109, 110, 129, 369, 370, Chemistry 101 and 102 or equivalent; Economics 200 or equivalent; Marketing 301; General History (HST) 111 and 112, or equivalent.

CURRICULUM IN HOME ECONOMICS EDUCATION

Students who plan to teach home economics in Washington high schools must include the following courses which meet the requirements for the Vocational Certificate, as well as for the Provisional Certificate, Secondary Level, which is issued through the College of Education (see the *College of Education* section for other requirements for certification): *Home Economics* 125, 134, 148, 216, 234, 307, 315, 316, 338, 347, 348, 354, 356, 457, approved elective. *Education requirements:* Education (EDUC) 288, 374 or 375, Education Curriculum and Instruction (EDC&I) 327, 404, Educational Psychology (EDPSY) 304, 308, and approved elective, which may be deferred until the fifth year; Speech 103. *Other:* Art 109 or 129, or equivalent; Chemistry 101 and 102, or equivalent; Economics 200 or equivalent; Microbiology 301; Psychology 100, 306, 320; Zoology 118 or 208. A course in vocational education, Education Curriculum and Instruction (EDC&I) 404, is required for a Vocational Certificate. See the *College of Education* section for requirements for the fifth year and the Standard General Certificate.

CURRICULUM IN GENERAL HOME ECONOMICS

This curriculum is for students who want a broad home economics background without specialization. The following courses are required: *Home Economics* 125, 134, 148, 216, 234, 307, 315, 347, 348, 354, 356, 457, approved elective. *Other:* Art 109 or 129, or equivalent; Chemistry 101 and 102, or equivalent; Economics 200 or equivalent; Psychology 100, 306, 320; Zoology 118 or 208, or equivalent; Microbiology 301 or equivalent.

Honors In Home Economics

Adviser

Margaret B. Murdoch
202 Raitt Hall

A student may enter the upper-division School of Home Economics Honors Program if she has successfully fulfilled the lower-division requirements of the College of Arts and Sciences Honors Program.

To maintain honors standing in the School, students shall be required to carry a minimum of 14 credits per quarter and to maintain a minimum grade-point average of 3.00.

To graduate "With College Honors in Home Economics," the student must meet the following requirements:

(1) Complete independent study projects in addition to the regular requirements in three of the following courses: *Home Economics* 307, 315, 338, 347, 354, 356. A special problems course may be substituted

for one of these additional independent study projects. Only upper-division home economics majors in the College of Arts and Sciences Honors Program may register for the honors section of the above courses.

(2) Complete a 6-credit senior thesis in major area of interest (*Home Economics* 496H).

In order to provide for curriculum flexibility, College honors students majoring in home economics may substitute 6 senior thesis credits plus other approved credits up to a maximum of 15 for home economics credits usually required in the curriculum they are following. They must, of course, complete a minimum of 50 credits in home economics as required by the College.

Graduate Programs

Graduate Program Adviser

Mary L. Johnson
201 Raitt Hall

PROGRAMS OF STUDY

The School of Home Economics offers courses leading to the degrees of Master of Science, Master of Arts, Master of Science in Home Economics and Master of Arts in Home Economics. Specialization for these degrees may be in the following areas or combinations thereof: foods, nutrition, institution administration, clothing, textiles, home management, home furnishings, family relationships, family economics, and home economics education. The master's degree programs require a minimum of 45 credits including the thesis. At least 30 credits must be taken in home economics. The specific courses required depend upon each student's preparation and interests and will be planned with the Graduate Program Adviser upon admission.

Master of Arts and Master of Science

The Master of Arts or Master of Science degree combines not more than two areas in Home Economics and requires a minor (at least 12 credits); and a foreign language. For the Master of Arts degree the minor may be in any field related to home economics. For the Master of Science degree the minor must be in natural science. The foreign language requirement may be met by passing the Graduate School Foreign Language Examination.

Master of Arts in Home Economics

Master of Science in Home Economics

For the degree of Master of Arts in Home Economics or Master of Science in Home Economics, the student may combine a maximum of three related areas in home economics with a maximum of 15 credits in related fields. For the Master of Science in Home Economics at least six credits of natural science are required.



Dietetic Internship

The School of Home Economics offers an administrative dietetic internship. Internship courses may apply toward an advanced degree if taken after the student has been admitted to the Graduate School.

All graduate students must meet the requirements of the Graduate School.

LINGUISTICS

Chairman

Sol Saporta

B5E Padelford

Professors

Melville Jacobs, Lew Micklesen, Sol Saporta

Associate Professors

Heles Contreras, Fred Lukoff, Joseph Voyles

Assistant Professors

Joseph Cooke, Philip Dale, Carol Eastman, Frederick J. Newmeyer, Harold Schiffman, Larry Selinker, Stamatios Tsitsopoulos, Sigrid Valfells

Linguistics is the scientific study of language, which is one of the most characteristic forms of human behavior. In contrast to other disciplines concerned with languages, linguistics deals with them from the point of view of their internal structure as systems of communication. Courses provide training in the method and theory of language analysis and description as well as techniques for dealing with language change and genetic relationships.

The University offers upper-division courses in linguistics, providing an introduction to method and theory and a program of studies for graduate students, leading to master's and doctoral degrees in linguistics. The program is administered by the Department of Linguistics in cooperation with various departments.

Undergraduate Programs

No undergraduate degrees are offered in linguistics; however, introductory courses to the nature of language and language learning are available to qualified undergraduates, as are courses in linguistic method and theory for those who wish to acquire a basic knowledge of the field.

The full-year course, Introduction to Language, (Linguistics 101-102-103), prepares students to enter specially designed accelerated one-year courses in one of two foreign languages.

This training serves as a valuable adjunct to students majoring in anthropology, English, or another language and literature, mathematics, psychology, or speech, and provides the essential basis for graduate

work in general linguistics and related specialties. Courses at the 400 level are available to graduate students who have been unable to acquire equivalent training before beginning graduate work. Undergraduates planning to work for an advanced degree in general linguistics are especially encouraged to complete this training prior to graduation.

For students wishing to take a full complement of work, the following schedule is recommended: junior year: 400, 451, 452, 453, 461, 462, 463; senior year: 404, 405, 406, 441, 454, 455.

Graduate Programs

Graduate Program Adviser

Sol Saporta

B5E Padelford Hall

In addition to the normal requirements of the Graduate School for admission to study for an advanced degree, the student admitted to the program in linguistics must have completed the equivalent of 45 quarter credits (30 semester credits) of undergraduate college credits in language study. This requirement implies the attainment of proficiency in one language other than English or, in the instance of a non-native speaker of English, a course of study and proficiency in a language other than his native speech. To register for courses, students should consult with the Graduate Program Adviser in Linguistics.

PROGRAMS OF STUDY

Master of Arts

Requirements for the Master of Arts degree are as follows: (1) A reading knowledge of German or French or Russian, to be demonstrated as soon as possible, preferably before the end of one year of graduate study; (2) 36 credits, with at least 18 credits in courses numbered 500 or above, including 9 credits for the thesis; (3) successful performance in a comprehensive examination in General Linguistics; (4) completion of a thesis acceptable to the student's committee; (5) attendance at a linguistic institute is strongly recommended.

Doctor of Philosophy

A student may plan to proceed directly for the doctoral degree without an M.A., but the Committee reserves the right to require any individual student to present himself as a candidate for the M.A. before accepting him as a prospective candidate for the Ph.D. Requirements for the Ph.D. include 36 credits in linguistics or supporting areas, in lieu of the M.A., plus the following (subject to readjustment by the student's Committee): a reading knowledge of two of the following—French, German, Russian; Linguistics 599; 33 additional credits in linguistics or supporting areas, as approved by the

Committee; an examination, in first, phonology; second, syntax; third, historical-comparative linguistics; and fourth, a specialty of the candidate's choice, e.g., Germanic, Romance, Slavic, Chinese, Altaic, American Indian linguistics, Southeast Asian linguistics, etc.; and finally, a dissertation suitable for publication and constituting a contribution to knowledge.

MATHEMATICS

Chairman

Ross A. Beaumont
C138 Padelford Hall

Professors

Carl B. Allendoerfer, Maynard G. Arsove, John P. Ballantine (emeritus), Ross A. Beaumont, Z. William Birnbaum, Robert M. Blumenthal, Francis H. Brownell III, Douglas G. Chapman, Harry H. Corson, Caspar R. Curjel, Clyde M. Cramlet (emeritus), Roy Dubisch, Tudor Ganea, Ramesh A. Gangolli, Irving L. Glicksberg, Allen A. Goldstein, Branko Grünbaum, Edwin Hewitt, James P. Jans, Victor L. Klee, Gunter Lumer, Lee H. McFarlan (emeritus), Ernest A. Michael, Ronald J. Nunke, Carl E. Pearson (joint with Aeronautics and Astronautics), Robert R. Phelps, Richard S. Pierce, Ronald Pyke, Roger W. Richardson, Roy W. Winger (emeritus), Herbert S. Zuckerman

Associate Professors

Sherwin P. Avann, Lutz Bungart, David B. Dekker, Mary E. Haller (emeritus), Charles R. Hobby, Thomas W. Hungerford, Arthur R. Jerbert (emeritus), Harold H. Johnson, J. Maurice Kingston, Linda Lumer, (acting), Robert T. Moore, Anne C. Morel, Isaac Namioka, Robert W. Ritchie, R. Tyrrell Rockafellar, Leonard Sarason, Jack Segal, Edgar Lee Stout, Garth W. Warner Jr., William B. Woolf

Assistant Professors

Yuan-Kwok Chan, Richard Duke, Lloyd D. Fisher, Jr., Barnett W. Glickfeld, Morton M. Hackman, Alfred P. Hallstrom, David Handel, John J. Hirschfelder, Norman Hosay, David Knudson, George A. Kozlowski, Jr., Michael H. McAndrew, George S. Monk, James A. Morrow, Vilnis Ozols, David L. Ragozin, William E. Ritter, Lewis C. Robertson, Galen R. Shorack, C. Gomer Thomas, Alan Troy, John W. Van Ness, Robert B. Warfield, Jr., Kenneth Whyburn, Daniel E. Wulbert

Instructors

John C. Clements, David F. Pincus, Sherman D. Riemenschneider, Vashishtha Singh, Robert T. Smythe

Lecturers

Kathleen B. O'Keefe, Helen C. Zuckerman

Traditionally, mathematics has been the basic language of physical science and engineering, but recently it has

also become of major importance for students in social science, business administration, and biological sciences. Mathematics is also an essential element of a liberal education, and students from humanities and the arts are encouraged to broaden their education by enrolling in appropriate courses in the Department. The Department of Mathematics serves the University by offering a wide selection of undergraduate and graduate courses which are organized to meet a great variety of mathematical needs.

Mathematics is also a discipline in its own right, and interesting and profitable careers are open to students who specialize in the subject. In order to prepare students for these careers, the Department offers a wide range of degree programs including a general bachelor's degree, a specialized bachelor's degree, several master's degrees, and a doctor's degree. In addition to pure mathematics, programs are available in mathematical statistics, numerical analysis, and teacher education. The Department cooperates closely with the Department of Physics and the College of Engineering in providing instruction in the area of applied mathematics. Several departments offer courses which are of interest to applied mathematics majors. Particular attention is directed to certain graduate courses in the Department of Aeronautics and Astronautics.

Special Facilities

The Center for Quantitative Science in Fisheries, Forest Resources, and Wildlife, directed by Douglas G. Chapman, provides a focus for applied statistical and mathematical activity directed particularly toward biological problems. Information on the applied statistics courses taught in the Center, most of which were formerly taught in the Mathematics Department, can be found in the section on the Center under the Colleges of Fisheries and of Forest Resources. The courses include Quantitative Science 382, 383, and 486 (formerly Mathematics 382, 383, and 486). Quantitative Science 281 is equivalent to Mathematics 281.

The University of Washington Computer Center is equipped with a CDC 6400 computer system, a Burroughs B5500, and miscellaneous supporting equipment. It provides computing services to all areas of the University and is also available to all students. Robert G. Gillespie is the Director, Hellmut Golde and William L. Clark are Assistant Directors of the Computer Center.

A graduate program in biostatistics leading to the degrees of Master of Science and Doctor of Philosophy is administered by the Graduate School Biomathematics Group. Faculty in the Department of Mathematics and



certain other departments in the College of Arts and Sciences and certain departments in the School of Medicine cooperate in this program. Information concerning the program will be found in the *Interdisciplinary Graduate Degree Programs* section of this catalog.

A graduate program in computer science leading to the M.S. and Ph.D. degrees is administered by the Graduate School Computer Science Group. Faculty in the Department of Mathematics and certain other departments throughout the University cooperate in this program. Information concerning the program will be found in the *Interdisciplinary Graduate Degree Program* section of this catalog.

Undergraduate Programs

Advisers

J. Maurice Kingston
C36B Padelford Hall

Kathleen B. O'Keefe
C36C Padelford Hall

Students planning to take courses in mathematics, either as mathematics majors, or as part of some other curriculum, are strongly advised to elect four years of mathematics in high school. Mastery of these four years of work will prepare them to enter Mathematics 124 (Calculus with Analytic Geometry), which is the first course of university level offered by the Department. Admission to this course is based upon high school records and either the Mathematics Achievement Test of the Washington Pre-college Testing Program or a placement test given by the Bureau of Testing. Students who have completed a full year of calculus in high school, preceded by accelerated study, are encouraged to take the Advanced Placement Test in Mathematics given by the College Entrance Examination Board or parts I and/or II of the Calculus Test given by the Bureau of Testing. Those whose scores on these examinations are satisfactory will be placed in Mathematics 125 or 126 and given university credit for the courses in calculus which they have been allowed to skip. Alternatively, these students may be qualified to enter the freshman honors course.

As a service to entering students who have had less than four years of high school mathematics, the Department offers the following courses which duplicate high school material: 101 (Intermediate Algebra), 104 (Plane Trigonometry), 105 (Elementary Functions). Mathematics 105 may be taken for University credit. If a student has not had the equivalent of 101 and/or 104 in high school, these courses may be taken and applied toward the total credit requirement for graduation (unless 101 was taken for no credit). Specific information

on this matter may be obtained by consulting the appropriate department or college material herein.

In order to enter 104 or 105, students must have the high school prerequisites listed under the detailed course descriptions (see *Description of Courses* section in this catalog) and also must obtain satisfactory scores on the Mathematics Achievement Test of the Washington Pre-College Testing Program.

GRADUATION REQUIREMENTS

Bachelor of Arts

The B.A. degree is designed for liberal arts majors who have only modest professional aims in mathematics. It also provides a suitable program for prospective high school teachers of mathematics. Grades in all mathematics courses to be counted toward this degree must be C or better, and a grade-point average of at least 2.00 in all mathematics courses must be maintained. There are two curricular options:

LIBERAL ARTS OPTION

A minimum of 50 credits in mathematics beyond trigonometry is required. Courses must include 124, 125, 126, 224, and 32 credits in approved electives.

TEACHER PREPARATION OPTION

A minimum of 50 credits in mathematics beyond trigonometry is required. Courses must include 114, 124, 125, 126, 224, 302, 391, 392, 411, 412, 444, 445, and 8 credits in approved electives.

Bachelor of Science

The B.S. degree is designed for students who wish professional training in mathematics as preparation for graduate study or industrial employment. Grades in all mathematics courses to be counted toward this degree must be C or better, and a grade-point average of at least 2.50 in all mathematics courses must be maintained. Candidates for the degree must elect one year of general physics and are strongly urged to obtain a reading knowledge of French, German, or Russian. There are three curricular options:

MATHEMATICS OPTION

A minimum of 54 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 224, and 36 credits in approved electives. The electives must include 9 credits in courses numbered 400 or above in each of two of the four categories: algebra, analysis, geometry, and statistics. This sequence of courses is recommended but not prescribed:

Freshman year: 124, 125, 126, general physics

Sophomore year: 224, 238, 302, 324, 325

Junior year: 402, 403, 404, 438

Senior year: 424, 425, 426, 441, 442, 443

MATHEMATICAL STATISTICS OPTION

A minimum of 54 credits in mathematics beyond college algebra is required. Courses must include 124, 125, 126, 224, 302, 303, 324, 394, 395, 482, 483, and two of the following three courses: 396, 484, 485. An additional requirement is 9 credits in approved mathematics or statistical electives.

NUMERICAL ANALYSIS OPTION

A minimum of 54 credits in mathematics beyond college algebra is required. Courses must include 114, 124, 125, 126, 224, 238, 302, 303, 374, 438, 464, 465, and 466, and 10 credits in approved electives.

HONORS IN MATHEMATICS

Adviser

Lloyd Fisher

C502 Padelford Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the departmental honors requirements listed below, receive a bachelor's degree "With College Honors in Mathematics." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Mathematics."

There are four departmental requirements for honors: (1) meet all requirements for a bachelor of science degree in mathematics; (2) complete the following courses: 302, 402, 403, 404, 424, 425, 426, and at least two quarters of 496H; (3) attain a grade-point average of 3.50 or better in all mathematics courses. In addition, it is strongly recommended that students in the honors program take the special freshman and sophomore honors courses, 134H, 135H, 136H, 234H, 235H, and 236H.

The Department also gives courses (201H, 202H, 203H) for liberal arts students who are in the College of Arts and Sciences Honors Program.

Graduate Programs

Graduate Program Adviser

Charles R. Hobby

C36 Padelford Hall

The student's minimum undergraduate preparation for an advanced degree in mathematics must be equivalent to the requirements for a mathematics major for the bachelor's degree. Students presenting only the minimum amount of undergraduate mathematics cannot expect to earn a master's degree in less than two years.

The Department offers programs leading to the degrees of Master of Arts, Master of Arts for Teachers, Master

of Science, Master of Science in Mathematical Statistics, and Doctor of Philosophy.

Since one foreign language is required for all the above master's degrees, except the Master of Arts for Teachers, and two languages are required for the doctor's degree, students seeking admission are advised as undergraduates to elect languages. French, German, and Russian are the only languages acceptable toward these degrees.

The minor in mathematics for a master's degree requires at least 12 credits in approved courses numbered 400 or above. At least 9 of these are to be taken in residence.

PROGRAMS OF STUDY

Master of Arts (Thesis Program)

A minimum of 27 approved credits in courses numbered 400 or above, with at least 9 credits in courses numbered 500 or above, is prescribed. These courses must include at least 6 credits in each of algebra, analysis, and one other field. The thesis (additional 9 credits) for this degree, while demonstrating ability and aptitude, may be largely expository.

Master of Arts (Nonthesis Program)

A minimum of 36 approved credits in courses numbered 400 or above, with at least 18 of these credits in courses numbered 500 or above, is prescribed. The 18 credits in courses numbered 500 or above should be distributed over no more than three sequences. The total credits should include at least 6 credits each in algebra, analysis, and one other field. The final examination will be a comprehensive one.

Master of Arts for Teachers

The program for this degree is planned to increase the mathematical background of present or prospective high school teachers of mathematics. Thus the program is devoted primarily to courses in mathematics chosen for their relevance to the mathematics curriculum of the high school.

A minimum of 36 credits is required, of which at least 33 must be in mathematics at the 400 level or above. The 3 credits remaining may be in either mathematics at the 400 level or above, or at the 300 level or above in a field other than mathematics. At least 18 of the required 36 credits must be at the level of 500 or above, of which at least 15 must be in mathematics courses. Up to 9 of these credits may be in Mathematics 700 (Thesis).

Master of Science

A minimum of 27 approved credits in courses numbered 400 or above, with at least 18 credits in courses numbered 500 or above, is prescribed. These courses



must include at least 6 credits in each of algebra, analysis, and one other field. The thesis (additional 9 credits) should demonstrate the student's ability to engage in independent research.

Under certain circumstances, this degree may also be awarded to a student who has passed the General Examinations for the Ph.D. degree. In such a case, no thesis is required.

Master of Science in Mathematical Statistics

The undergraduate preparation should consist of courses in probability and statistical inference equivalent to 394, 395, and 482, 483. The student must present a minimum of 27 approved credits in mathematics courses numbered 400 or above. This work may include, on approval, some courses in mathematical statistics needed to make up deficiencies in undergraduate preparation and must include 15 credits in mathematical statistics or probability courses numbered 500 or above. The thesis (9 credits) should demonstrate the student's ability to engage in independent research.

Doctor of Philosophy

The General Examination of a prospective candidate for the Doctor of Philosophy degree covers a basic graduate-level knowledge of algebra, real variables, complex variables, topology, and advanced calculus. The first-year level graduate courses provide adequate preparation for this examination.

The *minor for the degree of Doctor of Philosophy* requires a minimum of 33 approved credits in courses numbered 400 or above, including at least 6 credits in each of three of the four categories: algebra, analysis, geometry, and statistics.

MICROBIOLOGY

Chairman

Charles A. Evans

G305 Health Sciences Building

Microbiology is the science of microscopic organisms, their biological characteristics, chemical activities, industrial uses, and disease-producing mechanisms. The related fields concerned with parasites, viruses, and immunity are included in the work of this Department.

The Department of Microbiology offers a four-year curriculum leading to a bachelor's degree in the College of Arts and Sciences. An honors program leading to a bachelor's degree with honors or distinction is available to qualified students. The purpose of the undergraduate degree is to prepare the individual to assume the responsibilities of a microbiologist upon graduation. It also provides the background for advanced degree work should the student's capabilities warrant it.

The degrees of Master of Science and Doctor of Philosophy are also offered in this field.

Undergraduate Programs

Advisory Office

G305 Health Sciences Building

GRADUATION REQUIREMENTS

The requirements are 45 credits in the biological sciences, including Biology 210, 211, 212 (preferred sequence) or 10 to 15 credits in botany or zoology and a minimum of 30 credits in microbiology courses including 400, 430, 445, 446 and 496 or 499 for no less than 2 credits; Physics 114, 115, 116 (or 121, 122, 123); Chemistry 140, 150, 151, 160, 221 and 231, 232 or 335, 336, 337 (preferred sequence); Mathematics 124. A maximum of 10 credits in botany, genetics, and zoology from a list of courses approved by the Department of Microbiology may be counted toward the 30 credits of required Microbiology courses.

A grade-point average of 2.00 in microbiology courses is required for graduation.

During their third and fourth years most students take specialized courses in microbiology and related fields of interest. The following courses are recommended for all students: Microbiology 320, Genetics 451, Botany 360, and Biochemistry 405, 406 or 440, 441, 442. For students considering graduate work one year of calculus (Mathematics 124, 125, 126), and physical chemistry (Chemistry 350, 351 or 455, 456, 457) are also strongly recommended.

Honors In Microbiology

Adviser

Neal B. Groman

H325 Health Sciences Building

Members of the College of Arts and Sciences Honors Program may be admitted to the Honors Program in Microbiology during their junior year, or any time prior to that, subject to staff approval. They must fulfill the requirements of the College of Arts and Sciences Honors Program during the freshman and sophomore years, and while doing so are urged to take as many honors courses in undergraduate chemistry, physics, and mathematics as their program will permit.

Students graduating "With College Honors in Microbiology" must comply with the requirements for a Bachelor of Science degree. Their upper-division years must include a minimum of 6 credits in 499H (Undergraduate Laboratory Research), preparation of a thesis based on laboratory and library research, and an overall grade-point average of 3.25.

With the approval of the Department, superior students who are not members of the College Honors Program

may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Microbiology."

Graduate Programs

Graduate Program Adviser

Howard C. Douglas

H309 Health Sciences Building

Students who intend to work toward the Master of Science or Doctor of Philosophy degree must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section. Prospective candidates for advanced degrees are selected primarily upon the basis of scholarship and motivation. The fields of specialization for advanced degrees are general and medical bacteriology, microbial physiology and genetics, immunology and virology.

An undergraduate record of at least a B average is considered an indication that the student is capable of more advanced work.

While the academic background of students entering graduate work in microbiology is variable, it is generally agreed that a strong background in chemistry and biology is essential. One year of physics and mathematics through analytic geometry and calculus is also strongly recommended.

MUSIC

Director

William Bergsma

106 Music Building

Assistant Director

John T. Moore

202 Music Building

Professors

James Beale, William Bergsma, James Carlsen, Stanley Chapple, Mary Curtis-Verna, R. Alec Harman, Eva Heinitz, Randolph Hokanson, Demar Irvine, Berthe P. Jacobson (emeritus), Donald Keats (visiting), Gerald Kechley, Silvia Kind, Leon Lishner, George McKay (emeritus), Kathleen Munro (emeritus), Theodore Normann, Bela Siki, William O. Smith, Vilem Sokol, John Verrall, Walter Welke, August H. Werner (emeritus), Emanuel Zetlin

Associate Professors

Warren Babb, Irene Bostwick (emeritus), Henry L. Clarke, William D. Cole, Robert Dietz (visiting), Rodney Eichenberger, Walter A. Eichinger, Robert Garfias, Else Geissmar, Edison Harris, George C. Kirchner (emeritus), John T. Moore, Ralph Rosinbum, Robert Suderburg, Bessie Swanson, Miriam Terry, Paul D. Tufts, Edith Woodcock (emeritus)

Assistant Professors

Kenneth Benshoof, Clifford Cunha, Stuart Dempster, Arthur Grossman, Christopher Leuba, William McColl, Donald M. McInnes, Florence Mesler, Neal D. O'Doan, David Shrader, Felix Skowronek, Laila Storch, W. Ringwalt Warner

Acting Assistant Professors

Robert Kauffman, Charles Troy

Instructor

Joyce Berger

Lecturers

Joseph Brazil, Charles Brennand, Irwin Eisenberg, Alan Iglitzin, Veda Reynolds

The Philadelphia Quartet

Veda Reynolds (first violin), Irwin Eisenberg (second violin), Alan Iglitzin (viola), Charles Brennand (cello)

The Soni Ventorum Wind Quintet

Felix Skowronek (flute), Laila Storch (oboe), William McColl (clarinet), Arthur Grossman (bassoon), Christopher Leuba (horn)

Music, as a creative art, is studied through its literature, compositional techniques, and in the laboratory of performance. The general student may enroll in survey courses or participate, as qualified, in the performance life of the School of Music. Courses of study for the music major include the disciplines of composition, performance, history, theory, ethnomusicology, and music education; and extend through undergraduate training to the master's and doctor's level.

All music majors must qualify for private instruction in performance. Admission to private lessons is by audition before the appropriate faculty. No special charge is made for private instruction, for practice facilities, or use of the School's instruments.

The School's performing groups are the University Singers (no audition required), the 40-voice University Chorale, the Madrigal Singers; the University Symphony Orchestra and the Sinfonietta; the Opera Theater, Festival Opera, the Opera Workshop; the University Band, the 45-piece Wind Sinfonietta, the Marching Band; the Collegium Musicum; the Jazz Ensemble; the Contemporary Group; the Gagaku Ensemble; and many chamber music ensembles.

These groups cooperate with the School of Drama in production of musicals; with stations KUOW and KCTS-TV (Channel 9) in the presentation of musical events; with the Seattle Opera Guild and Seattle Public Schools in the production of touring chamber operas; and with the Division of Continuing Education in offering faculty and student concerts and recitals throughout the state.



The Philadelphia Quartet, in residence to the universities and colleges of Washington, gives approximately twenty concerts a year under the auspices of the School of Music.

The Soni Ventorum Wind Quintet is in residence at the University of Washington.

Special Facilities

The School of Music is housed in a five-story, sound-controlled modern building which contains a small recital hall (285 seats), an acoustics studio, 19 large class and rehearsal rooms, 21 teaching studios, 15 offices, 41 practice rooms; 42 grand pianos, 54 upright pianos; one baroque organ, three practice organs; four harpischords; a collection of baroque instruments; a collection of orchestral and band instruments; collections of Indian, Korean, and Japanese instruments; the Music Library (37,000 books and scores); the Record Library (17,000 records and tapes); and the Kinsella Collection of American music.

Chapters of *Mu Phi Epsilon*, the national music sorority; of *Phi Mu Alpha*, the national music fraternity; and a student chapter of the Music Educators National Conference are based at the School of Music.

Financial Aid

The Brechemin Family Foundation offers annually, through the School of Music, a number of scholarships in performance areas. These scholarships normally carry stipends of \$2,000, are renewable, and are awarded by faculty vote in auditions held each spring at the School of Music, as are a number of other prizes and awards. For audition appointments, write the Undergraduate Adviser, Room 105, Music Building.

Music students are eligible for scholarships offered by the University at large. Certain of these (such as the Milnora de Beelen Scholarships for sophomore, junior, and senior women) give special consideration to music majors. Students planning teaching careers may be eligible for loans under the National Defense Act. A special feature of these loans is that a percentage (up to 50 per cent) is forgiven graduates who teach in secondary and higher education. Applicants for scholarships and loans administered by the University should write the Office of Financial Aids, 3939 University Way N.E.

Student help is employed at hourly rates as accompanists, ushers, librarians, orchestra and band managers, and as assistants in performance. Applicants should consult the School's Administrative Assistant, 104 Music Building.

Graduate Financial Aid

Doctoral students may apply for Graduate School Research Assistantships and National Defense Education Act Fellowships. Teaching Assistantships are available in theory, sight-singing, history, piano, music education, opera coaching, opera staging, conducting, and ethnomusicology. Applicants should write to the Graduate Program Adviser, 109 Music Building. Hourly employment is available to readers, copyists, librarians, accompanists, and assistants in performance; consult the Administrative Secretary, 104 Music Building. Seattle and its suburbs afford substantial employment opportunities to qualified performers and teachers.

Undergraduate Programs

Adviser

Paul D. Tufts
105 Music Building

An advanced level of preparation, representing a number of years of private study, is expected in the major performance area. Ear-training, sight-singing, and studies in music history and theory are strongly encouraged. Advanced preparation in these areas may result in advanced standing and credit by examination.

The student is urged to complete the preparation in academic studies recommended by the College of Arts and Sciences. Early study of French or German is particularly useful for students planning graduate study.

All entering music majors must pass an examination in basic piano as follows: be able to play all major and harmonic minor scales; a simple piece by Bach; an easy sonatina; an easy composition by a romantic or contemporary composer; be able to read at sight music of moderate difficulty. Students proficient in another instrument or in voice, but deficient in basic piano, may begin their musical studies, but must enroll in 136 until basic piano proficiency is established.

The School of Music offers a four-year program leading to the degree of Bachelor of Arts, and a five-year program leading to the degrees of Bachelor of Arts and Bachelor of Music to be awarded concurrently. A four-year program leading to the degree Bachelor of Music is offered to a limited number of students.

For four-year programs leading to the bachelor's degree and teacher certification at the secondary or elementary level, see the *College of Education* section.

The core of each of the undergraduate curricula is represented by the following course of study intended to develop an understanding of music through the study of its theory and history.

Music Theory-History Core		
COURSES		CREDITS
110, 111, 112	FIRST-YEAR THEORY (2,2,2)	6
113, 114, 115	SIGHT SINGING (1,1,1)	3
210, 211, 212	SECOND-YEAR THEORY (3,3,3)	9
213, 214, 215	MUSIC AFTER 1750 (2,2,2)	6
310	MODAL COUNTERPOINT (3)	3
311	TONAL COUNTERPOINT (2)	2
312	CONTEMPORARY IDIOMS (3)	3
313, 314	MUSIC BEFORE 1750 (2,3)	5
315	MUSIC AFTER 1920 (2)	2
437	HARMONIC ANALYSIS (3)	3
	THEORY OR HISTORY ELECTIVES	12
		54

Bachelor of Arts

This degree is offered with a major in Music, and is intended for students who wish to emphasize general competence in music within the framework of a liberal education. Candidates are expected to acquire performance skills and ensemble experience comparable with those of the mature and intelligent adult amateur. The student has the option of additional concentration in either the theory-history aspects or the performance aspects of music.

Music Theory-History Option

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE	54
UPPER-DIVISION VOCAL OR INSTRUMENTAL INSTRUCTION	9
ENSEMBLES	6
	69

Vocal or Instrumental Option

MUSIC THEORY-HISTORY CORE	42
LOWER-DIVISION VOCAL OR INSTRUMENTAL INSTRUCTION	9
UPPER-DIVISION VOCAL OR INSTRUMENTAL INSTRUCTION	9
ENSEMBLES	9
	69

Students wishing to pursue the theory-history option, with emphasis in ethnomusicology, should consult with their music adviser regarding suitable electives to include languages and area studies outside of music.

Bachelor of Arts and Bachelor of Music (Concurrent)

This combined five-year program is intended for students who desire the advantages of a liberal education together with strong professional preparation. The requirements for the Bachelor of Arts and Bachelor of Music degrees are to be taken concurrently over a five-year period. Students contemplating graduate studies in music are strongly urged to pursue this curriculum.

Students who already hold an approved Bachelor of Arts degree may earn the Bachelor of Music degree separately, but must expect an extended period of study before the requirements can be fulfilled.

A grade-point average of 2.50 in music courses is required for graduation. Candidates for the concurrent Bachelor of Music degree "With Distinction in Music" must obtain a GPA of 3.20 in music courses.

Composition Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
333 ORCHESTRATION; 486 MODAL COUNTERPOINT;	
487 TONAL COUNTERPOINT; 488 CONTEMPORARY IDIOMS	54
191, 291, 391, 491 COMPOSITION	24
280, 380a, 381a, 382a, 380b, 381b, 382b (1,1,1,1,1,1)	
CONDUCTING	7
VOCAL OR INSTRUMENTAL INSTRUCTION	24*
ENSEMBLES	18
	127

Music History Major

MUSIC THEORY-HISTORY CORE, TO INCLUDE	
332 MUSICAL FORM OR 333 ORCHESTRATION; 487	
TONAL COUNTERPOINT; 5 CREDITS FROM 316, 317, 318	
MUSIC CULTURES OF THE WORLD	53
3 CREDITS FROM 400, 401, 402, 403	3
3 CREDITS FROM 404, 407, 410, 413, 416, 417, 420	3
3 CREDITS FROM 405, 408, 411, 412, 414, 415, 418, 421	3
3 CREDITS FROM 406, 409, 419, 422, 423	3
MUSIC HISTORY ELECTIVES	15
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
VOCAL OR INSTRUMENTAL INSTRUCTION	24
ENSEMBLES	18
	126

Students intending to pursue graduate studies are strongly advised to establish proficiency in German or French, and to acquire some acquaintance with one or two additional foreign languages. For emphasis in ethnomusicology, consult the music adviser regarding suitable area studies other than music.

Music Education Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
333 ORCHESTRATION OR 334 BAND ARRANGING;	
AND 487 TONAL COUNTERPOINT	54
383 ELEMENTARY SCHOOL MUSIC	3
384 THE TEACHING OF SECONDARY SCHOOL MUSIC	3
431 THE CURRICULUM IN MUSIC EDUCATION	2
432 THE GENERAL MUSIC CLASS	2
MAJOR PERFORMANCE MEDIUM	24
SECONDARY PERFORMANCE MEDIUM	12
PERFORMANCE ELECTIVES	6
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
ENSEMBLES (minimum of one year choral ensemble required)	12
	122

The performance media must include not less than 3 credits in first-year Instrumental Instruction (Piano) and 137, 138, 139 Class Instruction (Voice).

Vocal Music Option: Major and secondary performance media should be piano and voice, or voice and piano.

Instrumental Music Option: Major performance medium should be an orchestral or band instrument. The secondary and/or elective performance media should include the following or equivalent proficiency: 220, 221, 222, 223, 224, 225, String Techniques I, II; 226, 227, 228 Woodwind Techniques; 229, 230, 231 Brass Techniques; and 232 Percussion Techniques.

Piano Major

COURSES	CREDITS
MUSIC THEORY-HISTORY CORE, TO INCLUDE	
320, 321, 322 KEYBOARD TRANSPOSITION AND	
IMPROVISATION; 487 TONAL COUNTERPOINT	54

*Students proficient in performance may be permitted to substitute courses in theory or music history for not more than 6 of these credits.



COURSES	CREDITS
160, 260, 360 (PRIVATE INSTRUCTION: PIANO)	27
460 (TWO YEARS) (PRIVATE INSTRUCTION: PIANO)	18
479 SENIOR RECITAL	1
323, 324, 325 ACCOMPANYING (2,2,2)	6
326, 327, 328 REPERTOIRE (PIANO) (1,1,1)	3
434, 435, 436 PEDAGOGY (PIANO) (2,2,2)	6
ENSEMBLES	15
	130

Violin* or Violoncello Major

MUSIC THEORY-HISTORY CORE, TO INCLUDE	
335 KEYBOARD HARMONY; 337 HISTORY OF CHAMBER MUSIC;	
AND 487 TONAL COUNTERPOINT	54
161, 163, 261, 263, 361, 363 PRIVATE INSTRUCTION	27
461, 463 (TWO YEARS) PRIVATE INSTRUCTION	18
479 SENIOR RECITAL	1
434, 435, 436 PEDAGOGY (2,2,2)	6
140 PRIVATE INSTRUCTION (PIANO) OR 236 CLASS	
INSTRUCTION (PIANO)	6
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
ENSEMBLES	21
	137

Voice Major†

MUSIC THEORY-HISTORY CORE, TO INCLUDE	54
162, 262, 362 PRIVATE INSTRUCTION	27
462 (TWO YEARS) PRIVATE INSTRUCTION	18
479 SENIOR RECITAL	1
140 PRIVATE INSTRUCTION (PIANO) OR 236 CLASS	
INSTRUCTION (PIANO)	6
233 MUSIC THEATRE TECHNIQUE	1
309 ADVANCED MUSIC THEATRE TECHNIQUE	1
323 ACCOMPANYING	2
326, 327, 328 REPERTOIRE (1,1,1)	3
434, 435, 436 PEDAGOGY (2,2,2)	6
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
ENSEMBLES	12
	135

Organ Major

MUSIC THEORY-HISTORY CORE, TO INCLUDE	
335 KEYBOARD HARMONY; 487 TONAL COUNTERPOINT	54
165, 265, 365 PRIVATE INSTRUCTION	27
465 (TWO YEARS) PRIVATE INSTRUCTION	18
479 SENIOR RECITAL	1
320, 321, 322 KEYBOARD TRANSPOSITION AND	
IMPROVISATION (2,2,2)	6
323, 324 ACCOMPANYING (2,2)	4
326, 327, 328 REPERTOIRE (1,1,1)	3
434, 435, 436 PEDAGOGY (2,2,2)	6
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
ENSEMBLES	12
	129

Orchestral Instrument Major

MUSIC THEORY-HISTORY CORE, TO INCLUDE	
337 HISTORY OF CHAMBER MUSIC	54
166 THROUGH 176, 266 THROUGH	
276, 366 THROUGH 376 PRIVATE INSTRUCTION	27
466 THROUGH 476 (TWO YEARS) PRIVATE INSTRUCTION	18
479 SENIOR RECITAL	1
140 PRIVATE INSTRUCTION (PIANO) OR	
236 CLASS INSTRUCTION (PIANO)	6
280, 380, 381, 382 CONDUCTING (1,1,1,1)	4
ENSEMBLES	21
	131

Bachelor of Music

The Bachelor of Music degree is intended for a limited number of specially qualified students who wish to emphasize professional training in performance within a four-year program. A minimum of 180 credits is required, of which 60 credits must be taken in departments other than Music. The 60 credits should include the basic proficiency requirement of the College of Arts and Sciences and (as a distribution requirement

from the College List in this catalog) no less than 20 credits in each of two fields.

A GPA of 3.20 in music courses is required for graduation. All majors in this program must complete 54 credits in a theory-history sequence to include 110, 111, 112, 113, 114, 115, 210, 211, 212, 213, 214, 215, 310, 311, 312, 313, 314, 315, 437, and 12 credits to complete the total.

Specific requirements for each special area are as follows:

PIANO MAJOR: A minimum total of 122 credits in music is required. Courses must include 50 credits in 160, 260, 360, 379, 460, 479; 12 credits in Ensembles; 6 credits in approved electives in music.

ORGAN MAJOR: A minimum total of 123 credits in music is required. Courses must include 50 credits in 165, 265, 365, 379, 465, 479; 12 credits in Ensembles; 7 credits in approved electives in music.

VIOLIN OR VIOLONCELLO MAJOR: A minimum total of 124 credits in music is required. Courses must include 50 credits in 161, 163, 261, 263, 361, 363, 379, 461, 463, 479 ; 12 credits in Ensembles; 8 credits in approved electives in music.

VOICE MAJOR: A minimum total of 128 credits in music is required. Courses must include 50 credits in 162, 262, 362, 379, 462, 479; 12 credits in Ensembles; 12 credits in approved electives in music.

ORCHESTRAL INSTRUMENT MAJOR: A minimum total of 125 credits in music is required. Courses must include 43 credits in 166 through 176, 266 through 276, 366 through 376, 466 through 476, 479; 21 credits in Ensembles; 7 credits in approved electives in music.

COMPOSITION MAJOR: A minimum of 122 credits in music is required. Courses must include 24 credits in Composition from 191, 291, 391, 491; 12 credits in Ensembles; 16 credits in vocal or instrumental instruction; 16 credits in approved electives in music.

Honors in Music

Adviser

Paul Tufts

105 Music Building

Music majors who are members of the College of Arts and Sciences Honors Program and who fulfill the requirements of that program during their freshman and

*Violinists should complete one quarter of viola.

†Voice majors should establish proficiency in French, German, or Italian and complete an additional 15 credits in a *second* language from this group, as well as 5 credits in Speech 300, Speech Science.

sophomore years will be eligible for a bachelor's degree "With College Honors in Music" upon completion of the requirements of the departmental honors curriculum.

With approval of the School of Music Honors Committee, superior students who are not members of the College Honors Program but who are pursuing either the five-year combined Bachelor of Arts and Bachelor of Music or the four-year Bachelor of Arts curriculum with emphasis in music history-theory may participate in the School of Music honors curriculum and receive a bachelor's degree "With Distinction in Music."

The departmental honors requirements are: (1) completion of 18 credits from the following honors sections in: 311, 313, 437, 487, 499; (2) a cumulative grade-point average of at least 3.00 and a grade-point average in music courses of 3.20 or better.

Graduate Programs

Graduate Program Adviser

John T. Moore

109 Music Building

Graduate study in music may follow one of two general paths. In the programs leading to the degrees of Master of Arts and Doctor of Philosophy, the emphasis is upon the acquisition of a body of knowledge and the development of critical and research skills, as in the fields of music theory, musicology, systematic musicology, or ethnomusicology. In the programs leading to the degrees of Master of Music and Doctor of Musical Arts, the emphasis is upon the application of knowledge and the advancement of professional competence, as in the fields of composition, performance, conducting, or opera direction and production.

Whichever path the student chooses, his scope should not be limited. The scholar needs as background such a lively acquaintance with music as can be obtained only through training and experience in performance. Conversely, the composer, performer, or teacher requires the insight to be gained through investigation of the theory, history, and principles of his art.

Completion of one of the undergraduate majors, or the equivalent, with a superior scholastic record (B average or better), is the normal prerequisite to graduate study in the same field. A change of major emphasis will involve some adjustment of prerequisites. The student is expected to have had a reasonably broad liberal education along with the previous musical training; the bachelor's degree should have included not less than one-fourth, and preferably one-third, of its content in departments outside of music, in the humanities, social

sciences, and natural sciences. Students not fully qualified for graduate standing may wish to apply for Unclassified-5 status pending further preparation.

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Application for admission to the Graduate School must be made through the School of Music well in advance of intended enrollment. The applicant should also initiate correspondence or a conference with the Graduate Program Adviser, explaining the nature of his training and experience, the educational goals he seeks through graduate study, and his career plans. Supporting evidence in the form of letters of recommendation, musical compositions, programs, and tape recordings of performances or research papers, should be submitted as requested. Admission to graduate vocal or instrumental instruction is by jury examination only.

Master of Arts

A minimum of 36 credits is required, of which 15 credits must be in courses numbered 500 or above, and 9 credits represent the thesis. Students must have a reading knowledge of one foreign language. The emphasis in this program will be in music history and literature, music theory, music education, systematic musicology, or ethnomusicology. The purpose of the thesis is to develop the student's capacity for independent investigation.

Master of Arts for Teachers

Students accepted for admission to the Master of Arts for Teachers program must have completed at least one year of successful music teaching experience on the elementary, secondary, or college level. A minimum of 36 credits is required, of which 30 must be in music at the 400 level or above, and 6 must be in approved electives. At least 18 of the required 36 credits must be at the 500 level or above. No foreign language is required. The student must pass a comprehensive final examination which will be adapted in each case to the experience, program, and record of the student.

Master of Music

Specializations are offered in composition, music teaching, opera production, music performance (piano, violin, voice, organ, or another approved instrument), and conducting. The student may elect the thesis or the nonthesis option. Students must have a reading knowledge of one foreign language.

Thesis Option: The requirements are a minimum of 36 approved credits, of which 18 must be in courses numbered 500 or above, and 9 credits represent the thesis.



Nonthesis Option: The student must complete a minimum of 36 approved course credits, of which 18 must be in courses numbered 500 or above, and pass a comprehensive Final Examination. Before being admitted to the examination, the student must submit a qualifying essay demonstrating that he is able to discuss musical subjects with competence and insight, and in clear English.

Doctor of Musical Arts

This degree is offered with a choice of emphasis in some major branch of performance, in original composition, or in music teaching. Students entering this program are expected to have had some professional experience in addition to their formal training. The purpose of the program is to develop expertise in the creative and applied aspects of music, supported by a firm command of the theoretical and historical aspects together with a modest degree of breadth in cognate areas outside of music.

A reading knowledge of one foreign language is required. In lieu of a single longer dissertation, submission may be in three parts. One part must be a research paper; the other two may be additional research papers, or musical compositions, or documentation at public performances, or professional demonstration.

Doctor of Philosophy

This degree is offered in Music, and with opportunity for specialization in musicology, ethnomusicology, systematic musicology, or music theory. Students must have a reading knowledge of German, of French, Italian, or Latin, and of such other languages as are necessary for research in the field of the dissertation. Candidates must present an acceptable dissertation representing original and independent investigation.

Regulations governing doctor's degrees are outlined in the *Graduate Study* section. A minimum of three years of recent graduate study is required of which not less than two years must be spent in residence at the University of Washington.

OCEANOGRAPHY

Chairman

Maurice Rattray, Jr.

121 Oceanography Teaching Building

Assistant Chairman for Instruction

T. Saunders English

Assistant Chairman for Research

Francis A. Richards

Professors

Karl Banse, Clifford A. Barnes, Joe S. Creager, Richard H. Fleming, Joyce C. Lewin, Stanley R. Murphy, Maurice Rattray, Jr., Francis A. Richards

Associate Professors

Lawrence K. Coachman, William O. Criminale, Jr., T. Saunders English, Dean A. McManus

Assistant Professors

Lee C. Bennett, Jr., Roy Carpenter, Bruce W. Frost, Michael L. Healy, Victor W. Kaczynski, James C. Kelley, Ronald T. Merrill, David Z. Piper, J. Dungan Smith, Richard W. Sternberg, Peter B. Taylor

Research Appointments

Richard C. Dugdale (Professor); George C. Anderson, Dora P. Henry, Ulf Lie, Hsin-Yi Ling (Associate Professors); Knut Aagaard, Glenn A. Cannon, Alyn C. Duxbury, Ronald J. Echols, Lawrence H. Larsen, Clive R. B. Lister, Seelye Martin (Assistant Professors); Robert E. Burns, Mario Pamatmat, Gunnar I. Roden (Senior Research Associates); Fang An Lee, Kolla Venkata Rathnam, John J. Walsh (Research Associates); Walter C. Sands (Lecturer)

Oceanography is an environmental science which attempts to explain processes in the ocean and the interrelation of the ocean with the Earth and the Universe. Oceanography includes studies of the chemical composition of sea water; sea water in motion; interactions between sea and atmosphere and between sea and land and sediments and rocks beneath the sea; physics of the sea and sea floor; and life in the sea.

The student planning to enter oceanography should elect physics, chemistry, four years of mathematics, and other science courses available in high school. Preparation in French, German, or Russian is recommended. The time necessary to obtain a degree is longer if the student is not prepared to enter university-level science courses.

The Department of Oceanography offers curricula for the degrees of Bachelor of Arts, Bachelor of Science, Master of Science, and Doctor of Philosophy. In many courses, students work at sea on vessels of the department. Summer Quarter instruction is offered both on the main campus and at the Friday Harbor Laboratories on San Juan Island.

Undergraduate Programs

Advising Office

108 Oceanography Teaching Building

GRADUATION REQUIREMENTS

Bachelor of Arts

The student in the Bachelor of Arts curriculum must meet the requirements of the College of Arts and Sciences; choose a principal option and either (1) two supporting options or (2) one supporting option and two minor options in Oceanography. All programs must include one option in physical oceanography. Courses can be substituted by departmental permission.

PRINCIPAL OPTIONS

Biological

Biology 210, 211, 212, 472; Chemistry 231, 232 or 335, 336, 337; Genetics 451; Oceanography 434, 435; and Zoology 301, 433, 434

Chemical

Chemistry 221, 335, 336, 337, 345, 346, 455, 456, 457, 458, and 6 credits above 402; Oceanography 421-422, 423, 424; and Quantitative Science 281, 382

Geological (Geology)

Chemistry 350; Geological Sciences 205, 320, 321, 322, 330, 340; Mathematics 114, 224; Oceanography 444, 450, 452, 456; and Quantitative Science 281

Geological (Geophysics)

Chemistry 350; Geological Sciences 205, 320, 321, 340; Mathematics 224, 238, 324, 325; Oceanography 450 and one 5-credit course; and Physics 221, 222, 223, 321, 322, 323

Physical

Atmospheric Sciences 431, 432, 441, 442 or Geophysics 403 and Physics 321, 322, 323; Mathematics 224, 238, 324, 325, 391, 392, 438; Oceanography 417, 418, 419; and Physics 221, 222, 223

SUPPORTING OPTIONS

Biological

Biology 101-102; Oceanography 433, 435

Chemical

Chemistry 221; Oceanography 421-422, 423

Geological

Geological Sciences 205 or 310; Oceanography 405

Physical

Oceanography 401, 402, 460-461; or 417, 418, 419, 460-461

MINOR OPTIONS

Biological

Oceanography 403

Chemical

Oceanography 421-422

Geological

Oceanography 406

Bachelor of Science

The Bachelor of Science curriculum is recommended for students who desire to complete a more intensive program than is required for the Bachelor of Arts. The student must meet the requirements of the College of Arts and Sciences; choose one principal option and three supporting options in Oceanography; and select 10 or more credits of upper-division science or mathematics, with the guidance of an academic adviser.

Honors in Oceanography

Departmental Honors Office

108 Oceanography Teaching Building

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the first eight quarters of study and the departmental honors requirements, receive a degree "With College Honors in Oceanography." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Oceanography."

Requirements for honors students in the Department of Oceanography are: (1) grade requirements for admission to candidacy for an honors degree are a minimum average of 3.00 in oceanography courses and a minimum average of 3.00 in all other courses; (2) candidates for departmental honors will be selected by the departmental honors committee after completion of the sophomore year and before completion of the junior year; (3) honors courses in the Department of Oceanography, as follows:

Oceanography 180H

(Lower-division Tutorial—Honors, 6 credits)

Oceanography 380H

(Upper-division Tutorial—Honors, 6 credits)

Oceanography 480H

(Undergraduate Research—Honors, 6 credits)

Oceanography 488H

(Field Experience—Honors, 2-6, max. 6 credits)

Oceanography 489H

(Undergraduate Thesis—Honors, 1-6, max. 6 credits)

Honors credit is available to honors students in other courses by special arrangement with the professor and the departmental honors adviser; some advanced and graduate courses are open to honors students by arrangement. No regular courses are required of honors students that are not required of all oceanography majors.

A senior thesis will be required for each honors student. A comprehensive examination may be required of each honors student as part of the thesis requirement.

Graduate Programs

Graduate Program Advisory Office

108 Oceanography Teaching Building

Students who have majored in Oceanography or another science and appear likely to succeed in graduate



study can be accepted in the program of the Department of Oceanography. Admission is based on grade records, letters of recommendation, and the results of the Graduate Record Examination. Students who have not majored in Oceanography should acquire a broad background in science and mathematics equivalent to the requirements for the bachelors degrees in Oceanography. Students with weak or narrow undergraduate preparation will probably take longer to earn a graduate degree. Additional information can be obtained from the Graduate Program Office.

The student specializes in biological, chemical, geological, geophysical, or physical oceanography; interdisciplinary studies are possible. All requirements of the Graduate School must be satisfied.

Master of Science

The Department offers a thesis and a nonthesis program leading to the Master of Science degree. In both, the student and his adviser prepare a program of study to be approved by the student's Supervisory Committee. The program will include one principal option, two supporting options, and one minor option in Oceanography, and other courses in science and mathematics. A departmental comprehensive written examination is required, and a reading knowledge of one foreign language, French, German, Japanese, or Russian, must be demonstrated.

In the thesis program, a thesis approved by the Supervisory Committee must be prepared and presented at a seminar. The nonthesis program requires an approved research activity; the Supervisory Committee will decide whether written or oral reports are necessary.

Doctor of Philosophy

The student and his Supervisory Committee prepare a program of study and research. The program will include one principal option and three supporting options in oceanography, and other courses in science and mathematics. The student must pass a General Examination in oceanography and supporting fields. He then completes the research for his dissertation and prepares for his Final Examination.

PHILOSOPHY

Acting Chairman

John F. Boler

301 Parrington Hall

Professors

Paul Dietrichson, David Keyt, Melvin Rader, Robert J. Richman

Associate Professors

John F. Boler, Frederick A. Siegler

Assistant Professors

Oswaldo Chateaubriand, Kenneth Clatterbaugh, Charles Marks, James Mish'alani, John Moulton, Kenneth Small, Stephen Thomas

Instructor

John Chambless

Philosophy is an effort to clarify the concepts and principles presupposed by the main areas of practice and inquiry. The Department of Philosophy accordingly offers courses in logic, ethics, social philosophy, epistemology and metaphysics, philosophy of religion, and aesthetics. In addition, the history of ideas is studied in order to throw light on the contemporary problems encountered in each of the areas of philosophical investigation. For students who plan to teach in this field, programs leading to the doctorate are available. For most students, however, the study of philosophy is valuable as an important contribution to a liberal education.

Students majoring in other fields will find Philosophy 100, 110, 120, 200, 215, 250, 260, 267, 320, and 322 of particular interest.

Undergraduate Programs

Adviser

John R. Moulton

322 Parrington Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

The requirements are: 50 credits in philosophy, including 110 or 215*, 120, 320, 322, and at least one from 321, 325, or 326.

Honors in Philosophy

Adviser

John R. Moulton

322 Parrington Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements receive a bachelor's degree "With College Honors in Philosophy." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Philosophy." Honors students in philosophy must have a grade-point average higher than 3.25 in philosophy courses and must take 480H in the junior and/or senior year. They are also required to take at least two other courses numbered 400 or above, which must be approved by

* The student will elect one or both.

the Departmental Honors Committee. Special honors sections of Philosophy 100, 120, 200, and 215 are regularly offered.

Graduate Programs

Graduate Program Adviser
James Mish'alani
329 Parrington Hall

Master of Arts

The Department requires that students for the Master of Arts degree take a four-hour written, general qualifying examination to test the student's fitness for the master's degree program. This examination is normally to be taken the first time it is offered after the student's entrance into the graduate program. The examination is normally given in October and again in April.

Only after passing the general qualifying examination may the student register for thesis credit and thus formally undertake work on his thesis for the master's degree. Residence and credit requirements include a full year of residence, 9 credits per quarter plus 9 thesis credits (36 credits). In addition to the 9 thesis credits, 9 others must be in 500-level courses. The student is required to write a thesis acceptable to his committee, and must pass a final oral examination on his thesis.

Doctor of Philosophy

Normally it is expected that the prospective candidate for the Doctor of Philosophy degree has satisfied all requirements for the master's degree. Students in the Ph.D. program are required to pass the General Examination in four parts covering the fields of logic (this requirement may be satisfied by specified course work), metaphysics and epistemology, ethics and other normative fields, and a selected figure in the history of philosophy. The student is expected to have taken courses and seminars in these fields and his program must be approved by his Supervisory Committee. In addition, he must prepare an acceptable dissertation and pass the oral Final Examination on it.

PHYSICAL AND HEALTH EDUCATION

Chairman for Women
Ruth Abernathy
105 Hutchinson Hall

Chairman for Men
G. Spencer Reeves (acting)
210 Edmundson Pavilion

WOMEN

Professors

Ruth Abernathy, Marion R. Broer, Ruth M. Wilson

Associate Professors

Katharine S. Fox, Dorthalee B. Horne, M. Kathro Kidwell, Dorothy G. MacLean, Joseph Patterson, Joan Skinner

Assistant Professors

Barbara Milacek, Bonnie J. Purdy, Betty Jane Wills

Instructors

Susan Feinstein, Frances B. Kerr, Colleen A. Perry

Lecturer

Maryann Waltz

MEN

Professor

Eric L. Hughes

Associate Professors

Norman F. Kunde, Caswell A. Mills, Clifford L. Peek, G. Spencer Reeves, Leonard W. Stevens, John A. Torney, Jr.

Assistant Professors

Robert W. Buckley, Ronald G. Early, Watson B. Hovis

Lecturers

Richard D. Erickson, Robert W. Hendershott, Stanley J. Hiserman, Richard N. Huey, Kenneth Lehman, Leo W. Marty, James Owens, William W. Quillian, James A. Smith, John Tallman, Robert Tindall, Thomas O. Tipps

The School of Physical and Health Education offers a varied program of instruction in activities for all college students, as well as major curricular programs in physical education, health education, and recreational leadership.

The teacher education curricular options in physical education and health education are offered for students in the Colleges of Arts and Sciences and Education. (See *College of Education* section in this catalog for major and minor programs and requirements).

Degrees awarded are specified in the descriptions of undergraduate and graduate programs that follow.

Undergraduate Programs—Men

Advisory Office

210 Edmundson Pavilion

Curriculum in Physical Education

The general curriculum satisfies requirements for a Bachelor of Arts degree with a major in physical education, but not for a teaching certificate.

The requirements are: Biological Structure 301, Biology 101-102 or Zoology 111-112; Zoology 118 and 119 or 208; Health Education 291, 429, 465; Physical Education 164, 165, 166, 190, 264, 265, 266, 293, 322, 340, 345, 363, 370, 371, 450, 493; Dance 309 and Recreation Education 304, 324.



Curriculum in Recreation Management

The recreation curriculum prepares students for employment in municipal, county, and other tax-supported programs, as well as for positions in industrial, military, hospital, institutional, commercial, and voluntary agency recreation settings. The program of study provides a broad cultural foundation along with a core recreation curriculum leading to possible specialization in park management, therapeutic, or agency recreation. Students graduate with a Bachelor of Arts degree in recreation management.

Specific requirements for the recreation management majors are: Recreation Education 254, 304, 324, 334, 344, 354, 374, 434, 454; Health Education 250, 292; Physical Education 164, 165, 166, 265, 266, 340; Dance 309; Accounting 210 and 301 or Administrative Theory and Organizational Behavior 440; Political Science 202 or 470; selection of 6 credits from Communications 321, 338, and Education Curriculum and Instruction (EDC&I) 455; and selection of 2 credits each (chosen in consultation with adviser) in the areas of art, dance, drama, music, and outdoor recreation.

Curriculum for Teacher Education in Physical Education

Students who wish to emphasize high school physical education teaching should follow this curriculum which includes the requirements for the Bachelor of Arts degree in either the College of Arts and Sciences or the College of Education.

All electives must be chosen in consultation with an adviser.

The requirements are: Biological Structure 301; Biology 101-102 or Zoology 111-112; English 101, 102 or 103; Psychology 100; Sociology 110; Speech 103; Zoology 118 and 119 or 208; Health Education 291, 330, 465; Physical Education 164, 165, 166, 190, 264, 265, 266, 293, 322, 340, 345, 358, 361, 363, 364, 370, 371, 372 or 373, 447, 450, 493; Dance 309; and Recreation Education 304, 324. All requirements for teaching certification listed in the *College of Education* section must be fulfilled; students should consult with advisers in the College of Education concerning courses in education. Physical education majors may elect varsity or freshman intercollegiate sports for required physical education activity credit.

Undergraduate Programs—Women

Advisory Office

101 Hutchinson Hall

The Department for Women, School of Physical and Health Education, offers undergraduate curricula in three separate fields: Physical Education, Health Education, and Recreational Leadership. The degree of

Bachelor of Arts is awarded upon completion of graduation requirements with majors in either physical education, health education, or recreational leadership.

Curriculum in Physical Education

Programs of study in physical education include basic courses in the art and science of human movement, a pattern of approved elective or courses of specialization in a selected area of movement studies, and a group of related fields courses. The requirements are as follows:

Human Movement Core: Physical Education 231, 271, 281, 331, 332, 333, 350, and Dance 282, 283.

Specialization: From 15 to 20 credits are required in approved physical education, dance, or cognate courses. Programs for students pursuing depth study in a specific aspect of movement inquiry are planned in conference with a departmental adviser. Students planning to teach in elementary or secondary schools select courses to complete requirements for the teaching major or minor described in the *College of Education* section of this catalog.

Related Fields: Zoology 118 and 119 or 208, Biological Structure 301, and Psychology 100 are prerequisites to upper-division physical education courses. Sociology 110 and Health Education 292 or current advanced first-aid certification are also required. Chemistry 100 or one year of high school chemistry is required except in the elementary education emphasis and in the teaching minor.

Curriculum in Health Education

Programs of study in health education include a basic core of courses for all students of health education, approved elective or specialization courses for students interested in various aspects of health education, and foundation courses from related fields. The requirements are as follows:

Health Education Core: Home Economics 300 or 110; Health Education 291, 292 or current advanced first-aid certification, 453, 481 or Home Economics 356 or Sociology 352 or 453; Preventive Medicine 420, 422, 424; and Psychiatry 267, or Psychology 305 or 450, or Educational Psychology (EDPSY) 408.

Specialization: Programs for students pursuing studies in a specific aspect of health education are planned in conference with a health education adviser. Students interested in school health education have as additional requirements Health Education 465, and from 6 to 15 credits in approved health education or related cognate courses. Students interested in community health education have as additional requirements Preventive Medicine 482 and/or 484, and Sociology 240 and 443. Students planning to teach in elementary or secondary

schools select course work to complete requirements for the teaching major or minor described in the *College of Education* section of this catalog.

Foundation Courses: Biological Structure 301, Microbiology 301, Psychology 100, Sociology 110, and Zoology 118, 119 or 208.

Curriculum in Recreational Leadership

Programs of study in recreational leadership include three kinds of courses, recreational theory and practice, related fields courses, and specialization courses in two selected areas of emphasis. The requirements are as follows:

Recreation Education Courses: 304, 324, 344, 454

Related Fields: Dance 282, 283; Physical Education 231, 284, 374, 375, 436; Health Education 292 or current advanced first-aid certification; Biological Structure 301; Communications 303; Education Curriculum and Instruction (EDC&I) 343; Forest Resources 450; Librarianship 452; Psychology 306; Sociology 240; and elective; Speech 103, 373; and courses in art, drama, music, and history or political science. Psychology 100 and Sociology 110 are prerequisites to upper-division Recreation Education courses.

Specialization: From 10 to 16 approved credits are required in each of two of the following areas of specialization: art, dance, drama, outdoor education, music, sports. The departmental adviser for the Recreational Leadership Curriculum maintains a current list of specialization requirements. All courses must be approved before registration.

Honors in Physical Education or Health Education

Honors sections of special studies and undergraduate research courses provide an opportunity for outstanding upperclass women to pursue a selected topic in depth.

Graduate Programs—Men and Women

Graduate Program Advisers

Ruth Abernathy
104 Hutchinson

Ruth M. Wilson
106 Hutchinson Hall

G. S. Reeves
210 Edmundson Pavilion

The School of Physical and Health Education offers courses leading to the degrees of Master of Science with an emphasis in physical education or in health education, and Master of Science in Physical Education. Doctoral students majoring in another department may, with permission of the departmental graduate adviser, minor in physical education or in health education.

Programs of study for graduate students in physical education or in health education are designed to increase the scope and depth of understanding of the bodies of knowledge concerning moving man or the health sciences.

Students holding baccalaureate degrees with a sound and appropriate undergraduate major can complete the master's degree in one year of full-time study. In some areas of emphasis, students with less undergraduate preparation may require up to two years to complete the graduate degree.

Specific requirements for advanced degrees are established in consultation with the graduate program adviser in the student's area of specialization.

Assistantships enabling the superior graduate student to gain valuable teaching or research experience while pursuing graduate study are offered in physical education. Applications should be addressed to the Chairman of the Department for Men or of the Department for Women in the School of Physical and Health Education.

PHYSICS

Chairman

Ronald Geballe
215 Physics Hall

Professors

Arnold B. Arons, Marshall Baker, John S. Blair, David Bodansky, Henry L. Brakel (emeritus), Kenneth C. Clark, J. G. Dash, Hans G. Dehmelt, George W. Farwell, Ronald Geballe, James B. Gerhart, Isaac Halpern, Joseph E. Henderson, Ernest M. Henley, Jere J. Lord, Seth H. Neddermeyer, Fred H. Schmidt, Edward A. Stern, Edwin A. Uehling, Clinton L. Utterback (emeritus), Lawrence Wilets, Robert W. Williams

Associate Professors

David G. Boulware, Lowell S. Brown, Victor Cook, John G. Cramer, E. Norval Fortson, Paul M. Higgs (emeritus), Robert L. Ingalls, Ray W. Kenworthy (emeritus), Henry J. Lubatti, Robert D. Puff, Joseph E. Rothberg, Llewellyn A. Sanderman (emeritus), John F. Streib, Jr.

Assistant Professors

Naren F. Bali, Samuel C. Fain, George Glass, Larry D. Kirkpatrick, Philip C. Peters, Alberto Pignotti, Jesse J. Sabo, Jr., Michael Schick, Oscar E. Vilches, David M. Wolfe (visiting), Kenneth K. Young

Lecturers

Richard J. Davisson, Lillian C. McDermott

Research Associates

Michael H. Bancroft, Pierre L. Bastien, Shmuel Bukspan, John R. Calarco, John M. Cameron, Charles E.



Campbell, Nicholas S. Chant, Jan W. Dash, Alan K. Edwards, John T. A. Ely, James L. Friar, Keith Green, John F. Hague, Roberto D. Peccei, Ekkehard Preikschat, Joseph A. Rudnick, Alexander G. E. Schenck, Lauren M. Sompayrac, Jr., David L. Steele, Talbert S. Stein, William G. Weitkamp

Physics is the study of the fundamental structure of matter and the interactions of its constituents. Physicists are concerned with the continuing development of concepts needed for a precise description of nature and with experiments to test such concepts.

For students of the liberal arts, the study of physics provides an introduction to modern ideas about the most basic and elemental aspects of nature. For students in all scientific and technical fields, physics is an indispensable tool. Students majoring in physics are preparing for careers in teaching, in research, and in industry.

The Department of Physics offers courses leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy. Undergraduate majors obtain a basic preparation in the principal fields of physics augmented by advanced work in physics or closely allied subjects. By his choice of courses, a student may elect to prepare for graduate study in physics, or he may select a program of study emphasizing interdisciplinary study based on a background in physics. In addition, the Department offers major and minor academic fields for students in the College of Education.

Recommended preparation for undergraduate physics majors includes high school physics and 4 units of high school mathematics. High school chemistry also is desirable. Students who enter without this preparation may be delayed in their progress toward graduation.

Undergraduate Programs

Adviser

J. B. Gerhart

215 Physics Hall

A program of study in physics may vary considerably in extent, depending upon the values which the student wishes to derive from his education. The available choices include an adequate basic education in physics which may serve as the basis of a program in liberal education, an optimum preparation for graduate study in physics, or programs combining a core of physics courses with additional work in related fields such as astronomy, engineering, geophysics, chemical physics, history of science, and many others.

GRADUATION REQUIREMENTS

The departmental requirements for the physics major include the following:

1. Core courses in physics required of all majors: 121, 122, 123; 131, 132, 133; 221, 222, 223; 321, 322; 321, 322 (36 credits).
2. At least 3 credits selected from upper-division lecture courses in modern physics (324, 325, 327, 421, 422, 423).
3. At least 3 credits selected from upper-division laboratory courses (331, 405, 431, 432, 433).
4. At least 8 additional credits selected from upper-division physics courses or from approved courses in cognate subjects. A list of approved cognate courses is available from the Department of Physics.
5. Mathematics 124, 125, 126, 224, 324, 325 or 134H, 135H, 136H, 234H, 235H, 236H.
6. At least 9 credits chosen from natural sciences other than physics or mathematics, or from courses in the history or philosophy of science. Courses elected to fulfill this requirement may not also be used to fulfill requirement 4 above.

No grade less than C is acceptable in courses taken to fulfill requirements 1, 2, 3, or 4.

Students preparing for graduate study in physics are strongly advised to complete, in addition to the core courses listed in requirement 1, the following physics and mathematics courses: Physics 323, 324, 325, 331, 421, 422, 423, 424, 425, 426, 431, 432, 433, (39 credits) and Mathematics 427, 428, 429 (9 credits).

Honors in Physics

Adviser

J. B. Gerhart

215 Physics Hall

With the approval of the Department, superior students may be selected to participate in the departmental honors curriculum. Members of the College of Arts and Sciences Honors Program majoring in physics, who fulfill the requirements of that program during their freshman and sophomore years, may be selected to participate in the departmental honors curriculum to become candidates for the bachelor's degree "With College Honors in Physics." Undergraduates majoring in physics who are selected to participate in the departmental honors curriculum but who are not members of the College Honors Program may be recommended for the degree of Bachelor of Science "With Distinction in Physics."

A student may be selected to participate in the physics honors curriculum at any time in his undergraduate program, though such selection ordinarily is not made until late in the sophomore year. Selection is based

upon academic excellence in physics and upon promise of developing into an original and productive scientist.

To be recommended for an honors degree in physics, students must have (1) been selected to participate in the physics honors curriculum no later than the first quarter of their senior year; (2) completed an approved course of study to the satisfaction of the department by the time of graduation; (3) completed any additional requirements set by the College of Arts and Sciences.

Because the needs of honors students are diverse, there is no specified program of studies for students in the physics honors curriculum. Instead, it is required that the student's course of study: (1) be appropriate to his special abilities; (2) provide a sound basis for further study of physics; (3) include the senior honors seminar, Physics 485H, 486H, 487H; and (4) include a minimum of 3 credits of independent study (Physics 401H, 402H, 403H). In addition, it is strongly recommended that each candidate for an honors degree take the special honors section of Physics 121, 122, and 123.

Because the requirements listed above are expressed only in broad terms, the following comments are offered to clarify the intent of the physics honors curriculum. A typical physics honors candidate will achieve a grade-point average in physics courses of 3.30 or better, and an over-all grade-point average of 3.00 or better. His course of study usually will encompass that described in the preceding section as preparation for graduate study.

Graduate Programs

Graduate Program Adviser

D. Bodansky

215 Physics Hall

The Department of Physics offers programs leading to the degrees of Master of Science and Doctor of Philosophy. Specific departmental requirements are described briefly below. More complete information can be obtained by writing to the Graduate Program Adviser.

Undergraduate preparation is expected to include upper-division courses in mechanics, electricity and magnetism, statistical physics and thermodynamics, modern physics including an introduction to quantum mechanics, and advanced laboratory work. Preparation in mathematics should include study of vector analysis, complex variables, ordinary differential equations, Fourier analysis, boundary value problems, and special functions. A deficiency among these may delay com-

pletion of a degree by as much as one year. A reading knowledge of Russian, French, or German is desirable.

The Physics Department sometimes recommends that a student be admitted to the University first as an Unclassified-5 student rather than as a graduate student. This recommendation typically is made in cases where the student's undergraduate background is weak in physics but where there is promise that he later will qualify as a graduate student. An Unclassified-5 student obtains no credit toward a graduate degree for courses he takes, but a satisfactory performance, i.e., grades of A or B, is recognized as strong support for later admission to the Graduate School. The Department does not permit students to remain indefinitely in this Unclassified-5 status.

When the graduate student first arrives he is assigned an individual adviser from the faculty. The student should consult with his adviser on matters concerning his over-all program and on any other topics concerning his work at the University. The adviser serves as an important contact between the student and the Department.

At a later stage, the student may begin to work on a research project with a faculty member other than his original adviser. This faculty member then will serve as adviser. The Graduate Program Adviser of the Department, as well as the original adviser, should be notified of such changes.

In accordance with Graduate School procedure, a Supervisory Committee will be appointed for each prospective Ph.D. candidate. The adviser, ordinarily, will be the chairman of this committee.

Prospective candidates for advanced degrees in physics are expected to pass certain examinations as part of the departmental degree requirements. The first, a written preliminary examination, is designed to assess the student's knowledge and understanding of the material normally included in an undergraduate program with a major in physics. On the basis of his performance in the preliminary examination, together with his over-all record, a student will be placed in one of three categories: (A) students who qualify to proceed in a program leading either to the degree of Doctor of Philosophy or the degree of Master of Science; (B) students who qualify to proceed in a program leading only to the degree of Master of Science; and (C) students who do not qualify to proceed in a program leading to any degree. A student placed in either category (B) or (C) who wishes to qualify for a higher category should attempt the examination again the next time it is given. Ordinarily, a student is expected to take the preliminary examina-



tion during the first quarter of regular graduate study; the examination is given during the Spring and Autumn Quarters. The autumn preliminary examination usually consists of the Advanced Physics part of the Graduate Record Examination, while a department examination is used in the spring. No student is permitted to take the preliminary examination more than two times, except by special departmental approval. A student with a previous high score on the Advanced Physics part of the Graduate Record Examination may petition the Graduate Examinations Committee for waiver of the preliminary examination requirement.

Master of Science

A student working for this degree must satisfy the following requirements: (1) A minimum of 36 approved credits must be submitted, of which at least 18 must be in courses numbered 500 or above. These 18 credits must include a minimum of 3 credits in Physics 600 (for which a faculty sponsor is necessary), and a minimum of 12 credits in other physics graduate courses. No thesis is required. (2) The prospective candidate must obtain the classification of A or B in the preliminary examination either the first or second time this examination is taken. (3) Reading proficiency in a foreign language must be demonstrated by examination. Russian, German, or French are acceptable for this purpose. Another language may be used in special cases with departmental approval. (4) The student must pass a Final Examination which usually is oral.

Students working toward a master's degree in another field who wish to have a minor in physics must submit 9 credits in courses numbered 300 or above and 9 credits in courses numbered 400 and above.

Doctor of Philosophy

While no courses are required explicitly, the student is expected to obtain, by virtue of studies here or elsewhere, a background in physics equivalent to that provided by the following sequence of basic graduate courses: 505, 506, Analytical Mechanics 513, 514, 515, Electromagnetism and Relativity; 517, 518, 519, Quantum Mechanics; 524, 525, Thermodynamics and Statistical Mechanics; 527, 528, 529, Current Problems of Physics; and 566 Advanced Quantum Mechanics. In addition, the Department offers many specialized courses from which the student in consultation with his adviser, will select those appropriate to his interests. Entry into research usually is made by enrollment in 600, Independent Study or Research, by arrangement with individual faculty members at the initiative of the student. The student is expected to maintain a record of satisfactory quality (at least B level) in the courses he attempts.

A student is encouraged to take courses in fields other than physics. This outside work may be presented as either a minor or as individual courses. Details should be arranged by the student in consultation with his adviser or supervisory committee. Particular attention is called to offerings of the Departments of Astronomy, Chemistry, Electrical Engineering, and Mathematics.

Reading proficiency in one foreign language must be demonstrated by examination. French, German, or Russian are acceptable. In special cases another language may be used with departmental approval. This proficiency must be demonstrated before the General Examination can be taken. Standardized examinations prepared by the Educational Testing Service are employed. Scores on these examinations taken as an undergraduate student or as a graduate student at another institution may be recognized by the Graduate School.

In addition to the preliminary examination, prospective candidates for the degree of Doctor of Philosophy must pass, successively, a written qualifying examination, a General Examination for admission to candidacy, and a Final Examination. The qualifying examination is designed to assess the depth of the student's knowledge of the principal branches of physics. Students are permitted to take the qualifying examination only after passing the preliminary examination with sufficiently high standing to be placed in category (A). A student in the program leading to the Ph.D. is expected to take the qualifying examination in his second year of regular graduate study. The qualifying examination is given in the Autumn Quarter, and again in the Spring Quarter each year.

In the oral General Examination, a student is examined on topics related to the area of physics in which he plans to do his dissertation research. In order to take this examination, a student must have passed the qualifying examination and, ordinarily, he must have been accepted by a graduate faculty member as a research student. The General Examination should be taken as soon as possible after passing the qualifying examination, usually early in the third year of regular graduate study. On passing it, the student is admitted formally to candidacy for the Ph.D.

In recognition of the fact that teaching can play an important part in the education of a physicist, the Department requires teaching experience of all prospective candidates for the Ph.D. degree.

The Ph.D. Candidate is required to conduct an original and independent investigation in one of the fields of physics. Results of this research are submitted as a dissertation. In the Final Examination, the Candidate pre-

sents these results orally and is examined in his field of research.

Each student bears responsibility for being informed of the dates on which the examinations are offered and for planning his own program so that he can take the examinations at appropriate times.

If physics is to be used as a minor subject by a student seeking the doctor's degree in another department, the student should acquire training equivalent to a bachelor's degree in physics and, in addition, take three graduate courses in physics.

POLITICAL SCIENCE

Chairman

David W. Minar

201 Engineering Annex

Professors

Hugh A. Bone, C. W. Cassinelli, Kenneth C. Cole (emeritus), William J. Gore, Dell G. Hitchner, Morton Kroll, Charles E. Martin (emeritus), David W. Minar, George Modelski, John S. Reshetar, Jr., George A. Shipman, Donald H. Webster (emeritus)

Associate Professors

Paul R. Brass, Wayne L. Francis, Alex Gottfried, Donald C. Hellmann, Robert J. Pranger, Walter L. Riley, Peter H. Rohn, James R. Townsend, Robert Warren

Assistant Professors

James J. Best, Frederick J. Fletcher, Herbert M. Kagi, John H. Mikhail, Robert O. Myhr, James E. Todd, Louis F. Weschler

Political science is concerned with the general problem of government in all its manifestations, past and present. This includes the theory of obedience, the background of legal rules which determine the competence of government officers, the institutions through which the government functions, political behavior and the various interests which influence government through political parties, interest groups, and public opinion. In a democratic society, the political scientist has an obligation to investigate, analyze, and recommend programs and policies to make government at all levels a more effective agent of the people.

For most students, political science must be viewed primarily as one of the social sciences which constitutes an essential part of a liberal education. It is for this more general value, rather than immediate vocational applications, that prospective lawyers and other students elect courses in political science. Some students, however, plan on careers in government or teaching. For these it will become a professional field.

The Department of Political Science offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. It offers major and minor academic fields for students in the College of Education; it also cooperates with the College of Architecture and Urban Planning in a program leading to the degree of Master of Urban Planning. See also the sections for the *College of Education* and the *College of Architecture and Urban Planning*.

The basic requirements for the undergraduate major are set forth in the general curriculum described below.

General majors are expected to have a substantial background of elective courses in the College of Arts and Sciences. However, transfer students from other colleges may be able to complete a satisfactory program without undue loss of time, and students in the School of Law may use credits for elective purposes under the conditions set forth in the Arts-Law curriculum. Since political science provides a classic background for prospective Law School students, the departmental adviser is prepared to give special counseling to pre-law students.

The Washington State-Northern Idaho Center for Education in Politics is an affiliate of the National Center for Education in Politics operating under the direction of a member of the Department. It fosters political research, promotes participation in political organizations through internships, and sponsors conferences and workshops in practical politics. The University of Washington Center for Education in Politics is an affiliate of this group and operates several campus programs each year. The Department of Political Science faculty directs this project.

Undergraduate Programs

Advising Office

202 Engineering Annex

Maintenance of a better than C average in political science courses is expected of every political science major. Accordingly, no student whose cumulative grade-point average in political science courses taken at this University is less than 2.25 may take his Bachelor of Arts degree in any political science curriculum.

General Curriculum

A student majoring in political science must complete a course of study designed to meet his particular needs, developed by him, and approved by the Department. In addition to meeting general University and College requirements, the program must include a minimum of 50 credits in political science. The program must also include two of the introductory courses Political



Science 201, 202, and 203. The remaining credits must be distributed among the following three broad fields to the extent of at least 10 upper-division credits in each; political theory and public law; government, politics, and public administration; comparative government and international relations. Courses intended primarily for nonmajors are not to be used to satisfy the distribution requirement but may be used as political science electives.

A reading and translating knowledge of at least one modern foreign language is strongly recommended. The Arts and Sciences language requirement must be fulfilled.

Honors in Political Science

Adviser

Dell G. Hitchner

217 Engineering Annex

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, receive a bachelor's degree "With College Honors in Political Science." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Political Science."

Honors sections are available in 201, 202, and 203. Majors in political science are eligible to participate in the honors program at the beginning of their junior year, but no later than the second quarter thereof, if they have maintained a general grade-point average of 3.00, and have maintained in at least 10 credits of political science a grade-point average of 3.25. Work of similar distinction must be continued if the student is to remain in the program.

Honors students are required to complete 15 credits in the Honors Seminar, 398H, although with the approval of their adviser, 5 credits in the honors section of 499 may be substituted for five of these. These credits may be used as electives in the normal major program. Honors students must also present to the departmental honors committee, no later than the sixth week of their final quarter before graduation, a research paper or essay, and must pass with distinction a comprehensive examination, which will be scheduled according to need at the end of each quarter.

As opportunity permits, special honors sections of regular upper-division courses in political science will be given for honors students. Not only these, but also the similar offerings of other schools and departments,

when open to nonmajors, are recommended to participants in this program.

Graduate Programs

Graduate Program Adviser

C. W. Cassinelli

205 Engineering Annex

The Department of Political Science offers a program of studies leading to the degrees of Master of Arts and Doctor of Philosophy. Admission to these programs requires the completion of an undergraduate major in political science or its equivalent. Although the Department has a number of standard requirements for higher degrees, every effort is made to devise programs that will fit the needs and interests of the individual student.

PROGRAMS OF STUDY

Master of Arts

A minimum of 36 credits, 18 of which must be taken at the 500 level or above, is required for the Master of Arts degree. In addition, the student must submit an essay of distinction and pass a comprehensive examination in any three of the following areas of political science: political theory and methodology; public law; comparative government; special area studies; public administration; international relations; American government and politics; urban, state, and regional government. Appropriate courses from outside the discipline of political science may be included in any of these areas.

Master of Public Administration

A curriculum leading to this degree is offered by the Graduate School of Public Affairs; see the *Graduate School of Public Affairs* section in this catalog.

Doctor of Philosophy

The Doctor of Philosophy degree requires a minimum of 108 credits, including 36 credits allowed for the dissertation. Of the remaining 72 credits, at least 48 must be earned at the 500 level or above. Upon completion of the 72 credits, the student must pass a comprehensive examination covering four fields. In addition to using courses in disciplines other than political science to help satisfy these field requirements, the student may, with the approval of his supervisory committee, prepare one of the four fields entirely in another related discipline. The student, in planning his program, may choose from among the following seven areas of political science: political theory and methodology; public law; comparative government and special area studies; public administration and comparative administration; international politics, international law, international organization, and foreign policy; American government, politics, and public policy; and re-

gional, state, metropolitan, and urban government. With the approval of his committee, the student may use at most one of these areas—normally that in which he writes his dissertation—to satisfy two of his field requirements. Each program should provide as wide as possible coverage of the discipline of political science.

PSYCHOLOGY

Chairman

Arthur A. Lumsdaine
M40 Denny Hall

Professors

Joseph Becker, Robert C. Bolles, Allen L. Edwards, James P. Egan, Erwin A. Esper (emeritus), Fred E. Fiedler, Paul E. Fields, A. Paul Horst (emeritus), Earl B. Hunt, Roger B. Loucks (emeritus), Arthur A. Lumsdaine, Halbert B. Robinson, Irwin G. Sarason, Gilbert Sax, Moncrieff H. Smith, Jr., Ezra Stotland, Charles R. Strother, William R. Wilson (emeritus), Lloyd S. Woodburne

Associate Professors

Lee R. Beach, Helen L. Bee, John W. Broedel, Sidney S. Culbert, Robert J. Douglas, Louise B. Heathers, George P. Horton (emeritus), Robert B. Lockard, Clifford E. Lunneborg, Jr., Walter L. Makous, Benjamin B. McKeever, Nathaniel N. Wagner

Assistant Professors

John Alcock, John P. Berberich, Samuel A. Bobrow, Joseph C. Campione, Lance K. Canon, John E. Carr, Philip S. Dale, Hans O. Doerr, Robert J. Kohlenberg, Terence Mitchell, Barry A. Nyman, Robert R. Pagano, F. Michael Rabinowitz, Richard M. Rose, Sidney R. Roth, Ronald E. Smith, Davida Y. Teller, Richard C. Urbano (acting)

Lecturers

Irwin S. Dreiblatt, Robert H. Fenner, Wilbert E. Fordyce, Florence R. Harris, Thomas F. Hodgson, Patricia W. Lunneborg

Instructors

Anthony Biglan (acting), Gerald R. Oncken (acting)

The curricula and associated research activities in psychology stem from the dual scientific and professional character of the discipline: (1) Psychology as a branch of basic science, which seeks to describe and understand the behavior of organisms, both human and infra-human, normal and abnormal; and (2) the technology and profession of psychology, which further seeks to apply its basic findings and techniques to interpret human experience coherently, to predict and develop human capabilities more efficiently, and to improve man's ability to interact effectively with his physical and social environment.

Psychology is generally concerned with the individual organism rather than the collective or group as the primary unit of analysis. It attempts to increase our knowledge of how individuals are motivated; how they perceive the world; how they learn and develop over the course of their life histories; how they choose among alternative courses of action; and how they perform in groups and social organizations. The Department of Psychology offers upper-level courses ranging across these different aspects of behavior.

Basic courses in psychology (such as Psychology 100, 190, 201, 202, 203, 205, 222, 302, 303, 306, etc.) are intended to provide a foundation for those wishing to take advanced work in psychology as undergraduate or graduate majors or minors. The basic courses also serve those students for whom obtaining a better understanding of behavior is part of a liberal education. Some of these courses (e.g., 100, 205, 305, 306) should provide an orientation helpful in daily life and develop a basis for understanding and utilizing the services of psychologists in relation to other fields of professional endeavor. Of special interest are a few new courses designed specifically to deal with contemporary human and social problems (210, 250, 260, 443).

Although the undergraduate offerings of the Department do not train the student fully for any particular occupational role, certain courses are of value to students planning careers in the biological sciences, sociology, economics, political science, business and industry, the medical and legal professions, teaching, nursing, and social work.

Students interested in psychology as a professional career commonly spend from three to five years in graduate training. A variety of experimentally oriented undergraduate courses is offered for students planning to proceed to graduate work in psychology. These courses are designed to further an understanding of fundamental principles in psychology, its research findings, and the means by which psychological knowledge is acquired.

Undergraduate Programs

Adviser

Patricia W. Lunneborg
M30 Denny Hall

The Department of Psychology offers undergraduate programs leading to the degrees of Bachelor of Arts and Bachelor of Science. Also, the Department offers major and minor academic fields for students in the College of Education (see the *College of Education* section). Students planning a major in this Department should expect to complete Psychology 100 or 190, 201 or 202, and 302 as early as possible.



The Bachelor of Science curriculum is intended primarily to prepare the student for graduate study, which is almost mandatory for a professional career in psychology. The Bachelor of Arts degree provides a broad background in psychology, but by itself does not qualify a student for vocational or further educational goals. However, through electives in other areas, students in the Bachelor of Arts program can prepare for vocations which will combine their general background in psychology with specialized training in such fields as education, personnel management, communication, health sciences (clinical or technical), social work, engineering, and others.

GRADUATION REQUIREMENTS

Bachelor of Science

The Bachelor of Science degree currently requires Psychology 100 or 190, 201, 202 or 203, 302, 303, and 499. A minimum of 50 credits in psychology, including the above specified courses and 15 credits at the 400 level, is required with a minimal grade-point average of 3.30. Students must complete a year of calculus with analytic geometry (Mathematics 124, 125, 126) and earn at least 10 additional credits in natural science (preferably more) beyond the college distribution requirement, i.e., 10 credits of either biology, zoology, physics, chemistry, or mathematics (beyond Mathematics 124, 125, 126). A cumulative overall grade-point average of 3.00 is required. Transfer students must meet all of the above requirements, but depending on the undergraduate adviser's recommendation, as many as 35 credits in psychology might be taken prior to entering the University of Washington.

Because reading knowledge in one or two foreign languages is required for the doctorate at a large proportion of colleges and universities, students intending to seek advanced training are advised to acquire a good reading knowledge of one or more languages as undergraduates, preferably French, German, or Russian.

Bachelor of Arts

The Bachelor of Arts degree is based upon the concept of flexibility, of fitting students with courses designed to provide a broad background in academic psychology and specialized training in areas of particular interest and competence. It is not intended to prepare students for graduate work in psychology. No fixed curriculum is designated for the degree requirement. The requirements are 50 credits of psychology courses from departmental undergraduate offerings with a minimum grade-point average of 2.00. These must include 100 or 190; either 201 or 202 or 203; and both 302 and 303. A number of courses have stated prerequisites; therefore, a student's program should be planned with some care. Annual mimeographed leaflets issued by

the Department should be consulted in respect to further details and changes in requirements subsequent to issuance of the *General Catalog*.

Honors in Psychology

Adviser

David Y. Teller

M40 Denny Hall

In association with the College of Arts and Sciences Honors Program, the Department offers an enriched course of study designed to meet the needs of high-ability students. Special honors sections of 190H (Introduction to the Scientific Analysis of Behavior), of 201H, 202H (Laboratory in Human Performance and Laboratory in Animal Learning), and of certain other courses are available to all students of honors caliber regardless of field of major interest.

Candidates for the Bachelor of Science and the Bachelor of Arts "With College Honors in Psychology" must (1) fulfill the requirements of the College Honors Program; (2) fulfill the departmental requirements for the major corresponding to the particular degree being sought, with the exception that those seeking the Bachelor of Arts degree must elect at least 15 credits at the 400 level in psychology; (3) satisfactorily complete the Honors Seminars (350H and 450H) and Honors Thesis (451H-452H); and (4) maintain a minimal grade-point average of 3.50 in all courses in psychology and of 3.00 in courses in all other disciplines. Transfer students and others who have not had the opportunity to fulfill the requirements of the College Honors Program may become members of the departmental honors program by fulfilling requirements 2, 3, and 4 listed above. These students will receive the Bachelor of Arts or Bachelor of Science degree "With Distinction in Psychology."

Graduate Programs

Graduate Program Adviser

Robert C. Bolles

M40 Denny Hall

Graduate work in the Department of Psychology is at present organized primarily as preparation for the degree of Doctor of Philosophy. The doctoral program is designed primarily to prepare psychologists as researchers, college and university teachers, and professional psychologists. The Master of Science degree is taken as an optional choice by some doctoral students in the course of their work toward the doctorate; however, at the present time students are generally admitted to graduate study in the Department only if they intend to work full time toward the Ph.D. degree. The constraints on a student are primarily those arising from

the student's own imagination and interests, the current interests and skills of the Department faculty, and the faculties of associated graduate departments.

Admission

The basic requirements for admission to graduate study in Psychology are adequate intellectual ability and the desire for a career dedicated to the science and the profession. Applicants must have a bachelor's degree and meet other general requirements of the Graduate School (see *Graduate Study* section). Though many applicants will have an undergraduate major in psychology, this is not a requirement for admission. Undergraduate records that reveal a good science background, including mathematics, are regarded favorably. Work in biological sciences, chemistry, and physics is a valuable adjunct to the prospective psychologist, as is a grounding in mathematics to the level of calculus and beyond. This is *not* to imply that background in basic undergraduate psychology is unnecessary, but is meant to indicate that a formal major is not mandatory. Course work in philosophy (logic, epistemology, philosophy of science, etc.) is also desirable preparation for graduate study.

It is required that the applicant take the aptitude portion (verbal and quantitative) of the Graduate Record Examination, which is administered approximately every two months by the Educational Testing Service. Registration for this examination is made by writing directly to Educational Testing Services, Box 955, Princeton, New Jersey 08540, or 1947 Center Street, Berkeley, California 94704. The applicant is urged to take this examination as early as possible. Additional information on admission should be obtained directly from the Selection Committee, Department of Psychology. Applicants are usually admitted to the departmental graduate program during Autumn Quarter only. The Committee begins to process applications for the coming year during the month of January. Admission of graduate students is based upon the action of the Department's Selection Committee, which recommends formal acceptance by the Dean of the Graduate School. The Selection Committee bases its decisions primarily upon transcripts, GRE scores, and letters of recommendation. Applicants will not be admitted until all the materials requested by the Department and the Graduate School are received.

The Graduate School currently requires also that all students exhibit competence in reading a modern foreign language before application for the General Examinations. The student is expected to have developed the language skills that are needed either before he matriculates or as quickly as possible thereafter. Some language departments make available special courses

for graduate students that will prepare them for the language examinations.

Most graduate students admitted are offered some form of financial support. In addition to fellowships applied for and awarded directly to individual students by the National Science Foundation, U.S. Public Health Service, National Aeronautics and Space Agency, and other agencies, the Psychology Department has available several National Defense Education Act (Title IV) Fellowships and National Science Foundation Traineeships, and a number of teaching assistantships, research assistantships, and U.S. Public Health Service traineeships. Veterans Administration Clinical and Social Psychology Traineeships are also available, but usually are given only to advanced graduate students. Additional summer support in the form of teaching and research assistantships is available for a considerable number of students.

PROGRAMS OF STUDY

Each incoming graduate student is assigned to a faculty member who will act as his adviser. This assignment is not necessarily meant to be a permanent one and may be changed later in the year if this proves to be desirable.

Master of Science

Upon completion of the first year graduate program, an appropriate research program, and the general requirements of the Graduate School (residency, foreign language, etc.), the student may elect to apply for the Master of Science degree. He is not required, however, to do so. Recommendations for specific supporting work, normally including a thesis, will be made in consultation with the student's faculty adviser.

Doctor of Philosophy

The essential requirements of the doctoral program include several minimal competencies, statistics, minor area(s), major area, reading proficiency in a foreign language, independent research, and finally, the Departmental Qualifying and the Graduate School General Examinations and the dissertation. For purposes of graduate instruction the Department is organized into several content areas relating to specializations within psychology. These include physiological and animal psychology, experimental psychology, mathematical and quantitative psychology, developmental psychology, social psychology, and personality and clinical psychology.

The graduate program in psychology is very flexible. The number of fixed course requirements is small, so that students may elect courses according to their particular interests and abilities. Students are encouraged to take courses in other departments and in the Medical



School. Advanced undergraduate courses may be part of the graduate programs, and thus the selection of available topics, both within and outside the Department is considerably broadened.

The student is encouraged to engage in his own research as soon as possible. In some cases, the student's position as research assistant to a faculty member will lead to independent research (Psychology 600) to become familiar with techniques and subject matter in new research areas. Each student is also expected to gain experience as a teaching assistant.

Within these areas of specialization the student must, during his first two years, demonstrate minimal competency in several areas and select a minor and a major area of concentration. Annual bulletins describe in detail the current requirements for demonstration of minimal competency in each of the areas, the current requirements for a minor area, and the current major areas from among which students may select an area of concentration for the departmental Qualifying Examination. Courses below the level of 400 may not be used to fulfill the departmental requirements for an advanced degree in psychology. With the agreement of his adviser and other faculty members in his areas of specialization, a student may substitute graduate work elsewhere for minimal competency and minor area requirements.

The student is expected to complete his doctoral training in four to five years, excluding internships. During his first year he must demonstrate competence in statistics and experimental design (normally by completing Psychology 514 and 515); must complete two minimal competency requirements, which should be in his major and minor fields; and must enroll for at least 3 credits in independent predoctoral research. During the second year of graduate work the student must complete two more minimal competencies in areas of specialization for the total required of four. He must further have continued enrollment in independent predoctoral research. Required course work should be completed as early as possible in the second year. During the first and second years, students are evaluated several times by the faculty and notified what recommendations the faculty has made regarding their future work. Students must maintain a B average, and in satisfying minimal competency and minor requirements all work must be B level or higher.

Normally, during the first quarter of his second year, a student elects a major area. He must be accepted by a faculty member of that area who will act as chairman of his Supervisory Committee. Thereafter, the course work within the student's major area is planned indi-

vidually in conjunction with his Supervisory Committee and the faculty of his major area.

No later than the end of his third year a student must have completed the minor area requirement. The faculty regards completion of a minor area as evidence that the student can teach in this area at the undergraduate level. The student must also have met all Graduate School requirements, including the foreign language proficiency examination, the Departmental Qualifying Examination, and the Graduate School General Examination. During the third and fourth years the student normally will devote himself primarily to independent research which culminates in his doctoral dissertation.

Special Graduate Programs

The Department offers a specialized program of graduate study in clinical psychology that is designed to provide the student with training in the substantive fields and methodologies of psychology (e.g., developmental psychology, learning, perception, physiological and social psychology) which are a necessary foundation for the analysis and modification of deviant behavior. The program is designed, also, to provide the student with the special skills in research which are essential for the discovery of new knowledge and methods of prevention, assessment, and treatment. A predoctoral internship is required for the student interested in preparation for general clinical psychological practice. The clinical program is accredited by the American Psychological Association. The increased facilities provided by the new Center for Child Development and Mental Retardation, together with related staff increases in both child clinical and developmental psychology, make possible a special emphasis, within the clinical program, on child clinical psychology.

In addition to the doctoral programs in psychology, a joint program leading to the degree of Doctor of Philosophy in physiology and psychology is offered by an interdisciplinary Group of the Graduate School composed of certain members of the Department of Psychology and the Department of Physiology and Biophysics. The physiology psychology program is described in the *Interdisciplinary Graduate Degree Program* section of this catalog. Students interested in this program can obtain details from Dr. Moncrieff Smith, Department of Psychology.

Minors in Psychology

Students enrolled in graduate programs in other departments who wish to take offerings or minors in the Department of Psychology should contact either the Graduate Program Adviser or the appropriate professor to make these arrangements. No formal examination in the minor will be required if the student maintains a

minimum grade-point average of 3.00 in each of his courses.

The requirements for a minor in psychology for the master's degree are 15 graduate credits in psychology, including Psychology 302 and 303, and are subject to departmental approval. It is expected that the student electing a minor in psychology will have completed at least 25 credits in basic psychology courses prior to graduate study.

The requirements for a minor in psychology for the doctoral degree are 30 graduate credits in psychology, including Psychology 302 and 303 and are also subject to departmental approval.

ROMANCE LANGUAGES AND LITERATURE

Chairman

Constantine G. Christofides
C104C Padelford Hall

Professors

Constantine G. Christofides, Jean F. David, Lionel J. Friedman, Carlos García-Prada (emeritus), Abraham C. Keller, Edith Kern, Wolfgang Leiner, Howard L. Nostrand, Antonio Pace, Marcelino Peñuelas, Sol Saporita, Joseph Sommers, William E. Wilson (emeritus)

Associate Professors

Heles Contreras, A. Emerson Creore, R. C. Dale, Robert J. Ellrich, Victor E. Hanzeli, Michael P. Predmore, Fernando G. Salinero, Aníbal Vargas-Barón, Clotilde M. Wilson

Assistant Professors

James Algeo, Farris Anderson, Rodney Bodden, Nicolás Bratosevich, Thomas Drury, W. H. W. Field, Judith A. Goetzinger, Louisa Jones, Jurgén Klausenburger, Franco Masciandaro, John P. O'Connell, Oliver W. Rolf, George Shipley, Norman Stokle, Richard Vernier, W. Victor Wortley.

Lecturers

Pia Friedrich, Jacqueline Leiner, Frances C. Nostrand

Within the large and important family of Romance languages, those which are most widely spoken and which have the richest literatures are French, Spanish, Italian, and Portuguese. In each of these, the Department offers an undergraduate program combining the acquisition of language skills (speaking, comprehension, reading, writing,) with the history and the critical examination of literature.

On the graduate level (and in some cases in upper-division undergraduate work), advanced study is possible in several areas: history of literature and literary

criticism; analysis and structure of the separate Romance languages, their historical development, interrelations, and relations to other languages, as well as descriptions of the cultural context essential to an understanding of a language and its literature.

The study of a foreign language and literature forms an important part of any student's general education. Pursued as a vocational interest, it may lead to careers in international political, legal, business, and professional relations, and to teaching at all levels from the elementary grades to the graduate school.

The Department of Romance Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy.

Major and minor academic fields for the Provisional Teaching Certificate are offered in French and Spanish. Candidates for the certificate may major in this Department as students in either the College of Arts and Sciences or the College of Education (see the *College of Education* section). A curriculum in Latin-American Studies is provided by General Studies (See *Interdepartmental Programs* section).

Students entering from high school must have their language skills evaluated by means of a placement test before they may register for any course in the Department. (See *Undergraduate Education* section.)

Any of the prerequisites for courses in this Department may be waived at the adviser's discretion. Students with A or high B standing in elementary and intermediate courses in this Department are encouraged to skip one or more quarters between 101- and 301, or to enroll in the honors sections.

Undergraduate Programs

Advisory Office

C108 Padelford Hall

Advisers

R. C. Dale (French)

George Shipley (Spanish)

Pia Friedrich (Italian and, for Education majors, Spanish and Italian)

Education majors, French, see Advisory Office

Jurgén Klausenburger (Romance Linguistics)

GRADUATION REQUIREMENTS

A Bachelor of Arts degree may be obtained with a major in French, Spanish, Italian, Portuguese, or Romance linguistics. The general requirements for an undergraduate major in a Romance language are proficiency in the language and knowledge of the literature and culture of France, the Hispanic people, Italy, or Portugal. The curriculum for the undergraduate major



in Romance linguistics places its main emphasis on language and linguistics, rather than (but not to the exclusion of) literature. The following programs are designed to develop the required proficiency in the various fields.

French Major

A minimum of 42 credits of course work (or equivalent) in French beyond the level of 222, plus Romance 401. Required are: 301, 302, and 303; 304, 305, and 306; one course chosen from 308, 309, 310, 311, 350, 351, or 352; 409; 12 credits, none of which may be transfer credits, in literature courses numbered above 400.

Spanish Major

A minimum of 42 credits of course work (or equivalent) in Spanish beyond the level of 203, plus Romance 401. Required are: 301, 302, and 303; 304, 305, and 306; two courses chosen from 350, 351, or 352; 409; 12 credits, none of which may be transfer credits, in literature courses numbered above 400. (See also Latin-American Studies, *Interdepartmental Programs* section.)

Italian Major

A minimum of 42 credits of course work (or equivalent) beyond the level of 103, plus Romance 401. Required are 301, 302, and 303; 304, 305, and 306; 6 credits in 327; 12 credits, none of which may be transfer credits, in literature courses numbered above 400.

Portuguese Major

The Portuguese major consists of an individualized program of courses selected from those listed under the departmental heading, and may include supervised study and exercises in the Language Laboratory.

Romance Linguistics Major

Prerequisite: two college years (or equivalent) of study in each of two Romance languages. Required courses beyond this prerequisite are: 20 credits in third-year language courses in two Romance languages (recommended division: 10 each); 15 credits in literature courses, including a whole survey sequence; two courses in language structure (400 level); Romance 401 and 402; Spanish or French 474; a senior essay (2 credits).

Recommended electives: general linguistics courses. Thorough preparation for the senior essay requires that majors begin course work in Romance linguistics and general linguistics by the start of their junior year.

In all curricula, credits may be arranged for study abroad, preferably during the junior year, subject to University regulations governing transfer credit. Summer study abroad is encouraged.

Honors in French or Spanish

Adviser (French)

Robert Ellrich

C247 Padelford Hall

Adviser (Spanish)

George Shipley

C224 Padelford Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years, in addition to the following departmental honors requirements, receive a bachelor's degree "With College Honors in French" or "With College Honors in Spanish." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in French" or "... Spanish."

Candidates for departmental honors must have an overall grade-point average of 3.00 with 3.30 in Romance languages. These averages must be maintained through graduation. Qualified students may be accepted as honors candidates at the time of their first registration for courses numbered above 300.

The requirements for the major with college honors or distinction in French are honors sections of the following courses: French 301, 302, 303, 304, 305, 306, 490 (5 or 10 credits); plus one non-honors course chosen from 308, 309, 310, or 311, 350, 351, or 352; 409; Romance 401; plus electives in upper-division literature courses offered by the Department. Credits earned in the Honors Seminar, French 490H, may be used in fulfilling the departmental requirement of four 400-level literature courses.)

The requirements for the major with college honors or distinction in Spanish are honors sections of the following courses: Spanish 327 (6 credits), 304, 305, 306; plus non-honors courses Spanish 301, 302, 303; and two courses chosen from 350, 351, or 352; 409, and Romance 401; plus electives in upper-division literature courses offered by the Department (12 credits).

First- and second-year honors sections of certain courses are open to members of the College Honors Program and, with permission, to other qualified students. These courses are: French or Spanish 103, 201, 202, French 222, and Spanish 203.

Graduate Programs

Graduate Program Advisers

E. Kern

B323 Padelford Hall

Marcelino Peñuelas

B321 Padelford Hall

The Department of Romance Languages and Literature offers several programs of graduate study leading to the degrees of Master of Arts and Doctor of Philosophy.

Admission to a graduate program requires that the student satisfy admission requirements of the Graduate School and show completion of an undergraduate major, or its equivalent, appropriate to the proposed advanced degree program. In addition, he must supply his score in the Graduate Record Examination, i.e., the Advanced French or Spanish Test if he seeks a degree in those languages, or the Aptitude Test if his specialty will be Italian or Portuguese.

Students are responsible for knowing and fulfilling the general requirements of the Graduate School.

Master of Arts

The Master of Arts degree program is offered in the following areas of specialization: (1) French language and literature, (2) Italian language and literature, (3) Spanish language and literature, (4) Romance linguistics.

Each program requires the completion of 36 applicable course credits followed by a comprehensive examination based on reading lists provided by the Department for this purpose.

In exceptional cases, a student with a genuine research project and sufficient training will be permitted to take the Master of Arts degree with a thesis, upon prior approval by the Graduate Studies Committee.

Doctor of Philosophy

The doctoral program is offered with the following fields of specialization: (1) Romance literature, (2) Romance linguistics, (3) French language and literature, (4) Spanish language and literature. Supporting courses are offered in Italian and Portuguese.

The Master of Arts degree is a prerequisite for admission to a doctoral program, unless an exception is granted by the Graduate Studies Committee.

General requirements for all doctoral programs are: (1) A prospective candidate must be accepted by the Graduate School and the Graduate Studies Committee of the Department. (2) The student must have proficiency in the major language as certified by the Graduate Program Adviser. (3) The student must pass a reading knowledge examination in one Romance language other than the major, and one non-Romance language. (4) Each program requires completion of 90 applicable course credits earned in graduate status, of which 50 must be earned in courses numbered 500 and above, exclusive of 599. (5) After the completion of 90 course credits as specified above, the student must pass the General Examination. (6) A dissertation approved in subject and content by the student's adviser and Dissertation Reading Committee must be submitted in completed form to the chairman of his Supervisory

Committee six weeks before the date of the Final Examination. (7) The student must pass the Final Examination.

Special requirements for the various fields of specialization are as follows:

ROMANCE LITERATURE

In addition to a knowledge of the nature of language and training in bibliography, the student's course work will normally include at least 30 credits in each of two Romance literatures. Whatever the combination of these two literatures, every student will be examined on at least one major literary figure in French, Italian, and Spanish.

The student will be expected to demonstrate in the General Examination thorough knowledge of one literary genre or period in the literatures embraced in his program.

ROMANCE LINGUISTICS

Approximately half of the student's course work will be in Romance linguistics and the history and structure of individual Romance languages. The other half will be divided equally between courses in general linguistics and in one Romance literature. The student should have a knowledge of literary works such as is expected of M.A. candidates in the literature of the Romance language in which he specializes.

FRENCH OR SPANISH LANGUAGE AND LITERATURE

Students specializing in a single Romance literature will devote two-thirds of their course work to the field of specialization. They may devote the remainder of their work to studies, within or outside the Department, in a historical period, a literary genre, or any humanistic field relevant to the research specialization as represented by the choice of a doctoral dissertation subject.

SCANDINAVIAN LANGUAGES AND LITERATURE

Chairman

Walter Johnson
C8E Padelford Hall

Professors

Sverre Arestad, Karl-Ivar Hildeman, Walter Johnson,
Erik Wahlgren

Assistant Professors

Henning Sehmsdorf, Sigrid Valfells

The curriculum in Scandinavian Languages and Literature is designed to give students control of various skills (reading, speaking, writing) in Danish, Nor-



wegian, and Swedish so that they can proceed to a study of the respective literatures and cultures on an advanced level. Open to all students are a variety of courses given in English; for example, an introduction to Scandinavia, particularly for freshmen, and for the more advanced study of the drama and the novel.

The Department of Scandinavian Languages and Literature offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. For undergraduate students, it offers an elective curriculum with a major in Norwegian or Swedish, as well as courses in Danish and literature courses in English.

Undergraduate Programs

Henning Sehmsdorf (Norwegian)

C8J Padelford Hall

Walter Johnson (Swedish)

C8E Padelford Hall

Bachelor of Arts

For the Bachelor of Arts degree, at least 50 credits in the major language are required, of which 25 must be in upper-division courses.

Norwegian Major

Required courses are: Norwegian 101-102, 103, 220, 221, 222, 300, 301, 302, 450, and 490. Other courses may be substituted with the approval of the adviser.

Swedish Major

Required courses are: Swedish 101-102, 103, 220, 221, 222, 300, 301, 302, 450, and 490. Other courses may be substituted with the approval of the adviser.

Honors in Scandinavian Languages and Literature

Adviser (Norwegian)

Henning Sehmsdorf

C8J Padelford Hall

Adviser (Swedish)

Walter Johnson

C8E Padelford Hall

The Scandinavian Department does not offer a formal honors curriculum. On the basis of long tradition, however, provisions exist for the exceptional student to do work of an intensive nature in the Department. Arrangements can be made through the College Honors Council to permit the qualified student who has, as a member of the College of Arts and Sciences Honors Program, also fulfilled the requirements of that program during the freshman and sophomore years to graduate "With College Honors in Norwegian" or "With College Honors in Swedish." With the approval of the departmental honors adviser and the College Honors Council, superior students who are not members of the College Honors Program may participate in the directed inten-

sive work and receive a bachelor's degree "With Distinction in Norwegian" or "With Distinction in Swedish."

Graduate Programs

Graduate Program Adviser

Walter Johnson

C8E Padelford Hall

Students who intend to work toward advanced degrees must meet the requirements of the Graduate School. (See the *Graduate Study* section of this catalog).

Master of Arts

Requirements are a minimum of 36 credits in courses or seminars in Scandinavian and related subjects approved by the Department; a reading knowledge of a non-Scandinavian foreign language; and an oral examination. At least 20 of the credits must be in courses numbered 500 and above. Either a thesis or nonthesis program may be selected.

Doctor of Philosophy

Requirements are a minimum of 72 credits in courses or seminars in Scandinavian and related subjects approved by the Department; a reading knowledge of two non-Scandinavian foreign languages; General Examinations for admission to candidacy; an acceptable dissertation; and a Final Examination on the dissertation.

SLAVIC LANGUAGES AND LITERATURE

Chairman

Lew R. Micklesen (Acting)

111 Thomson Hall

Professor

Lew R. Micklesen

Associate Professor

E. Harold Swayze

Assistant Professors

James E. Augerot, Paul V. Gribanovsky, Roger M. Hagglund, Jack V. Haney, Willis Konick, Emil Kovtun, Alexandra Rudicina

Lecturers

Helen G. Dixon, Nora Holdsworth, Zdzislaw Mikulski, Elias T. Novikow, Vadim O. Pahn, Natalie Tracy

The Department of Slavic Languages and Literature teaches the languages and literatures of Russia and some of the East European countries. Courses making up the Department curricula lead to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. The student becomes acquainted with cultural and political entities different from his own, which may be regarded as indispensable to a proper understanding of his own nation and culture, and the other nations and cultures of the West.

This aim is furthered through the study of the main creative manifestation of these entities—their literature. Other aspects of these cultures, such as their history and geography, their social and political institutions, and their thought systems, are dealt with in courses offered by the Far Eastern and Russian Institute and its cooperating departments. The Department and the Institute work in close cooperation; most department faculty also hold membership in the Institute.

Undergraduate Programs

Adviser

Jack V. Haney

111 Thomson Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

The requirements for the Bachelor of Arts degree are: Russian 201, 202, 203, or the equivalent; 301, 302, 303, or the equivalent; 401, 402, 403, or the equivalent; Far East 243; Russian 320; 15 credits from the list of approved electives; and 10 credits of Russian history chosen from courses Far Eastern 421, 422, 423, 424, 448.

The list of approved electives includes Russian 451, 452, 453, (prerequisite, 403 or permission); 461, 462, 463, (prerequisite, 403 or permission); 421, 422, 426, 427, 428; Slavic 321, 322, 323. Russian 305 and 499 may not be counted as electives for the major.

Students in the College of Arts and Sciences may plan their program to include courses necessary to obtain the Provisional Certificate of the state of Washington for elementary and secondary teachers. For students in the College of Education, the Department offers major and minor academic fields in Russian language and literature for those preparing to teach in secondary schools, and a major academic field in Russian language and literature for students preparing to teach in elementary schools. (See the *College of Education* section.

The Honors Program

Undergraduate majors in Slavic Languages and Literature, who are also in the College of Arts and Sciences Honors Program and have fulfilled both the College and departmental honors requirements during their freshman and sophomore years, may receive a bachelor's degree "With College Honors." Students who enter the Department's honors program in their junior year and fulfill its requirements may receive a degree "With Distinction." A comprehensive examination in Russian language, literature or linguistics, and history and culture is required during the final quarter. For further information consult the departmental honors adviser.

Graduate Programs

Graduate Program Adviser

Lew R. Micklesen

111 Thomson Hall

The Department of Slavic Languages and Literature offers programs of study leading to the Master of Arts and Doctor of Philosophy degrees in Russian language and literature and in Slavic linguistics. Students who intend to work for these degrees must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. Requests for applications for admission should be addressed to the Graduate Program Adviser, Department of Slavic Languages and Literature. In addition to the application for admission submitted to the University Admissions Office, applicants are required to submit three letters of recommendation plus a statement of purpose (plan of study and advanced degree objective) to the Graduate Program Adviser in the department.

Master of Arts

RUSSIAN LITERATURE

Admission requirements specify that students should have the following background: four years of instruction in the Russian language or its equivalent; one survey course in Russian literature in English and one specialized course in Russian literature in English; work in Russian literature in Russian; some knowledge of Russian history. Students admitted to graduate study who have not had such preparation must take work in addition to the courses required for the M.A. program.

Course requirements for this degree include a pro-seminar series (three quarters), Graduate Survey in Russian Literature; the sequence of courses (three quarters) Structure of Russian; one Russian literature course in English; one graduate-level course in a major literary figure; one course in Russian poetry; eighteenth-century Russian literature or old Russian literature; one graduate-level course in literary criticism or comparative literature. A minimum of 45 credits must be earned. Among other requirements are a lengthy paper, written in partial fulfillment of the requirements of the pro-seminar series, and a written examination. Students, in consultation with their adviser, choose three of the following fields for examination: early Russian literature; eighteenth-century Russian literature; the nineteenth-century novel; nineteenth-century poetry; modern prose (from symbolism to the present); modern poetry (from symbolism to the present); Russian literary criticism; Russian stylistics; Slavic linguistics. The examination also requires that a short essay be written in Russian. Students must pass the Educational Testing Service examination in the Russian language.

**SLAVIC LINGUISTICS**

In order to qualify for admission, applicants should have taken four years of instruction in the Russian language or its equivalent and a full year of course work in the structure of Russian. Students admitted to graduate study who have not had such preparation must add the courses in which they are deficient to the program described below. For students with an excellent background in linguistics, the requirement for the structure of Russian may be waived; but under no circumstances will the four years of instruction in Russian or its equivalent be waived.

Course requirements are as follows: Slavic linguistics: Historical Survey of Common Slavic; Old Church Slavonic; Readings in Old Church Slavonic; History of the Russian Language; Readings in the History of the Russian Language; General linguistics (courses offered by the Department of Linguistics) including either Phonetics and Phonemics (two quarters) and Survey of Linguistic Method and Theory, or Morphology and Syntax (three quarters); the series (three quarters) Introduction to Russian Literature (in Russian), and 15 credits in a second Slavic language. Students must pass the Educational Testing Service examination in Russian. A minimum of 55 credits must be earned in this program. In addition to the above requirements, a written examination, approximately two-thirds of which is devoted to linguistics and one-third to literature, is given in which a short essay must be written in Russian.

Doctor of Philosophy
RUSSIAN LITERATURE

Students entering the doctoral program are required to have training equivalent to that required for the Master of Arts degree. Those, whose preparation is inadequate, must fulfill the M.A. requirements before beginning the program.

Courses required in the doctoral program include: Historical Survey of Common Slavic; the two-course sequence in either Old Church Slavonic or History of the Russian Language; two graduate level courses in major Russian literary figures; two courses in Russian poetry; one course in Russian literary criticism; one course in Soviet literature; one seminar in Russian prose; one general seminar in Russian literature; eighteenth-century Russian literature or old Russian literature (both if course work in pre-nineteenth-century literature was not taken at the M.A. level); 15 credits in a second Slavic language. A minimum of 60 credits beyond those earned in the M.A. program are required. A written General Examination in four fields selected from those listed within the M.A. program description (one of the fields must be Slavic linguistics), and demonstration through examination of a reading knowledge of French

or German are also required. After completing the above requirements, Candidates must present a dissertation.

SLAVIC LINGUISTICS

Students desiring to work toward the doctoral degree in this field should have training equivalent to that required for the Master of Arts degree. Those whose preparation is inadequate must fulfill the requirements for the M.A. before beginning the Ph.D. program.

The following requirements must be fulfilled to receive the Ph.D. degree. Comparative and historical sequence: History of the East Slavic Languages, History of the West Slavic Languages, History of the South Slavic Languages. Synchronic and theoretical sequence: Advanced Russian Morphology, Advanced Russian Syntax, Seminar in Slavic Linguistics. Advanced and theoretical sequence in General Linguistics: Morphology and Syntax (three quarters), Problems in Linguistics. Literature sequence: three courses in Russian literature. One year of instruction (15 credits) in a third Slavic language. A minimum of 58 credits is necessary beyond those earned in the M.A. program.

It is almost mandatory that students declare a minor in general linguistics at the Ph.D. level. Students must take an examination in general linguistics to account for the minor and, in addition, a General Examination (both written and oral) which covers the following areas: writing proficiency in Russian and reading proficiency in two other Slavic languages, historical and comparative Slavic linguistics, the history and structure of Russian, and Russian literature. Students who do not take a minor in linguistics must pass an examination in general linguistics as well. Reading knowledge of both French and German must be demonstrated in appropriate examinations. After completing the above requirements, Candidates are required to present a dissertation.

SOCIOLOGY

Chairman
 S. Frank Miyamoto
 202A Guthrie Hall

Professors
 E. A. T. Barth, Stuart C. Dodd, Robert E. L. Faris, Edward Gross, Norman S. Hayner (emeritus), Otto N. Larsen, Robert K. Leik, Stanley Lieberman, S. Frank Miyamoto, Calvin F. Schmid, Clarence C. Schrag, Pierre van den Berghe

Associate Professors
 Ronald Akers, Robert Burgess, Joseph Cohen, Herbert L. Costner, Richard M. Emerson, James Goodman, Travis Hirschi, David R. Schmitt, L. W. Wager

Assistant Professors

Philip W. Blumstein, Frederick Campbell, Lee J. Haggerty, Lowell Hargens, James McCann

Sociology is the study of forms, processes, and consequences of interaction among persons, groups, and organizations. Sociologists develop and test cause-and-effect generalizations about processes and structures of group life. Among the important subfields in sociology are the distribution, composition, and change of population; human ecology; the nature and development of custom; group formation; communication and mass behavior; the form and function of complex organizations; institutional aspects of society; and processes of change and disorganization. Instruction in subject matter is accompanied by an emphasis on understanding research methods and theory construction essential for extending the boundaries of knowledge. Students of sociology acquire a foundation for work in human affairs in many applied fields.

The Department of Sociology offers courses leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. In addition, it offers major and minor academic fields for students in the College of Education. (See the *College of Education* section.) Students using sociology as a major academic field in the College of Education must meet the same requirements as a sociology major.

Special Facilities

The Washington Institute for Sociological Research and the Center for Studies in Demography and Ecology are both part of the Department of Sociology. The Research Institute is available to graduate students and faculty. Its projects are primarily in long-term basic research. The Center has been designed to expand the research and student-training programs in the fields of demography and human ecology as well as to carry on basic research. As a part of the training program, laboratory facilities and research fellowships are available to qualified students.

Undergraduate Programs

Advising Office

204A Guthrie Hall

Bachelor of Arts

In this curriculum, at least 50 credits in sociology are required. Courses must include: 110, 223, 240, 352 or 450; and one of the following: 330, 331, 430, or 431; and 25 elective credits. A 2.30 grade-point average in sociology courses is required for graduation in this curriculum.

Honors in Sociology

Advisory Office

201D Guthrie Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the following departmental honors requirements receive a bachelor's degree "With College Honors in Sociology." With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Sociology." Students admitted to the honors program in sociology usually are planning to do graduate work and are enrolled in separate honors sections of Sociology 110, in which enriched instruction and personal attention are provided. Honors sections are also offered for Sociology 223, 240, and 270, when possible. In each of these there is greater emphasis on research problems and techniques than in regular sections. Nonmajors who are in the College Honors Program are also eligible for these special sections. Honors students majoring in sociology are also expected to enroll in Sociology 423, 496H, 497H, and 498H as a special part of the regular requirement of 50 credits in the major field. Students in this program are expected to maintain a higher grade-point average than other students.

Graduate Programs

Graduate Program Adviser

S. Frank Miyamoto

202 Guthrie Hall

All graduate students must complete undergraduate requirements for a major in sociology. Students whose undergraduate work in sociology is considered inadequate may be required to pass a qualifying examination before being admitted to graduate courses.

Master of Arts

Students are required to complete at least 27 credits of course work, plus thesis. At least 9 of the course credits must be in courses numbered 500 or above. A reading knowledge of one foreign language related to the student's field of study is a Graduate School requirement. A General Examination is required by the Department. A minor in another department or a program of supporting courses must also be taken. A master's thesis must be written, and submitted seven weeks before the degree is to be granted.

Doctor of Philosophy

The degree of Master of Arts should normally precede the Ph.D. This requirement may be waived by formal action of the Department.

Students in the doctoral program must complete a program of courses approved by his Supervisory Committee. Half of the credits, including the dissertation,



must be in courses numbered 500 or above. The residence requirement is three years, two of them at the University of Washington. One of the two years must be spent in continuous full-time residence. A reading knowledge of one foreign language is required. A written General Examination will cover four of fifteen divisions of specialization, one of which must be Division I, General Methodology. A minor sequence or a program of related courses, in addition to these fields, is also required.

A dissertation topic, with a written prospectus sponsored by a member of the faculty, must be submitted to the Supervisory Committee for approval before beginning work on the dissertation. The completed dissertation is to be submitted to the chairman of the Supervisory Committee seven weeks prior to the conferring of the degree. An oral Final Examination is given on the dissertation and the field in which it lies.

Students should also read carefully the general requirements for advanced degrees presented in the *Graduate Study* section.

SPEECH

Chairman

Barnet Baskerville
115 Parrington Hall

Professors

Barnet Baskerville, James A. Carrell, Laura I. Crowell, Horace G. Rahskopf (emeritus), William R. Tiffany, Phillip A. Yantis

Associate Professors

Delmond N. Bennett, Winfred W. Bird, Haig A. Bosmajian, Albert L. Franzke (emeritus), Mark S. Klyn, LuVern H. Kunze, Adah L. Miner, Oliver W. Nelson, Thomas R. Nilsen, John M. Palmer, Robert M. Post

Assistant Professors

Don M. Burks, John A. Campbell, Donald G. Douglas, Judith C. Espinola, Jerry D. Feezel (acting), Dona L. Hedrick, Joseph W. Helmick, C. David Mortensen, Elizabeth M. Prather, Stephen J. Stephenson (acting), John R. Stewart, Gary Thompson, Wendel K. Walton, Bruce A. Weber, Myron D. Weybright (acting), Wesley R. Wilson

Lecturers

Michael Hogan, Joanne Nyquist

Research Associate

Marie A. Rominger

As an academic discipline, speech study aims to provide an understanding of the nature of speech as a form of behavior and a social process, to improve its use for individual, social, and professional pur-

poses, and to aid the general intellectual and social competence of the individual.

Professionally, the study of speech at the University is concerned with preparing students for teaching positions in public schools and colleges, for specialized teaching and research positions in universities, for research careers in speech and hearing science, and for professional work in speech pathology and audiology.

It is also concerned with contributing to the preparation of students for careers which require a broad liberal education, and which involve extensive oral communication in interpersonal and audience situations, such as law, business, or the ministry.

The courses of the Department are organized into the following areas: rhetoric and public address, the oral interpretation of literature, speech education, speech-communication science, the speech and hearing sciences, speech pathology, and audiology.

The Department of Speech offers courses of study leading to the degrees of Bachelor of Arts, Master of Arts, Master of Speech Pathology and Audiology, and Doctor of Philosophy. In addition, it offers for students in the College of Education both major and minor academic fields in Speech Education at the secondary level; and major academic fields in Speech Education and Speech and Hearing Therapy at the elementary level. (See the *College of Education* section.)

Related courses of special interest to speech students are offered by the Departments of English, Biology, Linguistics, Philosophy, Psychology, and Sociology, the Schools of Drama and Communications, as well as the College of Education.

Special facilities for students interested in the natural and behavioral communication sciences are provided in the Speech Science Laboratories, in the University Speech and Hearing Clinic, and in the Child Development and Mental Retardation Center.

Undergraduate Programs

Adviser

Michael Hogan
119 Parrington Hall

GRADUATION REQUIREMENTS

Bachelor of Arts

At least 55 credits in approved courses are required in this curriculum. For students specializing in areas other than speech pathology and audiology, these must include Speech 102, 140 or 220, 270 or 373, 300 or 301 or 302, and 400. Of the remaining credits, 18 must be in 400-level courses. During the junior and senior years, the student may specialize in one of the areas of speech study. Additional courses may be required in Speech or

closely related areas (e.g., English, drama, history, linguistics, psychology) in response to the student's need or interest. Selection of courses for meeting group requirements will be made with the approval of the Department.

Students majoring in speech who wish specialization in speech pathology and audiology are required to complete the following courses: Speech 103, 301, 302, 303, 330, 331, 332, 350, 370, 371, 390, 430, and 6 credits from 351 and 391, and one of the following: Speech 140, 220, 230, 373, 414 or 415. Professional preparation for clinical work in the area of communication disorders requires completion of a minimum of 45 credits of approved courses acceptable for a graduate degree.

Students who transfer to a major in speech after entrance to the University must present a cumulative grade-point average of 2.50 in all University courses unless otherwise authorized by the Department, and students majoring in speech are required to maintain a grade-point average of 2.50 in all speech courses.

Graduate Programs

Graduate Program Advisers

Thomas R. Nilsen

109 Parrington Hall

Phillip A. Yantis (Speech Pathology and Audiology)

1320 Northeast Campus Parkway

Students who intend to work toward an advanced degree in speech must meet the requirements of the Graduate School as outlined in the *Graduate Study* section and present a background of undergraduate study acceptable to the Department, as outlined in its Graduate Student Guide.

Students wishing admission to the program in speech pathology and audiology at the graduate level should request special information about entrance and degree requirements from the Graduate Program Adviser in that area.

The academic program at the master's level in both speech pathology and audiology has been accredited by the American Boards of Examiners in Speech Pathology and Audiology of the American Speech and Hearing Association.

Master of Arts

Thesis Program: Prospective candidates must complete at least 31 credits in approved courses including Speech 501 or 504 or equivalent. Concentration is permitted in any of the various subject matter areas listed above, with appropriate supporting work in closely related areas, both within and outside the Department. Students must submit an acceptable thesis (9 credits) and pass a comprehensive examination.

Nonthesis Program: Students must complete a minimum of 45 credits in approved courses including Speech 501 or 504 or equivalent and at least one seminar in the area of specialization. Ordinarily at least 10 credits should be in supporting courses from closely related areas. Although the student in this program is not required to write a thesis, he must show evidence of ability in independent study and research, and must pass a comprehensive examination. This program is designed primarily for students *not* planning to undertake a doctoral program.

Master of Speech Pathology and Audiology

This program leads to a professional degree, which is normally terminal. A minimum of 45 credits in approved courses must be completed. Each student's program is designed so that his combined undergraduate and graduate study will allow him to meet the academic and practicum requirements for certification by the American Speech and Hearing Association in his area of specialization. Satisfactory demonstration of clinical competence is required; a thesis and a foreign language are not required. The student must pass a comprehensive examination.

Doctor of Philosophy

Three major areas of concentration are available: (1) *rhetoric and public address*, including argumentation and discussion, oral interpretation, and speech education; (2) *communication sciences*, including such emphases as applied phonetics, voice physiology, speech communication theory, etc.; and (3) *speech pathology or audiology*, including hearing science. For the Ph.D., no precise number of credits is prescribed. However, the requirement of three years of full-time residence suggests a total of not less than 108 credits, of which approximately one-third should be devoted to the dissertation.

STATISTICS AND PROBABILITY

Courses in the mathematical theories of Statistics and Probability are offered at both the undergraduate and graduate level in the Department of Mathematics. There is an undergraduate program leading to the Bachelor of Science degree, with a Mathematical Statistics option. The graduate program leads to the degrees of Master of Science in Mathematical Statistics and to the Doctor of Philosophy. Descriptions of these programs and courses are listed under the Department of Mathematics.

A graduate program in biostatistics, leading to the degrees of Master of Science and Doctor of Philosophy, is administered by the Graduate School Biomathematics Group. Information concerning this program will be



found in the *Interdisciplinary Graduate Degree Programs* section of this catalog.

ZOOLOGY

Chairman

Donald S. Farner
142A Johnson Hall

Assistant Chairman

Richard C. Snyder
146 Johnson Hall

Professors

Ingrith J. Deyrup-Olsen, W. Thomas Edmondson, Donald S. Farner, Robert L. Fernald, Aubrey Gorbman, Paul L. Illg, Alan J. Kohn, Eugene N. Kozloff, Arthur W. Martin, Jr., Gordon H. Orians, Richard C. Snyder, Arthur H. Whiteley

Associate Professors

Robert D. Cahn, Richard A. Cloney, John S. Edwards, W. Mary Griffiths (acting), Kjell Johansen, Kenneth L. Osterud, Robert T. Paine, Dixy Lee Ray, Frank Richardson

Assistant Professors

William D. Ball, Joseph E. Cummins, John M. Palka, Dennis R. Paulson, A. O. Dennis Willows

Lecturer

Leonie K. Piternick

The Department of Zoology offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, Master of Science, and Doctor of Philosophy. Undergraduate students who wish to study for the baccalaureate degree are offered two curricula: an elective curriculum leading to the Bachelor of Arts degree for those who prefer a broad liberal arts education, and a prescribed curriculum, the Bachelor of Science program, for those who are preparing for graduate or professional study. Also available to those intending to pursue graduate study in certain phases of molecular, developmental, or cellular biology, or in genetics, is an interdepartmental curriculum leading to the Bachelor of Science degree in Biology. In conjunction with the departments of Botany, Genetics, and Microbiology, the Department of Zoology offers a major academic field in biology for students in the College of Education, as well as an academic minor in biology. See *College of Education* section in this catalog.

Undergraduate Programs

Advisory Office

140 Johnson Hall

Students who plan to take a degree in zoology should declare their major no later than the beginning of the

junior year. Students with an interest in biology are urged to seek advice in the departmental Advisory Office as early as possible. Applicants must present an approved selection of courses in the major with a grade-point average of not less than 2.00.

The following courses are given to meet the needs of other students and will not be accepted for major credit: Zoology 114, 118, and 119. Zoology 208 will ordinarily not be accepted for major credit.

GRADUATION REQUIREMENTS

Bachelor of Arts

Requirements for this degree include the general College requirements for the baccalaureate degree. The minimum requirement (50 credits) for the departmental major will include: Biology 210, 211, 212, (15 credits) *or* Zoology 111-112 and Botany 112 *or* 311 (total 15 credits), *or*, with special permission, Biology 101-102 (10 credits) and Genetics 351 *or* 451 (3 credits).

The required courses listed above are designed to introduce the student to the field of biology as a whole. In addition, a program of advanced courses is to be selected by the student in consultation with a departmental adviser. This selection permits some degree of specialization in fields of particular interest to the student. Further, to provide breadth of training in biology, the total program should include experience with the major areas and approaches: cellular, developmental, morphological, physiological, ecological, and evolutionary biology.

Electives to complete the 50 credits required for the major are to be chosen from upper-division courses in zoology, biology, botany, microbiology, genetics, biochemistry, oceanography, and other biological departments; acceptable courses in these areas are listed under the Bachelor of Science requirements below. Note that courses other than those listed, if appropriate to an individual student's program, may be accepted by special permission. A minimum of 15 credits must be chosen from those listed as biology or zoology. In 100- and 200-level courses in biology, botany, and zoology, a maximum of 20 credits will be acceptable toward the major. Additional requirements: Mathematics 105; organic chemistry: a sequence through Chemistry 337 is preferable and is necessary for completion of Biology 210, 211, 212. Alternatively, chemistry through 102 or through 232 would meet the requirement.

Bachelor of Science

The requirements for this degree include the general College requirements for the baccalaureate degree. The minimum credit requirement (50 credits) for the departmental major will include:

BIOLOGY 210, 211, 212	15
or a student may be allowed to enter the major program by offering instead	
ZOOLOGY 111-112, AND BOTANY 112 OR 311	15
or, with special permission, a student may offer	
BIOLOGY 101-102	10
GENETICS 351 or 451	3
BIOLOGY 472	3
ZOOLOGY 301, PLUS AN APPROVED 400-LEVEL CELL BIOLOGY OR PHYSIOLOGY COURSE, THE TOTAL REPRESENTING A MINIMUM OF 8 CREDITS, INCLUDING 2 CREDITS OF LABORATORY	8
ZOOLOGY 433, 434, OR 453-454	10
ZOOLOGY 456	5

Electives are to be chosen from upper-division courses in zoology, biology, biochemistry, or genetics, or approved courses in other biological departments, to total a minimum of 50 credits in the major field. Approved courses will include: Physical Anthropology 201, 482, 484, 485; Biomedical History 419; Geological Sciences 330, 436, 437; Microbiology 400, 430; Oceanography 433 or 434, 435; Psychology 421. Other courses appropriate to an individual student's program may be accepted by special permission.

Additional requirements: general chemistry and organic chemistry through Chemistry 337, including prerequisites; a one-year course in general physics, with laboratory optional; Mathematics 124, 125, and either 126 or Quantitative Science 281. In 100- and 200-level courses in biology, botany, and zoology a maximum of 20 credits will be acceptable for the major.

The 50 credits in the major field and the additional requirements will total more than 90 credits, so that for some students who find it necessary to offer a full 90 credits to meet college proficiency and distribution requirements, the program for the Bachelor of Science degree will require a total of more than 180 credits for graduation.

Recommendations: Students planning graduate work in a biological field should take note that proficiency in a foreign language is required for an advanced degree and in some programs two languages must be offered. The languages most frequently used in advanced biological fields are French, Italian, German, and Russian. The student should consult early with an adviser for information on the language useful for his particular area of interest.

If the intended graduate program is to be directed toward molecular or cellular biology or some phases of developmental biology and physiology, basic course work in biochemistry and/or physical chemistry may be advisable. Some phases of population biology, ecology, and other disciplines require further training in statistics, as offered in Quantitative Science 382, 383.

In any event, a student planning to do graduate work should seek the advice of faculty members who are best acquainted with his areas of interest.

Honors in Zoology

Advisers

Robert D. Cahn
227 Johnson Hall
Alan J. Kohn
113 Johnson Hall

Members of the College of Arts and Sciences Honors Program who fulfill the requirements of that program during the freshman and sophomore years in addition to the departmental honors requirements receive a bachelor's degree "With College Honors in Zoology."

With the approval of the departmental honors committee, superior students who are not members of the College Honors Program may participate in the departmental honors curriculum and receive a bachelor's degree "With Distinction in Zoology." Students whose records merit such recognition will be selected at the end of their junior year and will complete their programs by fulfilling the requirements described in the next paragraph. It is recommended that students who desire admission to the "Distinction" program, take some honors credits during their junior year and present their records in these courses as part of their application for admission to the "Distinction" program.

Candidates for a Bachelor of Arts or Bachelor of Science degree with "Honors" or with "Distinction" will fulfill the departmental requirements by completing a minimum of 20 credits in upper-division zoology honors courses and honors courses in related biological science subjects. Honors credit for courses taken outside the Department of Zoology which are to be counted towards this requirement must be approved by the Honors Committee. Most courses in the Department of Zoology may be taken for honors credit, which will mean an opportunity for in-depth analysis by means of the preparation and presentation of special papers by the honors students at one or more informal seminars in addition to the regular course meetings. The format of the honors sections of a course will vary, but many will include an honors laboratory section. It is recommended that students interested in the "Distinction" program register in honors sections in Biology 210, 211, 212.

In addition to the 20 credits of upper-division (300- and 400-level) courses, graduation with "Honors" or with "Distinction" requires that the student have at least 3 credits in the honors section of Zoology 490, the departmental honors seminar. Its subject matter varies from quarter to quarter, and in so doing provides an opportunity for in-depth coverage of a selected area of biology which will allow integration of the various levels of biological organization. The honors section of



Zoology 490 is recommended for seniors, but may be taken under special arrangements with the professor in the junior year. It is strongly recommended that each honors or distinction student take 3 credits of Zoology 498 with a professor or professors of his choice to further acquaint him with the type of library and laboratory research involved in a career in the biological sciences. The honors section of Zoology 491, a seminar on research problems under investigation by department faculty members, is also recommended.

An overall grade-point average of 3.00 or higher must be maintained by all candidates for an honors degree or a degree with distinction.

Graduate Programs

Graduate Program Adviser

John S. Edwards

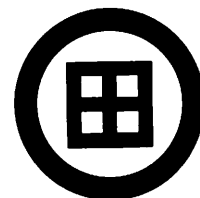
5 Thomas Burke Memorial Washington State Museum

The Department of Zoology offers courses of study leading to the degrees of Master of Science and Doctor

of Philosophy. Students seeking an advanced degree must meet the admission requirements of the Graduate School and, in addition, be accepted by the Department. A choice of supervisor need not be made immediately, but should not ordinarily be delayed into the second year of graduate work. A program of course work for each student will be developed under the direction of the Graduate Program Adviser, or his supervisor and a faculty committee.

Students are required to complete satisfactorily, at the beginning of the second year of residence, a written departmental examination covering four basic fields from the following list: physiology, cell biology and gene action, ecology and evolution, development, vertebrate biology, and invertebrate biology.

A departmental brochure, available on request, furnishes a detailed account of the requirements and procedures involved in the programs for advanced degrees.



BUSINESS ADMINISTRATION

Dean

Kermit O. Hanson
115 Mackenzie Hall

Associate Deans

Virgil E. Harder, Borje O. Saxberg

DEPARTMENT OF ACCOUNTING**Chairman**

Gerhard G. Mueller

Professors

Kenneth B. Berg, David H. Li, Arthur N. Lorig (emeritus), Fred J. Mueller, Gerhard G. Mueller, Julius A. Roller, Lauren M. Walker

Associate Professors

William J. Bruns, Jr., Don T. DeCoster, Loyd C. Heath, Daniel L. McDonald, W. Thomas Porter, Jr., George I. Prater, Eldon L. Schafer (visiting)

Assistant Professors

William L. Felix, Jr., Alvin Martin, John G. Rhode

Lecturers

Evelyn T. Borgersen, Frank H. Hamack (emeritus), Fletcher O. Johnson (emeritus), Robert M. Simpson

**DEPARTMENT OF FINANCE, BUSINESS ECONOMICS,
AND QUANTITATIVE METHODS****Chairman**

Stephen H. Archer

Professors

Stephen H. Archer, Philip J. Bourque, John S. Y. Chiu, Kermit O. Hanson (Dean), Charles N. Henning, Dudley W. Johnson, Robert H. Scott

Associate Professors

William Alberts, Charles A. D'Ambrosio, Peter A. Frost, Alfred N. Page, William Pigott

Assistant Professors

Philip R. P. Coelho (visiting), Hans G. Daellenbach, George Diehr, Moheb Amin Ghali (visiting), Charles W. Haley, Alan C. Hess, Robert C. Higgins, Potluri Rao (visiting), Lawrence D. Schall, Hirokuni Tamura

**DEPARTMENT OF BUSINESS, GOVERNMENT,
AND SOCIETY****Chairman**

Sumner Marcus

Professors

S. Darden Brown (emeritus), Joseph Demmery (emeritus), Leonard D. Goldberg, Jack Lessinger, Sumner Marcus, R. Joseph Monsen, Dwight E. Robinson, Warren R. Seyfried, Bayard O. Wheeler

Associate Professors

Lewis L. Langness, Dennis F. Strong, James A. Wickman

Assistant Professors

Philip L. Graham, Jr., David K. Hart, Donald J. Hermann

Lecturers

Ronald B. Jamieson, Maelissa Watson-Elmer

**DEPARTMENT OF MARKETING, TRANSPORTATION,
AND INTERNATIONAL BUSINESS****Chairman**

Guy G. Gordon

**Professors**

Stanley H. Brewer, Henry A. Burd (emeritus), Lowell J. Chawner (emeritus), Nathanael H. Engle (emeritus), Warren W. Etcheson, Guy G. Gordon, Virgil E. Harder, Endel J. Kolde, Wallace I. Little, Charles J. Miller, Charles E. Peck, Louis C. Wagner

Associate Professors

Frederick L. Denman, Harrison L. Grathwohl, Robert W. Little, Herta A. Murphy, John C. Narver, John J. Wheatley

Assistant Professors

Robert P. Brody, Reza Moinpour, Wilhelm Niederreiter, Sadaomi Oshikawa, Homer E. Spence, Frederick J. Truitt

Lecturer

Manuel S. Rustia

DEPARTMENT OF MANAGEMENT AND ORGANIZATION**Chairman**

James Rosenzweig

Professors

Theodore J. Barnowe, Edward G. Brown, Robert Dalgleish (visiting), Wendell L. French, Dale A. Henning, Richard A. Johnson, Fremont E. Kast, Harry R. Knudson, Jr., Preston P. LeBreton, Robert C. Meier, William T. Newell, James Rosenzweig, Borje O. Saxberg, Albert N. Schreiber, William G. Scott, Charles E. Sumner, Robert A. Sutermeister

Associate Professors

Vernon E. Buck, Margaret P. Fenn, Henry P. Knowles, John D. Senger (visiting), Roger C. Vergin, Karl H. Vesper, Robert T. Woodworth

Assistant Professors

Cecil H. Bell, Jr., Ronald T. Ebert, James S. Garrison, Terence R. Mitchell, Richard B. Peterson, DeWayne J. Piehl

Lecturer

Robert T. Patton

Anyone who embarks upon a career in business today faces a challenging assignment. He is involving himself in an area of human activity—the world of business—which is vital to continued economic progress and which is at the center of many of the social, political, and economic forces that are presently abroad in the world.

The School of Business Administration offers an undergraduate program leading to the Bachelor of Arts degree in Business Administration. The Graduate School of Business Administration offers programs leading to the following degrees: Master of Business Administration, Master of Arts, and Doctor of Business Administration. The Graduate School of Business Administration

also offers continuing education programs for executives, and cooperates with other colleges and departments in a program leading to the degree of Master of Urban Planning.

Undergraduate students entering the University of Washington as freshmen spend their first two years in the College of Arts and Sciences. Students transferring from community colleges or other schools are enrolled either in the College of Arts and Sciences or directly in the School of Business Administration, depending upon the number and types of credits completed at the time of transfer. Graduate students who are accepted by the Graduate School of Business Administration and the University Graduate School enter the appropriate program directly.

The baccalaureate program concentrates upon instilling values, sharpening problem-solving abilities, and increasing competence of thought about one of man's most important activities—business—and about the society within which it operates. Upon graduation, most students pursue careers in business, usually at the administrative and managerial levels; in addition, a considerable number continue their studies in graduate schools in such fields as business administration or law. The M.B.A. program provides an understanding of the tools, techniques, and applications of management systems and preparation for professional manager careers. The D.B.A. program is oriented toward theory and research in order to serve students planning careers as university professors or research staff specialists.

Business Administration became an independent unit within the University of Washington system in 1917. Since 1921, it has been a member of the American Association of Collegiate Schools of Business, with both its undergraduate and graduate programs certified. Senior faculty number about one hundred twenty members. Approximately thirteen hundred students (juniors and seniors) are enrolled in the undergraduate (B.A.) degree program; more than five hundred students are enrolled in the graduate (M.B.A., M.A., and D.B.A.) programs. Faculty, library, and other resources are organized to serve the varied objectives of the School and Graduate School of Business Administration.

Facilities and Services

Two buildings, Balmer Hall and Mackenzie Hall, serve as centers for most Business Administration activities.

Balmer Hall, named after Thomas Balmer, former President of the University of Washington Board of Regents, contains a large number of lecture and seminar rooms and the Business Administration Library.

Mackenzie Hall, named in memory of Professor Donald Mackenzie, chairman of the Department of Accounting, Finance, and Business Statistics from 1949 to 1955, is the School's administrative and faculty center. It contains the Dean's Office, the Office of Graduate Programs, the Office of Undergraduate Programs, the Office of Faculty Publications, and the Faculty Research offices, as well as faculty conference rooms and individual faculty offices.

The *Business Administration Library*, which occupies the first floor of Balmer Hall, has an outstanding collection of general and specialized materials on all phases of business, including books, magazines, periodicals, pamphlets, government publications, annual reports, indexes, bibliographies, and loose-leaf services. These sources, and the Library's reserve and reference service, supply the basic class and seminar needs of the students. Supplementary and additional primary research material are available in the University's main library and other specialized branch libraries located on the campus.

The *University of Washington Business Review* is a journal published quarterly by the Graduate School of Business Administration. The magazine serves as a means of disseminating information of wide interest to students of business, to the business community, and to other universities. Articles present significant results of business research; describe and evaluate trends and techniques in business administration and the business environment; and (in some cases) present regional business analyses. The magazine is distributed on a paid subscription basis to the public and on an exchange basis to bureaus of business research and libraries of other universities. Current subscription rates are \$4.00 for one year, \$10.00 for three years.

The *Journal of Financial and Quantitative Analysis* is published jointly with the Western Finance Association. It is issued in March, June, September, and December.

The Graduate School of Business Administration also publishes monographs of general interest to the business community or of a scholarly nature. Currently, five series of monographs are being published: (1) the Business Studies Series, for studies of general interest; (2) the Management Series, for studies related to business management theories, practices, and procedures; (3) the International Business Series, for studies of international business, including business in foreign countries; (4) the Technical Reports Series for special technical studies, usually quantitative or related to computer applications; and (5) Occasional Papers, for shorter or special studies, sometimes in preliminary form. In addition to the regular series of publications, special studies (often financed by research grants) are published

when they appear to be of general interest and to make a scholarly contribution to the study of business.

Honorary Societies and Professional Clubs

The clubs and fraternal organizations in the School are organized to further interest and promote higher standards in the various phases of business administration by acquainting members with their fellow students, the faculty, and with local business leaders.

Undergraduate Organizations

The purpose of the *Accounting Club* is to promote and encourage professional and social contact among students, instructors, and practicing accountants. Semi-monthly meetings are held in which career objectives and topics of current interest in accounting are discussed. Membership is open to all students interested in accounting.

Alpha Kappa Psi is a national commerce fraternity. Rho Chapter, at the University, is open to first-quarter sophomore business administration students who have an overall grade-point average of 2.50 or better.

Beta Alpha Psi is an active national accounting fraternity dedicated to furthering the professional aspects of its membership and profession. Delta Chapter is composed of accounting majors with a minimum of 20 credits in accounting and a cumulative grade-point average of 3.00 in accounting and 2.50 in all subjects. Membership is limited to students who successfully pass a five-hour examination covering accounting law, theory, and problems.

Beta Gamma Sigma, national honorary fraternity, is made up of men and women with high scholarship and outstanding character in schools of commerce and business administration. Seniors with an overall grade-point average of 3.30 and juniors with an overall grade-point average of 3.50 are eligible for membership in Washington's Alpha Chapter.

The *Finance Club* is organized to promote interest and knowledge in the several fields of finance, including banking, business finance, investments, and international finance. Membership is open to all interested students who are regularly enrolled.

The *International Association of Students in Economics and Commerce* (AIESEC) is an organization of students with interests in foreign exchange traineeships. It is open to all interested students.

Marketing Club, affiliated with the American Marketing Association, is open to all students interested in marketing.

Pan Xenia, a professional international foreign trade fraternity, is open to men with a satisfactory rating,



majoring in international business, political science, economics, or any international field.

Graduate Organizations

The D.B.A. Association provides a forum for regular contact between doctoral students and members of the faculty and administration. Various social functions are held for members throughout the year.

The M.B.A. Association and its Council form the focal point for the social and professional activities of the master's degree students. Faculty as well as members of the business community are involved in its activities.

Career Planning and Placement

Each year several hundred organizations from business, government, and education contact the University to interview applicants for a great variety of positions.

The Business and Government Placement Office, the nontechnical division of the University's Career Planning and Placement Office, is located in 301 Loew Hall. It provides information and assistance to graduating students and alumni of the School and Graduate School of Business Administration seeking full-time career employment. In addition to scheduling campus interviews each year, the office performs employment office service on an individual basis, currently listing around 500 positions a year. Company brochures and general career information are provided for students and alumni seeking full-time employment. Students and alumni are invited to visit this office for vocational and employment information.

Part-time and temporary work off campus in fields other than business administration may be obtained through the Student Employment Office, 1416 N.E. 41st Street. Applications are accepted from students or graduates of the University and from the wives or husbands of University students. Application must be made in person after residence in Seattle has been established.

Placement in jobs on the campus is handled by the Department of Personnel Services, 4014 University Way N.E., and the ASUW Personnel Office, in the Student Union Building.

UNDERGRADUATE PROGRAMS

Associate Dean

Virgil E. Harder
139-140 Mackenzie Hall

Undergraduate Office

137 Mackenzie Hall

The School of Business Administration, with admission at the junior level, offers a two-year program leading to

the Bachelor of Arts degree. The curriculum, building upon a basic foundation in the arts and sciences, provides exposure to a wide range of functional business areas and the opportunity to study a selected area (major) in some depth.

Students planning to study Business Administration at the University should emphasize college preparatory courses while in high school. A good foundation in mathematics is strongly recommended, since proficiency at the introductory calculus level is necessary for certain Business Administration courses.

Admission

Admission requirements include completion of 90 quarter credits, attainment of at least a 2.00 cumulative grade-point average, and completion of the following courses or their equivalents:

	CREDITS
Mathematics 105, 157	9
Economics 200, 201	10
Behavioral Sciences (psychology, sociology, and anthropology)	10
A balanced program composed of additional credits in the humanities, social sciences, and the natural sciences	42
Accounting 210, 220, 230	9
Business, Government, and Society 200	5
Quantitative Methods 200, 201	5
Total	90

Students who enter the University directly from high school are placed in the College of Arts and Sciences as pre-business majors until they fulfill the admission requirements. Students who transfer to the University from community or other four-year colleges must first apply to the University of Washington Office of Admissions, 2 Administration Building, Seattle, Washington 98105. Those who meet the University and Business Administration admission requirements at the time of transfer are placed directly in the School; those who meet the University entrance requirements but do not meet the Business Administration requirements are placed in the College of Arts and Sciences as pre-business majors.

Academic Counseling

After notification of admission, and before registration, students should visit or write to the School for assistance in planning their course programs. Pre-business students (enrolled in the College of Arts and Sciences) normally are advised in their quarterly programming by pre-business advisers located in B10 Padelford Hall. Junior and senior students enrolled in the School of Business Administration are served by full-time Cur-

riculum Advisers located in 137 Mackenzie Hall. These latter advisers are also available to serve students in other areas of the University who desire more information regarding courses and programs in the School of Business Administration.

The Curriculum Advisers' primary role is to help students achieve their academic goals via assistance in preparing programs of studies, registering for classes, and finding solutions to academic questions or problems which may arise. Selection of a major, choice of courses, and fulfillment of degree requirements are the responsibility of the student, and involve important decisions.

Scholarships

Most Business Administration undergraduate scholarships are awarded on the basis of high scholarship and/or financial need.

Additional information is available at the Office of Financial Aids, 3939 University Way N.E., Seattle, Washington 98105; telephone (206) 543-6101; and at the University of Washington School of Business Administration, Office of Undergraduate Programs, 137 Mackenzie Hall, Seattle, Washington 98105; telephone (206) 543-4350.

Graduation Requirements

Bachelor of Arts in Business Administration

Eligibility for the Bachelor of Arts degree in Business Administration requires that students (1) meet the general requirements of the University, including a total of 180 credits with a cumulative grade-point average of 2.00; (2) earn a cumulative grade-point average of at least 2.00 in all business administration courses taken at the University of Washington, and all University of Washington courses taken in the major(s); (3) complete a total of at least 72 credits in business administration courses and 72 credits in nonbusiness administration courses, of which no more than 18 credits in advanced ROTC subjects may be applied toward graduation; and (4) complete the Business Administration Core.

Business Administration Core		CREDITS
B ECN 300	MANAGERIAL ECONOMICS	3
B ECN 301	MONEY, NATIONAL INCOME, AND PRICES	4
MKTG 301	MARKETING CONCEPTS	4
O MGT 301	PRINCIPLES OF OPERATIONS MANAGEMENT	3
PERS 301	INDUSTRIAL RELATIONS (3)	
or		
A ORG 460	HUMAN RELATIONS IN BUSINESS AND INDUSTRY (4)	3 or 4
FIN 350	BUSINESS FINANCE	4
A ORG 440	ORGANIZATION THEORY	3
B G & S 444	BUSINESS AND SOCIETY	4
B POL 470	BUSINESS POLICY (4)	
or		
B POL 480	BUSINESS SIMULATION (5)	4 or 5
		32-34
MAJOR REQUIREMENTS AND ELECTIVES		58-56
		90

Major Requirements

For courses see major requirements under each Departmental Program section.

Electives

Electives must bring total credits to 180, and non-business administration credits to a minimum of 72. Physical Education Activity courses are in addition to the 180 total credit requirement and the 72 non-business administration credits.

Double Degrees

Students in other schools and colleges of the University who wish simultaneously to receive a degree from the School of Business Administration must receive approval from the Dean of the School of Business Administration at least three quarters before completing the requirements for the degree from this School.

Final Year Residence Requirement

Students transferring into the School of Business Administration with 135 or more earned credits will be required to accumulate a minimum of 45 additional credits in residence. Any exceptions to the residence requirement must be approved by the Dean.

Business Education

Students preparing to teach business subjects at the secondary level will normally enroll in the College of Education, major in business education, and graduate with the bachelor's degree. (See *College of Education* section.)

Major Areas of Study

Students in both undergraduate and graduate programs in business administration concentrate their study or elect to major in one of the areas of study described briefly in the paragraphs which follow.

In addition to these major areas of study, courses also are offered in business communications, business economics, administrative theory and organizational behavior, business policy, and risk and insurance.

Accounting

The Accounting curriculum provides a rigorous educational experience centered on developing and communicating financial and operational information for business and nonprofit economic entities. The curriculum provides foundations for careers in accounting (public accounting, industrial or private accounting, governmental and institutional accounting) or for a general business career, as well as for certain other professions, such as law.

The requirements for a major are: Accounting 301, 302, 303, 311, 411, 421, and 5 elective credits in 400-



level accounting courses (except 475 and 499). Total credits required: 25.

Business, Government, and Society (formerly General Business)

Business, Government, and Society is an interdisciplinary program that joins history, law, and the behavioral sciences in a study of the institutional and ideological environment of American business. The curriculum is designed to enable students to understand the interaction between business and other elements of society, and thereby to deal effectively with current issues.

To fulfill major requirements, students must select courses from at least three fields of business administration, totaling a minimum of 18 credits, including two courses numbered 400 or above, and not more than two courses in any one field. Business, Government, and Society 499 is the only 499 course acceptable.

Finance

The objective of the Finance curriculum is an understanding of the role of finance in the decision structure of the firm. This includes an understanding of the environment of the financial manager; the money and capital markets of the economy; the problems and decision structure for the allocation of capital within the firm; and understanding of the view of the suppliers of capital and a sound grasp of some of the tools useful in financial analysis (accounting and business economics). Students who major in finance may be interested in careers in financial institutions, in financial management (treasurers, controllers, financial administrators, capital project evaluators), and in investment management. The requirements for a major are: Finance 420, 450 (or 453), 460; Accounting 375 (Topics in Financial Reporting); plus 4 credits from Finance 423, 427, 453 (or 450), 461, and 499.

International Business

International business—including trade, payments, and multinational corporate systems and activities—has become a major force in the contemporary world. The curriculum prepares students for international responsibilities in business firms, governmental agencies, and other international organizations. The requirements for the major are: International Business 310; two courses from 320, 370, and 420; plus 470. Courses in foreign languages or literature are recommended.

Marketing

Sound decisions in the areas of consumer behavior, channels of distribution, determination and measurement of markets, pricing, physical movement of goods, product development and mix, promotions, and sales administration are fundamental to business success. Such decisions should be based on a knowledge of marketing concepts and relationships, planning and control, tools, principles, and policies. The curriculum prepares students to enter industrial marketing organizations, manufacturing and wholesaling institutions, retail stores, advertising, and research and government agencies. Requirements for the major are: Marketing 421, 491, plus any three of these courses: Marketing 341, 361 or 381, 401, 411, 415, 430, Transportation 372, or International Business 420.

Operations Management

This curriculum is concerned with management of operating systems in private and public enterprises. It includes study of managerial decision processes, design of system structure, determination of system effectiveness, and analysis of dynamics of system behavior. Modern techniques of analysis are employed, including construction of quantitative models for planning and control. Extensive consideration is given to the role of electronic computers in model building, system simulation, optimization methods, and information technology. The student may choose an operations management—operations research oriented program, an operations management—administrative organization oriented program, or a combination of courses selected to meet individual needs. The requirements for the major are 9 credits from Group A, 6 credits from Group B, plus 3 additional credits from either Group.

Group A: Operations Management 441, 442, 443, 460

Group B: Administrative Theory and Organizational Behavior 441, 460 (if not used to satisfy the core requirement), 463; Business Policy 470, 471, 480 (whichever course is not used to satisfy the core requirement); Quantitative Methods 404, 424, 444, 450, 451; Personnel 301 (if not used to satisfy the core requirement); Accounting 311, 430

Personnel and Industrial Relations

This curriculum deals with the human resources of organizations. The field includes consideration of topics such as employee selection, motivation, appraisal, compensation, development, and union-management relations. Using an interdisciplinary approach, the empha-

sis is on the design, administration, and evaluation of human resource systems in various organizational environments. Problems of measurement systems are given special consideration. Emphasis is also given to the impact of societal problems on human resource management.

Requirements for the major are: Personnel and Industrial Relations 301, or Administrative Theory and Organizational Behavior 460 (whichever course is not used to satisfy the core requirement), Personnel and Industrial Relations 445, 446, and 450; plus two courses selected from any *one* of the following specific course groups:

(A) Administrative Theory and Organizational Behavior 301 (4), 441 (3), 461 (5), 463 (4)

(B) Economics (of labor) 340 (5), 441 (5), 442 (5), 443 (5)

(C) Psychology 345 (5), 361 (5), 430 (5), 445 (5), 446 (3)

(D) Sociology 415 (5), 440 (5), 448 (5), 466 (5), 468 (5)

(E) Anthropology 425 (3), 429 (5), 441 (5)

Quantitative Methods

The Quantitative Methods curriculum provides education in the use of mathematical and statistical tools in the analysis of administrative problems and decision making. The purpose of the courses is to familiarize students with analytical methods useful in administrative decisions and to prepare students as staff specialists for government and business organizations or other important roles in organization requiring such technical familiarity. Courses required for all undergraduate students provide (1) a foundation of mathematics and probability with which to operate the specialized tools developed, and (2) analytical and statistical techniques to improve business decision making. Among subjects taught are classical statistical inference, regression and correlation, analysis of variance, survey sampling, time series analysis, operations research methods, and computer logic and analysis. The requirements for a major are: Quantitative Methods 350, 360, 450, one of 460, 470, or 480 plus 8 elective credits from 404, 424, 444, 451, 460, 470, 480, 490, and 499.

Transportation

The transportation industry and the services it performs are indispensable to our dynamic economy. New developments in physical distribution management are

revolutionizing long-established business practices. This curriculum is designed for students who plan careers in, or wish a working knowledge of, the many phases of the transportation industry. The requirements for a major are: Transportation 310, 372, 440, 471, and either 481 or 491.

Urban Development

The educational objective of Urban Development is the understanding and utilization of economic, social, and technological forces that affect the physical facilities and social institutions of cities. This area emphasizes systematic and scientific methods in the analysis of allocation, use, and development of urban land resources. Courses include urban land economics, methods and models of locational analysis, investment and financial analysis of residential, commercial, and industrial development, and public policy of urban development, including questions of taxation, housing, land-use controls, and urban renewal. Major requirements include: Urban Development 310, 320, 395, 405, 496, and related courses to be selected.

GRADUATE PROGRAMS

Associate Dean and Graduate Program Adviser
Borje O. Saxberg
109 Mackenzie Hall

Admission

Students wishing to work toward advanced degrees in business administration must first file an application for admission to the University of Washington Graduate School. The application is evaluated in the Graduate Admissions Office and it is then forwarded to the Graduate School of Business Administration for review. Admission must be approved by both the Graduate School of Business Administration and the University Graduate School.

Applicants also must submit their scores on the Admission Test for Graduate Study in Business. Inquiries concerning this test should be addressed to the Educational Testing Service, Box 966, Princeton, New Jersey 08540. Arrangements should be made for this examination well in advance of the quarter in which the student desires to enter.

Programs of Study

The Graduate School of Business Administration offers courses leading to the degrees of Master of Business Administration, Master of Arts, and Doctor of Business



Administration. Graduate training is given in these areas of concentration:

- Accounting
- Administrative Theory and Organizational Behavior
- Business Economics
- Business, Government, and Society
- Finance
- International Business
- Marketing
- Operations Management
- Personnel and Industrial Relations
- Quantitative Methods
- Transportation
- Urban Development

The above areas shall not be held to exclude others that may be appropriate in special instances. There is no foreign language requirement for the M.B.A. and D.B.A. degrees.

Two options are offered in the master's degree programs—the Master of Business Administration (M.B.A.) and the Master of Arts (M.A.) in the business field.

Properly qualified students who are graduates of the University of Washington or of other colleges or universities of recognized rank may be admitted to the master's degree programs. Ordinarily, the applicant should have at least a B or 3.00 grade-point average for courses taken during the junior and senior years of his undergraduate study.

All applicants must submit a score on the Admission Test for Graduate Study in Business. Students who do not meet the grade-point requirements may be recommended for admission if they can be properly accommodated, have achieved a high score on the Admission Test for Graduate Study in Business, and/or submit letters of recommendation or other evidence that they could succeed in graduate study.

Up to 9 graduate credits taken while a graduate student in the graduate school of another accredited institution may be accepted toward a master's degree. All work for a master's degree (including transfer credits) must be completed within six years.

Master of Business Administration

The M.B.A. program is designed for students who are preparing for professional careers in business management. The broad objective is to help the student develop the analytical tools and understanding of business administration that will be of continuing value throughout his career.

The program has been designed for students who hold bachelor's degrees in business administration and also for students who hold bachelor's degrees in arts and sciences, engineering, or other areas of study. Students with adequate preparation in business administration and economics may complete the program in a minimum of four quarters (one calendar year). A period of two academic years (six quarters) is required for students who have had no undergraduate courses in business administration; this period may be reduced for students with some undergraduate work in business.

The program consists of Core I courses for students who do not have bachelor's degrees in business, Core II courses for all students, a concentration area of study, and a substantial number of elective credits. These requirements are set forth in more detail below:

Core I	CREDITS
Acct 500	Managerial Accounting 5
A Org 500	Human Relations—Organizational Behavior 3
B Ecn 500	Business Economics I 4
B Ecn 501	Business Economics II 3
Fin 502	Financial Management 3
Mktg 500	Marketing Management 4
O Mgt 500	Operations Management 3
Q Meth 500	Business Statistics (prerequisites, calculus, computer programming) 3
Total Core I Credits 28	

Core II	
Acct 592	Seminar in Administrative Controls 3
A Org 550	Organization and Management 3
B G & S 510	Business and Public Policy 3
B Pol 593	Policy Determination & Administration 3
Q Meth 510	Quantitative Methods 3
Research 571-572	Research Reports 6

Area of Concentration

Selected from any of the areas of graduate study. If the area selected is represented in Core II, credits earned therein are included in the total credits for the area 6-12

Electives

Limited to a maximum of 6 credits in any area other than the area of concentration 18-12

Total Advanced Credits 45*

Total Credits for Two-Year Program

(A minimum of 36 credits must be earned in courses numbered above 502.) 73

Admission to the M.B.A. program is usually for Summer and Autumn Quarters only. Those entering students who have not previously satisfied Core I requirements should plan to commence their programs during Autumn Quarter.

Master of Arts

The M.A. program is designed for students who desire greater specialization than is possible under the M.B.A. program. Usually admission is by way of the M.B.A. program. A transfer to the M.A. program can be accomplished under the sponsorship of a faculty member endorsing the planned M.A. program of a student whose special talents and needs warrant it. Students electing the M.A. program usually have an objective other than preparation for a career as a professional manager; some are interested in becoming technical business specialists, some are interested in research careers, and others are interested in teaching careers in a limited subject area.

Students who lack undergraduate preparation in business administration normally will be required to complete the Core I courses in the M.B.A. program. All students in the M.A. program must complete a minimum of 45 credits including thesis credits, beyond Core I courses. A minimum of 15 credits, exclusive of the 9 credits for thesis must be earned in the major field. A minor may be taken in the Graduate School of Business Administration or elsewhere; a minimum of 9 credits is required in the minor field. If the minor is elected outside the Graduate School of Business Administration, requirements of the department offering the minor must be met.

A minimum of 18 credits exclusive of thesis must be earned in courses numbered above 502. Remaining course credits may be in approved upper-division courses.

The student also is required to have a reading knowledge of an acceptable foreign language, as determined by examination.

Minor in Business Administration

Students working for a master's degree in other colleges who elect a minor in the Graduate School of Business Administration must have as a background 15 credits in acceptable courses in business administration. The student must earn a minimum of 15 credits in approved upper-division and graduate courses in one field of business administration.

Doctor of Business Administration

A requirement for consideration for admission to the Doctor of Business Administration program is a grade-point average of at least 3.25 during the preceding year

of graduate study and submission of a score for the Admission Test for Graduate Study in Business. Usually an applicant is expected to have completed a master's degree prior to study toward the D.B.A. degree. Applications for admission to the D.B.A. program must be accompanied by three letters of recommendation, at least two of which must come from former instructors.

Requirements of study: The D.B.A. program is designed to further advanced study in business administration for persons preparing for careers in teaching, research, business, and government; since the inception of the program, the majority of D.B.A. graduates have entered university teaching careers. Students who complete this program are expected to possess the professional administrative competency that is the objective of the M.B.A. program, and are required to demonstrate academic competence in four areas of study, at least three of which normally are in the Graduate School of Business Administration. In addition, the student must show evidence of competency in business research, computer technology, and a knowledge of economics and mathematics pertinent to his area. Thus, the objective of the D.B.A. program is to provide subject area specializations that will enable a graduate to participate actively in advancing the frontiers of knowledge both in teaching and research in his primary areas.

The residence requirement for the doctor's degree is three academic years, two of which must be at the University of Washington. Since one of the two years must be spent in continuous full-time residence (three out of four consecutive quarters), the residence requirement for the doctor's degree cannot be met solely with summer study. All work for the D.B.A. degree must be completed within ten years. (This includes applicable work that may be transferred from other institutions.) There is no foreign language requirement for the D.B.A. degree.

Admission to Candidacy: At the end of the student's two years of graduate study, as approved by his Supervisory Committee, the chairman of the committee may present to the Dean of the Graduate School for approval an application to take the General Examinations for admission to candidacy. The General Examinations consist of written and oral parts in all of the prospective candidate's areas. Written examinations are scheduled by the D.B.A. Faculty Program Committee through the Graduate Programs Office; students may sit for all written examinations in a single quarter, or they may

*Only 45 credits are required for students for whom Core I requirements have been waived. Waiver for specific course requirements in Core I also may be granted to students who have completed equivalent courses. Credits earned in Core I courses may not be applied toward satisfaction of the minimum 45 credit requirement.

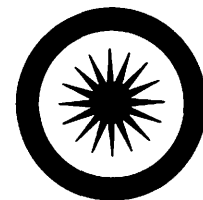


sit for individual area examinations as scheduled during three consecutive academic quarters. The oral examination is taken after all written examinations have been passed.

No student is regarded by the Graduate School as a Candidate for the doctor's degree until after the report certifying the successful completion of the General Examinations has been filed with the Graduate School Office by the chairman of his Supervisory Committee. After his admission to candidacy, the student ordinarily devotes his time to the completion of his research work to be embodied in the dissertation and to preparation for his Final Examination.

Dissertation and Final Examination: The Candidate's dissertation must represent original and independent investigation. It should reflect not only his mastery of research techniques but also his ability to select an important problem for investigation and to deal with it competently. Instructions for the preparation of the dissertation in acceptable form may be obtained at the Graduate School Office.

The Final Examination is oral and will normally be taken not less than two quarters after the General Examination. It is primarily on the dissertation and its field, and will not be given until after the dissertation has been accepted.



EDUCATION

Dean

Frederic T. Giles
210 Miller Hall

Associate Dean

Roger G. Olstad
210 Miller Hall

Assistant Dean

Homer Boroughs, Jr.
200 Miller Hall

Professors

Phillip Bacon, Athol R. Bailey, Dale L. Bolton, Homer Boroughs, Jr., Lawrence M. Brammer, J. Robert Briggs, Henry R. Fea, Clifford D. Foster, Maurice F. Freehill, Frederic T. Giles, Norris G. Haring, Alice H. Hayden, John Jarolimek, Jack Kittell, Arthur A. Lumsdaine, Francis F. Powers, Rufus C. Salyer, Gilbert Sax, George D. Strayer, Jr., Gerald M. Torkelson

Associate Professors

Robert A. Anderson, Frank P. Besag, John W. Broedel, Robert L. Brown, Charles O. Burgess, D. Cecil Clark, Ambrose A. Clegg, John P. Driscoll, Ellis D. Evans, George A. Fargo, Jerald R. Forster, Barbara B. Hauck, Frances P. Hunkins, Theodore Kaltsounis, Thomas C. Lovitt, Cecilia MacDonald, Rosemarie E. McCartin, Merle L. Meacham, Dianne L. Monson, Roger G. Olstad, Henry M. Reitan, William J. Schill, Sam L. Sebesta, Robert E. Tostberg, Sylvia Vopni, Richard Wisniewski, Kenneth H. Wodtke

Assistant Professors

James Q. Affleck, Richard L. Andrews, James A. Banks, Husain I. Bashey (acting), Edward C. Caldwell, Robert G. Cope, Marion E. Cupp, Charles W. Dohner, Robert H. Fenner, Richard L. Hawk, D. David Island, Mildred E. Kersh, Alan J. Klockars, Howard B. Larsen, George L. Lawrence, Gerald R. Lee, Sheila Lowenbraun, Richard Montgomery, Doris Olch, Kenneth H. Ostrander, Percy D. Peckham, David B. Ryckman, John P. Smith, Stanton P. Thalberg, Donald T. Williams, Jr.

Emeritus

Harriett V. Batie, Thomas R. Cole, John E. Corbally, August Dvorak, John H. Jessup, Edwin B. Stevens

Lecturers

Louise Collins, Frederick M. DeBruler, William A. Hurd, S. Lyman Hilby, Fred W. Holbein, Elmer F. Marten, Marcia McBeath, Elmore Oistad, Raymond C. Schneider

Representatives of Departments and Schools Affiliated With the College of Education

Kenneth E. Read, Viola E. Garfield (Anthropology); Spencer Moseley, Pauline Johnson (Art); Turrell V. Wylie, Tamako Niwa (Asian Languages and Literature); Richard B. Walker, H. Weston Blaser (Biology-Botany and Zoology); Verner Schomaker, David M. Ritter (Chemistry); J. B. McDiarmid, William M. Read (Classics); Merrill Samuelson, Howard M. Brier (Communications); Gregory A. Falls, Geraldine B. Siks (Drama); Douglass C. North, J. Richard Huber



(Economics); Robert B. Heilman, William F. Irmscher, Eugene Smith (English); John C. Sherman, George H. Kakiuchi, Douglas K. Fleming (Geography); Howard A. Coombs, Bates McKee (Geology); William H. Rey, Horst M. Rabura (Germanic Languages and Literature); Otis Pease, Thomas J. Pressly (History); Mary Louise Johnson, Laura E. McAdams (Home Economics); Irving Lieberman, Eleanor S. Ahlers (Librarianship); Ross A. Beaumont, J. Maurice Kingston (Mathematics); William Bergsma, James C. Carlsen, T. F. Normann (Music); G. Spencer Reeves, Clifford L. Peek (Physical Education for Men); Ruth Abernathy, Katharine S. Fox (Physical Education for Women); Ronald Geballe, Arnold B. Arons (Physics); David W. Minar, Alex Gottfried (Political Science); Arthur A. Lumsdaine, Robert R. Pagano (Psychology); Constantine Christofides, Pia Friedrich (Romance Languages and Literature); Walter Johnson, Sverre Arestad (Scandinavian Languages and Literature); S. Frank Miyamoto, Travis Hirchi (Sociology); Barnet Baskerville, Oliver Nelson, Jerry Feezel (Speech)

Members-at-Large

Julian D. Barksdale (Geology), Ernest A. T. Barth (Sociology), James S. Bethel (Forest Resources), Walter A. Fairservis, Jr. (Thomas Burke Memorial Washington State Museum), Richard H. Fleming (Oceanography)

Faculty Consultants, Bureau of School Service and Research

Donald W. Emery (English); Philip Bacon (Geography); C. Frank Brockman, (Conservation Education, Forest Resources); Roy Dubisch (Mathematics); Eleanor Evans (Psychology); J. B. Gillingham (Economics); Howard L. Nostrand (Romance Languages and Literature); Ingrith Olsen (Biological Sciences); Thomas J. Pressly (History); L. A. Sanderman, Physical Science (Physics)

BUREAU OF SCHOOL SERVICE

Director

Charles E. Danowski
403 Miller

Associate Director

Donald W. Emery

Special Consultants

Joe A. Chandler, Eleanor Evans

The teacher is the transmitter of knowledge to each generation; he is responsible for the continuation of his particular society and interpretations of it in relation to all other societies.

The College of Education offers programs for the preparation of teachers and school administrators, and programs for the advanced study of education. In

conjunction with other colleges of the University, the College seeks to provide broad training in the liberal arts and sciences that is designed to develop the knowledge, understanding, skills, and abilities characteristic of citizenship in a free, democratic society.

The several programs offered by the College of Education in undergraduate and graduate work are designed to: (1) Help the prospective teacher develop competence and sophistication in one or more teaching fields and to develop proficiency in the teaching process through study and practice. (2) Introduce students to the study of education as a basic social institution and to the profession of teaching. (3) Through research, observation, and direct experience, develop the understanding of growth and development in children, youths, and adults. (4) Develop the understanding of teaching and learning processes as they affect the selection, organization, presentation, and evaluation of curriculum materials and resources for various age levels and ability groups. (5) Promote and foster research and advanced study in the several branches of the field of education for which post-baccalaureate work is appropriate. (6) Assist each student in developing a workable philosophy of education and an appreciation of the ethical responsibilities of a professional educator in a free society. An extensive schedule of classroom observation and directed teaching is made available through cooperative arrangement with the public schools in the greater Seattle area.

Through the Bureau of School Service, the College and University provide a wide variety of professional services to the schools and communities of the state of Washington.

Accreditation

Full accreditation, retroactive to September 1, 1965, has been granted to the College by the National Council for the Accreditation of Teacher Education. The College is also a member of the University Council for Educational Administration.

College Facilities and Services

The *College of Education Record* is published four times a year. In addition to book reviews, education news notes, and occasional College announcements, the journal contains articles on a variety of subjects for teachers and administrators. Bulletins on the graduate degree program and the training of public school teachers keep students and educators acquainted with changes in these areas.

The College of Education maintains a close liaison with public schools both in the Seattle area and throughout the state. In cooperation with the State Department

of Public Instruction and school districts in all parts of the state, the College carries out the training program for the Standard Certificate through in-service work, individual visits, and conferences with beginning teachers and their administrators. The College also maintains special programs for observation, research, and practice in the public schools of the Seattle area and other nearby districts; the regular student teaching program provides every person who seeks a teaching certificate with a quarter of full-time practice teaching, working with a master teacher in a public school.

Employment

The Office of School and College Placement helps qualified students and graduates find teaching and administrative positions. Those who wish to use this service should register with the Office, 120 Miller Hall, during the first quarter of their final year, and should obtain recommendations before leaving the University, while their work and personal qualities are clear in the minds of their instructors. These records are kept in the Office files for use when needed.

Student Activities

Any college student who is preparing to teach may become a member of the *Student Education Association* (SEA) by joining the College chapter. Campus meetings are held on a regular schedule; in addition, there are four regional meetings a year and a state convention in the spring.

Phi Delta Kappa, for men, and *Pi Lambda Theta*, for women, are national professional organizations for education students. Upper-division and graduate students who maintain high scholarship and show outstanding professional promise may be invited to join one of these organizations.

UNDERGRADUATE PROGRAMS

Advisory Office

Rufus C. Salyer
Director, Advisory Services
207 Miller Hall

Jane Watt
207 Miller Hall

Bachelor of Arts

Admission to the College of Education or to any of the programs within the College of Education assumes and is dependent upon the student's eligibility for admission, enrollment, and registration at the University of Washington.

Students working toward the Bachelor of Arts degree in the College of Education must meet certain general requirements of the University and the College as well

as the particular requirements of their major and minor departments.

Requirements for the Bachelor of Arts degree awarded by the College of Education were instituted and took effect Autumn Quarter, 1964. Students entering the College of Education during that quarter and thereafter are governed by these requirements.

To qualify for the Bachelor of Arts degree, students in the College of Education, in addition to meeting the University requirements, must fulfill basic proficiency requirements, a distribution requirement, a major and minor requirement, and a certification requirement.

Basic Proficiencies

All incoming students whose high school program includes 3 units (years) of college preparatory mathematics, 3 units (years) of a single foreign language, and four units (years) of English, will be considered to have satisfied the basic proficiency requirements. Students who do not satisfy the requirements in this way are required during the first year in residence to complete 15 credits normally selected from such courses in English composition, foreign language, or mathematics as he and his adviser consider most appropriate to his needs and interests. Incoming students with 90 or more acceptable transfer credits, and students who have fulfilled the general education requirements of other accredited colleges or universities, will be considered to have satisfied the basic proficiency requirements. Courses taken to satisfy the basic proficiency requirements will normally not be accepted in satisfaction of the distribution requirement.

Distribution Requirement

The College reserves an appreciable fraction of the student's four undergraduate years to develop in him a breadth of knowledge and appreciation and to enable him to explore subjects different in content and method from those in which he will pursue a special competence. For the purposes of general education, a listing of appropriate courses has been prepared, divided into three large fields of knowledge—the humanities, the social sciences, and the natural sciences. Each student must select, with the approval of his adviser, courses from the following list to total at least 60 credits, distributed so that no fewer than 20 credits are in any one of the three basic areas. In meeting the distribution requirement, no more than 20 credits of the total shall be taken from any one department.

Humanities

Anthropology 333, 334, 335, 429, 430, 455, 459, 493
Architecture and Urban Planning: Architecture 150, 151, 340, 341, 342, 350, 351, 352, 450; Landscape Architecture 230, 231; Urban Planning 400, 479



Art and Art History: all undergraduate courses except Art 490

Arts and Sciences courses, as designated

Asian Languages and Literature: all undergraduate courses

Biomedical History 401, 419, 420, 421, 425, 430

Classics: all undergraduate courses except Latin 475

Communications: 321, 324, 326, 370, 373

Comparative Literature: all undergraduate courses

Dance 251, 252, 253, 256, 257, 258, 351, 352, 353, 490

Drama 101, 102, 103, 146, 151, 152, 230, 275, 276, 277, 331, 338, 414, 416, 451, 452, 453, 455, 461, 462, 474, 476, 477, 478, 479, 492, 495

English: all undergraduate courses

Far Eastern and Russian Institute 240, 242, 243, 281, 295, 302, 482, 483, 495

Germanic Languages and Literature: all undergraduate courses

History: Ancient and Medieval History 452, 453; Asian History 401, 402; History 311, 312, 411, 412, 413, 414; History of the Americas 402, 405-406, 454; Modern European History 401, 421

Home Economics 240 or 347, 321, 322, 329, 429, 432, 433

Humanities 101, 102, 103, 201

Librarianship 451 or 453, 470

Linguistics 101, 102, 103, 200, 201, 400, 404, 405, 406, 443, 455

Music: all undergraduate courses except 136, 137, 138, 139, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 236, 237, 320, 321, 322, 323, 324, 325, 326, 327, 328, 383, 384, 431, 432, 433, 434, 435, 436

Philosophy: all undergraduate courses except 110, 113, 120, 230, 231, 370, 410, 460, 463, 465, 470

Physical and Health Education: Dance 283, 364

Romance Languages and Literature: all undergraduate courses

Scandinavian Languages and Literature: all undergraduate courses

Slavic Languages and Literature: all undergraduate courses

Speech 100, 101, 103, 140, 220, 240, 320, 345, 349, 400, 420, 421, 440, 442, 444

Social Sciences

Anthropology: all undergraduate Archaeology courses and all undergraduate Anthropology courses except 333, 334, 335, 429, 430, 455, 459, 493, except Physical Anthropology courses

Architecture and Urban Planning: Urban Planning 482, 485

Arts and Sciences courses, as designated

Business Administration: Business, Government, and Society 101, 200, 444; Administrative Theory and Organizational Behavior 440, 460, International Business 310

Communications 150, 200, 201, 202, 203, 220, 226, 314, 338, 400, 402, 406, 411, 414, 443, 470, 480, 485

Economics: all undergraduate courses

Education: History, Philosophy, and Sociology of Education 479, 480

Far Eastern and Russian Institute: all undergraduate courses except 240, 242, 243, 281, 295, 302, 482, 483, 495

General Studies 455-456

Geography: all undergraduate courses

History: all undergraduate courses except Ancient and Medieval History 452, 453; Asian History 401, 402; History 311, 312, 411, 412, 413, 414; History of the Americas 402, 405-406, 454; Modern European History 401, 421

Home Economics 350, 354, 356, 409, 454, 457

Linguistics 451, 452, 453, 461, 462, 463

Philosophy 110, 113, 120, 230, 231, 410, 460, 463, 465

Physical and Health Education: Health Education 250; Recreation Education 304

Political Science: all undergraduate courses

Psychology: all undergraduate courses except 201, 202, 203, 222, 302, 303, 406, 416, 421, 422, 423, 425

Psychiatry 267, 450, 451, 452

Scandinavian Languages and Literature 380, 381

Social Science 150

Sociology: all undergraduate courses except 223

Speech 230, 235, 329, 335, 339, 373, 425, 426, 428, 473

Natural Sciences

Anthropology: all undergraduate Physical Anthropology courses

Arts and Sciences courses, as designated

Astronomy: all undergraduate courses

Atmospheric Sciences: all undergraduate courses

Biochemistry: all undergraduate courses

Biological Structure 301

Biology: all undergraduate courses

Botany: all undergraduate courses

Chemistry: all undergraduate courses

Fisheries 101

Genetics: all undergraduate courses

Geological Sciences: all undergraduate courses

Home Economics 307, 407, 408, 415

Mathematics: all undergraduate courses except 114, 497

Microbiology: 101, 301, 400

Oceanography: all undergraduate courses except 110, 111, 112

Philosophy 370, 470

Physical Education 293, 322, 331, 332, 333, 480

Physics: all undergraduate courses

Psychology 201, 202, 203, 222, 302, 303, 406, 416, 421, 422, 423, 425

Speech 300, 301, 415

Zoology: all undergraduate courses

Major and Minor Requirements

The College of Education requires for graduation the satisfactory completion of an approved *major* and *minor*. Students electing an elementary school teaching emphasis will complete a minor in Elementary Education. In certain instances, a major and minor may be taken in different aspects of the same field, but only where such a procedure is clearly appropriate to preparation for teaching. Such major-minor combinations must be approved by the Dean and the Executive Committee of the College of Education. Major or minor departmental requirements are indicated under Programs in Education.

TEACHER CERTIFICATION

Teacher education and certification in the state of Washington are controlled by the State Board of Education. All colleges and universities preparing teachers must conform to the general certification pattern established by the Board. Two certificates are author-

ized within the regular certification pattern—the *Provisional Certificate*, the initial teaching certificate, and the *Standard Certificate*.

The *Provisional Certificate* is a temporary teaching certificate that is valid for a three-year period and is renewable *once* for an additional three-year period. Completion of 12 quarter credits after issuance of the Provisional Certificate plus a minimum of one year of successful teaching is necessary to renew the certificate for a second three-year period. The certificate will show the subject areas of competence as well as the level(s) on which the holder is prepared to teach. Beginning teachers are to be assigned in accordance with their stipulated competencies.

The *Standard Certificate* requirements must be completed during the six-year period of the Provisional Certificate. The Standard Certificate is valid as long as the holder teaches and for five years thereafter.

All persons seeking certification at the University of Washington must have been admitted to the certification program. Requirements for teaching certificates shall be those prescribed by the College of Education at the time the certificate is to be granted.

Specific details concerning the earning of each of the certificates at the University of Washington are presented in the discussion following this introduction.

Information on out-of-state transfers and emergency and special certificates can be obtained from the State Department of Public Instruction, Olympia, Washington.

The certificate patterns outlined below provide the typical student a program approved by the faculty of the College of Education that is consonant with the requirements of the State Board of Education. Students who can demonstrate equivalent competence in any of the stipulated areas, as indicated by previous course work or by the successful completion of advanced credit examinations, may petition through the Advisory Office in the College of Education for appropriate waivers. Courses in professional education completed 11 or more years before admission or readmission are not applicable on certification requirements. Such courses may be reestablished by examination.

The professional course sequence outlined for the Provisional and Standard Certificates makes provisions for the gaining of an understanding of various age groups, a comprehension of the learning process, an introduction to the techniques and methods employed in the classroom, information concerning the history and philosophy of American education, all brought into focus by a school visitation program and directed teaching



experience. Students are also urged to participate in the "September Experience" Program that is explained fully in the Introduction to Teaching course (Education 288); complete information is also available from the Director of Student Teaching, 200 Miller Hall.

Admission to the Teacher Education Programs (Provisional Certification)*

1. A minimum of 45 approved credits (exclusive of credits earned through correspondence study or extension classes).
2. A cumulative grade-point average of 2.50 (exclusive of credits earned through correspondence or extension classes). Students presenting fewer than 30 quarter credits earned at the University of Washington shall have their GPA's computed upon total college credits; those with 30 credits or more earned at the University of Washington shall have their GPA's computed upon University of Washington credits *only*.
3. Proof of physical and mental health giving promise of success in teaching.
4. Satisfactory completion of Education 288, Introduction to Teaching, and formal application.
5. Admission is contingent upon availability of faculty and physical resources and space available in existing teacher education programs.

The Provisional Certificate

The College of Education offers three programs at the elementary school level, leading to the Provisional Certificate: 1. Early Childhood Education (pre-kindergarten and primary grades); 2. General Elementary (primary and intermediate grades); 3. Elementary School Speech and Hearing Therapy. One program is offered at the secondary level, grades 7-12.

The Provisional Certificate (elementary emphasis) will be awarded upon demonstration of such general scholarship and such evidence of physical and mental health as give promise of success, and upon completion of (1) a bachelor's degree, (2) an authorized major (2.00 minimum grade-point average required), (3) the appropriate professional elementary education minor (2.00 minimum grade-point average required), (4) the appropriate professional education sequence (elementary), (5) student teaching. Formal admission to any phase of the teacher education program is required.

To Insure Proper Registration

Specific areas in the College of Education course numbering system are designated by capital letters. To insure registration for the proper courses, it is abso-

* Effective September 1, 1969

lutely necessary that these designation letters be written on the student's Official Program, preceding each course number.

Designation letters and their definitions are:

EDADM	Educational Administration
EDC&I	Curriculum and Instruction
EDHED	Higher Education
EDHPS	History, Philosophy, and Sociology of Education
EDPSY	Educational Psychology
EDSPE	Special Education
EDUC	Independent study, research, and field study (student teaching)

The Professional Education Sequence (A)

For the Early Childhood Education minor (pre-kindergarten and primary grades)

Track I Emphasis: Pre-Kindergarten Level

COURSES	CREDITS
EDUC 288	INTRODUCTION TO TEACHING 1
*SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION 5
*SPCH 203	PRINCIPLES OF ORAL COMMUNICATION 3
EDPSY 304	EDUCATIONAL PSYCHOLOGY. PREREQUISITE, EDUC 288 5
EDPSY 308	EVALUATION IN EDUCATION. PREREQUISITE, EDUC 288 3
EDUC 371	STUDENT TEACHING: PRE-KINDERGARTEN. (TAKEN CONCURRENTLY WITH EDC&I 350, PROGRAM PLANNING IN EARLY CHILDHOOD EDUCATION). PREREQUISITES, EDPSY 304, EDPSY 308, SPEECH 203, COMPLETION OF REQUIRED PORTION OF THE EARLY CHILDHOOD EDUCATION MINOR, 2.00 GRADE-POINT MINIMUM AVERAGE IN PROFESSIONAL EDUCATION, 120 CREDITS, AND PERMISSION 8
EDUC 372	STUDENT TEACHING: KINDERGARTEN OR PRIMARY. PREREQUISITES, EDPSY 304, SPEECH 203, COMPLETION OF REQUIRED PORTION OF THE EARLY CHILDHOOD EDUCATION MINOR, 2.00 GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION, 120 CREDITS, AND PERMISSION 7
EDHPS 410 OR 412 OR 479 OR 480 OR 488	EDUCATIONAL SOCIOLOGY OR FOUNDATIONS OF FREEDOM AND EDUCATION OR CRUCIAL ISSUES OF EDUCATION OR HISTORY OF EDUCATIONAL THOUGHT OR PHILOSOPHY OF EDUCATION. PREREQUISITE, EDUC 371 OR 372. COMPLETION OF ONE OF THESE COURSES WILL SATISFY THE REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THIS REQUIREMENT UNTIL THE FIFTH YEAR. (STANDARD CERTIFICATION PROGRAM) 3
HSTAA 432	HISTORY OF WASHINGTON AND THE PACIFIC NORTHWEST 5
TOTAL CREDITS	. . . . . 35-37

* Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 203 without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Department of Speech.

Track II Emphasis: Primary Level, K-3

EDUC 288	INTRODUCTION TO TEACHING 1
*SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION 5
*SPCH 203	PRINCIPLES OF ORAL COMMUNICATION 3
EDPSY 304	EDUCATIONAL PSYCHOLOGY. PREREQUISITE, EDUC 288 5
EDPSY 308	EVALUATION IN EDUCATION. PREREQUISITE, EDUC 288 3

COURSES	CREDITS
EDUC 289 INTRODUCTION TO CLASSROOM PROCEDURES: LABORATORY (PRE-SCHOOL LEVEL). PREREQUISITE, EDUC 288	3
EDUC 371 OR 372 STUDENT TEACHING: KINDERGARTEN OR PRIMARY. PREREQUISITES, EDPSY 304, EDPSY 308, SPEECH 203, COMPLETION OF REQUIRED PORTIONS OF THE EARLY CHILDHOOD EDUCATION MINOR, 2.00 GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION, 120 CREDITS, AND PERMISSION	15
EDHPS 410 OR 412 OR 479 OR 480 OR 488 EDUCATIONAL SOCIOLOGY OR FOUNDATIONS OF FREEDOM AND EDUCATION OR CRUCIAL ISSUES OF EDUCATION OR HISTORY OF EDUCATIONAL THOUGHT OR PHILOSOPHY OF EDUCATION. PREREQUISITE, EDUC 371 OR 372. COMPLETION OF ONE OF THESE COURSES WILL SATISFY THIS REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THE REQUIREMENT UNTIL THE FIFTH YEAR (STANDARD CERTIFICATION PROGRAM)	3
TOTAL CREDITS	33-35

* Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 203 without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Speech Department.

The Professional Early Childhood Education Minor

Requirements are 53 credits for Track I and 50 credits for Track II for Provisional Certification.

EDPSY 365 SENSORY-MOTOR AND LANGUAGE DEVELOPMENT IN YOUNG CHILDREN. PREREQUISITE, EDPSY 304	3
EDC&I 347 MODERN THEORIES AND PRACTICES IN EARLY CHILDHOOD EDUCATION. PREREQUISITE, EDUC 288.	3
GEOG 100 INTRODUCTION TO GEOGRAPHY	5
EDC&I 348 LANGUAGE ARTS AND SOCIAL STUDIES IN EARLY CHILDHOOD EDUCATION. PREREQUISITES, EDPSY 304 AND GEOG 100	3
EDC&I 349 MATHEMATICS AND SCIENCE IN EARLY CHILDHOOD EDUCATION. PREREQUISITES, EDPSY 304 AND MATH 170 AND A MINIMUM OF 5 CREDITS IN A SCIENCE COURSE TO BE SELECTED FROM THE FOLLOWING LIST (SELECT ONE): ATMOSPHERIC SCIENCES 101; BIOLOGY 101-102 (10 CREDITS); BOTANY 111, 112; CHEMISTRY 100, 101; GEOLOGICAL SCIENCES 101; OCEANOGRAPHY 101; PHYSICS 110, 111; ZOOLOGY 111-118	5
MATH 170 THEORY OF ARITHMETIC	3
**EDC&I 350 PROGRAM PLANNING IN EARLY CHILDHOOD EDUCATION. APPLICABLE TO TRACK I STUDENTS ONLY. TO BE TAKEN CONCURRENTLY WITH EDUC 371, 8 CREDITS. PREREQUISITES, EDPSY 304, SPEECH 203, COMPLETION OF REQUIRED PORTION OF THE ELEMENTARY EDUCATION MINOR, 2.00 MINIMUM GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION, 120 CREDITS, AND PERMISSION	3
EDC&I 360 READING IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304	3
PSYCH 320 FIELD ANALYSIS OF THE BEHAVIOR OF YOUNG CHILDREN. PREREQUISITE, EDPSY 304 OR PSYCHOLOGY 306	3
*ART 100 INTRODUCTION TO ART	3
*EDC&I 342 ART IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND ART 100	3
*MUSIC 119 MUSIC FUNDAMENTALS	2
*EDC&I 343 MUSIC IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND MUSIC 119	3
*EDC&I 321 HEALTH IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304	2
*EDC&I 322, 323, or 324 PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL. PREREQUISITE EDPSY 304	3
TOTAL CREDITS REQUIRED (TRACK I)	53
TOTAL CREDITS REQUIRED (TRACK II)	47

* Students are normally expected to complete *all* of the requirements for the Early Childhood Education minor prior to Provisional

Certification. *One* of the starred courses must be included for the Provisional Certificate. The others may, with the approval of the Advisory Office of the College of Education, be deferred until the fifth year (Standard Certification Program).

**EDC&I 350 PROGRAM PLANNING IN EARLY CHILDHOOD EDUCATION. A FIFTH-YEAR (STANDARD CERTIFICATE) REQUIREMENT FOR TRACK II STUDENTS.

The Professional Education Sequence (B)

For the General Elementary Education Minor and the Elementary School Speech and Hearing Therapy Minor.

COURSES	CREDITS
EDUC 288 INTRODUCTION TO TEACHING	1
*SPCH 103 BASIC PRINCIPLES OF ORAL COMMUNICATION	5
or	
*SPCH 203 PRINCIPLES OF ORAL COMMUNICATION	3
EDPSY 304 EDUCATIONAL PSYCHOLOGY. PREREQUISITE, EDUC 288	5
EDPSY 308 EVALUATION IN EDUCATION. PREREQUISITE, EDUC 288	3
EDUC 371 OR 372 STUDENT TEACHING: KINDERGARTEN OR ELEMENTARY. PREREQUISITES, EDPSY 304, SPEECH 203, COMPLETION OF REQUIRED PORTION OF THE ELEMENTARY EDUCATION MINOR, 2.00 MINIMUM GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION, 120 CREDITS, AND PERMISSION	15
EDHPS 410 OR 412 OR 479 OR 480 OR 488 EDUCATIONAL SOCIOLOGY OR FOUNDATIONS OF FREEDOM AND EDUCATION OR CRUCIAL ISSUES OF EDUCATION OR HISTORY OF EDUCATIONAL THOUGHT OR PHILOSOPHY OF EDUCATION. PREREQUISITE, EDUC 371 OR 372	3
COMPLETION OF ONE OF THESE COURSES WILL SATISFY THIS REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THE REQUIREMENT UNTIL THE FIFTH YEAR (STANDARD CERTIFICATION PROGRAM).	
**HSTAA 432 HISTORY OF WASHINGTON AND THE PACIFIC NORTHWEST	5
TOTAL CREDITS	35

* Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 203, without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Department of Speech.

** Required of intermediate grade teachers only. May be taken during the fifth year but *must* be completed *before* Standard Certification.

The General Elementary Education Minor

Requirements are 47 credits for Provisional Certification.

EDC&I 355 LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304	3
EDC&I 360 READING IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304.	3
GEOG 100 INTRODUCTION TO GEOGRAPHY.	5
EDC&I 365 SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND GEOG. 100.	3
MATH 170 THEORY OF ARITHMETIC	3
EDC&I 370 SCIENCE IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304. IN ADDITION, A MINIMUM OF 5 CREDITS IS REQUIRED IN A SCIENCE COURSE TO BE SELECTED FROM THE FOLLOWING LIST (SELECT ONE): ATMOSPHERIC SCIENCES 101; BIOLOGY 101-102 (10 CREDITS); BOTANY 111, 112; CHEMISTRY 100, 101; GEOLOGICAL SCIENCES 101; OCEANOGRAPHY 101; PHYSICS 101-102, 110, 111; ZOOLOGY 118	5
EDC&I 375 MATHEMATICS IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND MATH 170	3
*ART 100 INTRODUCTION TO ART	3
*EDC&I 342 ART IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND ART 100	3



COURSES	CREDITS
*MUSIC 119 MUSIC FUNDAMENTALS	2
*EDC&I 343 MUSIC IN THE ELEMENTARY SCHOOL. PREREQUISITES, EDPSY 304 AND MUSIC 119	3
*EDC&I 321 HEALTH IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304	2
*EDC&I 322, 323 OR 324 PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304	3
TOTAL CREDITS	44

*Students are normally expected to complete all of the requirements for the Elementary Education minor prior to Provisional Certification. One of the starred courses must be included for the Provisional Certificate. The others may, with the approval of the Advisory Office of the College of Education, be deferred until the fifth year (Standard Certification Program).

The Elementary School Speech and Hearing Therapy Minor

The following courses and 30 approved credits are required:

EDC&I 348	LANGUAGE ARTS AND SOCIAL STUDIES IN EARLY CHILDHOOD EDUCATION. PREREQUISITES, EDPSY 304 AND GEOG. 100	3
EDC&I 355	LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304	3
EDC&I 360	READING IN THE ELEMENTARY SCHOOL. PREREQUISITE, EDPSY 304.	3
EDPSY 401	ADVANCED EDUCATIONAL PSYCHOLOGY—LEARNING. PREREQUISITE, EDPSY 304	3
EDPSY 402	ADVANCED CHILD DEVELOPMENT. PREREQUISITE, EDPSY 304	3
TOTAL CREDITS		12

In addition, 18 approved credits must be elected from the following:

EDUC 289	INTRODUCTION TO CLASSROOM PROCEDURES: LABORATORY. PREREQUISITE, EDUC 288	3
EDUC 472 OR 473 OR 475	PRACTICUM IN TEACHING: ELEMENTARY OR JUNIOR HIGH OR SENIOR HIGH, PREREQUISITES, EDUC 372 AND PERMISSION	7 OR 8
EDSPE 403	EDUCATION OF THE EMOTIONALLY DISTURBED. PREREQUISITES, EDPSY 401 AND EDSPE 404	3
PSYCH 305	DEVIANANT PERSONALITY. PREREQUISITE, PSYCHOLOGY 100 OR 190	5
PSYCH 306	DEVELOPMENTAL PSYCHOLOGY. PREREQUISITE, PSYCHOLOGY 100 OR 190	5
PSYCH 410	DEVIANANT DEVELOPMENT. PREREQUISITE, PSYCHOLOGY 305 AND 306 AND PERMISSION	3
LING 400	SURVEY OF LINGUISTIC METHOD AND THEORY	3
LING 447	LANGUAGE DEVELOPMENT	3
EDSPE 416	EVALUATION OF INSTRUCTIONAL MATERIAL FOR EXCEPTIONAL CHILDREN. PREREQUISITE, PERMISSION	3
EDSPE 418	VOCATIONAL DEVELOPMENT OF HANDICAPPED CHILDREN AND YOUTH. PREREQUISITE, PERMISSION	3
EDSPE 404	EXCEPTIONAL CHILDREN. PREREQUISITE, EDPSY 304	3
EDSPE 405	EDUCATING THE MENTALLY RETARDED. PREREQUISITES, EDSPE 404 AND PERMISSION	3
EDPSY 365	SENSORY-MOTOR AND LANGUAGE DEVELOPMENT IN YOUNG CHILDREN	3
EDSPE 409	MENTAL RETARDATION. PREREQUISITES, EDSPE 404 AND PERMISSION	3
EDSPE 411	LEARNING DISABILITIES. PREREQUISITE, EDSPE 404	3
EDC&I 347	MODERN THEORIES AND PRACTICES IN EARLY CHILDHOOD EDUCATION. PREREQUISITE, EDUC 288	3
EDC&I 348	LANGUAGE ARTS AND SOCIAL STUDIES IN EARLY CHILDHOOD EDUCATION. (UNLESS EDC&I 348 WAS TAKEN AS A REQUIRED COURSE). PREREQUISITE, EDPSY 304	3
EDC&I 362	READING IN THE SECONDARY SCHOOL. PREREQUISITE, EDPSY 304	3
EDPSY 447	PRINCIPLES OF GUIDANCE	3
DRAMA 338	CREATIVE DRAMATICS	3

COURSES	CREDITS
SPCH 355	SPEECH IN THE ELEMENTARY CLASSROOM (UNLESS SPEECH 359 WAS TAKEN TO SATISFY MAJOR REQUIREMENT). PREREQUISITES, JUNIOR STANDING AND EDUC 288 OR PERMISSION 3
PSYCH 320	FIELD ANALYSIS OF THE BEHAVIOR OF YOUNG CHILDREN. PREREQUISITE, EDPSY 304 OR PSYCHOLOGY 306 3

The Provisional Certificate

(Secondary Emphasis, Grades 7-12)

The Provisional Certificate (secondary emphasis) will be awarded upon demonstration of such general scholarship and such evidence of physical and mental health as give promise of success, and upon completion of (1) a bachelor's degree, (2) an authorized major (2.00 minimum grade-point average required), (3) the professional education sequence (secondary), (4) student teaching.† Admission to any phase of the teacher education program is not automatic.

The Professional Education Sequence

(Secondary Emphasis)

EDUC 288	INTRODUCTION TO TEACHING	1
*SPCH 203	PRINCIPLES OF ORAL COMMUNICATION	3
SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION	5
EDPSY 304	EDUCATIONAL PSYCHOLOGY. PREREQUISITE, EDUC 288	5
EDPSY 308	EVALUATION IN EDUCATION. PREREQUISITE, EDUC 288	3
EDC&I	SPECIAL METHODS (AS REQUIRED)	3-6
EDUC 374 OR 375	STUDENT TEACHING: JUNIOR OR SENIOR HIGH SCHOOL. PREREQUISITES, SPEECH 203, EDPSY 304, EDPSY 308, SPECIAL METHODS, 120 CREDITS, 2.00 GRADE-POINT AVERAGE IN PROFESSIONAL EDUCATION, AND PERMISSION. STUDENTS ENROLLING IN STUDENT TEACHING WITH MAJORS IN SOCIAL STUDIES FIELD MUST HAVE COMPLETED COURSE WORK IN GEOGRAPHY, ECONOMICS, WORLD HISTORY, UNITED STATES HISTORY, AND WASHINGTON STATE HISTORY PRIOR TO STUDENT TEACHING	15
EDHPS 410	OR 412 OR 479 OR 480 OR 488 EDUCATIONAL SOCIOLOGY OR FOUNDATIONS OF FREEDOM AND EDUCATION OR CRUCIAL ISSUES OF EDUCATION OR HISTORY OF EDUCATIONAL THOUGHT OR PHILOSOPHY OF EDUCATION. PREREQUISITE, EDUC 374 OR 375. COMPLETION OF ONE OF THESE COURSES WILL SATISFY THIS REQUIREMENT. STUDENTS MAY, WITH THE APPROVAL OF THE ADVISORY OFFICE OF THE COLLEGE OF EDUCATION, DELAY FULFILLMENT OF THE REQUIREMENT UNTIL THE FIFTH YEAR (STANDARD CERTIFICATION PROGRAM).	3
TOTAL CREDITS		33-41

*Students having completed one or more semesters of speech (principles, theory, and proficiency) in high school may petition for an examination which, if passed, may be substituted for Speech 203, without academic credit. Transfer students with one or more college speech courses may apply for a waiver. Address all questions to the Department of Speech.

MAJOR AND MINOR PROGRAMS IN EDUCATION

Following is a listing of the major and minor academic fields for elementary and secondary teachers. It is the responsibility of the student to consult the department

in which he plans to take his work to verify the requirements.

Anthropology

Teaching Major: Secondary School Emphasis

(45 approved credits required)

COURSES	CREDITS
ANTH 202 PRINCIPALS OF SOCIAL ANTHROPOLOGY	5
ANTH 311 INDIAN CULTURES OF THE PACIFIC NORTHWEST (3) OR	
ANTH 416 NORTH AMERICAN INDIANS	3
ARCHY 205 PRINCIPLES OF ARCHAEOLOGY	5
PHY A 201 PRINCIPLES OF PHYSICAL ANTHROPOLOGY	5

Select 10 credits from the following:

ANTH 350 THE CIVILIZED AND THE PRIMITIVE	3
ANTH 429 EXPRESSIVE CULTURE	5
ANTH 430 MUSIC: AN ANTHROPOLOGICAL VIEW	3
ANTH 436 SOCIAL ANTHROPOLOGY OF RELIGION	5
ANTH 439 PRIMITIVE LAW AND SOCIAL CONTROL	5
ANTH 450 INTRODUCTION TO LANGUAGE	5
ARCHY 304 PREHISTORIC CULTURES OF THE NEW WORLD	3
TOTAL	35

ANTH 202 PRINCIPLES OF SOCIAL ANTHROPOLOGY	5
ARCHY 205 PRINCIPLES OF ARCHAEOLOGY	5
PHY A 201 PRINCIPLES OF PHYSICAL ANTHROPOLOGY	5
APPROVED ANTHROPOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST	20
TOTAL CREDITS	35

Art

* Combined Teaching Major and Minor: Secondary School Emphasis

(90 approved credits required)

Basic Requirements	
ART 105, 106, 107 DRAWING (3,3,3)	9
ART 109, 110 DESIGN (3,3)	6
ART 129 APPRECIATION OF DESIGN	2
ART H 201, 202, 203 HISTORY OF WESTERN ART (3,3,3)	9
APPROVED ART HISTORY ELECTIVE	3

SPECIAL SUBJECT AREAS

ART 201 CERAMIC ART (3); ART 205 GRAPHIC DESIGN: INTRODUCTION (3); ART 265 ADVANCED DRAWING (3); ART 272 BEGINNING SCULPTURE COMPOSITION (3); ART 358 JEWELRY DESIGN (3) TO TOTAL	6
ART 250, 251, 252, 253, 254, 255 DESIGN AND MATERIALS (3,3,3,3,3,3)	12
ART 256 PAINTING (3); ART 259 WATER-SOLUBLE MEDIA (3)	6
ART 300, 302, 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3,3,3) TO TOTAL	12
APPROVED ART ELECTIVES FOR COMBINED TEACHING MAJOR-MINOR	20
EDC&I 340 ELEMENTARY ART EDUCATION (2); EDC&I 341 THE TEACHING OF ART (3)	5
TOTAL	90

* The Combined Teaching Major and Minor also satisfies the minor area degree requirements within the College of Education. A major in Art may be taken without a minor. Students should confer with Department Advisers.

Art Major: Elementary School Emphasis

(53 approved credits required)

ART 105, 106, 107 DRAWING (3,3,3)	9
ART 109, 110 DESIGN (3,3)	6
ART 129 APPRECIATION OF DESIGN	2
ART 250, 255 DESIGN AND MATERIALS (3,3) TO TOTAL	6
ART 256 PAINTING (3), ART 259 WATER-SOLUBLE MEDIA (3)	6
ART 302, 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3,3) TO TOTAL	6

COURSES	CREDITS
ART H 201, 202, 203 HISTORY OF WESTERN ART (3,3,3)	9
APPROVED ART ELECTIVES (ANY COURSES WHERE PREREQUISITES ARE SATISFIED)	6
EDC&I 342 ART IN THE ELEMENTARY SCHOOL	3
TOTAL	18

Teaching Minor: Secondary School Emphasis

(35 approved credits required)

ART 105, 106, 107 DRAWING (3,3,3)	9
ART 109, 110 DESIGN (3,3)	6
ART 129 APPRECIATION OF DESIGN	2
ART 250, 251, 252, 253, 254, 255 DESIGN AND MATERIALS (3,3,3,3,3,3) TO TOTAL	3
ART 256 PAINTING (3), ART 259 WATER-SOLUBLE MEDIA (3) TO TOTAL	3
ART 300, 302, 303, 304, 305 ART EDUCATION: CRAFTS (3,3,3,3,3) TO TOTAL	3
ART H 201, 202, 203 HISTORY OF WESTERN ART (3,3,3)	9
TOTAL	35

Biology

Biology Teaching Major: Secondary School Emphasis

(48-60 approved credits required. Of these, no more than 20 credits will be allowed for freshman-level courses. The biology major should give serious consideration to chemistry as his minor academic field.)

BIOL 101-102 GENERAL BIOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
ZOOL 111-112 GENERAL ZOOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR BIOL 210, 211, 212 INTRODUCTORY BIOLOGY (5,5,5)	15-20
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (5) OR	
OTHER ORGANIC CHEMISTRY COURSES INCLUDING LABORATORY	3-5
ONE COURSE EACH IN THE FOLLOWING FIELDS: GENETICS, MICROBIOLOGY, ANIMAL PHYSIOLOGY, PLANT PHYSIOLOGY, VERTEBRATE ZOOLOGY, AND INVERTEBRATE ZOOLOGY	30-35
TOTAL	48-60

Biology Major: Elementary School Emphasis

(43-50 approved credits required. Of these, no more than 20 credits will be allowed for freshman-level courses.)

BIOL 101-102 GENERAL BIOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
ZOOL 111-112 GENERAL ZOOLOGY (5-5) AND	
BOT 112 THE PLANT KINGDOM (5), 113 ELEMENTARY PLANT CLASSIFICATION (5) OR	
BIOL 210, 211, 212 INTRODUCTORY BIOLOGY (5,5,5)	15-20
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (5) OR OTHER ORGANIC CHEMISTRY COURSES INCLUDING LABORATORY	3-5
APPROVED ELECTIVES IN ADVANCE COURSES MUST INCLUDE AT LEAST 5 CREDITS IN BOTANY AND 10 CREDITS IN ZOOLOGY	25
TOTAL	43-50

RECOMMENDED ADVANCED COURSES:

BOT 201, 202, 203 PLANT PROPAGATION (2,2,2)	
BOT 331 ELEMENTARY PLANT PHYSIOLOGY (5)	
BOT 371 ORNAMENTAL PLANTS (3)	
GENETICS 351 HUMAN GENETICS (3) OR 451 GENETICS (4)	
MICRO 301 GENERAL MICROBIOLOGY (3 OR 5) OR 400 FUNDAMENTALS OF BACTERIOLOGY (3 OR 6)	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5) OR 301 INTRODUCTORY PHYSIOLOGY(3)	
ZOOL 330 NATURAL HISTORY OF MARINE INVERTEBRATES (5)	
ZOOL 362 NATURAL HISTORY OF VERTEBRATES (5)	
ZOOL 458 VERTEBRATE PHYSIOLOGY (5) OR 468, 469 COMPARATIVE PHYSIOLOGY (5,5)	

**Teaching Minor: Secondary School Emphasis**

(30 approved credits required. In addition to elementary courses, at least one course in botany and one course in zoology are required. One 5-credit course must be upper division. The Biology Teaching Minor is recommended only for students whose teaching major is in one of the sciences.)

Business Education**Teaching Major: Secondary School Emphasis**

(60 approved credits required)

COURSES	CREDITS
ACCTG 210, 220 FUNDAMENTALS OF ACCOUNTING (3,3)	6
ACCTG 230 BASIC ACCOUNTING ANALYSIS	3
BGS 101 BUSINESS: AN INTRODUCTORY ANALYSIS	5
BGS 200 INTRODUCTION TO LAW	5
ECON 200 INTRODUCTION TO ECONOMICS	5
ECON 201 PRINCIPLES OF ECONOMICS	5
MKTG 301 MARKETING CONCEPTS	4
B ECN 301 MONEY, NATIONAL INCOME, AND PRICES	4
B CMU 301 BASIC WRITTEN BUSINESS COMMUNICATIONS (4) OR	
A ORG 460 HUMAN RELATIONS IN BUSINESS AND INDUSTRY (4)	
*FIN 350 BUSINESS FINANCE (4)	
MKTG 381 RETAILING (4)	
*BGS 361 BUSINESS HISTORY (3)	3
SEC STUDIES 111 SECRETARIAL STUDIES	2
SEC STUDIES 112 SECRETARIAL STUDIES	2
SEC STUDIES 115 OFFICE MACHINES	3
SEC STUDIES 320 SECRETARIAL PRACTICE	5
†SEC STUDIES 310 ADVANCED SECRETARIAL STUDIES (5) PREREQ-	
UISITES, TWO YEARS OF HIGH SCHOOL SHORT-	
HAND AND/OR DEMONSTRATED COMPETENCE	
OR SEC STUDIES 122, AND	
†SEC STUDIES 311 ADVANCED SECRETARIAL STUDIES (5) PREREQ-	
UISITE, SEC STUDIES 310	0-10
EDC&I 315 THE TEACHING OF BUSINESS EDUCATION: TYPE-	
WRITING, SHORTHAND, TRANSCRIPTION	2
EDC&I 316 THE TEACHING OF BUSINESS EDUCATION: BOOK-	
KEEPING AND GENERAL BUSINESS	2
	60

* May be deferred until fifth year.

† Required only if student plans to teach shorthand.

Business Education Major: Elementary School Emphasis

(38-39 approved credits required)

BGS 101 BUSINESS: AN INTRODUCTORY ANALYSIS	5
ECON 200 INTRODUCTION TO ECONOMICS	5
BGS 200 INTRODUCTION TO LAW	5
ACCTG 210, 220 FUNDAMENTALS OF ACCOUNTING (3,3)	6
ECON 201 PRINCIPLES OF ECONOMICS (5) OR	
ACCTG 230 BASIC ACCOUNTING ANALYSIS (3)	3
B CMU 301 BASIC WRITTEN BUSINESS COMMUNICATIONS	4
SEC STUDIES 111 SECRETARIAL STUDIES	2
SEC STUDIES 112 SECRETARIAL STUDIES	2
BGS 361 BUSINESS HISTORY (3) OR	
A ORG 460 HUMAN RELATIONS IN BUSINESS AND INDUSTRY (4) OR	
SEC STUDIES 115 OFFICE MACHINES (3)	3-4
MKTG 301 MARKETING CONCEPTS (4) OR	
B ECN 301 MONEY, NATIONAL INCOME, AND PRICES (4) OR	
SEC STUDIES 320 SECRETARIAL PRACTICE (5)	4
	38-39

Teaching Minor: Secondary School Emphasis

(35-38 approved credits required)

BGS 101 BUSINESS: AN INTRODUCTORY ANALYSIS	5
ECON 200 INTRODUCTION TO ECONOMICS	5
BGS 200 INTRODUCTION TO LAW	5
ACCTG 210, 220 FUNDAMENTALS OF ACCOUNTING (3,3)	6
SEC STUDIES 111 SECRETARIAL STUDIES	2
SEC STUDIES 112 SECRETARIAL STUDIES	2
SEC STUDIES 115 OFFICE MACHINES	3

COURSES**CREDITS**

ACCTG 230 BASIC ACCOUNTING ANALYSIS (3) OR	
SEC STUDIES 320 SECRETARIAL PRACTICE (5)	3-5
EDC&I 315 THE TEACHING OF BUSINESS EDUCATION:	
TYPEWRITING, SHORTHAND, TRANSCRIPTION	2
EDC&I 316 THE TEACHING OF BUSINESS EDUCATION:	
BOOKKEEPING AND GENERAL BUSINESS	2
	35-38

Chemistry**Teaching Major: Secondary School Emphasis**

(55 approved credits required. A grade of C or better must be obtained in each required chemistry course—or approved equivalent.)

CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND	
LABORATORY (3,3,2,3)	11
CHEM 170 QUALITATIVE ANALYSIS	3
CHEM 221 QUANTITATIVE ANALYSIS	5
CHEM 231, 232, 241, 242 ORGANIC CHEMISTRY AND	
LABORATORY (3,3,2,2)	10
CHEM 350, 351 ELEMENTARY PHYSICAL CHEMISTRY (3,3)	6
PHYS 114, 115, 116, 117, 118, 119 GENERAL PHYSICS AND	
LABORATORY (4,4,4,1,1,1) OR APPROVED EQUIVALENT	15
MATH 101 INTERMEDIATE ALGEBRA (3) AND	
MATH 105 COLLEGE ALGEBRA (5) OR	
FOUR YEARS HIGH SCHOOL MATHEMATICS PLUS QUALIFYING	
EXAMINATION	0-8
MATH 124 CALCULUS WITH ANALYTIC GEOMETRY	5
	55-63

Chemistry Major: Elementary School Emphasis

(55 approved credits required. A grade of C or better must be obtained in each required chemistry course—or approved equivalent.)

CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND	
LABORATORY (3,3,2,3)	11
CHEM 170 QUALITATIVE ANALYSIS	3
CHEM 221 QUANTITATIVE ANALYSIS	5
CHEM 231, 232, 241, 242 ORGANIC CHEMISTRY AND	
LABORATORY (3,3,2,2)	10
CHEM 350, 351 ELEMENTARY PHYSICAL CHEMISTRY (3,3)	6
PHYS 114, 115, 116, 117, 118, 119 GENERAL PHYSICS AND	
LABORATORY (4,4,4,1,1,1) OR APPROVED EQUIVALENT	15
MATH 101 INTERMEDIATE ALGEBRA (3) AND	
MATH 105 COLLEGE ALGEBRA (5) OR	
FOUR YEARS HIGH SCHOOL MATHEMATICS PLUS QUALIFYING	
EXAMINATION	0-8
MATH 124 CALCULUS WITH ANALYTIC GEOMETRY	5
	55-63

Teaching Minor: Secondary School Emphasis

(37 approved credits required. A grade of C or better must be obtained in each required chemistry course—or approved equivalent.)

CHEM 140, 150, 151, 160 GENERAL CHEMISTRY (3,3,2,3)	11
CHEM 170 QUALITATIVE ANALYSIS	3
CHEM 221 QUANTITATIVE ANALYSIS	5
CHEM 231, 232, 241 ORGANIC CHEMISTRY AND	
LABORATORY (3,3,2)	8
PHYS 110, 111, 112 GENERAL PHYSICS (3,3,4) OR	
APPROVED EQUIVALENT	10
	37

Chinese**Teaching Minor: Secondary School Emphasis**

(37 approved credits required plus a proficiency in oral and written Chinese and training in teaching methods of Chinese. Proficiency in the language must be demonstrated by examination.)

COURSES	CREDITS
CHINESE 300 ADVANCED CHINESE CONVERSATION (1-3, MAX. 9) . . .	6
CHINESE 311, 312 INTERMEDIATE MODERN CHINESE (5,5) . . .	10
CHINESE 400 TUTORIAL CHINESE (5)	5
CHINESE 443 STRUCTURE OF CHINESE (3)	3
CHINESE 499 UNDERGRADUATE RESEARCH (3-5, MAX. 15) . . .	5
METHODS COURSE IN CHINESE LANGUAGE ALSO REQUIRED . . .	3
ONE COURSE CHOSEN FROM ELECTIVES LISTED BELOW	5
	<u>37</u>

ELECTIVES FOR BACKGROUND IN CHINESE STUDIES

FAR EAST 210 THE FAR EAST IN THE MODERN WORLD	5
FAR EAST 240 CHINESE CIVILIZATION	5
FAR EAST 290 HISTORY OF CHINA	5
FAR EAST 344 CHINESE GOVERNMENT	5
FAR EAST 435 PROBLEMS IN THE GEOGRAPHY OF CHINA	5
FAR EAST 443 CHINESE SOCIAL INSTITUTIONS	5
FAR EAST 468 HISTORY OF MODERN CHINA	5
FAR EAST 493 ECONOMY OF MODERN CHINA	5

Drama

*Combined Teaching Major and Minor: Secondary School Emphasis (70 approved credits required)

101 INTRODUCTION TO THE THEATRE	5
102-103 PLAY ANALYSIS (3-3)	6
210, 211, 212 THEATRE TECHNICAL PRACTICE (2 OR 4 EACH) . .	12
460 INTRODUCTION TO DIRECTING	3
251, 252, 253 ACTING (4,4,4) OR	
146 THEATRE VOICE AND SPEECH (3) OR	
151, 152, 153 ACTING (3,3,3)	12
316 THEATRICAL MAKE-UP	2
275, 276, 277 HISTORY OF WESTERN THEATRE AND DRAMA (5,5,5)	15
	<u>55</u>

FIFTH YEAR

DRAMA ELECTIVES OR APPROVED COGNATES	15
COMBINED TEACHING MAJOR AND MINOR TOTAL	70

* Satisfaction of the Combined Teaching Major and Minor also satisfies the minor area degree requirements for Education.

RECOMMENDED DRAMA COGNATE COURSES

CLAS 427 GREEK AND ROMAN TRAGEDY IN ENGLISH (3)	
CLIT 301 WORLD CLASSICS OF GERMANY, RUSSIA, AND SCANDINAVIA (5)	
ENGL 259 INTRODUCTION TO MODERN DRAMA (5)	
ENGL 322 MEDIEVAL AND RENAISSANCE ENGLISH DRAMA EXCLUSIVE OF SHAKESPEARE (5)	
ENGL 335 RESTORATION LITERATURE: 1660-1700 (5)	
ENGL 410 TYPES OF DRAMATIC LITERATURE: COMEDY (5)	
ENGL 411 TYPES OF DRAMATIC LITERATURE: TRAGEDY (5)	
ENGL 513 SHAKESPEARE'S DRAMATIC CONTEMPORARIES (5)	
ENGL 517, 518, 519 SHAKESPEARE (5,5,5)	
FREN 417 RACINE AND MOLIÈRE IN ENGLISH (3)	
HUM 102 THE ARTS (5)	
JAP 423 MODERN JAPANESE LITERATURE IN ENGLISH (5)	
MUSIC 420, 421 OPERA 1600-1750, OPERA 1750-1850 (3,3)	
RUSS 422 RUSSIAN PLAYS IN ENGLISH (5)	
SCAND 480 IBSEN AND HIS MAJOR PLAYS IN ENGLISH (2)	
SCAND 481 STRINDBERG AND HIS MAJOR PLAYS IN ENGLISH (2)	
SCAND 482 LAGERKRIST AND HIS CONTEMPORARIES IN ENGLISH (2)	
SPAN 420 SPANISH LITERATURE OF THE EIGHTEENTH CENTURY (3)	

Drama Major: Elementary School Emphasis

(46 approved credits required)

151 ACTING (3) AND	
146 THEATRE VOICE AND SPEECH (3) AND	
152 ACTING (3)	9
OR	
251, 252 ACTING (4,4)	8
230 INTRODUCTION TO CHILDREN'S DRAMA	2
316 THEATRICAL MAKE-UP	2
325 PLAY PRODUCTION	5
OR	
210, 211, 212 THEATRE TECHNICAL PRACTICE (2 or 4 each) . .	12

COURSES	CREDITS
331 PUPPETRY	3
336 DRAMA IN THE ELEMENTARY SCHOOL	3
338 CREATIVE DRAMATICS	3
436 DRAMA IN THE ELEMENTARY SCHOOL	3
438 CREATIVE DRAMATICS AND LABORATORY	3
VARIABLE CREDITS IN DRAMA ELECTIVES AND COGNATE COURSES WITH APPROVAL OF DRAMA ADVISER WILL COMPLETE THE TOTAL REQUIRED CREDITS	46

RECOMMENDED DRAMA ELECTIVES

101 INTRODUCTION TO THE THEATRE	5
432 ADVANCED PUPPETRY (2, MAXIMUM 4)	2-4
435 CHILDREN'S THEATRE	3
437 LABORATORY IN TEACHING DRAMA TO CHILDREN	1
460 INTRODUCTION TO DIRECTING	3

Teaching Minor: Secondary School Emphasis

(28 approved credits required)

101 INTRODUCTION TO THE THEATRE	5
146 THEATRE VOICE AND SPEECH	3
151, 152 ACTING (3,3)	6
230 INTRODUCTION TO CHILDREN'S DRAMA	2
316 THEATRICAL MAKE-UP	2
325, 326 PLAY PRODUCTION (5,5)	10
	<u>28</u>

Economics

Teaching Major: Secondary School Emphasis

(58-59 approved credits required)

ECON 200 INTRODUCTION TO ECONOMICS (MACRO-ECONOMICS) .	5
ECON 201 PRINCIPLES OF ECONOMICS (MICRO-ECONOMICS) . .	5
ECON 300 INTERMEDIATE PRICE THEORY	5
ECON 301 NATIONAL INCOME ANALYSIS	5
ONE ADDITIONAL COURSE IN ECONOMICS	5
ACCTG 210 FUNDAMENTALS OF ACCOUNTING (3) AND	
ACCTG 220 FUNDAMENTALS OF ACCOUNTING (3) AND	
ACCTG 230 BASIC ACCOUNTING ANALYSIS (3) OR	
ACCTG 210 FUNDAMENTALS OF ACCOUNTING (3) AND	
B ECN 301 MONEY, NATIONAL INCOME, AND PRICES (4) AND	
FIN 350 BUSINESS FINANCE (4)	8
ECON 281 INTRODUCTION TO ECONOMIC STATISTICS (5) OR	
OTHER APPROVED COURSE IN STATISTICS	5-6
APPROVED ELECTIVES IN ECONOMICS, OTHER SOCIAL SCIENCES, OR BUSINESS ADMINISTRATION	20
	<u>58-59</u>

Economics Major: Elementary School Emphasis

(45 approved credits required, chosen from the courses required for the Economics Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(25 approved credits required)

200 INTRODUCTION TO ECONOMICS	5
201 PRINCIPLES OF ECONOMICS	5
TWO APPROVED UPPER-DIVISION ECONOMICS COURSES FROM TWO DIFFERENT FIELDS OF SPECIALIZATION; AND ANY RECOMMENDED ELECTIVE COURSES TO COMPLETE THE FIELD	15
	<u>25</u>

English

Teaching Major: Secondary School Emphasis

(59 approved credits required)

257 INTRODUCTION TO POETRY	5
264 ENGLISH MASTERPIECES: BEGINNINGS THROUGH SHAKESPEARE (TO 1600)	5
265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE (1600-1800)	5
271 EXPOSITORY WRITING; PLUS THREE ADDITIONAL CREDITS IN ADVANCED WRITING	6
324 SHAKESPEARE	5



COURSES	CREDITS
341 ROMANTIC POETS (BLAKE, WORDSWORTH, COLERIDGE) (5) OR	
342 ROMANTIC POETS (BYRON, SHELLEY, KEATS) (5) OR	
344 VICTORIAN POETS (BROWNING, TENNYSON, AND OTHERS) (5) OR	
347 NINETEENTH-CENTURY PROSE (5)	5
361 AMERICAN LITERATURE: (5) OR	
362 AMERICAN LITERATURE: 1800-1865 (5) OR	
363 AMERICAN LITERATURE: 1865-1914 (5)	5
387 ENGLISH GRAMMAR (5) OR	
447 HISTORY OF THE ENGLISH LANGUAGE (5)	5
417 OR 418 OR 419 THE ENGLISH NOVEL (5,5,5)	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1900-1930 (5) OR	
435 AMERICAN LITERATURE: SINCE 1930 (5)	5
SPCH 140 ORAL INTERPRETATION	5
EDC&I 356 THE TEACHING OF ENGLISH	3
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English Major: Elementary School Emphasis

(45 approved credits required)

257 INTRODUCTION TO POETRY	5
264 ENGLISH MASTERPIECES: BEGINNINGS THROUGH SHAKESPEARE (TO 1600)	5
265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE (1600-1800)	5
267 AMERICAN MASTERPIECES: BEGINNINGS TO 1900	5
271 EXPOSITORY WRITING	3
324 SHAKESPEARE	5
387 ENGLISH GRAMMAR (5) OR	
447 HISTORY OF THE ENGLISH LANGUAGE (5)	5
341 ROMANTIC POETS (BLAKE, WORDSWORTH, COLERIDGE) (5) OR	
342 ROMANTIC POETS (BYRON, SHELLEY, KEATS) (5) OR	
344 VICTORIAN POETS (TENNYSON, BROWNING, AND OTHERS) (5) OR	
347 NINETEENTH-CENTURY PROSE (5) OR	
417 OR 418 OR 419 THE ENGLISH NOVEL (5,5,5)	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1914-1945 (5) OR	
435 AMERICAN LITERATURE: SINCE 1945 (5)	5
APPROVED ELECTIVES	2 OR MORE
	<hr/> 45

Teaching Minor: Secondary School Emphasis

(41 approved credits required)

265 ENGLISH MASTERPIECES: DONNE THROUGH BLAKE (1600-1800)	5
266 ENGLISH MASTERPIECES: WORDSWORTH THROUGH HARDY (1800-1900)	5
267 AMERICAN MASTERPIECES: BEGINNINGS TO 1900	5
271 EXPOSITORY WRITING	3
324 SHAKESPEARE	5
387 ENGLISH GRAMMAR	5
430 ENGLISH LITERATURE: 1900-1930 (5) OR	
431 ENGLISH LITERATURE: SINCE 1930 (5) OR	
434 AMERICAN LITERATURE: 1914-1945 (5) OR	
435 AMERICAN LITERATURE: SINCE 1945 (5)	5
SPCH 140 ORAL INTERPRETATION	5
EDC&I 356 THE TEACHING OF ENGLISH	3
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Far Eastern and Russian Institute

Teaching Major: Secondary School Emphasis

(60 approved credits required)

FAR E 210 THE FAR EAST IN THE MODERN WORLD	5
FAR E 439 (POL S 435) JAPANESE GOVERNMENT AND POLITICS (5) OR	
FAR E 454 (HSTAS 423) HISTORY OF MODERN JAPAN	5
FAR E 243 RUSSIAN CIVILIZATION (5) OR	
FAR E 423 (HSTEU 445) TWENTIETH-CENTURY RUSSIA (5) (NOTE PREREQUISITES)	5
FAR E 290 (HSTAS 251) HISTORY OF CHINA (5) OR	
FAR E 443 CHINESE SOCIAL INSTITUTIONS (5) OR	

COURSES	CREDITS
FAR E 468 (HSTAS 454) HISTORY OF MODERN CHINA	5
FAR E 343 (POL S 343) GOVERNMENT AND POLITICS OF SOUTHEAST ASIA	5
CHIN 362 CHINESE LITERATURE IN ENGLISH (5) OR	
JAP 421 JAPANESE LITERARY TRADITION (5) OR	
JAP 423 MODERN JAPANESE LITERATURE IN ENGLISH (5)	5
RUSS 320 RUSSIAN LITERATURE IN ENGLISH (5) OR	
RUSS 421 CONTEMPORARY RUSSIAN LITERATURE IN ENGLISH (5)	5
FAR E 313 (GEOG 313) EAST ASIA (5)	5
FAR E 333 (GEOG 333) GEOGRAPHIC PATTERNS OF SOVIET DEVELOPMENT	5
FAR E 344 (POL S 344) CHINESE GOVERNMENT (5) OR	
FAR E 414 (POL S 414) CHINESE POLITICAL THOUGHT	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR	
FAR E 432 (POL S 432) AMERICAN FOREIGN POLICY IN THE FAR EAST (5)	5
FAR E 420 (POL S 420) FOREIGN RELATIONS OF THE SOVIET UNION (5) OR	
FAR E 441 (POL S 441) POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)	5
	<hr/> 60

Far Eastern and Russian Institute Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis)

Teaching Minor: Secondary School Emphasis

(30 approved credits required)

FAR E 210 THE FAR EAST IN THE MODERN WORLD	5
FAR E 240 CHINESE CIVILIZATION (5) OR	
FAR E 313 (GEOG 313) EAST ASIA (5) OR	
FAR E 333 (GEOG 333) GEOGRAPHIC PATTERNS OF SOVIET DEVELOPMENT (5) OR	
FAR E 344 (POL S 344) CHINESE GOVERNMENT (5) OR	
FAR E 439 (POL S 435) JAPANESE GOVERNMENT AND POLITICS (5) OR	
FAR E 414 (POL S 414) CHINESE POLITICAL THOUGHT (5) TO TOTAL	10
FAR E 243 RUSSIAN CIVILIZATION (5) OR	
FAR E 423 (HSTEU 445) TWENTIETH-CENTURY RUSSIA (5) (NOTE PREREQUISITES)	5
FAR E 290 (HSTAS 251) HISTORY OF CHINA (5) OR	
FAR E 468 (HSTAS 454) HISTORY OF MODERN CHINA (5) OR	
FAR E 343 (POL S 343) GOVERNMENT AND POLITICS OF SOUTHEAST ASIA (5) OR	
FAR E 454 (HSTAS 423) HISTORY OF MODERN JAPAN (5)	5
POL S 429 INTERNATIONAL RELATIONS IN THE FAR EAST (5) OR	
FAR E 432 (POL S 432) AMERICAN FOREIGN POLICY IN THE FAR EAST (5) OR	
FAR E 420 (POL S 420) FOREIGN RELATIONS OF THE SOVIET UNION (5) OR	
FAR E 441 (POL S 441) POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)	5
	<hr/> 30

French (Romance Languages and Literature)

Teaching Major: Secondary School Emphasis

(45 approved credits required beyond French 222, and a proficiency in oral and written French, knowledge of French literature and culture, and training in the application of modern principles, materials, and methods of foreign-language teaching. The candidate will be required to take certain tests to demonstrate his acquisition of the language skills; satisfaction of the requirements is to be certified by the adviser in the Department of Romance Languages and Literature before the candidate begins student teaching. The candidate's program of study, supervised by the Department adviser, should normally include the following courses.)

COURSES	CREDITS
301, 302, 303 ADVANCED FRENCH (5,5,5)	15
304 SURVEY OF FRENCH LITERATURE: 1100-1635 (3)	
305 SURVEY OF FRENCH LITERATURE: 1635-1800 (3)	
306 SURVEY OF FRENCH LITERATURE: 1800-1960 (3)	9
350 DRAMA (3) OR	
351 POETRY (3) OR	
352 FICTION (3)	3
409 ADVANCED PHONETICS (3)	3
APPROVED ELECTIVES IN ROMANCE LANGUAGES AND LITERATURE	
COURSES NUMBERED ABOVE 400	9
ROM 401 INTRODUCTION TO ROMANCE LINGUISTICS (3)	3
EDC&I 331 THE TEACHING OF FRENCH	3
	<u>45</u>

Credit may be arranged for study abroad, preferably during the junior year, subject to the regulations governing transfer credit and provided the student's plan is approved in advance by the Registrar's Office and by the departments in which he is studying. Summer study abroad is encouraged.

Teaching Minor: Secondary School Emphasis

(36 approved credits required after French 222. Requirements are the same as for the Teaching Major: Secondary School Emphasis, with one exception—electives in the Romance Languages and Literature courses numbered above 400 are not required of the candidate for the French Teaching Minor.)

Teaching Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Minor: Secondary School Emphasis.)

Geography

Teaching Major: Secondary School Emphasis

(50 approved credits required)

100 INTRODUCTION TO GEOGRAPHY	5
205 PHYSICAL GEOGRAPHY	5
207 ECONOMIC GEOGRAPHY	5
258 MAPS AND MAP READING	2
302 THE PACIFIC NORTHWEST	3
325 HISTORICAL GEOGRAPHY OF AMERICA	3
402 UNITED STATES	5
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVES COURSES OR	
DEPENDING UPON WHETHER ONE SELECTS 325 OR 402	22-24
	<u>50</u>

The following are highly recommended courses:

277 GEOGRAPHY OF CITIES	5
300 ADVANCED REGIONAL GEOGRAPHY	5
370 CONSERVATION OF NATURAL RESOURCES	5

Geography Major: Elementary School Emphasis

(45 approved credits required)

100 INTRODUCTION TO GEOGRAPHY	5
205 PHYSICAL GEOGRAPHY	5
207 ECONOMIC GEOGRAPHY	5
258 MAPS AND MAP READING	2
300 ADVANCED REGIONAL GEOGRAPHY	5
302 THE PACIFIC NORTHWEST	3
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES	20
	<u>45</u>

The following are highly recommended courses:

277 GEOGRAPHY OF CITIES	5
325 HISTORICAL GEOGRAPHY OF AMERICA	3
370 CONSERVATION OF NATURAL RESOURCES	5
402 UNITED STATES	5

Teaching Minor: Secondary School Emphasis

(25 approved credits required)

COURSES	CREDITS
100 INTRODUCTION TO GEOGRAPHY	5
205 PHYSICAL GEOGRAPHY	5
207 ECONOMIC GEOGRAPHY	5
APPROVED GEOGRAPHY UPPER-DIVISION ELECTIVE COURSES	10
	<u>25</u>

Geological Sciences

Teaching Major: Secondary School Emphasis

(64 approved credits required. 10 credits of electives may be taken during the student's fifth year.)

CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND	
LABORATORY (3,3,2,3)	11
PHYS 114, 115, 116, 117, 118, 119 (4,4,4,1,1,1) GENERAL PHYS-	
ICS AND LABORATORY OR 121, 122, 123, 131, 132,	
133 (4,4,4,1,1,1) MECHANICS, ELECTROMAGNETISM	
AND OSCILLATORY MOTION, WAVES, AND GENERAL	
PHYSICS AND LABORATORY	15
MATH 104 PLANE TRIGONOMETRY (3) OR	
HIGH SCHOOL TRIGONOMETRY EQUIVALENT	0-3
GEOL 205 PHYSICAL GEOLOGY (5) OR	
GEOL 101 PHYSICAL GEOLOGY (5)	5
GEOL 103 EARTH HISTORY (5) OR	
GEOL 308 GEOLOGY OF THE NORTHWEST (5)	5
GEOL 320 MINERALOGY	5
APPROVED UPPER-DIVISION GEOLOGICAL SCIENCES ELECTIVES OR	
APPROVED COURSES IN RELATED FIELDS	10
	<u>64</u>

Geological Sciences Major: Elementary School Emphasis

(64 approved credits required. 10 credits of electives may be taken during the student's fifth year.)

CHEM 140, 150, 151, 160 GENERAL CHEMISTRY AND	
LABORATORY (3,3,2,3)	11
BIOL 101-102 GENERAL BIOLOGY (5-5) OR	
ZOOL 111-112 GENERAL ZOOLOGY (5-5)	10
MATH 104 PLANE TRIGONOMETRY (3) OR HIGH SCHOOL	
TRIGONOMETRY EQUIVALENT	0-3
GEOL 205 PHYSICAL GEOLOGY (5) OR	
GEOL 101 PHYSICAL GEOLOGY (5)	5
GEOL 103 EARTH HISTORY (5) OR	
GEOL 308 GEOLOGY OF THE NORTHWEST (5)	5
GEOL 320 MINERALOGY	5
GEOL 330 GENERAL PALEONTOLOGY	5
APPROVED UPPER-DIVISION GEOLOGICAL SCIENCES ELECTIVES OR	
APPROVED COURSES IN RELATED FIELDS	10
	<u>64</u>

Teaching Minor: Secondary School Emphasis

(19 credits required)

205 PHYSICAL GEOLOGY (5) OR	
101 PHYSICAL GEOLOGY (5)	5
106 GEOLOGY IN WORLD AFFAIRS OR	
320 MINERALOGY	5
103 EARTH HISTORY	5
411 FLUVIAL GEOMORPHOLOGY (3) OR	
308 GEOLOGY OF THE NORTHWEST (5)	3-5
	<u>19-20</u>

German (Germanic Languages and Literature)

(A grade-point average of 2.50 must be maintained in all German courses in the programs.)

Teaching Major: Secondary School Emphasis

(A minimum of 45 credits above the second-year level is required. By taking the following courses, 36 credits must be acquired; the rest of the required 45 credits



can be chosen from other upper-division courses offered by the Department.)

COURSES	CREDITS
301 PHONETICS	3
302, 303 GRAMMAR AND CONVERSATION	6
310 20TH CENTURY LITERATURE	3
311 19TH CENTURY LITERATURE	3
312 GOETHE	3
401, 402 ADVANCED COMPOSITION AND STYLISTICS	6
403 APPLIED LINGUISTICS	3
405 INTRODUCTION TO LINGUISTICS	3
413 OR 414 MEDIEVAL LITERATURE OR 16TH-18TH CENTURY LITERATURE	3
EDC&I 336 THE TEACHING OF GERMAN IN SECONDARY SCHOOLS	3
	<u>36</u>

Germanic Major: Elementary School Emphasis

(A minimum of 24 credits above the second-year level required)

301 PHONETICS	3
302, 303 GRAMMAR AND CONVERSATION	6
310 20TH CENTURY LITERATURE	3
311 19TH CENTURY LITERATURE	3
312 GOETHE	3
405 INTRODUCTION TO LINGUISTICS	3
EDC&I 337 THE TEACHING OF GERMAN IN ELEMENTARY SCHOOLS	3
	<u>24</u>

Teaching Minor: Secondary School Emphasis

(A minimum of 30 credits above the second-year level required)

301 PHONETICS	3
302, 303 ADVANCED GRAMMAR AND CONVERSATION	6
310 20TH CENTURY LITERATURE	3
311 19TH CENTURY LITERATURE	3
312 GOETHE	3
401, 402 ADVANCED COMPOSITION AND STYLISTICS	6
403 APPLIED LINGUISTICS	3
EDC&I 336 THE TEACHING OF GERMAN IN SECONDARY SCHOOLS	3
	<u>30</u>

Health Education

(School of Physical and Health Education)

Teaching Major: Secondary School Emphasis

(40 approved credits required, and 29-30 credits in foundation courses)

H ED 291 PERSONAL AND COMMUNITY HEALTH	3
H ED 292 FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION) (AMERICAN RED CROSS)	0-2
H ED 453 THEORY AND PRACTICE OF HEALTH EDUCATION	3
H ED 465 THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM	3
P MED 420 PRINCIPLES OF EPIDEMIOLOGY	3
P MED 422 INTRODUCTION TO ENVIRONMENTAL HEALTH	3
P MED 424 PUBLIC HEALTH PROGRAMS	3

Area requirement is one course from each of the following groups:

GROUP A GENERAL REQUIREMENTS		CREDITS
H ED 292 FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION) (AMERICAN RED CROSS)		0-2
H EC 300 NUTRITION (2) OR		
H EC 110 FOOD AND NUTRITION (5)		2-5
GROUP B		
H EC 300 NUTRITION (2) OR		
H EC 110 FOOD AND NUTRITION (5)		2-5
H ED 481 FOUNDATIONS OF SEX EDUCATION (2 OR 3) OR		
H EC 356 FAMILY RELATIONSHIPS (3) OR		
SOC 352 THE FAMILY (5) OR		
SOC 453 SOCIAL FACTORS IN THE FAMILY (3)		3-5

GROUP C

GENERAL REQUIREMENTS		CREDITS
H ED 481 FOUNDATIONS OF SEX EDUCATION (2 OR 3) OR		
H EC 356 FAMILY RELATIONSHIPS (3) OR		
SOC 352 THE FAMILY (5) OR		
SOC 453 SOCIAL FACTORS IN THE FAMILY (3)		3-5
PSYC 267 PREVENTIVE METHODS FOR MENTAL HEALTH (2) OR		
PSYC 450 PRINCIPLES OF PERSONALITY DEVELOPMENT (2) OR		
PSYCH 305 DEVIANT PERSONALITY (5) OR		
EDPSY 408 MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS (3)		2-5

GROUP D

PSYC 267 PREVENTIVE METHODS FOR MENTAL HEALTH (2) OR		
PSYC 450 PRINCIPLES OF PERSONALITY DEVELOPMENT (2) OR		
PSYCH 305 DEVIANT PERSONALITY (5) OR		
EDPSY 408 MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS (3) AND		
APPROVED ELECTIVES IN HEALTH EDUCATION OR RELATED FIELDS		10-15
		<u>40</u>

Foundation course requirements:

B STR 301	GENERAL ANATOMY	4
MICRO 301	GENERAL MICROBIOLOGY (OR APPROVED SUBS- TUTE) (3 OR 5)	5
PSYCH 100	GENERAL PSYCHOLOGY	5
SOC 110	SURVEY OF SOCIOLOGY	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 119	ELEMENTARY PHYSIOLOGY LABORATORY (1) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5)	5-6
		<u>29-30</u>

Teaching Major: Elementary School Emphasis

(45 approved credits required. Requirements for the Elementary School emphasis are established with the guidance of a Health Education adviser)

Teaching Minor: Secondary School Emphasis

(25-30 approved credits required)

H ED 250 CONTEMPORARY HEALTH CONCEPTS	2
H ED 291 PERSONAL AND COMMUNITY HEALTH	3
H ED 292 FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION) (AMERICAN RED CROSS)	0-2
H ED 453 THEORY AND PRACTICE OF HEALTH EDUCATION AND ONE COURSE FROM EACH OF THE FOLLOWING GROUPS:	3

GROUP A

H ED 292 FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION) (AMERICAN RED CROSS)	0-2
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GROUP B

H EC 300 NUTRITION (2) OR		
H EC 110 FOOD AND NUTRITION (5)		2-5

GROUP C

H ED 481 FOUNDATIONS OF SEX EDUCATION (2 OR 3) OR		
H EC 356 FAMILY RELATIONSHIPS (3) OR		
SOC 352 THE FAMILY (5) OR		
SOC 453 SOCIAL FACTORS IN THE FAMILY (3)		3-5

GROUP D

PSYC 267 PREVENTIVE METHODS FOR MENTAL HEALTH (2) OR		
PSYC 450 PRINCIPLES OF PERSONALITY DEVELOPMENT (2) OR		
PSYCH 305 DEVIANT PERSONALITY (5) OR		
EDPSY 408 MENTAL HYGIENE FOR TEACHERS AND ADMINISTRATORS (3)		2-5
APPROVED ELECTIVES IN HEALTH EDUCATION OR RELATED FIELDS		2-10

Recommended electives to be approved by the Health Education adviser:

ANTH 301	HUMAN NATURE AND CULTURE	3
ECON 346	ECONOMICS OF HEALTH CARE	3
EDC&I 321	HEALTH IN THE ELEMENTARY SCHOOL (2) OR	
P MED 461	SCHOOL AND COMMUNITY HEALTH PROGRAMS	5

COURSES	CREDITS
EDPSY 402 ADVANCED CHILD DEVELOPMENT (3) OR	
NURS 299 INTRODUCTION TO NORMAL GROWTH AND DEVELOPMENT (2)	2-3
GENET 351 HUMAN GENETICS (3) OR	
GENET 451 GENETICS (4)	3-4
EDC&I 420 PRINCIPLES OF SAFETY EDUCATION (3) OR	
H ED 330 SAFETY AND ACCIDENT PREVENTION	2
H ED 451 HEALTH EDUCATION FOR THE CLASSROOM TEACHER	2½
H ED 454 CURRICULUM DEVELOPMENT AND EVALUATION IN HEALTH EDUCATION	2-3
H ED 465 THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM	3
H ED 498 SPECIAL STUDIES IN HEALTH EDUCATION (PERMISSION ONLY TO OUTSTANDING STUDENTS)	2-6
H ED 499 UNDERGRADUATE RESEARCH	3
MICRO 301 GENERAL MICROBIOLOGY	3 OR 5
PH CH 460 MECHANISM OF DRUG ACTION	3
PHCOL 300 PRINCIPLES OF DRUG ACTION	3
P MED 323 INTRODUCTION TO PUBLIC HEALTH: PRINCIPLES AND PRACTICES	3
P MED 420 PRINCIPLES OF EPIDEMIOLOGY	3
P MED 422 INTRODUCTION TO ENVIRONMENTAL HEALTH	3
P MED 424 PUBLIC HEALTH PROGRAMS	3
P MED 410 PRINCIPLES OF COMMUNICABLE DISEASE CONTROL AND BIostatistics	2
P MED 426 FIELD WORK IN PUBLIC HEALTH	5
P MED 460 FIELD TRAINING IN HEALTH EDUCATION	5
PSYCH 250 MENTAL HEALTH OF MINORITY GROUPS	3
SOC 331 POPULATIONS ANALYSIS	5
SOC 452 HEALTH AND SOCIAL BEHAVIOR	5

History

Teaching Major: Secondary School Emphasis

(53 approved credits required. A grade-point average of 2.50 is required in the history courses taken at the University of Washington. Approved equivalents may be substituted for the numbered courses below.)

HST 111 THE ANCIENT WORLD, OR HSTAM 201 AND 202	
ANCIENT HISTORY	5-10
HST 112 THE MEDIEVAL WORLD	5
HST 113 MODERN WORLD HISTORY	5
ONE 400-LEVEL COURSE IN MODERN EUROPEAN HISTORY	3-5
THREE UPPER-DIVISION COURSES IN UNITED STATES HISTORY	12-15
HSTAA 432 HISTORY OF WASHINGTON AND THE PACIFIC NORTHWEST	5
EDC&I 366 THE TEACHING OF SOCIAL STUDIES IN SECONDARY SCHOOLS	3
	38-48

and ADDITIONAL COURSES IN HISTORY SUFFICIENT TO CONSTITUTE A MAJOR OF 50 CREDITS IN HISTORY, OF WHICH AT LEAST HALF COMPRISE UPPER-DIVISION WORK.

History Major: Elementary School Emphasis

(Requirements are same as for the History Teaching Major: Secondary School Emphasis, except that EDC&I 366 is not required.)

Teaching Minor: Secondary School Emphasis

(33 approved credits required. Requirements are similar to those for the History Teaching Major: Secondary School Emphasis, except that HSTAM 201, 202 are not required.)

Home Economics

***Combined Teaching Major and Minor: Secondary School Emphasis**
(62 approved credits and 32 credits in prerequisite and supporting courses)

125 TEXTILES	3
134 CLOTHING (3 OR 5)	5
148 THE HOME, ITS EQUIPMENT, AND MANAGEMENT	3

COURSES	CREDITS
216 FOOD PREPARATION AND MEAL MANAGEMENT	3
234 COSTUME DESIGN	3
307 NUTRITION (3 OR 5)	5
315 ADVANCED FOOD SELECTION AND PREPARATION (3 OR 5)	5
316 DEMONSTRATION TECHNIQUES	3
338 CLOTHING FOR THE FAMILY	3
347 HOME FURNISHING (3 OR 5)	5
348 HOME-MANAGEMENT HOUSE	3
354 FAMILY ECONOMICS AND FINANCES (3 OR 5)	5
356 FAMILY RELATIONSHIPS	3
457 CHILD NUTRITION AND CARE	3
APPROVED HOME ECONOMICS ELECTIVE AT 400 LEVEL	2
†EDC&I 327 THE TEACHING OF HOME ECONOMICS	5
PSYCH 320 FIELD ANALYSIS OF THE BEHAVIOR OF YOUNG CHILDREN	3
	62

PREREQUISITES

ART 109 DESIGN (3) (PREREQUISITE FOR H EC 234 AND 347) OR	
ART 129 APPRECIATION OF DESIGN (2)	2-3
CHEM 101 GENERAL CHEMISTRY (PREREQUISITE FOR CHEM 102)	5
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR H EC 216 AND 307)	5
ECON 200 INTRODUCTION TO ECONOMICS (PREREQUISITE FOR H EC 354)	5
MICRO 301 GENERAL MICROBIOLOGY (3 OR 5)	5
PSYCH 100 GENERAL PSYCHOLOGY (PREREQUISITE FOR PSYCH 306)	5
PSYCH 306 DEVELOPMENTAL PSYCHOLOGY (PREREQUISITE FOR PSYCH 320)	5
ZOOL 118 SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR H EC 307 AND 457)	5
	37-38

*This is a composite program. The major may not be taken without completion of the minor. Completion of the Combined Teaching Major and Minor satisfies the major and minor degree requirements within the College of Education and these courses plus EDC&I 404 fulfill Home Economics course requirements for a Vocational Certificate.

†2 credits count as Education, and 3 credits count as Home Economics.

Home Economics Major: Elementary School Emphasis

(45 approved credits and prerequisite courses)

*110 FOOD AND NUTRITION (5) OR	
216 FOOD PREPARATION AND MEAL MANAGEMENT (3)	5 OR 3
125 TEXTILES	3
134 CLOTHING (3 OR 5)	5
148 THE HOME, ITS EQUIPMENT AND MANAGEMENT	3
240 HOME FURNISHING (3) OR	
347 HOME FURNISHING (3 OR 5)	3 OR 5
*300 NUTRITION (2) OR	
*307 NUTRITION (3 OR 5)	2 OR 5
350 MANAGING FAMILY FINANCES (3) OR	
354 FAMILY ECONOMICS AND FINANCES (3 OR 5)	3 OR 5
356 FAMILY RELATIONSHIPS	3
457 CHILD NUTRITION AND CARE	3
APPROVED HOME ECONOMICS ELECTIVES	8-17

* Students cannot receive credit for both Home Economics 110 and 300, or 300 and 307.

PREREQUISITES

ART 109 DESIGN (3) (PREREQUISITE FOR H EC 347) OR	
ART 129 APPRECIATION OF DESIGN (2)	3 OR 2
CHEM 101 GENERAL CHEMISTRY (PREREQUISITE FOR CHEM 102)	5
CHEM 102 GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR H EC 216 AND 307)	5
ECON 200 INTRODUCTION TO ECONOMICS (PREREQUISITE FOR H EC 354)	5
ZOOL 118 SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR H EC 307 AND 457)	5

**Teaching Minor: Secondary School Emphasis**

(32 approved credits in Home Economics and 22 credits in prerequisite courses)

PREREQUISITES	CREDITS
125 TEXTILES	3
134 CLOTHING (3 OR 5)	5
148 THE HOME, ITS EQUIPMENT, AND MANAGEMENT	3
216 FOOD PREPARATION AND MEAL MANAGEMENT	3
307 NUTRITION (3 OR 5)	5
347 HOME FURNISHING (3 OR 5)	5
354 FAMILY ECONOMICS AND FINANCES (3 OR 5)	5
356 FAMILY RELATIONSHIPS	3
	<u>32</u>

ART 109	DESIGN (3) (PREREQUISITE FOR H EC 347) OR	
ART 129	APPRECIATION OF DESIGN (2)	3 OR 2
CHEM 101	GENERAL CHEMISTRY (PREREQUISITE FOR CHEM 102)	5
CHEM 102	GENERAL AND ORGANIC CHEMISTRY (PREREQUISITE FOR H EC 216 AND 307)	5
ECON 200	INTRODUCTION TO ECONOMICS (PREREQUISITE FOR H EC 354)	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5) (PREREQUISITE FOR H EC 307)	5
		<u>22-23</u>

Industrial Education**Teaching Major: Secondary School Emphasis**

(54 approved credits required)

EDC&I 200, 201	INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING (3,3)	6
EDC&I 202	INDUSTRIAL EDUCATION: GENERAL SHOP	5
EDC&I 204	INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3
EDC&I 206	INDUSTRIAL EDUCATION: GENERAL METALWORK	3
EDC&I 307	INDUSTRIAL EDUCATION: TOOLS AND MATERIALS	2
EDC&I 304-305	INDUSTRIAL EDUCATION: WOODWORKING TECHNOLOGY (3-2)	5
EDC&I 300	INDUSTRIAL EDUCATION: HOME PLANNING	4
EDC&I 400	SELECTION AND ORGANIZATION OF OCCUPATIONAL AND INDUSTRIAL EDUCATION SUBJECT MATTER	3
ME 201	METAL CASTING	1
ME 202	WELDING	1
ME 203	METAL MACHINING	1
ME 312	MACHINE TOOL FUNDAMENTALS	3
ART 253	DESIGN AND MATERIALS: WOOD	3
APPROVED ELECTIVES		<u>14</u>
		<u>54</u>

ALSO REQUIRED

EDC&I 401	THE TEACHING OF OCCUPATIONAL AND INDUSTRIAL EDUCATION	3
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Industrial Education Major: Elementary School Emphasis

(36 approved credits required)

EDC&I 200	INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING	3
EDC&I 202	INDUSTRIAL EDUCATION: GENERAL SHOP	5
EDC&I 204	INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3
EDC&I 206	INDUSTRIAL EDUCATION: GENERAL METALWORK	3
EDC&I 304-305	INDUSTRIAL EDUCATION: WOODWORKING TECHNOLOGY (3-2)	5
EDC&I 302	INDUSTRIAL EDUCATION FOR ELEMENTARY TEACHERS	5
APPROVED ELECTIVES		<u>12</u>
		<u>36</u>

Teaching Minor: Secondary School Emphasis

(35 approved credits required)

EDC&I 200, 201	INDUSTRIAL EDUCATION: SKETCHING AND TECHNICAL DRAWING	6
EDC&I 202	INDUSTRIAL EDUCATION: GENERAL SHOP	5

COURSES**CREDITS**

EDC&I 204	INDUSTRIAL EDUCATION: FUNDAMENTALS OF WOODWORK	3
EDC&I 206	INDUSTRIAL EDUCATION: GENERAL METALWORK	3
EDC&I 400	SELECTION AND ORGANIZATION OF OCCUPATIONAL AND INDUSTRIAL EDUCATION SUBJECT MATTER	3
EDC&I 401	THE TEACHING OF OCCUPATIONAL AND INDUSTRIAL EDUCATION	3
ME 201	METAL CASTING	1
ME 202	WELDING	1
ME 203	METAL MACHINING	1
ME 312	MACHINE TOOL FUNDAMENTALS	3
APPROVED ELECTIVES		<u>6</u>
		<u>35</u>

Japanese (Asian Languages and Literature)**Teaching Minor: Secondary School Emphasis**

(38 approved credits, including the courses listed below, and a proficiency in oral and written Japanese and training in teaching methods of Japanese are required. Proficiency in the language must be demonstrated by examination.)

JAP 211, 212, 213	SECOND-YEAR JAPANESE (5,5,5) OR	
JAP 331	INTENSIVE JAPANESE (15)	15
JAP 411, 412, 413	FOURTH-YEAR JAPANESE (5,5,5)	15
	ONE COURSE CHOSEN FROM ELECTIVES FOR BACKGROUND IN JAPANESE STUDIES (SEE LIST OF ELECTIVES BELOW)	5
		<u>35</u>

ELECTIVES FOR BACKGROUND IN JAPANESE STUDIES

FAR E 210	THE FAR EAST IN THE MODERN WORLD	5
FAR E 295	INTRODUCTION TO JAPANESE CIVILIZATION	5
FAR E 335	JAPANESE FOREIGN POLICY IN ASIA	3
FAR E 437	PROBLEMS IN THE GEOGRAPHY OF JAPAN	3 OR 5
FAR E 439	JAPANESE GOVERNMENT AND POLITICS	5
FAR E 454	HISTORY OF MODERN JAPAN	5
JAP 421	JAPANESE LITERARY TRADITION	5

Journalism**Teaching Major: Secondary School Emphasis**

(45-50 approved credits required. All elective courses must be approved by the curriculum adviser of the School of Communications.)

CMU 150	THE MASS MEDIA	5
CMU 200	THE COMMUNICATION PROCESS	5
CMU 220	LEGAL ASPECTS OF COMMUNICATIONS	3
CMU 321	NEWS WRITING	4
CMU 322	REPORTING CONTEMPORARY AFFAIRS (4) OR	
CMU 323	REPORTING URBAN AFFAIRS (4)	4
CMU 324	CRITICAL WRITING FOR THE MASS MEDIA	4
CMU 406	SOCIAL CONTROL OF THE MASS MEDIA	5
CMU 480	PUBLIC OPINION AND PROPAGANDA	5
EDC&I 358	THE TEACHING OF JOURNALISM	3

ELECTIVE COURSES

CMU 291	PHOTOGRAPHY (3)	
CMU 314	THE ROLE OF THE MAGAZINE IN AMERICA (3)	
CMU 325	COPY EDITING (4)	
CMU 353	RADIO AND TELEVISION NEWS WRITING (3)	
CMU 400	COMMUNICATION THEORY (3)	
CMU 402	GOVERNMENT AND MASS COMMUNICATION (3)	
CMU 411	MASS COMMUNICATIONS RESEARCH (5)	
CMU 414	HISTORY AND COMMUNICATIONS (5)	
CMU 443	THE SOCIAL FUNCTIONS OF ADVERTISING (2½)	
CMU 474	BROADCAST PROGRAMMING (3)	
CMU 450	THE EDUCATIONAL ROLE OF THE MASS MEDIA (2½)	
CMU 485	COMPARATIVE COMMUNICATION SYSTEMS (5)	
SOC 443	MASS COMMUNICATION (5)	
TO TOTAL		<u>9-12</u>
		<u>45-50</u>

Journalism Major: Elementary School Emphasis

(The requirements are the same as those for the Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(27 approved credits required)

COURSES	CREDITS
CMU 150 THE MASS MEDIA	5
CMU 200 THE COMMUNICATION PROCESS	5
CMU 321 NEWS WRITING	4
EDC&I 358 THE TEACHING OF JOURNALISM	3

ELECTIVE COURSES

CMU 406 SOCIAL CONTROL OF THE MASS MEDIA (5)	
CMU 414 HISTORY AND COMMUNICATIONS (5)	
CMU 443 THE SOCIAL FUNCTIONS OF ADVERTISING (2½)	
CMU 450 BROADCAST PROGRAMMING (3)	
CMU 474 THE EDUCATIONAL ROLE OF THE MASS MEDIA (2½)	
CMU 480 PUBLIC OPINION AND PROPAGANDA (5)	
CMU 485 COMPARATIVE COMMUNICATIONS SYSTEMS (5)	
TO TOTAL	$\frac{10}{27}$

Latin (Classics)**Teaching Major: Secondary School Emphasis**

(36 approved credits required: 27 credits in upper-division Latin courses, and 9 credits chosen from courses in Greek, upper-division Latin, or the elective courses listed below.)

ELECTIVE COURSES

CL AR 341 GREEK ARCHAEOLOGY AND ART (3)	
CL AR 342 ROMAN ARCHAEOLOGY AND ART (3)	
CL AR 442 GREEK AND ROMAN POTTERY (3)	
CL AR 444 GREEK AND ROMAN SCULPTURE (3)	
CL AR 446 GREEK ARCHITECTURE (3)	
CLAS 210 GREEK AND ROMAN CLASSICS IN ENGLISH (5)	
CLAS 422 GREEK HISTORIANS AND PHILOSOPHERS IN ENGLISH (3)	
CLAS 426 GREEK AND ROMAN EPIC IN ENGLISH (3)	
CLAS 427 GREEK AND ROMAN TRAGEDY IN ENGLISH (3)	
CLAS 428 GREEK AND ROMAN COMEDY IN ENGLISH (3)	
CLAS 430 GREEK AND ROMAN MYTHOLOGY (3)	
CLAS 435 THE ANCIENT NOVEL (3)	
CLAS 440 GREEK AND ROMAN CRITICS IN ENGLISH (3)	
HST 111 THE ANCIENT WORLD (5)	
HSTAM 201, 202 ANCIENT HISTORY (5,5)	
HSTAM 401 EARLY GREECE (3)	
HSTAM 402 GREECE IN THE AGE OF PERICLES (3)	
HSTAM 403 ALEXANDER THE GREAT AND THE HELLENISTIC AGE (3)	
HSTAM 411 THE EARLY ROMAN REPUBLIC (3)	
HSTAM 412 THE LATE ROMAN EMPIRE (3)	
HSTAM 413 THE EARLY ROMAN EMPIRE (3)	
HSTAM 414 THE LATE ROMAN EMPIRE (3)	
PHIL 320 HISTORY OF ANCIENT PHILOSOPHY (5)	

Latin Major: Elementary School Emphasis

(Requirements are the same as those for the Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(18 approved credits required in recommended upper-division Latin courses.)

Librarianship**Teaching Minor: Secondary School Emphasis**

(24 approved credits required)

COURSES	CREDITS
440 LIBRARIES AND SOCIETY	3
441 BASIC LIBRARY MATERIALS	3
442 BOOK SELECTION	3

COURSES**CREDITS**

443 ORGANIZATION OF LIBRARY MATERIALS: THEORY AND PRACTICE	3
451 CHILDREN'S LITERATURE I	3
453 LITERATURE FOR YOUNG PEOPLE	3
454 LIBRARY IN THE SCHOOL	3
EDC&I 480 INTRODUCTION TO LEARNING RESOURCES IN TEACHING	$\frac{3}{24}$

Elementary and secondary school librarians must have preparation according to *Programs for the Learning Resources Center; Standards for Integrating School Library and Media Services*, approved by the State Board of Education.

(1) For service in schools with enrollment up to 400, 18 credits;

(2) For service in schools with enrollment of 400 or more, Library Science degree or equivalent.

Every applicant for a school library position must hold a teaching certificate for the appropriate level and meet the recommended standards of the state Board of Education.

Courses listed above meet:

(1) Recommendations for elementary, junior, and senior high school librarians in compliance with the *Standards of 1968*, and/or

(2) Requirements for the Librarianship Teaching Minor: Secondary School Emphasis, undergraduate teacher preparation.

A permission signature must be obtained in Room 133, Suzzallo Library.

Mathematics**Teaching Major: Secondary School Emphasis**

(45 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be obtained in all mathematics courses.)

124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5)	15
224 INTERMEDIATE ANALYSIS	3
302 ELEMENTARY LINEAR ALGEBRA	3
391 ELEMENTARY PROBABILITY	3
392 ELEMENTS OF STATISTICS	3
411, 412 INTRODUCTION TO MODERN ALGEBRA FOR TEACHERS (3,3)	6
444, 445 FOUNDATIONS OF GEOMETRY (3,3)	6
APPROVED MATHEMATICS ELECTIVES	$\frac{6}{45}$

EDC&I 377 The Teaching of Secondary School Mathematics (3) is recommended for all Mathematics Teaching Majors.

Mathematics Major: Elementary School Emphasis

(36 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be obtained in all mathematics courses.)

124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5)	15
170 THEORY OF ARITHMETIC (3) OR	
224 INTERMEDIATE ANALYSIS (3)	3



COURSES	CREDITS
171 THEORY OF ARITHMETIC (3) OR	
301 ELEMENTARY NUMBER THEORY (3) OR	
305 INTRODUCTION TO MATHEMATICAL LOGIC (3) OR	
391 ELEMENTARY PROBABILITY (3)	3
302 ELEMENTARY LINEAR ALGEBRA	3
411, 412 INTRODUCTION TO MODERN ALGEBRA FOR TEACHERS (3,3)	6
444, 445 FOUNDATIONS OF GEOMETRY (3,3)	6
	<hr/> 36

Teaching Minor: Secondary School Emphasis

(30 approved credits required beyond college algebra. Grades of C or higher and a grade-point average of at least 2.00 must be obtained in all mathematics courses.)

124, 125, 126 CALCULUS WITH ANALYTIC GEOMETRY (5,5,5)	15
302 ELEMENTARY LINEAR ALGEBRA	3
411, 412 INTRODUCTION TO MODERN ALGEBRA FOR TEACHERS (3,3)	6
444, 445 FOUNDATIONS OF GEOMETRY (3,3)	6
	<hr/> 30

EDC&I 377 The Teaching of Secondary School Mathematics (3) is recommended for all Mathematics Teaching Minors.

Music

(A grade-point average of 2.50 must be obtained in all music courses.)

Combined Teaching Major and Minor: Secondary School Emphasis (97 approved credits)

110, 111, 112 FIRST-YEAR THEORY (2,2,2)	6
113, 114, 115 SIGHT SINGING (1,1,1)	3
210, 211, 212 SECOND-YEAR THEORY (3,3,3)	9
213, 214, 215 MUSIC AFTER 1750 (2,2,2)	6
313, 314 MUSIC BEFORE 1750 (2,3)	5
310, 311, OR 333 MODAL COUNTERPOINT, TONAL COUNTER- POINT, ORCHESTRATION (3,2,3)	6
330 MUSIC IN THE UNITED STATES	2
380, 381, 382 CONDUCTING (1,1,1)	3
383 ELEMENTARY SCHOOL MUSIC	3
384 THE TEACHING OF SECONDARY SCHOOL MUSIC	3
431 THE CURRICULUM IN MUSIC EDUCATION	2
432 THE GENERAL MUSIC CLASS	2
MAJOR INSTRUMENT OR VOICE TO TOTAL	24
MINOR INSTRUMENTS OR VOICE	12
MUSIC ENSEMBLE (MINIMUM OF ONE YEAR CHORAL ENSEMBLE REQUIRED)	12
	<hr/> 97

Music Major: Elementary School Emphasis (50 approved credits required)

110, 111, 112 FIRST-YEAR THEORY (2,2,2)	6
113, 114, 115 SIGHT SINGING (1,1,1)	3
210, 211 SECOND-YEAR THEORY (3,3)	6
213, 214, 215 MUSIC AFTER 1750 (2,2,2)	6
330 MUSIC IN THE UNITED STATES	2
383 ELEMENTARY SCHOOL MUSIC	3
APPLIED MUSIC (INCLUDE NOT LESS THAN 3 CREDITS IN VOICE, NOR LESS THAN 3 CREDITS IN PIANO) TO TOTAL	18
MUSIC ENSEMBLE	6
	<hr/> 50

Natural Science

Teaching Major: Elementary School Emphasis

(60-69 approved credits required. The natural science major for elementary school emphasis students is offered jointly by the departments of Botany, Chemistry,

Geological Sciences, Physics, and Zoology. Approval of the major may be obtained by the student from any one of the departments listed above. The department giving original authorization shall be the major department until the approved program is completed.)

PHYSICAL SCIENCES

Chemistry

COURSES	CREDITS
CHEM 101 GENERAL CHEMISTRY	5
CHEM 102 GENERAL AND ORGANIC CHEMISTRY	5
OR	
CHEM 140, 150, 160 GENERAL CHEMISTRY (3,3,3) AND	9
CHEM 151 GENERAL CHEMISTRY LABORATORY (2)	2
CHEM 170 QUALITATIVE ANALYSIS	3

Physics

PHYS 101-102, 103 PHYSICS FOR TEACHERS (5-5,5)	15
PHYS 114, 115, 116 GENERAL PHYSICS (4,4,4) AND	12
PHYS 117, 118, 119 GENERAL PHYSICS LABORATORY (1,1,)	3
OR	
PHYS 121, 122, 123 MECHANICS (4), ELECTROMAGNETISM AND OSCILLATORY MOTION (4), WAVES (4) AND	12
PHYS 131, 132, 133 GENERAL PHYSICS LABORATORY (1,1,1)	3
OR	
*PHYS 110, 111, 112 GENERAL PHYSICS (3,3,4)	10

BIOLOGICAL SCIENCES

BIOL 101-102 GENERAL BIOLOGY (5-5)	10
BOT 112 THE PLANT KINGDOM (5)	5
ZOOL 118 SURVEY OF PHYSIOLOGY (5) OR	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5)	5
OR	
ZOOL 111-112 GENERAL ZOOLOGY (5-5)	10
BOT 111 ELEMENTARY BOTANY	5
BOT 112 THE PLANT KINGDOM (5) OR	
BOT 371 ELEMENTARY PLANT PHYSIOLOGY (5)	5
OR	
BIOL 210, 211, 212 INTRODUCTORY BIOLOGY (5,5,5)	15
BOT 371 ELEMENTARY PLANT PHYSIOLOGY (5) OR	
ZOOL 330 NATURAL HISTORY OF MARINE INVERTEBRATES (5) OR	
ZOOL 362 NATURAL HISTORY OF VERTEBRATES	5
	<hr/> 20

EARTH SCIENCES

ASTR 101 ASTRONOMY	5
ATM S 101 SURVEY OF THE ATMOSPHERE	5
GEOL 101 PHYSICAL GEOLOGY	5
OCEAN 101 SURVEY OF OCEANOGRAPHY	5
	<hr/> 60-69

* Student must secure written permission from either the Physics Department or the College of Education before enrollment.

Norwegian (Scandinavian Languages and Literature)

(A grade-point average of 2.50 must be maintained.)

Teaching Major: Elementary School Emphasis

(36 approved credits required)

NORW 220, 221, 222 INTRODUCTION TO NORWEGIAN LITERATURE (3,3,3)	9
NORW 223, 224, 225 NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2)	6
NORW 300, 301, 302 MODERN NORWEGIAN LITERATURE (3,3,3)	9
NORW 303, 304, 305 ADVANCED NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2)	6
NORW 490 SUPERVISED READING	1
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS (3) OR	
NORW 450 HISTORY OF NORWEGIAN LITERATURE	3
EDC&I 339 THE TEACHING OF SCANDINAVIAN	2
	<hr/> 36

Teaching Minor: Secondary School Emphasis
(42 approved credits required)

COURSES	CREDITS
NORW 220, 221, 222 INTRODUCTION TO NORWEGIAN LITERATURE (3,3,3)	9
NORW 223, 224, 225 NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2)	6
NORW 300, 301, 302 MODERN NORWEGIAN LITERATURE (3,3,3)	9
NORW 303, 304, 305 ADVANCED NORWEGIAN CONVERSATION AND COMPOSITION (2,2,2)	6
NORW 450 HISTORY OF NORWEGIAN LITERATURE	3
NORW 490 SUPERVISED READING	4
SCAND 455 INTRODUCTION TO SCANDINAVIAN LINGUISTICS	3
EDC&I 339 THE TEACHING OF SCANDINAVIAN	2
	<u>42</u>

Physical Education for Men

Teaching Major: Secondary School Emphasis
(65 approved credits required in Dance, Physical Education, Health Education, and Recreation Education; and 35 approved credits required in specific related courses)

H ED 291 PERSONAL AND COMMUNITY HEALTH	3
H ED 465 THE SCHOOL ENVIRONMENTAL HEALTH PROGRAM	3
PE 164 SKILLS AND MATERIALS IN AQUATICS	2
PE 165 SKILLS AND MATERIALS IN GYMNASTICS	2
PE 166 SKILLS AND MATERIALS IN TEAM SPORTS	2
PE 190 INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION	2
PE 265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES	2
PE 266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS	2
PE 293 PHYSIOLOGY OF MUSCULAR EXERCISE	3
DANCE 309 THE SCHOOL DANCE PROGRAM: SECONDARY	2
PE 322 KINESIOLOGY	3
PE 340 ADMINISTRATION OF INTRAMURAL SPORTS	3
PE 345 PRINCIPALS OF PHYSICAL EDUCATION	3
PE 358 METHODS OF TEACHING GYMNASTICS	2
PE 361 METHODS OF TEACHING WRESTLING	2
PE 363 METHODS OF TEACHING SPORTS	2
PE 364 METHODS OF TEACHING AQUATICS	2
PE 370 COACHING OF FOOTBALL (2) OR	
PE 371 COACHING OF BASKETBALL (2) OR	
PE 372 COACHING OF TRACK AND FIELD (2) OR	
PE 373 COACHING OF BASEBALL (2)	TO TOTAL 6
PE 447 TESTS AND MEASUREMENTS	3
PE 450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	3
PE 493 PROBLEMS IN ATHLETICS	3
R ED 304 INTRODUCTION TO RECREATION	2
R ED 324 RECREATION PROGRAMS	3
	<u>63</u>

RELATED COURSES

B STR 301 GENERAL ANATOMY	4
PSYCH 100 GENERAL PSYCHOLOGY	5
SOC 110 SURVEY OF SOCIOLOGY	5
SPCH 100 VOICE AND ARTICULATION: THEORY AND APPLICATIONS	2
BIOL 101-102 GENERAL BIOLOGY (5-5) OR	
ZOOL 111-112 GENERAL ZOOLOGY (5-5)	10
ZOOL 118 SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 119 ELEMENTARY PHYSIOLOGY LABORATORY (1)	6
	<u>32</u>

Teaching Major: Elementary School Emphasis
(50 approved credits in Physical Education, Health Education, and Recreation Education)

PE 164 SKILLS AND MATERIALS IN AQUATICS	2
PE 165 SKILLS AND MATERIALS IN GYMNASTICS	2
PE 166 SKILLS AND MATERIALS IN TEAM SPORTS	2
PE 190 INTRODUCTION TO PHYSICAL AND HEALTH EDUCATION	2
PE 264 SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING	2
PE 265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES	2
PE 266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS	2
PE 293 PHYSIOLOGY OF MUSCULAR EXERCISE	3
DANCE 309 THE SCHOOL DANCE PROGRAM: SECONDARY	2

COURSES	CREDITS
PE 322 KINESIOLOGY	3
PE 340 ADMINISTRATION OF INTRAMURAL SPORTS	3
PE 345 PRINCIPALS OF PHYSICAL EDUCATION	3
PE 358 METHODS OF TEACHING GYMNASTICS	2
PE 361 METHODS OF TEACHING WRESTLING (2) OR	
PE 364 METHODS OF TEACHING AQUATICS (2)	2
PE 363 METHODS OF TEACHING SPORTS	2
PE 370 COACHING OF FOOTBALL	2
PE 371 COACHING OF BASKETBALL	2
PE 450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	3
PE 493 PROBLEMS IN ATHLETICS	3
R ED 324 RECREATION PROGRAMS	3
	<u>50</u>

Teaching Minor: Secondary School Emphasis
(27 approved credits required)

PE 164 SKILLS AND MATERIALS IN AQUATICS	2
PE 165 SKILLS AND MATERIALS IN GYMNASTICS	2
PE 166 SKILLS AND MATERIALS IN TEAM SPORTS	2
PE 264 SKILLS AND MATERIALS IN TRACK AND FIELD AND WEIGHT TRAINING	2
PE 265 SKILLS AND MATERIALS IN LOW-ORGANIZED GAMES	2
PE 266 SKILLS AND MATERIALS IN INDIVIDUAL SPORTS	2
PE 345 PRINCIPALS OF PHYSICAL EDUCATION	3
PE 358 METHODS OF TEACHING GYMNASTICS (2) OR	
PE 361 METHODS OF TEACHING WRESTLING (2) OR	
PE 363 METHODS OF TEACHING SPORTS (2) OR	
PE 364 METHODS OF TEACHING AQUATICS (2)	2
PE 370 COACHING OF FOOTBALL (2) OR	
PE 371 COACHING OF BASKETBALL (2) OR	
PE 372 COACHING OF TRACK AND FIELD (2) OR	
PE 373 COACHING OF BASEBALL (2)	2
PE 450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	3
ZOOL 118 SURVEY OF PHYSIOLOGY	5
	<u>27</u>

Physical Education for Women

Teaching Major: Secondary School Emphasis
(50-51 approved credits in Physical Education and Dance and 19-27 approved credits in courses in related fields required)

HUMAN MOVEMENT CORE COURSES	CREDITS
PE 231 INTRODUCTION TO MOVEMENT ANALYSIS	5
PE 271 FIELD SPORTS	2
PE 281 WOMEN'S GYMNASTICS	2
PE 331, 332, 333 HUMAN KINEOENERGETICS (3,3,3)	9
PE 350 LEARNING AND MOVEMENT PERFORMANCE	5
DANCE 282 FUNDAMENTALS OF RHYTHM	2
DANCE 283 CONTEMPORARY DANCE	2

RELATED FIELDS COURSES

B STR 301 GENERAL ANATOMY	4
CHEM 100 CHEMICAL SCIENCE OR 1 YEAR HIGH SCHOOL CHEMISTRY	0-5
H ED 292 FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION) (AMERICAN RED CROSS)	0-2
PSYCH 100 GENERAL PSYCHOLOGY	5
SOC 110 SURVEY OF SOCIOLOGY	5
ZOOL 118 SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 119 ELEMENTARY PHYSIOLOGY LABORATORY (1) OR	
ZOOL 208 ELEMENTARY HUMAN PHYSIOLOGY (5)	6-5

SPECIALIZATION COURSES

PE 273 INDIVIDUAL SPORTS	2
PE 284 AQUATICS	1
PE 304 OFFICIATING (2) OR	
PE 305-306 OFFICIATING (1-1)	2
PE 345 PRINCIPLES OF PHYSICAL EDUCATION	3
PE 366 PRACTICUM (2 QUARTERS)	0
PE 375 METHODS IN PHYSICAL EDUCATION I	4
PE 376 METHODS IN PHYSICAL EDUCATION II (7) OR	
DANCE 377 METHODS IN PHYSICAL EDUCATION III (6)	7-6
PE 436 ADAPTED ACTIVITIES	3
PE 450 THE SCHOOL PHYSICAL EDUCATION PROGRAM	2

**Teaching Minor: Secondary School Emphasis**

(31-33 approved credits in Physical Education and Dance and 19-27 approved credits in courses in related fields required)

HUMAN MOVEMENT CORE COURSES:

(Requirements are the same as those for the Teaching Major: Secondary School Emphasis)

RELATED FIELDS COURSES:

(Requirements are the same as those for the Teaching Major: Secondary School Emphasis)

SPECIALIZATION COURSES

PE 273	INDIVIDUAL SPORTS	2
PE 375	METHODS IN PHYSICAL EDUCATION I	4

Teaching Major: Elementary School Emphasis

(29 approved credits in Physical Education and Dance and 26 approved credits in courses in related fields and electives required)

HUMAN MOVEMENT CORE COURSES

PE 231	INTRODUCTION TO MOVEMENT ANALYSIS	5
PE 271	FIELD SPORTS	2
PE 281	WOMEN'S GYMNASTICS	2
PE 331, 332, 333	HUMAN KINEOENERGETICS (3,3,3)	9
PE 350	LEARNING AND MOVEMENT PERFORMANCE	5
DANCE 282	FUNDAMENTALS OF RHYTHM	2
DANCE 283	CONTEMPORARY DANCE	2

RELATED FIELDS COURSES

B STR 301	GENERAL ANATOMY	4
H ED 292	FIRST AID (OR CURRENT ADVANCED FIRST AID CERTIFICATION)	0-2
PSYCH 100	GENERAL PSYCHOLOGY	5
SOC 110	SURVEY OF SOCIOLOGY	5
ZOOL 118	SURVEY OF PHYSIOLOGY (5) AND	
ZOOL 119	ELEMENTARY PHYSIOLOGY LABORATORY (1) OR	
ZOOL 208	ELEMENTARY HUMAN PHYSIOLOGY (5)	6-5

SPECIALIZATION COURSES

EDC&I 324	PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL	3
PE 304	OFFICIATING (2) OR	
PE 305-306	OFFICIATING (1-1)	2

APPROVED ELECTIVES (see departmental adviser for current complete list, the following are exemplary):

DANCE 310	TRADITIONAL DANCE FORMS (2½)	
DANCE 311	RHYTHMIC ACTIVITIES FOR SMALL CHILDREN (2)	
H ED 250	CONTEMPORARY HEALTH CONCEPTS (2)	
PE 312	PHYSICAL FITNESS ACTIVITIES FOR CHILDREN (2½)	
PE 375	METHODS IN PHYSICAL EDUCATION 1 (4)	
PE 436	ADAPTED ACTIVITIES (3)	
PE 438	DEVELOPMENTAL MOTOR ACTIVITIES FOR THE EXCEPTIONAL CHILD (3)	
PE 478	PROGRAMS IN ELEMENTARY PHYSICAL EDUCATION (2½)	

Physics**Teaching Major: Secondary School Emphasis**

(63 approved credits required)

MATH 124, 125, 126	CALCULUS WITH ANALYTICAL GEOMETRY (5,5,5) OR	
MATH 134H, 135H, 136H	CALCULUS WITH ANALYTICAL GEOMETRY (5,5,5)	15
MATH 224	INTERMEDIATE ANALYSIS (3) OR	
MATH 234H	ADVANCED CALCULUS (3)	3
PHYS 121	MECHANICS	4
PHYS 122	ELECTROMAGNETISM AND OSCILLATORY MOTION	4
PHYS 123	WAVES	4
PHYS 131, 132, 133	GENERAL PHYSICS LABORATORY (1,1,1)	3
PHYS 221	QUANTUM PHYSICS	3

COURSES**CREDITS**

PHYS 222	STATISTICAL PHYSICS	3
PHYS 223	ELEMENTARY MATHEMATICAL PHYSICS	3
PHYS 231, 232	ELECTRIC CIRCUITS LABORATORY (3,3)	6
PHYS 327	INTRODUCTION TO NUCLEAR PHYSICS	3
PHYS 405	LABORATORY FOR PHYSICS TEACHERS	3
ELECTIVES IN PHYSICAL SCIENCES OTHER THAN MATHEMATICS AND PHYSICS		9
		<u>63</u>

Student teaching (EDUC 374, 375) must include experience with physics or physical science classes.

Teaching Minor: Secondary School Emphasis

(39 approved credits required)

MATH 124, 125, 126	CALCULUS WITH ANALYTICAL GEOMETRY (5,5,5) OR	
MATH 134H, 135H, 136H	CALCULUS WITH ANALYTICAL GEOMETRY (5,5,5)	15
PHYS 121	MECHANICS	4
PHYS 122	ELECTROMAGNETISM AND OSCILLATORY MOTION	4
PHYS 123	WAVES	4
PHYS 131, 132, 133	GENERAL PHYSICS LABORATORY (1,1,1)	3
PHYS 221	QUANTUM PHYSICS (3) OR	
PHYS 320	INTRODUCTION TO MODERN PHYSICS (3)	3
PHYS 222	STATISTICAL PHYSICS	3
PHYS 405	LABORATORY FOR PHYSICS TEACHERS	3
		<u>39</u>

Note: Students who have completed the sequence Physics 114, 115, 116, 117, 118, 119 and who wish to earn a Teaching Minor in Physics should consult an adviser in the Department of Physics.

Political Science**Teaching Major: Secondary School Emphasis**

(50 approved credits required)

201	MODERN GOVERNMENT	5
202	AMERICAN GOVERNMENT AND POLITICS	5
*BROAD FIELDS:		
(1)	POLITICAL THEORY AND PUBLIC LAW (MINIMUM 10 CREDITS)	
(2)	GOVERNMENT, POLITICS, AND PUBLIC ADMINISTRATION (MINIMUM 10 CREDITS)	
(3)	COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS (MINIMUM 10 CREDITS)	TO TOTAL 40

A useful course for teachers in the state of Washington is

POL S 351	THE AMERICAN DEMOCRACY (5)	
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The Department strongly recommends that a student who intends to teach in senior high school elect a minor in history in addition to his major in political science; and that a student who intends to teach in junior high school elect a minor in geography and take History of the Americas HSTAA 201, in addition to his major in credits in the Department.)

Political Science Major: Elementary School Emphasis

(Requirements are the same as those for the Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(30 approved credits required)

201	MODERN GOVERNMENT	5
202	AMERICAN GOVERNMENT AND POLITICS	5
*BROAD FIELDS:		
(1)	POLITICAL THEORY AND PUBLIC LAW	TO TOTAL 5
(2)	GOVERNMENT, POLITICS, AND PUBLIC ADMINISTRATION	TO TOTAL 5

COURSES	CREDITS
(3) COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS	TO TOTAL 5
APPROVED UPPER-DIVISION POLITICAL SCIENCE ELECTIVES	5
	<u>30</u>

*The Department of Political Science maintains a current list of approved courses for the three broad fields.

Psychology

Teaching Major: Secondary School Emphasis

Required are 50 approved credits in psychology and a grade-point average of 2.00. Transfer students must meet the same requirements but need to take only 15 credits in the Department.)

100	GENERAL PSYCHOLOGY (5) OR	
190	INTRODUCTION TO THE SCIENTIFIC ANALYSIS OF BEHAVIOR (5) OR APPROVED EQUIVALENT	5
201	LABORATORY IN HUMAN PERFORMANCE (3) OR	
202	LABORATORY IN ANIMAL LEARNING (3) OR	
203	LABORATORY IN ANIMAL BEHAVIOR (3)	3
302	STATISTICAL METHODS I	3
303	STATISTICAL METHODS II	3
	APPROVED ELECTIVES	36
		<u>50</u>

Psychology Major: Elementary School Emphasis

(Requirements are the same as those for the Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(Required are 30 approved credits in psychology and a grade-point average of 2.00. Transfer students must meet the same requirements but need only take 15 credits in the Department.)

100	GENERAL PSYCHOLOGY (5) OR	
190	INTRODUCTION TO THE SCIENTIFIC ANALYSIS OF BEHAVIOR (5) OR APPROVED EQUIVALENT	5
201	LABORATORY IN HUMAN PERFORMANCE (3) OR	
202	LABORATORY IN ANIMAL LEARNING (3) OR	
203	LABORATORY IN ANIMAL BEHAVIOR (3)	3
302	STATISTICAL METHODS I	3
303	STATISTICAL METHODS II	3
	APPROVED ELECTIVES	16
		<u>30</u>

Russian (Slavic Languages and Literature)

Teaching Major: Secondary School Emphasis

(52 approved credits required)

RUSS 210	ACCELERATED RUSSIAN (10) OR	
RUSS 202, 203	RUSSIAN (5,5)	10
RUSS 301, 302, 303	INTERMEDIATE RUSSIAN (5,5,5)	15
RUSS 401, 402, 403	ADVANCED RUSSIAN (5,5,5)	15
EDC&I 338	THE TEACHING OF RUSSIAN	2
	COURSES CHOSEN FROM ELECTIVES LISTED BELOW	
	MINIMUM OF	10
		<u>52</u>

ELECTIVES FOR BACKGROUND IN RUSSIAN STUDIES

FAR E 333	GEOGRAPHIC PATTERNS OF SOVIET DEVELOPMENT (5)	
FAR E 421	KIEVAN AND MUSCOVITE RUSSIA, 850-1700 (5)	
FAR E 422	IMPERIAL RUSSIA, 1700-1900 (5)	
FAR E 423	TWENTIETH-CENTURY RUSSIA (5)	
FAR E 424	MODERN RUSSIAN INTELLECTUAL HISTORY (5)	
LING 400	SURVEY OF LINGUISTIC METHOD AND THEORY (3)	
POL S 441	POLITICAL INSTITUTIONS OF THE SOVIET UNION (5)	
RUSS 320	RUSSIAN LITERATURE IN ENGLISH (5)	
RUSS 421	CONTEMPORARY RUSSIAN LITERATURE IN ENGLISH (5)	
RUSS 422	RUSSIAN PLAYS IN ENGLISH (5)	

COURSES	CREDITS
RUSS 426, 427, 428	THE RUSSIAN NOVEL IN ENGLISH (4,4,4)
RUSS 451, 452, 453	STRUCTURE OF RUSSIAN (3,3,3)
RUSS 461, 462, 463	INTRODUCTION TO RUSSIAN LITERATURE (3,3,3)

Teaching Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Minor: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(33 approved credits required)

RUSS 210	ACCELERATED RUSSIAN (10) OR	
RUSS 202, 203	SECOND-YEAR RUSSIAN (5,5)	10
RUSS 301, 302, 303	INTERMEDIATE RUSSIAN (5,5,5)	15
EDC&I 338	THE TEACHING OF RUSSIAN	2
	COURSES CHOSEN FROM ELECTIVES LISTED ABOVE	
	MINIMUM OF	6
		<u>33</u>

Sociology

Teaching Major: Secondary School Emphasis

(50 approved credits in sociology and a cumulative 2.30 grade-point average are required.)

110	SURVEY OF SOCIOLOGY	5
223	SOCIAL STATISTICS	5
330	HUMAN ECOLOGY (5) OR	
430	HUMAN ECOLOGY (5) OR	
331	POPULATION ANALYSIS (5) OR	
431	POPULATION ANALYSIS (5)	5
240	GROUP BEHAVIOR	5
450	CONTEMPORARY AMERICAN INSTITUTIONS (5) OR	
352	THE FAMILY (5)	5
	APPROVED SOCIOLOGY ELECTIVES, CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST	25
		<u>50</u>

Sociology Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis.)

Teaching Minor: Secondary School Emphasis

(27 approved credits in sociology required)

110	SURVEY OF SOCIOLOGY (5) OR	
352	THE FAMILY (5) OR	
330	HUMAN ECOLOGY (5) OR	
331	POPULATION ANALYSIS (5)	5
	APPROVED SOCIOLOGY ELECTIVES CHOSEN AFTER CONSULTATION REGARDING THE STUDENT'S SPECIAL FIELD OF INTEREST	17
		<u>27</u>

Spanish (Romance Languages and Literature)

Teaching Major: Secondary School Emphasis

(Required are 45 approved credits beyond Spanish 203, proficiency in oral and written Spanish, knowledge of Hispanic literature and culture, and training in the application of modern principles, materials, and methods of foreign-language teaching. The candidate's program of study should include the courses listed below. Satisfaction of the requirements is to be certified by the adviser in the Department of Romance Languages and Literature before the candidate begins student teaching.)

SPAN 301, 302	ADVANCED SYNTAX AND COMPOSITION (4,4)	8
SPAN 303	SPANISH STYLISTICS	4
SPAN 304	SURVEY OF SPANISH LITERATURE: 1140-1498	3
SPAN 305	SURVEY OF SPANISH LITERATURE: 1498-1681	3



COURSES	CREDITS
SPAN 306 SURVEY OF SPANISH LITERATURE: 1681 TO THE PRESENT	3
SPAN 350 DRAMA (3) OR	
SPAN 351 POETRY (3) OR	
SPAN 352 FICTION (3)	TO TOTAL 6
SPAN 409 ADVANCED PHONETICS	3
ROM 401 INTRODUCTION TO ROMANCE LINGUISTICS	3
APPROVED ELECTIVES IN ROMANCE LANGUAGES AND LITERATURE	
COURSES NUMBERED ABOVE 400	9
EDC&I 333 OR 334 OR 335 THE TEACHING OF SPANISH:	
SECONDARY EMPHASIS	3
	<u>45</u>

Credit may be arranged for study abroad, preferably during the junior year, subject to the regulations governing transfer credit, and provided the student's plan is approved in advance by the Registrar's Office and by the departments in which he is studying. Summer study abroad is encouraged.

Teaching Minor: Secondary School Emphasis

(Requirements are the same as for the Teaching Major: Secondary School Emphasis, with one exception—electives in Romance Languages and Literature courses numbered above 400 are not required of the candidate for the Teaching Minor. 36 approved credits beyond Spanish 203.)

Teaching Major: Elementary School Emphasis

(Requirements are the same as for the Teaching Minor: Secondary School Emphasis.)

Speech

Teaching Major: Secondary School Emphasis

(59 approved credits required.)

Students who transfer to a major in speech after entering the University must present a cumulative grade-point average of 2.50 in all University courses, unless otherwise authorized by the Department, and students majoring in speech are required to maintain a grade-point average of 2.50 in all speech courses.

SPCH 100	VOICE AND ARTICULATION: THEORY AND APPLICATION	2
SPCH 102	SPEECH, MAN, AND SOCIETY	5
SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION	5
SPCH 140	ORAL INTERPRETATION	5
SPCH 220	INTRODUCTION TO PUBLIC SPEAKING	5
SPCH 230	ESSENTIALS OF ARGUMENT	5
SPCH 235	PARLIAMENTARY PROCEDURE	3
SPCH 300	SPEECH SCIENCE	5
SPCH 335	METHODS OF DEBATE	3
SPCH 348	SURVEY OF COMMUNICATION DISORDERS	3
SPCH 373	PRINCIPLES OF GROUP DISCUSSION	5
EDC&I 357	THE TEACHING OF SPEECH	3
DRAMA 325	PLAY PRODUCTION (STAGECRAFT)	5
DRAMA 326	PLAY PRODUCTION (ACTING AND DIRECTING)	5

59

Teacher candidates with a major in speech normally will be advised to elect English as their minor. Other recommended minors include social studies, drama, or a modern foreign language. Such major-minor combinations are proposed on the basis of most probable teaching assignment combinations in the secondary schools of the state of Washington.

Speech Major: Elementary School Emphasis (45 approved credits required)

COURSES		CREDITS
SPCH 100	VOICE AND ARTICULATION: THEORY AND APPLICATION	2
SPCH 101	APPLIED PHONETICS	2
SPCH 102	SPEECH, MAN, AND SOCIETY	5
SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION	5
SPCH 140	ORAL INTERPRETATION	5
SPCH 220	INTRODUCTION TO PUBLIC SPEAKING	5
SPCH 348	SURVEY OF COMMUNICATION DISORDERS	3
*SPCH 355	SPEECH IN THE ELEMENTARY CLASSROOM	3
SPCH 373	PRINCIPLES OF GROUP DISCUSSION	5
APPROVED SPEECH ELECTIVES WHICH MAY INCLUDE DRAMA 338, CREATIVE DRAMATICS (3), AND LIBRARIANSHIP 452 STORYTELLING (3)		10
		45

*Available Spring Quarter and Summer "b" term.

Speech Minor: Secondary School Emphasis

(33 approved credits required)

SPCH 100	VOICE AND ARTICULATION: THEORY AND APPLICATION	2
SPCH 102	SPEECH, MAN, AND SOCIETY	5
SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION	5
SPCH 140	ORAL INTERPRETATION	5
SPCH 220	INTRODUCTION TO PUBLIC SPEAKING	5
SPCH 348	SURVEY OF COMMUNICATION DISORDERS	3
*SPCH 356	SPEECH IN THE SECONDARY CLASSROOM (3) OR	
EDC&I 357	THE TEACHING OF SPEECH (3)	3
SPCH 373	PRINCIPLES OF GROUP DISCUSSION	5
	<u>33</u>	

*Available Winter Quarter and Summer "a" term.

Speech and Hearing Therapy Major: Elementary School Emphasis

(57–61 credits required)

SPCH 301	ANATOMY OF THE SPEECH MECHANISM	5
SPCH 302	GENERAL PHONETICS	5
SPCH 303	SPEECH AND LANGUAGE DEVELOPMENT	3
SPCH 330	SPEECH DISORDERS	5
SPCH 331	SPEECH DISORDERS	5
SPCH 332	DIAGNOSIS OF SPEECH DISORDERS	3
SPCH 430	STUTTERING	3
SPCH 370	INTRODUCTION TO AUDIOLOGY	5
SPCH 371	BASIC AUDIOMETRY	3
SPCH 390	INTRODUCTION TO AURAL REHABILITATION	5
SOC W 401	PRINCIPLES OF INTERVIEWING	2
SPCH 350	METHODS OF CLINICAL MANAGEMENT	3
SPCH 351	PRACTICUM IN SPEECH PATHOLOGY (1-5, MAX. 15)	
	AND	
SPCH 391	PRACTICUM IN AUDIOLOGY (1-5, MAX. 15)	
	MINIMUM OF 2 CREDITS IN EITHER	TO TOTAL 4

(TWO COURSES ELECTED FROM THE FOLLOWING:)

SPCH 140	ORAL INTERPRETATION (5)
SPCH 220	INTRODUCTION TO PUBLIC SPEAKING (5)
SPCH 230	ESSENTIALS OF ARGUMENT (5)
SPCH 355	SPEECH IN THE ELEMENTARY CLASSROOM (3)
SPCH 400	THEORETICAL BACKGROUNDS IN SPEECH (3)

Swedish (Scandinavian Languages and Literature)

Teaching Major: Elementary School Emphasis

(35 approved credits and a grade-point average of 2.50 are required)

SWED 220, 221, 222	INTRODUCTION TO SWEDISH LITERATURE (3,3,3)	9
SWED 223, 224, 225	SWEDISH CONVERSATION AND COMPOSITION (2,2,2)	6
SWED 300, 301, 302	MODERN SWEDISH LITERATURE (2,2,2)	6
SWED 303, 304, 305	ADVANCED CONVERSATIONAL SWEDISH (2,2,2)	6
SWED 306, 307, 308	ADVANCED SWEDISH COMPOSITION (1,1,1)	3

COURSES	CREDITS
SWED 450 HISTORY OF SWEDISH LITERATURE	3
EDC&I 339 THE TEACHING OF SCANDINAVIAN	2
	<u>35</u>

Teaching Minor: Secondary School Emphasis

(42 approved credits and a grade-point average of 2.50 are required)

SWED 220, 221, 222 INTRODUCTION TO SWEDISH LITERATURE (3,3,3)	9
SWED 223, 224, 225 SWEDISH CONVERSATION AND COMPOSITION (2,2,2)	6
SWED 300, 301, 302 MODERN SWEDISH LITERATURE (2,2,2)	6
SWED 303, 304, 305 ADVANCED CONVERSATIONAL SWEDISH (2,2,2)	6
SWED 306, 307, 308 ADVANCED SWEDISH COMPOSITION (1,1,1)	3
SWED 490 SUPERVISED READING	7
SWED 450 HISTORY OF SWEDISH LITERATURE	3
EDC&I 339 THE TEACHING OF SCANDINAVIAN	2
	<u>42</u>

THE STANDARD CERTIFICATE

Admission to the College of Education or to any of the programs within the College of Education assumes and is dependent upon the student's eligibility for admission, enrollment, and registration at the University of Washington.

The Standard Certificate is issued by the State Department of Public Instruction upon recommendation from an approved institution of higher learning in the state of Washington. The requirements of the College of Education, University of Washington, combined with the requirements of the State Board of Education for the Standard Certificate are as follows:

Basic Provisions, General

(1) Possession of a valid Provisional Certificate; (2) at least two years of successful teaching on the Provisional Certificate or equivalent, at the elementary and/or secondary level(s); (3) completion of 45 quarter credits of approved course work beyond the Provisional Certificate requirement including completion of deferred courses from the Provisional Certificate pattern and any appropriate suggestions from the field. Such work must represent study in both professional and academic fields.

Specific Requirements, University of Washington College of Education

ELEMENTARY EMPHASIS (Early childhood education [prekindergarten and primary grades]; general elementary, primary, and intermediate grades; elementary school speech and hearing therapy)

Students shall complete or have completed 15 credits beyond minimum degree requirements in the College of Education in the two basic fields of knowledge outside the major (humanities, social sciences, natural sciences).

SECONDARY EMPHASIS

A minimum of 3 credits must be selected from one of the following areas: (a) curriculum development, (b) guidance and counseling, (c) special education.

Specific Requirements, State Board of Education

1. At least 50 per cent of the 45 quarter credits in the fifth year must be upper-division and/or graduate courses.
2. A maximum of 12 quarter credits may be taken by correspondence and/or extension in the fifth year provided no transfer work from other institutions is included.
3. A minimum of 22½ quarter credits approved by the attesting institution must be completed in *residence* at one institution. These credits may be earned in the thirteenth, fourteenth, or fifteenth quarters.
4. A maximum of 30 quarter credits in excess of degree requirements may be taken before or during the first year of teaching.
5. A minimum of 15 quarter credits must be taken after one year of successful teaching experience.
6. A college-level course in Washington State history must be completed by intermediate-grade (grades 4, 5, and 6) and all secondary social studies teachers.
7. An average of C or higher must be attained in all course work required for the fifth year.

Students are reminded that a petition for the Standard Certificate should be filed in the College of Education Advisory Office when the conversion program is started.

GRADUATE PROGRAMS

Graduate Program Adviser

Roger G. Olstad
210 Miller Hall

Graduate Information Office

210 Miller Hall

Admission to the College of Education or to any of the programs within the College of Education assumes and is dependent upon the student's eligibility for admission, enrollment, and registration at the University of Washington.

The College of Education provides, by means of its graduate programs, for the continuing education of teachers and other specialists in various phases of education, for the preparation of school and college administrators, and for the scholarly study of the educational process itself: its history, philosophy, organization, and sociological and psychological foundations of its operation. In addition to the "fifth" or postbaccalaureate year required by the state of Washington for the standard teaching credential, which may be part of an approved graduate program, certain of the special professional certificates for school personnel



that require graduate study may be earned through the College of Education.

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet its general requirements together with any major field requirements that may be specified. For example, test scores often are required, and some fields require successful experience relative to the program. For further details, students should check with the Graduate Program Adviser, appropriate members of the faculty, or the Office of Graduate Studies, 210 Miller Hall.

GRADUATE DEGREE PROGRAMS

The basic graduate programs offered by the College of Education lead to one of four advanced degrees: Master of Arts, Master of Education, Doctor of Philosophy, or Doctor of Education. Students entering these programs will be governed by requirements as outlined below.

Master of Arts

Requirements for the Master of Arts degree are: completion of an approved program of a minimum of 36 quarter credits (exclusive of prerequisites) that consists of at least 27 quarter credits in courses in a field of concentration in education, including related course work in and outside of education, and 9 quarter credits in thesis; completion of an acceptable thesis; demonstration of a reading knowledge of one language other than English; and a written final examination. The Master of Arts degree is currently offered in several programs of study: Curriculum and Instruction (Language Arts Education, Mathematics Education, Science Education, Social Studies Education); Educational Administration; History of Education; Philosophy of Education; and Sociology of Education.

Master of Education (Pattern I)

Requirements for the Master of Education (Pattern I) degree are: completion of an approved program of a minimum of 45 quarter credits (exclusive of prerequisites) that consists of at least 24 quarter credits in a field of concentration in education, at least 12 quarter credits in related courses in and outside of education, and 9 quarter credits in thesis or such special assignment as research seminar or field study; and a written final examination. The Master of Education (Pattern I) degree is currently offered in these programs of study: Curriculum and Instruction (Elementary Education, Learning Resources, Reading [jointly with Educational Psychology], Secondary Education, Vocational Education); Educational Administration; Educational Psychology and Psychological Services (Educational Psychology, Reading [jointly with Curriculum and Instruction], Reading Disability [jointly with Special Education], Counseling, Vocational Rehabilitation); Spe-

cial Education (General Curriculum Reading Disability [jointly with Educational Psychology]).

Master of Education (Pattern II)

Requirements for the Master of Education (Pattern II) degree are: completion of an approved program of 45 quarter credits (exclusive of prerequisites) consisting of at least 24 quarter credits in a teaching field, at least 12 quarter credits in education, and 9 quarter credits in thesis or such special assignment as research seminar or field study; and a written final examination. The Master of Education (Pattern II) degree is currently offered in these programs of study: Curriculum and Instruction (Art Education, Business Education, Industrial Education, Mathematics Education, Music Education, Science Education, Social Studies Education).

Doctor of Philosophy

Requirements for the Doctor of Philosophy degree are: completion of an approved program of a minimum of 90 quarter credits of graduate work beyond the master's degree (exclusive of prerequisites) that focuses upon an area of specialization consisting of at least 36 quarter credits in a field of concentration in education and approximately 12 quarter credits in supporting courses in a field other than education; approximately 12 quarter credits in the techniques of scholarly research; 30 quarter credits in dissertation; demonstration of a reading knowledge of one language other than English; a General Examination, written and oral; an oral Final Examination after the dissertation has been satisfactorily completed. The Doctor of Philosophy degree is currently offered in these fields: Curriculum and Instruction (Elementary Education, General Curriculum, Language Arts, Learning Resources, Science Education, Secondary Education, Social Studies Education); Educational Administration; Educational Psychology and Psychological Services (Counseling and School Psychology, Learning and Thinking, Measurement and Evaluation); Higher Education; History of Education; Philosophy of Education; Special Education (Exceptional Children).

Doctor of Education

Requirements for the Doctor of Education degree are: completion of an approved program of a minimum of 96 quarter credits of graduate work beyond the master's degree (exclusive of prerequisites) that focuses upon an area of specialization consisting of at least 24 quarter credits in a field of concentration in education; approximately 20 credits in related courses in and outside of education; approximately 10 credits in an internship or field experience relevant to the area of concentration; approximately 12 quarter credits in the techniques of scholarly research; 30 quarter credits in

dissertation; a General Examination, written and oral; and an oral Final Examination after the dissertation has been satisfactorily completed. The Doctor of Education degree is currently offered in these fields: Curriculum and Instruction (Elementary Curriculum, General Curriculum Development, Language Arts, Learning Resources, Science Education, Secondary Curriculum); Educational Administration; Higher Education; Special Education (Exceptional Children).

ADMINISTRATORS' CREDENTIALS

The revised requirements for administrators' credentials were adopted by the State Board of Education March 24, 1956, and became effective June 1, 1957. All applications are to be made to the State Superintendent of Public Instruction, Olympia, Washington, through the intermediate school district in which the applicant's school is located.

I. Provisional Principal's Credential (Elementary, Secondary, and General)

A. Applications for the Provisional Principal's Credential may be filed by students with full graduate standing in the Graduate School after one year of successful teaching and prior to completion of requirements, preferably before the applicant has begun study for the credential.

B. A total of 54 quarter credits beyond the bachelor's degree in an approved institution is the required minimum. Of these 54 credits, 24 must be in an approved program, which will make a maximum contribution to the individual's responsibilities as a principal.

C. At least 9 credits of the 54 quarter credits must have been earned *after* completion of the Standard Certificate. These 9 quarter credits shall be in courses in administration, curriculum, and supervision on the elementary and/or secondary level. These 9 credits must be earned in residence at the University of Washington.

D. A total of 12 credits toward the 24 may be transferred from an approved institution. Not more than 6 of the 24 credits may be earned by extension, and no credits earned in correspondence study may be applied. The combination of transfer and extension work may not exceed 12 credits.

E. Laboratory and internship type experiences shall be a part of the program. These shall take the form of supervised administration experiences in school situations.

F. Proof of three years of successful teaching experience on the appropriate level or levels is one of the requirements for a Provisional Principal's Credential.

G. The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary for school administration and an evaluation of the applicant's success in positions already held.

H. After admission to graduate standing in the Graduate School and admission to the area of Educational Administration, an official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

I. The Provisional Principal's Credential is valid for not more than four years of administrative experience in elementary schools of six or more teachers or in accredited junior, senior, and four-year or six-year high schools.

II. Standard Principal's Credential (Elementary, Secondary, and General)

A. Applications for the Standard Principal's Credential may be filed during the applicant's second year of experience as a principal and prior to completion of requirements.

B. After completion of the Provisional Principal's Credential, 12 credits in residence at the University of Washington must be earned for a Standard Principal's Credential. These credits shall be in approved courses in administration, supervision, and curriculum on the elementary and/or secondary level.

C. A master's degree is required for the Standard Principal's Credential. This degree may be completed in the College of Education or in an academic department.

D. Three years of successful teaching experience (two years of which must be as a full-time classroom teacher), and three years of experience as a principal on the appropriate level or levels are requirements for a Standard Principal's Credential.

E. The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary for school administration and an evaluation of the applicant's success in positions already held.

F. An official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

G. The Standard Principal's Credential is valid as long as the holder's teaching certificate is valid.



III. Provisional Superintendent's Credential

A. Applications for the Provisional Superintendent's Credential may be filed after the applicant has completed preparation for a Standard Principal's Credential and prior to completion of requirements.

B. After completion of the Standard Principal's Credential, 12 credits in residence at the University of Washington must be earned for a Provisional Superintendent's Credential. These credits shall be in approved courses in administration, supervision, and curriculum on the elementary and/or secondary level.

C. A master's or higher degree is required for the Provisional Superintendent's Credential. This degree may be completed in an academic department or in the College of Education.

D. Candidates with experience as principals at one level only are to have laboratory experience at the opposite level. These experiences are to be planned with the candidate, the teacher-education institution, and school administrators.

E. Three years of successful teaching experience (two years of which must be as a full-time classroom teacher), and four years of administrative experience on the appropriate level or levels are requirements for a Provisional Superintendent's Credential.

F. The credential is dependent upon proof that the applicant possesses the qualities of leadership necessary

for school administration and an evaluation of the applicant's success in positions already held.

G. An official program plan must be arranged in consultation with a faculty supervisor in Educational Administration.

H. The Provisional Superintendent's Credential is valid for three years of administrative experience.

IV. Standard Superintendent's Credential

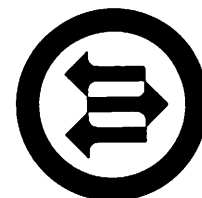
A. Applications for the Standard Superintendent's Credential may be filed by the candidate after one year's service as a superintendent, and prior to completion of requirements.

B. After completion of the Provisional Superintendent's Credential, 12 credits in residence at the University of Washington must be earned for a Standard Superintendent's Credential. These credits shall be in approved courses in the areas of administration, supervision, and curriculum.

C. Three years of successful superintendent's experience are required for a Standard Superintendent's Credential.

D. An official program must be completed by all candidates with a faculty supervisor in Educational Administration.

E. The Standard Superintendent's Credential is valid as long as the holder's teaching certificate is valid.



ENGINEERING

Dean

Charles H. Norris
369 Loew Hall

Associate Deans

W. Ryland Hill
373 Loew Hall

H. Myron Swarm
376 Loew Hall

Assistant Dean

Endrik Noges
367 Loew Hall

Executive Committee

Charles H. Norris, Chairman, Albert L. Babb, R. J. H. Bollard, Daniel G. Dow, V. B. Hammer, R. G. Hennes, A. Hertzberg, W. Ryland Hill, E. W. Jordahn (*ex officio*), C. J. Kippenhan, Howard C. Merchant, R. W. Moulton, Endrik Noges, D. H. Polonis, R. F. Rushmer, H. Myron Swarm, Myron L. White

Twentieth-century technology is dependent on cooperative teamwork among engineers, scientists, and engineering technicians. Engineers use the principles of science and engineering to create things that people need or want. Bridges, highways, ships, planes, rockets, power transmission lines, and the machinery to build them—these and more are the concern of the engineer. He must be competent to understand and use methods of science; he must apply ingenuity to devise a product or process that is both useful and economical; he must assume professional responsibility

for the safety and well-being of the people affected by his works.

The scientist discovers new principles. A truly qualified scientist usually must have a college education extending past the four-year bachelor's degree to the Doctor of Philosophy degree. The engineer with the bachelor's degree is more immediately useful to industry for many technical positions. However, engineers who plan to engage in research, in college teaching, or in creative design on a high professional level now need graduate study leading to master's and doctoral degrees. Students with academic aptitudes should seriously consider at least a fifth year of specialization.

Assisting the engineer and the scientist is the engineering technician. His work is practical and applied, requiring approximately two years of post-high-school training in a technical institute or a junior college. He works closely with the engineer to test and develop models and to put engineering designs into production.

The College offers educational programs for men and women in the various fields of engineering with five main aims: (1) to provide a strong undergraduate engineering education leading to a bachelor's degree and enabling some students immediately to enter the engineering profession; (2) to provide a fundamental scientific and technical foundation for graduate studies and research for students who have the potential to pursue such programs successfully; (4) to permit the



outstanding student to realize his full capabilities; and progress professionally on his own.

Although engineering education is directed primarily toward providing the scientific and technical foundation required for the profession, each curriculum includes courses in the humanities and social studies to broaden the student's knowledge, to increase his sense of responsibility, and to help him live more effectively as an individual engineer and citizen.

In recognition of the responsibility of the University for the development of knowledge and the training of research personnel, the College has active graduate programs in all engineering degree departments. The College has also developed an expanded research program at every level in these departments. Not only does this research advance engineering knowledge, but it is an integral part of the educational experience needed to qualify men and women for research and development positions, or for careers in engineering teaching.

The College of Engineering has been a major unit of the University since 1899, with the first engineering degree awarded in mining engineering in 1900. Progressively, degrees in civil engineering (1901), electrical engineering (1902), mechanical engineering (1906), chemical engineering (1907), aeronautical engineering (1929), and nuclear engineering (1955) were added. The College, participating in the technological development of the Northwest, has shared the University's rapid growth, with a present faculty of 190 members. Last year, 2,531 undergraduates and 780 graduate students were enrolled in engineering curricula.

College Facilities and Services

The teaching and research activities of the College of Engineering occupy fourteen major campus buildings and portions of others. All except the Hydraulics Laboratory are grouped around the Engineering Quadrangle. These buildings, most of them relatively new, contain the office, classroom, and administrative facilities of the College and also house the numerous research and teaching laboratories. A new central Engineering Library serves the College, and together with the nearby Chemistry and Chemical Engineering Libraries and the Mathematics and Physics Libraries provide outstanding collections of books and periodicals of interest to engineers. The Research Computer Laboratory of the University is also located within the College of Engineering complex, thus making it particularly convenient for many engineering studies.

Facilities of particular interest include a large wind tunnel, a 100-kilowatt nuclear reactor, a 44-acre antenna site, a microwave laboratory, a large structural

testing laboratory, an extensive hydraulics laboratory, a laboratory for heat transfer studies, and recently expanded laboratory facilities for Ceramics and Metallurgy.

Interdisciplinary Research Facilities

The Aerospace Research Laboratory is the first unit of an interdisciplinary engineering research building that is planned to contain about 110,000 square feet (gross). This laboratory is an interdepartmental and interdisciplinary facility organized by the College of Engineering for the conduct of fundamental research studies oriented toward those engineering problems associated with terrestrial and extraterrestrial environments and with flight systems.

Experimental programs of this laboratory are of interest to the several departments of the College. The laboratory serves as a special facility wherein inquiry in the areas of common interest between faculty and students of different departments of the College is undertaken. It frequently serves to complement areas of research being conducted within the departmental laboratories. The laboratory also offers opportunity for interdisciplinary study in areas of common interest between faculty of the College of Engineering and the faculties in other departments of the University.

Office of Engineering Research

Director

H. Myron Swarm
376 Loew Hall

Assistant Director

Erik W. Jordahn
374 Loew Hall

The *Office of Engineering Research* performs a three-fold function:

1. It stimulates, promotes, and coordinates investigations and research in all fields of engineering.
2. It publishes results of significant research achievements.
3. It provides opportunities through graduate research assistantships for engineering students to extend their professional educations while pursuing a course of study leading to the master's or doctoral degree.

The functioning of the Office of Engineering Research is guided by an Engineering Research Board, consisting of the director as chairman, the assistant director, and the chairmen of the academic departments. All research is carried on either in the departments of the College or in the interdepartmental laboratories.

The Office offers a number of research assistantships to highly qualified graduate students, who are assigned to

the academic departments. Current research findings, as well as listings of sponsored projects, appear in the quarterly journal, *The Trend in Engineering*, which has a circulation of 4,000, including 150 foreign institutions.

Student Activities

The *Engineering Student Council* is made up of representatives elected from student organizations in the departments of the College. Tau Beta Pi, the engineering honorary fraternity, also has a representative on the Council, which supervises various student activities.

Honorary and Professional Societies

All the great professional engineering societies, such as the American Society of Civil Engineers, the Institute of Electrical and Electronic Engineers, and the American Society of Mechanical Engineers, have student chapters on the campus, and every engineering student is encouraged to join the chapter that represents his field of interest. The College also has a student chapter of the Society of Women Engineers.

Honor societies open to engineering students are *Tau Beta Pi* and *Sigma Xi*. Students who have maintained high scholarship and are of commendable character may be elected to membership in Tau Beta Pi in their junior or senior year. Election to Tau Beta Pi constitutes one of the highest honors an undergraduate engineering student can receive.

Financial Aids

The College offers financial assistance to undergraduates through industrial scholarships and limited loan funds. The *Handbook of Scholarships*, available from the Office of Financial Aids, 3939 University Way N.E., or the departmental advising offices, lists available scholarships. Qualified graduate students may obtain financial assistance through industrial and governmental fellowships, National Science Foundation, National Aeronautics and Space Administration, and Public Health Service traineeships, research assistantships, or teaching assistantships. Students seeking such aid should apply at the office of their major department.

UNDERGRADUATE PROGRAMS

(Advisers are listed under the individual departments.)

Curricula in the College of Engineering are accredited by the Engineers' Council for Professional Development, the principal accrediting agency of the engineering profession in the United States. All courses of study are designed to provide an understanding of the physical sciences; a fundamental background for the conception, design, construction, operation, and improvement of structures and machines, of processes

and projects; and an educational foundation in the humanities and the social sciences.

Admission as Freshmen

Admission to the University as described in the *Undergraduate Education* section establishes that the student is eligible for admission to the College of Engineering. However, a student intending to pursue an engineering career should choose his high school electives to provide the background essential to engineering studies. College algebra, trigonometry, physics, and chemistry are prerequisites for the first-year courses in Engineering. Those who fail to include these subjects in high school must study equivalent courses at the University in addition to the normal required program. This may extend the time needed for a degree. The College also recommends electing a fourth year of mathematics and senior composition when possible.

Admission with Advanced Standing

A qualified student in good standing at an accredited institution may apply for admission with advanced standing. Such an applicant is expected to have the same high school preparation as the student who enters as a freshman, and to meet the scholastic standards specified in the section on admission of transfer students of the *Undergraduate Education* section in this catalog.

Mathematics Placement Tests

For information concerning the qualifying mathematics tests in the Pre-College Testing Program, see *Undergraduate Education* section.

Programs of Study

The engineering student enrolls for his first year in the Department of General Engineering, where he is assigned to a member of the faculty who advises him on his educational objectives and his program of study. This first-year curriculum, administered for the other departments of the college by the Department of General Engineering, provides courses in basic engineering and science subjects as well as an orientation course designed to familiarize the student with University activities, the various fields of engineering, and the opportunities open to the engineering graduate. At the beginning of the sophomore year, regular students enter the curriculum of the department in which they have decided to major.

All undergraduate engineering students are required to take courses in the humanities and social sciences as an integral part of their professional educations. These courses may be taken in the Department of Humanistic-Social Studies, which offers an integrated sequence especially designed for engineers, or in the College of Arts and Sciences.



Four-year curricula leading to bachelor's degrees are offered in the Departments of Aeronautics and Astronautics, Chemical, Civil, Electrical, and Mechanical Engineering, and in the Department of Mining, Metallurgical, and Ceramic Engineering.

In addition to the four-year curricula, the College offers a course of study in industrial engineering for which a second bachelor's degree is awarded at the end of five years; the first four years comprise the standard four-year curriculum of any branch of engineering in which the College grants a bachelor's degree, while the fifth is made up of courses in industrial management and related subjects.

Cooperative Work-Study Program

Coordinator

Erik W. Jordahn
374 Loew Hall

The Cooperative Work-Study Program of the College of Engineering offers the engineering undergraduate student an option to combine practical engineering experience with his studies. Starting with the sophomore year and continuing through the junior year, the selected student alternates six-month periods of work with six-month periods of study. The freshman and senior years do not include work periods. The program requires time equivalent to an additional academic year to complete, because the alternating periods of work and study require three calendar years to finish the middle academic years of study.

The Cooperative Work-Study Program furnishes practical experience to the student, assists the student financially through remunerative employment, provides insight into the human element in engineering through contacts at work as well as school, and helps the student assess his fitness and desire for actual practice in engineering as a life's work.

Organizations rely more than ever upon college-trained men to assume positions of responsibility in all phases of operations. These young men, however, frequently have only a vague concept of how organizations function. Although well grounded in theories involved in industrial operations, they have not had an opportunity to acquire practical knowledge during their formative years of theoretical training. The Cooperative Work-Study Program is designed to minimize this transitional difficulty when a practicing engineer commences his career. The cooperating organizations include aerospace firms, electric and electronic equipment manufacturers, gas companies, power companies, manufacturers of machinery and mechanical equipment, pulp and paper mills, construction and engineering firms, and state and federal agencies.

For the present, enrollment in the Cooperative Work-Study Program is limited to undergraduates in the disciplines of civil, electrical, and mechanical engineering. For further information and a detailed publication on this program, write to the University of Washington, College of Engineering, Coordinator, Cooperative Work-Study Program, 376 Loew Hall, Seattle, Washington 98105.

Graduation Requirements

Students working toward bachelor's degrees in engineering must meet the general requirements of the University and the College as well as the particular course requirements of their major department. Course requirements for each degree are described in the curricular announcements of the departments.

For graduation, the College of Engineering requires completion of one of the prescribed engineering curricula, including the required quarters of physical education activity. This requirement supersedes the minimum credit requirement of the University (180 academic credits plus 3 physical education activity credits). No more than 9 quarter credits in advanced ROTC courses may be counted toward graduation. Grades earned at other institutions may not be used to raise the grade-point average at the University of Washington.

Honors Program

Committee Chairman

W. Ryland Hill
373 Loew Hall

The honors program of the College of Engineering provides an opportunity for the gifted undergraduate engineering student to develop to his fullest extent.

The objectives of the honors program are achieved through the provision of special honors sections in the engineering and supporting curricula, by permitting greater program flexibility to suit special needs, by the development of ingenuity and a research attitude in special honors projects, and by participation in seminars and honors colloquia available on a campus-wide basis.

Although the designation of honors students is not made until the end of the freshman year, the program actually starts at college entrance. The taking of honors sections in mathematics or entrance into the college mathematics sequence at a higher level than normal because of advanced high school preparation will serve as the basis of the honors work to follow. However, the honors program should also attract those students who display outstanding scholarship during the freshman year, even though their progress may not have been accelerated in high school or in college honors courses.

Of importance in the selection of honors students at the end of the freshman year will be advanced standing in mathematics, inclusion of honors courses in mathematics, and outstanding academic performance.

An entering student interested in the honors program should consult with an adviser in the Department of General Engineering to plan a program that will best fit his abilities and high school preparation.

A student may drop from the honors program into regular status at any time. Conversely, a student may enter the honors program later than normal if he can demonstrate the necessary ability and background. He should consult his departmental honors adviser and present to the college honors chairman supporting letters from one or more professors familiar with his work.

Honors students successfully completing a program including a substantial number of honors courses are graduated "With College Honors in Engineering."

CONTINUING EDUCATION PROGRAMS

Because of the rapid advances in applied mathematics and in the physical and engineering sciences, it is especially important that practicing engineers who are more than ten to fifteen years out of school continue to update their educations.

A rapid growth of knowledge and accompanying changes in the engineering practices have placed higher and higher demands on the analytical ability and fundamental preparation of the practicing engineer. Some analytical tools that were available only in graduate school a decade or two ago are now required material in the undergraduate engineering programs. As a result, older engineers find it increasingly difficult to communicate with their younger counterparts. They also find it more difficult to read current engineering and scientific literature unless they have first undertaken an intensive study of applied mathematics, physics, and related subjects. To accomplish this by taking courses directed toward a degree is seldom practical or efficient for practicing engineers.

To meet this need, the College of Engineering offers a variety of continuing education programs. These programs may be divided into two categories: (1) courses carrying continuing studies credit, and (2) noncredit courses, short courses, and conferences.

In general, the Continuing Education courses are offered according to need and are announced in *Spectrum* magazine, in special circulars, and in news media.

Courses Carrying Continuing Studies Credit

To distinguish between more informal short courses and courses of longer duration with formal evaluation of student performance, the University of Washington established in 1966 a category of courses that carry Continuing Studies credit. This specially designed credit is *not* intended for application toward a university degree; rather, its aim is to satisfy the immediate needs of professional engineers and their employers. Quantitatively, one credit in Continuing Studies normally requires the same amount of work as normally needed for one quarter of University credit within the degree programs. All successfully completed courses will be entered on an official transcript available to the student as part of his educational record.

The courses in this category usually are offered on a basis of need and may take many forms. They may be offered over a quarter's duration, with lectures given during the evenings or weekends. On the other hand, they may take the form of the Continuing Education for Engineers Series, which combines the advantages of a residential course with those of correspondence studies.

Short Courses and Conferences

To serve the needs of the engineering and scientific community of the state, the University offers from time to time short intensive courses on advanced topics. Because of the nature of these courses, formal evaluation of the participants is not possible, and therefore these courses usually do not carry Continuing Studies credit. Each course usually covers a specialized topic and is offered on a level that approaches the forefront of current knowledge or technology.

General Education Programs

In its continuing education program, the College of Engineering also offers courses for nonengineers as part of the general education program. These serve to acquaint laymen with engineering methods, nomenclature, and discipline of thought.

GRADUATE PROGRAMS

(Graduate Program Advisers are listed under individual departments.)

Students who intend to work toward advanced degrees must fulfill the admission requirements of the Graduate School and of the department in which they expect to major. Acceptance will also depend upon the availability of the faculty and facilities for the program desired.

Departmental Graduate Programs

Graduate study leading to a Master of Science degree with departmental designation is available in the Departments of Aeronautics and Astronautics, Chemical,



Civil, Electrical, Mechanical, and Nuclear Engineering, and in the Department of Mining, Metallurgical, and Ceramic Engineering.

The degree of Master of Science in Engineering (without departmental designation) is offered to qualified advanced students whose undergraduate majors have been in departments different from those in which they are working toward master's degrees, and to students who are doing graduate work in several engineering departments with the approval of advisers in their major departments.

The degrees of Master of Aeronautics and Astronautics and Master of Electrical Engineering are granted to students who satisfactorily complete an approved two-year program of graduate work in these departments.

Graduate study leading to the Doctor of Philosophy degree is available in Aeronautics and Astronautics, Ceramic, Chemical, Civil, Electrical, Mechanical, and Nuclear Engineering, and Metallurgy.

Graduate students must satisfy the requirements for an advanced degree that are in force at the time the degree is to be awarded. No foreign language is required for master's degree programs offered by the College of Engineering, except for the Master of Science degree in Civil Engineering.

Interdepartmental and Intercollege Programs

ENGINEERING MECHANICS

Graduate Advisers

Ellis H. Dill

Aeronautics and Astronautics
315B Guggenheim Hall

Billy J. Hartz
Civil Engineering
313 More Hall

Albert S. Kobayashi
Mechanical Engineering
261 Mechanical Engineering Building

A program in Engineering Mechanics is offered through the cooperation of the Departments of Aeronautics and Astronautics, Civil Engineering, and Mechanical Engineering. The student will normally enroll in one of these departments. Work can lead to the Master of Science degree with departmental designation, to the Master of Science in Engineering degree, or to the Doctor of Philosophy degree.

Engineering mechanics is an important link between new developments in the physical sciences, in mathematics, and in engineering. The field covers such topics

as the mechanics of solids and fluids, dynamics, behavior of materials, and experimental mechanics.

Students entering this program should have completed an undergraduate degree in a field such as aeronautical, civil, or mechanical engineering, physics, engineering physics, mathematics, or an equivalent. The course program is planned through consultation with an adviser to fit the student's interests and background. The student's program will ordinarily include continuing study in mathematics and the engineering sciences (solid mechanics, fluid mechanics, thermodynamics, dynamics), and must satisfy the basic requirements of the department in which he is enrolled.

The engineering science courses for this program are normally selected from available courses offered by the Departments of Aeronautics and Astronautics, Civil Engineering, and Mechanical Engineering in the following areas: (1) Mechanics of Continua and Thermodynamics: heat transfer, electrodynamics and thermodynamics of a continuum; (2) Mechanics of Solids: theory of elasticity, theory of plasticity, viscoelasticity, thermoelasticity, properties of solids, fracture mechanics, experimental stress analysis; (3) Mechanics of Fluids: fluid mechanics, hydrodynamics, aerodynamics, gasdynamics, hydrodynamic waves; (4) Dynamics and Wave Propagation: advanced dynamics, nonlinear dynamics, space dynamics, vibration theory, random vibrations, wave propagation; (5) Structural Mechanics: theory of plates and shells, dynamics of structures, elastic stability, matrix theory of structures, variational and energy methods.

BIOENGINEERING

An intercollege program in bioengineering is offered through the cooperation of the School of Medicine. Work in this field can lead to the Master of Science in Engineering and the Doctor of Philosophy degrees. See *Intercollege Program*, in latter part of *College of Engineering* section.

GENERAL ENGINEERING

Chairman

Vernon B. Hammer
111 General Engineering Building

Professors

Herbert Boehmer, Robert Q. Brown (emeritus), Clarence E. Douglass, Walter L. Dunn, Vernon B. Hammer, Thomas M. Rowlands (emeritus), E. Roscoe Wilcox (emeritus)

Associate Professors

Daniel E. Alexander, W. Burnett Bonow (on leave)
William S. Chalk, Geoffrey K. Douthwaite, Albert L.

Hoag, Dorland H. Konichek, Thomas W. Macartney,
Donald C. McNeese, Rowland E. Messer, Robert W.
Seabloom

Assistant Professors

James D. Collins, Keith C. Crandall, George A. Nelson,
Mahlon O. Ness, Charles C. Redeker

Affiliate Assistant Professor

Frank R. Marshall

Instructor

Gail H. Allwine, Richard C. Duncan, David Rogers

Lecturers

Richard W. Seed, Wells Thompson

During the first year, the Department of General Engineering offers several unique advantages for the introduction and examination of engineering as a career.

In the first quarter, a course is offered in the analysis and solution of engineering problems. Further engineering experience is provided during this year in a series of integrated engineering graphics and mechanics courses. Classes in the engineering graphics and problems courses are on a "lecture-laboratory" basis, meeting for two hours, three times a week. This allows the instructor to introduce a subject, initiate a class discussion, then spend the remainder of the period working with the various members of the class as individual problems arise. These courses, together with the normal mathematics, chemistry, and communication subjects, give the student the opportunity to assess his interest and ability to pursue engineering.

Every freshman takes an orientation course to learn about the various fields of engineering—the academic requirements as well as the present and future opportunities in the field. These presentations are from men actively engaged in the various fields and consist of talks, films, question sessions, and open-house tours.

The student is assigned an adviser who is informed of his previous academic background. Consultation with him on matters of program planning is required, and his advice in other academic and some personal matters is available. In addition, other members of the staff representing all fields of engineering are available for consultation. A staff of professional counselors is also available at the University Counseling Center.

CURRICULUM IN GENERAL ENGINEERING

First Year

FIRST QUARTER		CREDITS
GE 100	ORIENTATION	1
GE 104	GRAPHICS	3
GE 111	PROBLEMS	3
CHEM 140	GENERAL	3
MATH 124	CALC. WITH ANALYTIC GEOMETRY	5
*PE ACTIVITY	. . . . .	—
		15

SECOND QUARTER		CREDITS
GE 105	GRAPHICS	3
GE 115	DIGITAL COMPUTING	2
CHEM 150	GENERAL	3
CHEM 151	GEN. CHEM. LAB.	2
MATH 125	CALC. WITH ANALYTIC GEOMETRY	5
*PE ACTIVITY	. . . . .	—
		15

THIRD QUARTER		CREDITS
GE 112	STATICS	3
CHEM. 160	GENERAL	3
MATH 126	CALC. WITH ANALYTIC GEOMETRY	5
PHYSICS 121	GENERAL	4
*PE ACTIVITY	. . . . .	—
		15

Technical Electives

GE 107	APPLIED DESCRIPTIVE GEOMETRY
GE 121	PLANE SURVEYING AND MEASUREMENTS (REQUIRED FOR MINING ENGINEERING)
GE 215	TOPICS IN DIGITAL COMPUTING
GE 351	INVENTIONS AND PATENTS
GE 390	COMPUTER APPLICATIONS IN ENGINEERING PROBLEMS

Exceptions are as follows:

Students without high school chemistry will take Chemistry 100, (Chemical Science), followed by Chemistry 140, 150, 151, 160.

Students are required to demonstrate proficiency in mathematics by passing qualifying tests. Those who are unable to pass a test in algebra will adjust their programs of studies to allow for a refresher course.

At the beginning of the sophomore year, regular students enter the curriculum of the department in which they have decided to major.

AERONAUTICS AND ASTRONAUTICS

Chairman

R. J. H. Bollard
206 Guggenheim Hall

Professors

R. J. H. Bollard, Ellis H. Dill, Fred S. Eastman, Ian M. Fyfe, Victor M. Ganzer, Abraham Hertzberg, Harold C. Martin, Carl E. Pearson, Robert E. Street

Associate Professors

Harlow G. Ahlstrom, Walter H. Christianson, M. E. Fourney, Robert G. Joppa, Jirair K. Kevorkian, Gordon C. Oates, William H. Rae, Jr., Davis A. Russell

Assistant Professors

Reiner Decher, Keith A. Holsapple, R. Reid Parmerter, Juris Vagners

The departmental programs are directed to the education of men and women seeking professional careers in the engineering, research, and development activities associated with the exploration of space and the creation

* See *Undergraduate Education* section for Physical Education Activity requirement.



of water and airborne vehicles. The complexity of the associated technologies and their rapid change requires these programs to provide a firm basis in the basic and engineering sciences upon which fields of chosen specialization can be built with relative ease and confidence during studies in the Department and throughout a professional career.

A study of the programs illustrates the emphasis given to the engineering sciences with application to gas and solid mechanics, dynamics, vibrations, and systems theory in areas of professional interest such as aerodynamics, structural analysis, aeroelasticity, astronautics, propulsion, flight mechanics, and systems analysis. These programs are characterized by the liberal content of free electives allowing concentration on the sciences on one hand and the development of professional skills on the other. The majority of students choosing a program between these extremes find themselves well prepared for successful careers.

The timeliness of the program content is assured by faculty research and consulting association with industrial and government organizations and an extensive program of visiting lecturers who participate in colloquia and seminars and as visiting professors for longer term appointments.

Undergraduate Programs

The curriculum for the Bachelor of Science in Aeronautics and Astronautics for the first year is administered by the Department of General Engineering. An honors program is offered under the advisement of Harold C. Martin, 315C Guggenheim Hall.

CURRICULUM IN AERONAUTICS AND ASTRONAUTICS

Second Year

FIRST QUARTER		CREDITS
ECON 211	GENERAL	3
HSS 265	TECH. OF COMMUN.	3
MATH 224	INTERMED. ANAL.	3
PHYSICS 122	ELMAG. AND OSCIL. MOTION	4
HSS ELECTIVE		3
		16

SECOND QUARTER

CEEM 292	MECH. OF MT'LS I	3
CEEM 296	MECH. OF MT'LS I TUTORIAL	(0)
MATH 238	DIFF. EQUATIONS	3
MTL E 250	MT'LS. SCIENCE	4
HSS 270	REPORT WRITING	2
PHYSICS 123	WAVES	4
		16

THIRD QUARTER

AA 200	INTRO. TO AERO. AND ASTRO.	2
CEEM 291	DYNAMICS	3
CEEM 295	DYNAMICS TUTORIAL	0
ME 320	THERMODYNAMICS I	4
HSS 331	ORIG. WEST. CULT. INST.	3
MATH ELECTIVE		3
		15

Third Year

FIRST QUARTER		CREDITS
AA 300	AERODYNAMICS I	3
AA 320	JUNIOR LAB. I	2
AA 330	STRUCT. ANAL. I	3
EE 301	ELEMENTS OF EE	4
EE 302	EE LAB.	1
PHYS 221	QUANTUM PHYSICS	3
		16

SECOND QUARTER

AA 301	AERODYNAMICS II	3
AA 321	JUNIOR LAB. II	2
AA 331	STRUCT. ANAL. II	3
PHYS 222	STATISTICAL PHYSICS	3
HSS 332	DEV. WEST. CULT. INST.	3
		14

THIRD QUARTER

AA 302	AERODYNAMICS III	3
AA 322	JUNIOR LAB. III	2
AA 332	STRUCT. ANAL. III	3
ME 340	ENGR. MT'LS	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
HSS ELECTIVE		2
		16

Fourth Year

FIRST QUARTER		CREDITS
HSS 491	LIT. HERITAGE WEST. WORLD I	3
TECHNICAL ELECTIVES		12
		15

SECOND QUARTER

HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVES		12
		15

THIRD QUARTER

HSS 493	LIT. HERITAGE WEST. WORLD III	3
TECHNICAL ELECTIVES		12
		15

At least 27 credits of technical electives will be selected from the following list of courses. It is expected that three one-year sequences will be followed in the chosen areas of specialization. The remaining required 9 credits may be selected from course offerings within the University in appropriate related fields. Senior programs should be planned with the assistance of a faculty adviser and will meet with the adviser's approval.

Technical Electives

GAS DYNAMICS AA 400, 401, 402
 DESIGN AA 410, 411, 412
 LABORATORY AA 420, 421, 422
 STRUCTURES AA 430, 431, 432
 FLIGHT MECHANICS AA 440, 441, 442
 SPACE MECHANICS AA 450, 451, 452
 PROPULSION AA 460, 461, 462
 DYNAMICS AA 480, 481
 MATHEMATICS MATH 324, 325, 427, 428, 429, 438, AA 470
 AUTOMATIC CONTROL EE 315, 479, 493

Graduate Programs

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

Master of Science in Aeronautics and Astronautics

Students who have earned a bachelor's degree in engineering, physics, or mathematics are eligible for admission. Prospective candidates must complete an ap-

proved program of study. This program is tailored to the needs and interests of each student, but must possess breadth, through study of a variety of subjects, and depth through extensive study of a chosen field of specialization.

The program may either consist of 39 credits of course work, or 30 credits of course work and a minimum of 9 credits for thesis. The following courses are suggested to provide the required breadth and are usually taken by all students: 504, 530, 567, 568, 569, 571, 575. Depth is obtained through a choice of electives from among the courses available in this department or in other departments. A minimum of three quarters of full-time study after admission to the Graduate School is required. No foreign language is required.

Master of Aeronautics and Astronautics

This degree is intended to provide course work and research beyond that normally included in the degree program for the Master of Science in Aeronautics and Astronautics. The student must complete an approved program of study and research. This program usually consists of a prior Master of Science degree followed by 30 credits of course work and a thesis, for which 9 credits are given.

Doctor of Philosophy

The doctoral program consists of lectures, seminars, discussions, and independent study enabling the student to master his field and to demonstrate his ability to make original contributions. The formal steps toward the degree are listed in the *Graduate Study* section of this catalog. In addition to those requirements, the student is expected to be in continuous full-time residence for one academic year after advancement to candidacy.

Admission to the Graduate School does not imply admission to the Ph.D. program. Admission to the Ph.D. program is based upon the performance in the first year of graduate study. Students who have achieved a 3.50 grade-point average will be admitted to the doctoral program. In other cases, admission will be determined by the Department based on evidence of superior ability, achievement, and motivation for advanced study and research.

CHEMICAL ENGINEERING

Chairman

Ralph W. Moulton
105 Benson Hall

Professors

Albert L. Babb, Morton M. David, Howard S. Gardner, Lennart N. Johanson, Joseph L. McCarthy, Ralph W. Moulton, Kyosti V. Sarkanen, Charles A. Sleicher, Jr.

Associate Professors

John C. Berg, Kermit L. Garlid, William J. Heideger, Norman F. Sather

Assistant Professors

Bruce A. Finlayson, Carl W. Larson

Today's rapidly changing technology offers many challenges in chemical engineering. Emphasis is placed on the development and application of processes and equipment in which matter is treated to induce a change in state (or phase), energy content, or chemical composition. Chemistry and physics are the underlying sciences of chemical engineering, mathematics is its quantitative language, and economics and human relations are its guides in practice.

The chemical engineering graduate of today must cope with new and complex technologies that until but a few years ago existed only in the minds of men with vision and imagination. For this reason and many others, today's undergraduate is presented with a less descriptive and a less industry-oriented approach to education than he was ten to fifteen years ago. The emphasis now is on a more fundamental treatment with a good foundation in mathematics, physics, and chemistry. Such a sound, fundamental background coupled with practical engineering training is needed to prepare the graduate for work in the wide diversity of problems and variety of careers offered to the chemical engineer of today.

Undergraduate Programs

Adviser

Ralph W. Moulton
105 Benson Hall

The curriculum for the Bachelor of Science in Chemical Engineering for the first year is administered by the Department of General Engineering.

The honors adviser is William J. Heideger, 363 Benson Hall.

CURRICULUM IN CHEMICAL ENGINEERING

Second Year

FIRST QUARTER		CREDITS
CHEM 170	QUAL. ANAL.	3
CHEM 335	ORGANIC	3
CHEM 345	ORGANIC LAB.	2
MATH 224	INTERMED. ANAL.	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		<hr/> 15

SECOND QUARTER

CH E 200	INTRO. TO CHEM. E.	3
CHEM 336	ORGANIC	3
ENGL 101	INTRODUCTORY ENGL.	3
MATH 238	DIFF. EQUATIONS	3
PHYSICS 123	WAVES	4
		<hr/> 16



THIRD QUARTER		CREDITS
CH E 210	MATERIAL & ENERGY BALANCES	4
CHEM 337	ORGANIC	3
ENGL 102	INTRODUCTORY ENGL.	3
HSS	ELECTIVES	5
		<hr/> 15

Third Year**FIRST QUARTER**

CH E 325	THERMODYNAMICS	4
EE 301	ELEMENTS OF E.E.	4
EE 302	ELEC. E. LAB.	1
HSS	ELECTIVES	5
CHEM 455	PHYSICAL	3
		<hr/> 17

SECOND QUARTER

CH E 326	THERMODYNAMICS AND KINETICS	4
HSS	ELECTIVES	5
CHEM 456	PHYSICAL	4
CH E 330	TRANSPORT PROCESS PRINCIPLES I	4
		<hr/> 17

THIRD QUARTER

CH E 340	TRANSPORT PROCESS PRINCIPLES	4
HSS	ELECTIVES	5
CHEM 457	PHYSICAL	3
CHEM 458	PHYSICAL CHEM. LAB.	4
		<hr/> 16

Fourth Year**FIRST QUARTER**

CH E 435	HEAT AND MASS TRANSFER	4
CH E 436	CHEM. ENGR. LAB. I	3
HSS	ELECTIVES	5
TECHNICAL	ELECTIVES	3
		<hr/> 15

SECOND QUARTER

CH E 437	CHEM. ENGR. LAB. II	3
CH E 485	PROCESS DESIGN PRINCIPLES II	3
TECHNICAL	ELECTIVES	6
HSS	ELECTIVES	5
		<hr/> 17

THIRD QUARTER

CH E 486	PROCESS DESIGN	5
TECHNICAL	ELECTIVES	6
HSS	ELECTIVES	5
		<hr/> 16

Elective Chemical Engineering Courses

438	CHEMICAL ENGINEERING LABORATORY III
440	FLUID MECHANICS
450	HEAT TRANSFER
460	MASS TRANSFER
465	REACTOR DESIGN
470	CHEMISTRY OF WOOD
471	PULP AND PAPER TECHNOLOGY
472	PULP AND PAPER LABORATORY
480	PROCESS DYNAMICS AND CONTROL
481	PROCESS OPTIMIZATION
499	UNDERGRADUATE RESEARCH

Graduate Programs**Graduate Program Adviser**

Ralph W. Moulton
105 Benson Hall

The Department of Chemical Engineering offers courses leading to the degrees of Master of Science in Chemical Engineering, Master of Science in Engineering, and Doctor of Philosophy. Students who intend to work toward advanced degrees must apply for admission to and meet the requirements of the Graduate School.

Prospective candidates for the degrees of Master of Science in Chemical Engineering and Doctor of Philosophy are required to take four qualifying examinations prior to initial registration for graduate study. These examinations are designed to assess the student's knowledge and understanding of material normally contained in an undergraduate program with a major in chemical engineering, and their results are used to aid the faculty in advising the student on registration. They are usually given during the week preceding the opening of Autumn Quarter. Special arrangements will be made for students entering at other times.

Master of Science in Chemical Engineering

The requirements for this degree are a minimum of 39 credits, of which 30 credits are in formal course work and 9 in thesis. The course work is usually divided in the ratio of about two to one between Chemical Engineering and other departments. At least half of these courses must be numbered 500 or above.

Doctor of Philosophy

In addition to the general requirements of the Graduate School, students who wish to work toward the Ph.D. degree must pass a preliminary examination. This examination is normally taken after three quarters of satisfactory graduate study. It is designed to assess the student's comprehension of both undergraduate and graduate material and especially his ability to apply fundamental concepts to new and varied situations.

More detailed information on degree requirements is available from the Graduate Program Adviser.

CIVIL ENGINEERING**Chairman**

Robert G. Hennes
201 More Hall

Associate Chairman

Holger P. Mittet
126 More Hall

Professors

Richard H. Bogan, Thomas H. Campbell, Dale A. Carlson, Jack R. Clanton, J. E. Colcord, Jr., Martin I. Ekse, F. Burt Farquharson (emeritus), Charles W. Harris (emeritus), Billy J. Hartz, Robert G. Hennes, Edgar M. Horwood, Alan H. Mattock, Harold K. Moritz (emeritus), Ronald E. Nece, Charles H. Norris, Fred H. Rhodes, Jr. (emeritus), Eugene P. Richey, August T. Rossano, Jr., Roy B. Sawhill, Sergius I. Sergev, Robert O. Sylvester, Robert B. Van Horn (emeritus), Desi D. Vasharhelyi, Harold E. Wessman (emeritus)

Associate Professors

Colin B. Brown, Robert J. Charlson, Harry H. Chenoweth, Hiram M. Chittenden (emeritus), Russell F. Christman, Ziad M. Elias, Neil M. Hawkins, Joseph C. Kent, Brian W. Mar, Richard H. Meese, William M. Miller, Holger P. Mittet, Mehmet A. Sherif, Howard S. Strausser, Jr., Sandor A. Veress

Assistant Professors

William L. Clark, Max D. Coon, Roger J. Evans, Bruce W. Hunt, James H. Matteson, Jack I. Nicholls, Michael J. Pilat, Ronald L. Terrel, Eugene B. Welch

Lecturers

William F. Cottrell, James L. Tocher

Civil engineering is the branch of the engineering profession primarily responsible for the engineering of physical facilities for the public. The civil engineer is part of the team that plans, designs, and constructs highway and road systems, air terminals, port and river developments, and water supply and waste disposal systems. In the planning and design phases, he works with professionals from such disciplines as architecture, urban planning, business and industrial management, economics, and various social sciences. He may also work as a member of the firm or organization that constructs and maintains these facilities.

To prepare the civil engineer for his professional role, the undergraduate curriculum includes a fundamental base of mathematics, physics, and chemistry, supplemented by courses in solid mechanics, constructional materials, fluid mechanics, thermodynamics, elements of electrical engineering, and geology. The standard Humanistic-Social Studies program of the College of Engineering is incorporated in the curriculum. A strong core of courses in civil engineering planning, analysis, and design starts in the junior year and extends throughout the remainder of the four-year program

The departmental honors adviser is B. J. Hartz, 313 More Hall.

An extensive graduate program is also offered.

Undergraduate Programs

Adviser

Jack R. Clanton
201 More Hall

The curriculum for the Bachelor of Science in Civil Engineering for the first year is administered by the Department of General Engineering.

CURRICULUM IN CIVIL ENGINEERING

A student is not required to take any specific civil engineering course in the senior year. At least 21 credits,

however, should be in one area of interest, and courses in two other areas should be included. Each student's individual program will be arranged upon consultation with Department advisers.

Students may elect graduate courses for which they have the proper prerequisites, subject to the approval of their advisers, course instructors, and the Dean of the Graduate School. They may also wish to select as electives courses in fields related to civil engineering, subject to the approval of their advisers.

Second Year

FIRST QUARTER		CREDITS
ECON 211	GENERAL	3
HSS 265	TECH. OF COMMUN.	3
HSS 331	ORIG. WEST. CULT. INST.	3
MATH 224	INTERMED. ANAL.	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		16

SECOND QUARTER

CEEM 291	DYNAMICS	3
CEEM 295	DYNAMICS TUTORIAL	0
HSS 332	DEV. WEST. CULT. INST.	3
MATH	ELECTIVE	3
ME 215	STAT. MTHDS.	3
PHYSICS 123	WAVES	4
		16

THIRD QUARTER

CEEM 292	MECH. OF MT'LS I	3
CEEM 296	MECHANICS OF MATERIALS TUTORIAL	0
HSS 270	REPORT WRITING	2
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
MTL E 250	MATERIALS SCIENCE	4
ME 320	THERMODYNAMICS I	4
		16

Third Year

FIRST QUARTER

CEEM 342	FLUID MECHANICS I	4
CIVE 316	GEOMETRONICS	4
CIVE 363	CONSTRUCTIONAL MATERIALS I	4
CIVE 393	MECH. OF MT'LS II	4
		16

SECOND QUARTER

CIVE 320	TRANSPORT. ENGR. I	4
CIVE 345	HYDRAULIC ENGR.	4
CIVE 350	ENVIRONMENTAL ENGR.	4
CIVE 380	ANAL. OF ELASTIC STRUCTURES	4
		16

THIRD QUARTER

CIVE 366	SOILS ENGR.	4
CIVE 381	CONCEPTS OF STRUCTURAL DESIGN	4
CIVE 390	ENVIRONMENTAL SYSTEMS PLANNING	4
EE 301	ELEMENTS OF EE	4
EE 302	EE LAB	1
		17

Fourth Year

FIRST QUARTER

A ORG 460	HUMAN RELATIONSHIP IN BUS. & IND.	4
HSS 491	LIT. HERITAGE WEST. WORLD I	3
TECHNICAL ELECTIVES	. . . . .	9
		16

SECOND QUARTER

GEOL 310	GEOL. FOR ENGINEERS	4
HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVES	. . . . .	6
ELECTIVES	. . . . .	3
		16



THIRD QUARTER		CREDITS
HSS 493	LIT. HERITAGE WEST. WORLD III	3
BGS 307	BUSINESS LAW FOR ENGINEERS	3
TECHNICAL ELECTIVES		6
ELECTIVES		3
		<hr/> 15

Graduate Programs

Graduate Program Adviser

B. J. Hartz

313 More Hall

The Department of Civil Engineering offers courses leading to the degrees of Master of Science, Master of Science in Engineering, Master of Science in Civil Engineering, and Doctor of Philosophy. Programs of graduate study and research leading to these degrees are available in any of several fields: Engineering Mechanics, Hydraulic Engineering, Structural Engineering, Transportation, Construction, and Materials Engineering, and Water and Air Resources Engineering.

Master of Science in Civil Engineering

Programs leading to this degree are available to qualified civil engineering graduates who wish to continue their professional training. Thirty credits in course work and 9 credits of thesis are required. A foreign language is not required.

Master of Science in Engineering

Programs of study leading to this degree may be undertaken by students who are deficient in undergraduate qualifications for the Bachelor of Science in Civil Engineering degree at the University of Washington, but who hold a bachelor's degree in some branch of engineering or are otherwise broadly prepared for graduate study in civil engineering.

Master of Science

This degree is available for students without engineering degrees who desire to apply their otherwise relevant undergraduate training to the solution of problems in some specific sector of civil engineering. In addition to credits in course work and thesis as specified for Master of Science in Civil Engineering programs, competence in one foreign language is required. Students also may be required to complete a limited core of preparatory courses from the undergraduate curriculum.

Doctor of Philosophy

Prospective candidates for this degree must complete an approved program of studies and a research program that makes a definite contribution to knowledge. Many doctoral programs can be strengthened by combining approved courses from several institutions. Thus, some offerings in Geoscience at the University of Hawaii usefully complement the Geometronics courses listed herein.

ELECTRICAL ENGINEERING

Chairman

Daniel G. Dow

211 Electrical Engineering Building

Professors

F. Robert Bergseth, John L. Bjorkstam, Robert N. Clark, Lyall B. Cochran (emeritus), Daniel G. Dow, Austin V. Eastman (emeritus), Hellmut Golde, Arthur E. Harrison, W. Ryland Hill, Jr., G. Lisle Hoard (emeritus), Akira Ishimaru, David L. Johnson, Laurel J. Lewis, Dean W. Lytle, Jerre D. Noe, Endrik Noges, Donald K. Reynolds, Walter E. Rogers, George S. Smith (emeritus), H. Myron Swarm

Associate Professors

Frank J. Alexandro, Jr., Edward C. Guilford, Chih-Chi Hsu, Curtis C. Johnson, Peter O. Lauritzen, Irene C. Peden, Floyd D. Robbins, Rubens A. Sigelmann

Assistant Professors

Jonny Andersen, David C. Auth, Jean Baer, F. Paul Carlson, Mark J. Damborg, Graham L. Duff, Jay H. Harris, Ward J. Helms, Alistair D. C. Holden, Richard D. Martin, Peter R. Metz, Kenneth H. O'Keefe, Robert B. Pinter, Eugen G. Schibli, Sinclair S. Yee

Lecturer

William E. Creedon

Affiliate Professor

Betsy Ancker-Johnson

Electrical Engineering is concerned with the control of electricity and the electrical properties of materials in service to mankind. Electrical engineers may be involved in research, development, or design of devices, of assemblies of devices, or of major systems. Typical major systems of concern to this profession include those for communication, control, power distribution, and large-scale computation. In relatively recent times the profession has been rapidly changed, due in large part to the invention of the integrated circuit and the large-scale digital computer. These have made it possible to manipulate and store information in enormous quantity, and it is now possible to design very complex systems for control and communication. These are the responsibility of the electrical engineer.

The educational program of the Department of Electrical Engineering is based upon mathematics, physics, chemistry, and electrical fundamentals, which are of broad general significance to the profession. The student is also given experience in specific design and analysis problems to prepare and motivate his interests toward those of the engineering profession.

Many subspecialties have arisen within the general field of electrical engineering. Among the most important of

these are: system theory, computers, physical electronics, and electromagnetic propagation. Elective courses in these and many other areas are available in addition to the fundamentals upon which the profession is based.

A degree in engineering is a possible stepping stone to many different careers. The majority of bachelor's-degree engineers follow careers in design and development, while an increasing number go on for advanced degrees to be better prepared for work in development or to follow careers in research and/or education. Many engineering graduates also find rewarding careers in management, technical marketing, or government service.

Because of the phenomenal rate at which new discoveries are made and engineering practice must be revised, it is necessary to emphasize the fundamental principles that underlie engineering. In addition, the close relationships between technology and society require social and political awareness on the part of the engineer. In an attempt to partially meet this need, a significant emphasis is put on studies in the humanities and social sciences.

Undergraduate Programs

Adviser

William E. Creedon

205 Electrical Engineering Building

The curriculum for the Bachelor of Science in Electrical Engineering is nominally of four years duration, the first of which is administered in common with the other areas of engineering by the Department of General Engineering.

The curriculum consists of a number of required courses, which cover the fundamentals that underlie the profession, plus sequences in humanities and the social sciences and electives. The latter are intended to encourage the student to explore one of the subspecialties or to give him freedom to prepare for a specific area of work, but only after acquiring a solid fundamental knowledge.

The student is expected to consult with his adviser concerning the choice of elective courses, the possibility of substitution of other courses for the required Humanistic-Social Studies courses, and for general advice and counsel about the profession, the curriculum, and the university.

Interdepartmental programs that combine electrical engineering with other disciplines are becoming increasingly common. Current examples are bioengineering, computer science, geophysics, and ocean engineering. Students interested in these related areas should consult

with faculty advisers in the selection of appropriate electives. Many will want to continue with one or more years of graduate study in these specialized areas.

Students who plan to study for a Master of Science degree should, with the guidance of a faculty counselor, plan a coordinated program for their fourth and fifth years (senior and graduate).

Students planning to take a degree in industrial engineering should obtain curriculum counseling from the industrial engineering advisers.

The honors adviser is Irene C. Peden, 330D Electrical Engineering Building.

CURRICULUM IN ELECTRICAL ENGINEERING

Second Year

FIRST QUARTER		CREDITS
EE 231	INTRO. CIRCUIT THEORY I	5
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
MATH 224	INTERMED. ANAL.	3
HSS 265	TECH. OF COMMUN.	3
		<u>15</u>

SECOND QUARTER

EE 233	INTRO. CIRCUIT THEORY II	4
EE 234	INTRO. CIRCUIT THEORY LAB	1
PHYSICS 123	WAVES	4
MATH 238	DIFF. EQUATIONS	3
ECON 211	GENERAL	3
HSS 270	REPORT WRITING	2
		<u>17</u>

THIRD QUARTER

CEEM 291	DYNAMICS	3
MTL E 250	MATERIALS SCIENCE	4
MATH	ELECTIVE	3
TECHNICAL ELECTIVE	. . . . .	3
HSS 331	ORIG. WEST. CULT. INST.	3
		<u>16</u>

Third Year

FIRST QUARTER

EE 315	SIGNALS & SYSTEMS I	4
EE 316	SIGNALS & SYSTEMS LAB I	1
EE 321	EM FIELDS & WAVES I	4
PHYSICS 320	MODERN	3
HSS 332	DEVELOPMENT OF WEST. CULT. INST.	3
		<u>15</u>

SECOND QUARTER

EE 323	EM FIELDS & WAVES II	4
EE 324	EM FIELDS & WAVES LAB I	2
EE 363	ELECTRONIC DEVICES & CCTS. I	4
EE 364	ELECTRONIC DEVICES & CCTS. LAB. I	1
MATH	ELECTIVE	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
		<u>17</u>

THIRD QUARTER

EE 343	ELECTROMECH. ENERGY CONVERSION	5
EE 361	ELECTRONIC PROPS. OF MATERIALS	4
TECHNICAL ELECTIVE	. . . . .	4
HSS 491	LIT. HERITAGE WEST. WORLD I	3
		<u>16</u>

Fourth Year

FIRST QUARTER

EE 362	PHYSICAL ELECTRONICS LAB.	1
EE	ELECTIVE	5
TECHNICAL ELECTIVE	. . . . .	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
FREE ELECTIVES	. . . . .	4
		<u>16</u>



SECOND QUARTER		CREDITS
EE	ELECTIVE	4
ME 320	THERMODYNAMICS I	4
HSS 493	LIT. HERITAGE WEST. WORLD III	3
FREE ELECTIVES		5
		<hr/> 16

THIRD QUARTER		CREDITS
EE	ELECTIVE	5
TECHNICAL ELECTIVE		7
FREE ELECTIVES		4
		<hr/> 16

Graduate Programs

Graduate Program Adviser

F. Robert Bergseth

211 Electrical Engineering Building

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

Although most graduate students in electrical engineering have received their bachelor's degree training in the same area, students from other physical sciences and from mathematics are often able to pursue graduate study in electrical engineering with little difficulty. Persons coming from other schools or other backgrounds are encouraged to discuss their probable standing with respect to a graduate program in this department with the Graduate Adviser.

Master of Science in Electrical Engineering

A total of 45 credits, of which 36 are in course work and 9 are for a suitable thesis, are required for this degree. Course work should be divided between electrical engineering and supporting courses in other fields in the ratio of approximately two to one. See also the section on the Master of Science in Engineering in this catalog.

Master of Electrical Engineering

This is a more advanced degree than that of Master of Science in Electrical Engineering. A total of 72 credits or course work and a more extensive thesis are required. Other requirements are similar to those for the Master of Science in Electrical Engineering degree.

Doctor of Philosophy

This is primarily a research degree. It is not conferred as a result of course work, no matter how faithfully nor how long it is pursued. The granting of the degree in this department is based essentially on general proficiency and distinctive attainments in electrical engineering, particularly on the demonstrated ability to pursue independent research. Evidence of research investigation is the production of a doctoral dissertation that makes a definite contribution to knowledge and is presented with a satisfactory degree of literary skill.

Prospective candidates for this degree normally have obtained the master's degree. They must meet the re-

quirements of the Graduate School (see the *Graduate Study* section), and are selected by the department by means of a series of examinations given each year during Winter Quarter.

HUMANISTIC-SOCIAL STUDIES FOR ENGINEERS

Chairman

Myron L. White

356 Loew Hall

Professors

Stuart W. Chapman, Dell R. Skeels, James W. Souther

Associate Professors

David C. Botting, Jr., Eugene C. Elliott, Jay A. Higbee, Jack T. Leahy, John R. Rustad, Louis P. Trimble, Myron L. White

Lecturers

Wesley L. Hunner, Robert B. Johnstone

The Department of Humanistic-Social Studies offers courses designed to give engineering students a general, nontechnical education as an integral part of their professional training. Most of these courses are normally required in all engineering curricula. Students who wish to take courses in the humanities and social sciences other than those offered by the Department should consult their engineering advisers.

The Department's aim is to help its students to understand the growth of the society in which they live; to recognize and analyze critically some of the problems of that society; to think logically and express themselves lucidly; to appreciate great works of literature; and to develop social and philosophical concepts that will help them lead effective lives as professional men and women, citizens, and individuals. To this end, the Department offers an integrated program of study that begins in the sophomore year and continues through the senior year.

Certain nontechnical courses offered in other colleges of the University are required or are elective in the various engineering curricula: Administrative Theory and Organizational Behavior (A ORG) 460 (Human Relations in Business and Industry), and Economics 211 (General Economics).

INDUSTRIAL ENGINEERING

Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design, to specify,

predict, and evaluate the results to be obtained from such systems.

The Industrial Engineering curriculum consists of a regular four-year course of study in any engineering department that offers a full curriculum, supplemented by a fifth year devoted to study in industrial management, accounting, quality control, and related subjects.

Students in Unclassified-5 status working toward a Bachelor of Science in Industrial Engineering as a second bachelor's degree will be placed under the administration of the Mechanical Engineering Department and advised by the Industrial Engineering advisers listed below. Other students who combine the Industrial Engineering program with their regular bachelor's degree studies will continue to register in their major departments. However, they should obtain curriculum counseling from the Industrial Engineering advisers.

Undergraduate Programs

Advisers

Berl W. Owens

206 Mechanical Engineering Building

Albert B. Drui

210 Mechanical Engineering Building

The second Bachelor of Science in Industrial Engineering degree is granted when 45 credits in the curriculum outlined below are successfully completed. In case of schedule difficulties, substitutions may be made for Mechanical Engineering 410, 411, or 419. A minimum of 15 credits from the College of Engineering is required.

CURRICULUM IN INDUSTRIAL ENGINEERING

FIRST QUARTER		CREDITS
ME 415	STAT. QUAL. CONTROL	3
ME 417	METH. ANAL.	3
ACCTG 210	FUNDAMENTALS	3
B EGN 300	MANAGERIAL ECONOMICS	3
TECHNICAL ELECTIVES		3
		15

SECOND QUARTER		
ME 410	ENGR. ADMIN.	3
ME 411	ENGR. ECON.	3
ACCTG 220	FUNDAMENTALS	3
Q METH 450	OPERATIONS RESEARCH TECHNIQUES I	4
TECHNICAL ELECTIVES		3
		16

THIRD QUARTER		
ME 419	IND. FACILITIES DESIGN	3
CETC 405	CRIT. PATH MTHDS. OF PROJ. SCHEDULING	3
ACCTG 230	BASIC ACCTG. ANALYSIS	3
TECHNICAL ELECTIVES		5
		14

Recommended Electives

PRODUCTION TECHNOLOGY AREA		CREDITS
EE 433	ELECTRONIC CIRCUIT DESIGN	3
EE 479	FUND. OF AUTOMATIC CONTROL	4
ME 201	METAL CASTING	1
ME 202	WELDING	1
ME 203	METAL MACHINING	1
ME 204	INTRO. TO MANUFACTURING METHODS	3
ME 308	PRODUCTION METHODS	3
ME 401	METAL CASTING THEORY AND DESIGN	3

COURSES		CREDITS
ME 403	MATERIAL-REMOVAL PROCESSES	3
ME 404	THEORY OF WELDING	3
ME 414	INDUSTRIAL SAFETY	2
ME 420	ENGINEERING RELIABILITY	3
ME 465	WELDING DESIGN	3
ME 471	AUTOMATIC CONTROL	3

WORK MEASUREMENT AND CONTROL AREA

ME 420	ENGINEERING RELIABILITY	3
ME 471	AUTOMATIC CONTROL	3
PERS 301	INDUSTRIAL RELATIONS	3
PERS 445	PERSONNEL METHODS AND THEORY I	3
A ORG 440	ORGANIZATION THEORY	3
O MGT 443	SCHEDULING AND INVENTORY CONTROL	3
O MGT 460	ADMIN. OF OPERATIONS	4
ME 499	RESEARCH PROJECTS	2-5

OPERATIONS RESEARCH AREA

Q METH	OPERATIONS RESEARCH TECHNIQUES II	4
FIN 350	BUSINESS FINANCE	4
MKTG 301	MARKETING CONCEPTS	4
ACCTG 311	COST ACCOUNTING	3
O MGT 443	SCHEDULING AND INVENT. CONTROL	3
O MGT 460	ADMIN. OF OPERATIONS	4
BG&S 444	BUSINESS AND SOCIETY	4

Graduate Programs

While the University does not award advanced degrees designated Industrial Engineering, interdisciplinary graduate studies in the related areas of operations analysis, systems analysis, human factors, and work measurement and design are supervised by certain faculty in the Department of Mechanical Engineering. The degree of Master of Science in Engineering is awarded upon satisfactory completion of a 9-credit thesis and 36 credits of course work. Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

MECHANICAL ENGINEERING

Chairman

Charles J. Kippenhan (on leave 1969-70)

142 Mechanical Engineering Building

Acting Chairman

Dean E. McFeron

142 Mechanical Engineering Building

Professors

Peter L. Balise, Jr., Morris E. Childs, Emmett E. Day, Ashley F. Emery, Joseph C. Firey, Charles J. Kippenhan, Albert S. Kobayashi, Dean E. McFeron, Harry J. McIntyre (emeritus), Bryan T. McMinn (emeritus), Blake D. Mills, Jr., James B. Morrison, Stanley R. Murphy, Gilbert S. Schaller (emeritus), Raymond Taggart, Paul J. Waibler

Associate Professors

John R. Bodoia, James D. Chalupnik, Richard C. Corlett, Richard W. Crain, Sr., Creighton A. Depew, Albert B. Drui, Paul W. Ford, Kurt R. Galle, Michael Guidon III, Richard E. Holt, William C. Kielling,



Howard C. Merchant, Berl W. Owens, Norman H. Roberts, Robert E. Sherrer, Karl H. Vesper, Jan Wolak

Assistant Professors

Jay W. Anderson, Colin H. Daly, Fred B. Gessner, Jens E. Jorgensen, R. Blair Osborn, Colin J. Sandwith

Lecturers

Henry T. Meador, Donald F. Owens, Robert Y. Walker

Research Assistant Professor

Lee L. Huntsman

Mechanical Engineering, historically the second of the now numerous curricular branches, was established to educate professionals for design and development of machines. Broadening of this category brought on development of the even more specialized branches. At present, the practice is changing to accommodate systems of current interest by formation of interdepartmental and interdisciplinary groups (mission-oriented programs). The Department's faculty is broadly interested in and is associated with all three of the current programs organized as the Aerospace Research Laboratory, the Bioengineering Program, and the Ocean Engineering Committee. (More than three-fourths of the departmental faculty is associated with one or more of these groups.)

The program in mechanical engineering is aimed at providing the fundamental knowledge required to begin a career in professional engineering, and in particular in the analysis, design, manufacture, and production of apparatus, devices, and machines. Throughout the program of study, courses in manufacturing methods and design parallel those in analysis and the humanities.

In the early program, the basic physical sciences and mathematics are included as precursors of the engineering sciences. The latter include mechanics, systems analysis, thermodynamics, fluid mechanics, heat transfer, electrical circuits, and electronics. In the design sequence, mechanisms, machine components, and dynamics of machines are required. In the senior year, the program is flexible and, by appropriate choice of electives, the individual student can pursue any one of several areas of particular interest.

The philosophy of the entire program is not only to equip the student with the basic tools of analysis, but also to direct his attention and interest to the exciting art of synthesis, toward the culmination of a final, manufacturable design, at an optimum criteria of strength, function, and economic feasibility—the dominant function of an engineer.

Undergraduate Programs

Advisers

Student advising and counseling is performed by the entire departmental faculty, organized at any one time

into a group of eight advisers and including a coordinating adviser and an honors adviser. The membership rotates through the faculty according to a comprehensive plan to insure continuity of function. The names of current advisers are posted in the departmental advisory office, 141 Mechanical Engineering, and on the faculty roster.

The curriculum for the Bachelor of Science for the first year is administered by the Department of General Engineering.

CURRICULUM IN MECHANICAL ENGINEERING

Second Year

FIRST QUARTER		CREDITS
ME 204	INTRO. TO MANUFACTURING MTHDS.	3
ME 215	STAT. MTHDS.	3
MATH 224	INTERMED. ANAL.	3
HSS 265	TECH. OF COMMUN.	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		<hr/> 16

SECOND QUARTER

ME 222	INTRODUCTORY ME LAB.	2
CEEM 292	MECH. OF MT'LS. I	3
MT'L E 250	MATERIALS SCIENCE	4
MATH 238	DIFF. EQUATIONS	3
PHYSICS 123	WAVES	4
		<hr/> 16

THIRD QUARTER

ME 261	KINEMATICS AND DYNAMICS	3
ME 263	MECHANICAL SYSTEMS	3
ME 320	THERMODYNAMICS I	4
HSS 270	REPORT WRITING	2
MATH	ELECTIVE	3
		<hr/> 15

Third Year

FIRST QUARTER

ME 321	THERMODYNAMICS II	4
ME 340	ENGINEERING MATERIALS	3
ME 360	DYNAMICS OF MACHINES	3
ME 363	MECHANICAL SYSTEMS II	3
EE 304	BASIC EE LAB	1
HSS 331	ORIG. WEST CULT. INST.	3
		<hr/> 17

SECOND QUARTER

ME 322	MICROSCOPIC THERMODYNAMICS	4
ME 361	MACHINE DESIGN	3
ME 364	MECHANICAL SYSTEMS DYNAMICS	3
CEEM 342	FLUID MECHANICS I	4
HSS 332	DEV. WEST. CULT. INST.	3
		<hr/> 17

THIRD QUARTER

ME 308	PRODUCTION METHODS	3
ME 331	INTRO. TO HEAT TRANSFER	4
ME 362	MACHINE DESIGN	3
EE 400	INSTRUMENTATION AND CONTROL	5
OR		
EE 305	ELECTRICAL MACHINERY	5
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
		<hr/> 18

Fourth Year

FIRST QUARTER

ME 468	MACHINE DESIGN	3
HSS 491	LIT. HERITAGE WEST. WORLD I	3
ECON 211	GEN. ECONOMICS	3
ELECTIVES	. . . . .	6
		<hr/> 15

SECOND QUARTER

HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVE	. . . . .	6
ELECTIVES	. . . . .	6
		<hr/> 15

THIRD QUARTER	CREDITS
HSS 493 LIT. HERITAGE WEST. WORLD III	3
TECHNICAL ELECTIVE	9
	<hr/> 12

Graduate Programs

Graduate Program Adviser

Emmett E. Day

140A Mechanical Engineering Building

Students who intend to work toward degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section. The graduate offerings in mechanical engineering cover a broad spectrum. Although options are not designated, graduate offerings in mechanical engineering are so arranged that prospective students who are interested in the special fields of energy conversion, engineering materials, gas dynamics, heat transfer, instrumentation and control systems, materials processing, or stress analysis will find well-integrated programs available. Additionally, students interested in the newer interdisciplinary areas organized as the Aerospace Research Laboratory, the Bioengineering Program, and the Ocean Engineering Committee will find course offerings and faculty research interests to accommodate almost any program desired. Subject to the approval of the student's committee, work beyond bachelor requirements in physics, mathematics, aeronautics and astronautics, and chemical, civil, or electrical engineering is permitted and often required.

Master of Science in Mechanical Engineering

This degree requires a 9-credit thesis and a minimum of 30 credits of approved course work, including the seminar courses 518-519-520. See also the section on Master of Science in Engineering in this catalog.

Doctor of Philosophy

Students working for this degree must complete an approved program of studies and a research program that makes a definite contribution to knowledge.

MINING, METALLURGICAL, AND CERAMIC ENGINEERING

Chairman

Douglas H. Polonis
211 Roberts Hall

Professors

Donald L. Anderson, Frederick B. Brien, James I. Mueller, Drury A. Pifer, Douglas H. Polonis, O. J. Whittemore, Jr.

Associate Professors

Thomas F. Archbold, Henk I. Dawson, David B. Fischbach, Thomas G. Stoebe

Assistant Professors

Robert J. Campbell, Jr., John H. Jones, Alan D. Miller, William D. Scott, Richard R. Zupp

Affiliate Professor

Spencer H. Bush

Lecturer

Wolf G. Bauer

The program in Mining, Metallurgical, and Ceramic Engineering is concerned with the engineering aspects of the minerals industry. The Department offers courses leading to the degrees of Bachelor of Science in Mining Engineering (with options in mineral engineering and geological engineering); Bachelor of Science in Metallurgical Engineering; Bachelor of Science in Ceramic Engineering; Master of Science in Engineering; Master of Science in Mining, Metallurgical, or Ceramic Engineering; Master of Science in Ceramics or Master of Science in Metallurgy; and Doctor of Philosophy in the fields of metallurgy and ceramics.

The honors adviser is Thomas F. Archbold, 241 Roberts Hall Addition.

MATERIALS ENGINEERING

Courses in materials engineering are offered jointly by the several degree-granting divisions of the Department. These courses are part of a core that constitutes the base in materials science upon which the specific branches are founded.

CERAMIC ENGINEERING

Division Head

James I. Mueller
301 Roberts Hall

Ceramic engineering is concerned principally with the development, production, evaluation, and understanding of ceramic materials or products, and includes those activities generally associated with engineering, including economic considerations. The ceramic engineer deals with problems of ceramic materials and high temperature technologies, and is concerned with manufacturing facilities, production processes, feasibility studies, administration, research, and development.

Ceramic engineering graduates are employed by a wide range of industries including those whose primary product is a ceramic material, plus manufacturers in the chemical, electrical and electronic, automotive, metallurgical, nuclear, and aerospace industries. There are few major industries that are not employers of ceramic engineers. In addition, ceramic engineers serve in government laboratories, defense installations, universities, and industrial laboratories. They are inherently involved with all engineering fields.



Undergraduate Programs

Adviser

James I. Mueller
301 Roberts Hall

The curriculum for the Bachelor of Science in Ceramic Engineering for the first year is administered by the Department of General Engineering. Students who decide to transfer into Ceramic Engineering may complete the chemistry requirements by rearranging the required curriculum in consultation with the Division Head of the Division of Ceramic Engineering.

As part of their course, students should have ceramic industrial experience during the summer vacation following their sophomore and junior years and must participate in scheduled field excursions.

CURRICULUM IN CERAMIC ENGINEERING

Second Year

FIRST QUARTER		CREDITS
CER E 201	INTRODUCTION	2
MTL E 250	MATERIALS SCIENCE	4
HSS 265	TECH. OF COMMUN.	3
MATH 224	INTERMED. ANAL.	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		<u>16</u>

SECOND QUARTER

CER E 202	RAW MATERIALS	3
ME 203	METAL MACHINING	1
HSS 270	REPORT WRITING	2
CHEM 350	PHYSICAL	3
MATH 238	DIFF. EQUATIONS	3
PHYSICS 123	WAVES	4
		<u>16</u>

THIRD QUARTER

CER E 203	MEASUREMENTS	3
HSS 302	TECH. WRITING	3
CHEM 351	PHYSICAL	3
ME 215	STAT. MTHDS.	3
ELECTIVES	. . . . .	3
		<u>15</u>

Third Year

FIRST QUARTER

CER E 306	EXCURSION	1
CER E 312	STRUCTURE AND RHEOLOGY	5
MTL E 351	MINERAL PROCESSING I	4
MET E 322	MET. THERMODYNAMICS	3
HSS 331	ORIG. WEST. CULT. INST.	3
		<u>16</u>

SECOND QUARTER

CER E 301	CERAMIC PROCESSING I	3
CER E 314	EQUILIBRIA I	3
CER E 322	MICROSCOPY OF CERAMICS	3
EE 301	ELEMENTS OF EE	4
EE 302	ELEC. E LAB.	1
ELECTIVES	. . . . .	3
		<u>17</u>

THIRD QUARTER

CER E 302	CERAMIC PROCESSING II	3
CER E 315	VITREOUS STATE	4
CER E 470	REFRACTORIES	3
CER E 499	SPECIAL PROJECTS	1
CEEM 292	MECH. OF MTL'S I	3
CEEM 296	MECH. OF MTL'S II	0
ECON 211	GENERAL	3
		<u>17</u>

Fourth Year

FIRST QUARTER

		CREDITS
CER E 307	EXCURSION	0
CER E 401	CERAMIC PROCESS ANAL.	3
CER E 412	X-RAY DIFFRACTION	3
CER E 441	UNDERGRAD. SEMINAR	1
CER E 499	SPECIAL PROJECTS	2
HSS 332	DEV. WEST. CULT. INST.	3
HSS 491	LIT. HERITAGE WEST. WORLD I	3
ELECTIVES	. . . . .	3
		<u>18</u>

SECOND QUARTER

CER E 402	EQUIP. AND PLANT DESIGN	2
CER E 441	UNDERGRAD. SEMINAR	1
CER E 499	SPECIAL PROJECTS	2
HSS 333	CONTEMP. POL. AND SOCIAL PROBLEMS	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
A ORG 460	HUM. REL.	4
ELECTIVES	. . . . .	3
		<u>18</u>

THIRD QUARTER

CER E 403	EQUIP. AND PLANT DESIGN	2
CER E 421	CER. BODIES LAB.	3
CER E 441	UNDERGRAD. SEMINAR	1
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVES	. . . . .	6
		<u>15</u>

Graduate Programs

Graduate Program Adviser

William D. Scott
327 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

Master of Science in Ceramic Engineering

A total of 39 credits of which 30 credits are in course work, a suitable thesis for 9 credits, and a comprehensive oral examination complete the requirements for this degree.

Students may select courses and research in accordance with their special interests and objectives. Graduate work is largely concerned with advanced physical sciences as applied to ceramics; however, courses may also be selected that prepare for plant operation and management. Graduates of accredited ceramic engineering curricula and graduates of other accredited engineering curricula who complete the basic undergraduate courses in ceramic engineering and in science may work for this degree.

Master of Science in Ceramics

Students with undergraduate majors in science, particularly chemistry or physics, may work for this degree after completing basic undergraduate courses in ceramics. The same academic and thesis program is required for this degree as is described under Master of Science in Ceramic Engineering.

Doctor of Philosophy

Students who have completed at least one year of satisfactory graduate study may request an examination

to determine their eligibility for work leading toward the doctorate. Accepted students must complete an approved program of studies and a research program that makes a definite contribution to the knowledge of the field.

METALLURGICAL ENGINEERING

Division Head

Douglas H. Polonis

328 Roberts Hall

Graduates in metallurgical engineering are in almost all industries concerned with the processing, fabrication, and utilization of materials. Attractive employment opportunities are available in many areas, including the aerospace, automotive, nuclear power, and electrical industries, as well as the metallurgical industry. Metallurgical engineers become involved with production, research, development, and sales related to metals, alloys, and metallic products. Chemical metallurgists are concerned with technology related to the processing and refining of metals and their compounds. Physical metallurgists are concerned with the structure and properties of materials, the development of new materials with improved properties, and the application and performance of materials in modern engineering systems and design.

The undergraduate curriculum is planned to provide during the first three years a broad science-oriented basis in the general field of metallurgy. Emphasis is placed on the general intellectual development of the individual and on the cultivation of an imaginative approach to modern engineering problems.

The early part of the program includes a thorough grounding in the basic and engineering sciences, such as mathematics, physics, physical chemistry, and engineering mechanics. Subsequent studies are oriented toward the materials sciences, with emphasis being placed on atomic, molecular, and crystalline structure, the physical properties of solids, thermodynamic properties of materials, transport phenomena, reactions, and mechanical behavior. Problems in the preparation, properties, and applications of metals and alloys are considered in the light of scientific and engineering principles.

The curriculum provides a liberal number of senior-year electives arranged through discussions with faculty advisers. Technical electives emphasize specific areas in metallurgy, such as electrical and electronic properties, nuclear materials, mechanical metallurgy, chemical metallurgy, and minerals processing. By the selection of appropriate courses, a student may orient his program toward careers in development research and production in industry, basic research, teaching, management, or sales. The senior-year electives allow the student to

pursue in depth those aspects of metallurgical engineering that are most essential in preparing him for his professional career. Opportunities are available in the senior year for a limited number of students to undertake senior projects that involve their participation in current research projects in the division.

Undergraduate Programs

Adviser

Thomas G. Stoebe

326 Roberts Hall

The curriculum for the first year is administered by the Department of General Engineering. Those students who transfer into metallurgical engineering may complete the requirements by rearranging their programs in consultation with the Division Head or the Undergraduate Adviser.

Students are permitted to substitute other humanities and social science courses for those offered in the Humanistic-Social Studies Department if such substitutions are more effective in meeting the student's interests. The approval of a faculty adviser is required.

In the fourth year, students may choose electives in physical metallurgy, chemical metallurgy, or mineral processing. Electives in labor relations, business administration, mechanical engineering, and economics are recommended for students interested in plant operation and administration. Students are required to participate in scheduled field excursions and plant visits.

CURRICULUM IN METALLURGICAL ENGINEERING

Second Year

FIRST QUARTER		CREDITS
MTL E 250	MT'LS SCIENCE	4
MTL E 251	MT'LS SCIENCE LAB.	1
HSS 265	TECH. OF COMMUN.	3
MATH 224	INTERMED. ANAL.	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		<hr/> 15

SECOND QUARTER

MET E 255	INTRODUCTORY MET. E.	3
HSS 270	REPORT WRITING	2
CHEM 350	PHYSICAL	3
MATH 238	DIFF. EQUATIONS	3
PHYSICS 123	WAVES	4
PHYSICS 131	GEN. PHYSICS LAB.	1
		<hr/> 16

THIRD QUARTER

MET E 270	UNIT PROCESSES	4
ME 215	STAT. MTHDS.	3
CEEM 291	DYNAMICS	3
CHEM 351	PHYSICAL	3
PHYSICS 132	GEN. PHYSICS LAB.	1
ELECTIVE		3
		<hr/> 17

Third Year

FIRST QUARTER

MET E 322	MET. THERMODYNAMICS	3
MET E 361	STRUCT. OF SOLIDS	4
CEEM 292	MECH. OF MT'LS.	3
MTL E 351	MINERAL PROCESSING I.	4
HSS 331	ORIG. WEST. CULT. INST.	3
		<hr/> 17



SECOND QUARTER		CREDITS
MET E 323	THERMODYNAMICS & KINEMATICS	3
MET E 362	PROP. OF SOLIDS	4
HSS 332	DEV. WEST. CULT. INST.	3
CH E 330	TRANSPORT PROCESS PRINCIPLES I	4
ECON 211	GENERAL	3
		<hr/> 17

THIRD QUARTER		
MET E 306	EXCURSION	1
MET E 363	REACT. IN SOLIDS	4
EE 301	ELEMENTS OF EE	4
EE 302	ELEC. E LAB.	1
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
ELECTIVE		3
		<hr/> 16

Fourth Year

FIRST QUARTER

MET E 468	UNDERGRAD. SEMINAR	1
HSS 491	LIT. HERITAGE WEST. WORLD I	3
TECHNICAL ELECTIVES		12
		<hr/> 16

SECOND QUARTER

MET E 468	UNDERGRAD. SEMINAR	1
HSS 492	LIT. HERITAGE WEST. WORLD II	3
TECHNICAL ELECTIVES		9
ELECTIVE		3
		<hr/> 16

THIRD QUARTER

MET E 306	EXCURSION	1
MET E 468	UNDERGRAD. SEMINAR	1
HSS 493	LIT. HERITAGE WEST. WORLD III	3
TECHNICAL ELECTIVES		8
ELECTIVES		3
		<hr/> 16

In the senior year, students majoring in physical metallurgy may choose technical electives from Metallurgical Engineering 461, 462, 463, 466; chemical metallurgy majors may elect Metallurgical Engineering 422 and 471; mineral processing majors may elect Metallurgical Engineering 470, 471, 472, 473, and Materials Engineering 352.

Recommended technical electives include Metallurgical Engineering 421, 422, 455, 461, 462, 463, 466, 470, 471, 472, 473, 499; Mining Engineering 465, 481; Ceramic Engineering 314, 412; Nuclear Engineering 444, 484; Mechanical Engineering 410, 411, 415, 417, 443; CEEM 342, 494; Electrical Engineering 400, 485; General Engineering 390; Geological Sciences 320; Chemistry 231, 455, 456, 457, 458.

Graduate Programs

Graduate Program Adviser

Thomas F. Archbold

241 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

Master of Science in Metallurgical Engineering

A total of 39 credits, of which 30 credits must be in acceptable course work and 9 credits for a suitable thesis,

and a comprehensive oral examination are required for this degree. Prospective candidates may select courses in accordance with their special interests and objectives.

Master's degree work is largely concerned with advanced materials science as applied to physical metallurgy, extractive metallurgy, or mineral processing. However, courses may also be selected that prepare for plant operation and management. Graduates of accredited metallurgical engineering curricula and graduates of other engineering curricula who complete the basic undergraduate courses in metallurgical engineering may work for this degree.

Master of Science in Metallurgy

Students with undergraduate majors in science, particularly physics or chemistry, may work for this degree after completing basic undergraduate courses in metallurgy or equivalent.

Doctor of Philosophy

Students who have completed one year of graduate work may request an examination to determine whether or not the faculty will advise proceeding to the Ph.D. General Examination. A critical examination of the applicant's record, recommendations, and proposed course of study will be pertinent to this decision. The language requirement will be satisfied by passing the scheduled examinations in one language, either German, French, or Russian and by completing a satisfactory technical translation assigned by the faculty. In addition to course work, a student will be expected to study independently for examination on a list of subjects prepared by his Supervisory Committee. General Examinations will be taken at the end of the second year or during the third year of residence. The General Examinations are sufficiently comprehensive to demonstrate the student's ability to deal with broad aspects of materials science, as well as his specialized subject area. Each prospective Candidate is required to present a written dissertation based on his research program and it must make an original and independent contribution to knowledge. Proficiency in basic research is of paramount importance, and the research is to be conducted in the University laboratories. The Final Examination consists of the student's oral defense of his dissertation.

MINING ENGINEERING

Division Head

Donald L. Anderson

223 Roberts Hall

Mining engineering requires the application of the fundamentals from other branches of engineering as well as those peculiar to the minerals industry. The

unique nature of engineering in the mineral industries is characterized by a knowledge of minerals, their geologic environment, methods for their exploitation and recovery, and of the technical and economic factors controlling the industry. In the curriculum, the basic and engineering sciences common to all engineering are complemented by the addition of geologic science.

Mining Engineering is concerned with the economic evaluation of mineral deposits and the application of engineering principles to mine operations. These include the application of rock mechanics to support and design of underground openings and to the breaking of ore, the design of systems for breaking, loading, and transporting large tonnages, and the control of environment in underground mines. Modern operations involve the application of systems analysis and similar computer-based mathematical techniques, research in applying industrial engineering methods, efficiency studies, and the analysis of economic potential through comprehensive feasibility studies. Industrial relations, organization planning, personnel management, cost control, financial provisions, and marketing of mineral products are essential activities of the mine engineer in management.

The professional practice of the mining engineer is mainly in the selection of ore deposits for exploitation and in planning and directing the operation of mines. Responsibility for the social welfare of the community is often associated with these assignments. Mining engineers are sought by government departments, petroleum corporations, financial institutions, and the transportation industry, as well as by their principal employers, the minerals industry. The economics of mineral resources also is a field for professional activity. Foreign service is attractive, and in the future the recovery of the ocean mineral resources will challenge the mining engineer.

Undergraduate Programs

Adviser

Donald L. Anderson
223 Roberts Hall

The curriculum for the Bachelor of Science in Mining Engineering for the first year is administered by the Department of General Engineering. The mining engineering curriculum options provide for basic preparation in exploration geology, mine engineering and production, and mineral preparation and concentration. A pre-professional training program, conducted in cooperation with the major mines in the Northwest, provides essential industrial and geologic field experience.

Geologic engineering involves the search for and evaluation of ore deposits and other engineering applications

of geology. The geologic engineering curriculum is supplemented by senior-year study of a mineral deposit in the field.

Mineral preparation engineering deals with the recovery of valuable minerals from raw ores by processes of beneficiation or concentration. The mineral preparation option is supported by complete experimental facilities in the Milnor Roberts Hall laboratories.

All students make an annual field study trip to a major mining district. These activities supplement classwork and develop a realistic view of the minerals industry. Courses in labor relations, business administration, and economics are recommended to students interested in mine administration.

CURRICULUM IN MINING ENGINEERING

Second Year

FIRST QUARTER

		CREDITS
HSS 265	TECH. OF COMMUN.	3
GEOL 320	MINERALOGY	5
MATH 224	INTERMED. ANAL.	3
PHYSICS 121	GENERAL	4
		<hr/> 15

SECOND QUARTER

MIN E 221	EXPLOSIVES AND ROCK DRILLING	2
HSS 270	REPORT WRITING	2
GEOL 321	PETROLOGY I	5
MATH 238	DIFF. EQUATIONS	3
PHYSICS 122	ELMAG. & OSCIL. MOTION	4
		<hr/> 16

THIRD QUARTER

MIN E 330	MINE SURVEYING	3
MTL E 250	MT'LS SCIENCE	4
CEEM 291	DYNAMICS	3
ME 215	STAT. MTHDS.	3
PHYSICS 123	WAVES	4
		<hr/> 17

Third Year

FIRST QUARTER

MIN E 322	PRINCIPLES OF MINE PROD.	4
MTL E 351	MINERAL PROCESS. I.	4
EE 301	ELEMENTS OF EE	4
EE 302	ELEC. E LAB.	1
HSS 331	ORIG. WEST. CULT. INST.	3
		<hr/> 16

SECOND QUARTER

MIN E 325	MINERAL LAND VALUATION	2
CEEM 292	MECH. OF MT'LS I	3
HSS 332	DEV. WEST. CULT. INST.	3
GEOL 340	STRUCTURAL GEOL.	5
A ORG 460	HUM. BEHAVIOR IN ORGANIZATIONS	4
		<hr/> 17

THIRD QUARTER

MIN E 306	EXCURSION	1
GEOL 487	ORE DEPOSITS	5
MTL E 352	MINERAL PROCESSING II	2
CEEM 293	MECH. OF MT'LS II	3
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
ECON 211	GENERAL	3
		<hr/> 17

Fourth Year

FIRST QUARTER

MIN E 425	ROCK MECHANICS	2
MIN E 433	ENVIRON. CONTROL OF MINES	3
ME 320	THERMODYNAMICS I	4
HSS 491	LIT. HERITAGE WEST. WORLD I	3
ELECTIVE		3
		<hr/> 15



SECOND QUARTER		CREDITS
MIN E 481	MINERAL INDUST. ECON.	3
ME 415	STAT. QUAL. CONTROL	3
ME 417	METHODS ANAL.	3
HSS 492	LIT. HERITAGE WEST. WORLD II	3
ELECTIVE		5
		17

THIRD QUARTER		
CEEM 342	FLUID MECHANICS I.	4
MIN E 426	EXPLORATION	4
MIN E 432	MINE PLANT DESIGN	5
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVE		2
		18

GEOLOGICAL ENGINEERING OPTION

Fourth Year

FIRST QUARTER		
MIN E 425	ROCK MECHANICS	2
GEOL 423	OPTICAL MINERALOGY	5
HSS 491	LIT. HERITAGE WEST. WORLD I	3
ME 320	THERMODYNAMICS I.	4
ELECTIVE		3
		17

SECOND QUARTER		
MIN E 325	MINERAL LAND VAL.	2
MIN E 481	MINERAL INDUST. ECON.	3
GEOL 424	PETROG. AND PETROL. OF IGNEOUS ROCKS	5
HSS 492	LIT. HERITAGE WEST. WORLD II	3
CEEM 342	FLUID MECHANICS I.	4
		17

THIRD QUARTER		
MIN E 426	EXPLORATION	4
MIN E 427	EXPLORATION GEOPHYSICS	3
GEOL 425	PETROG. AND PETROL. OF METAMORPHIC ROCKS	5
HSS 493	LIT. HERITAGE WEST. WORLD III	3
ELECTIVE		2
		17

MINERAL PROCESSING ENGINEERING OPTION

SECOND QUARTER		
CEEM 292	MECH. OF MT'LS II	3
ME 415	STAT. QUAL. CONTROL	3
HSS 332	DEV. WEST. CULT. INST.	3
CHEM 350	PHYSICAL	3
ECON 211	GENERAL	3
		15

THIRD QUARTER		
MIN E 306	EXCURSION	1
MTL E 352	MINERAL PROCESSING II	2
CEEM 342	FLUID MECHANICS I.	4
HSS 333	CONTEMP. POL. AND SOC. PROBLEMS	3
CHEM 351	PHYSICAL	3
MET E 270	PRIN. UNIT PROCESSES	4
		17

Fourth Year

FIRST QUARTER		
MET E 470	FLOTATION	3
CER E 412	X-RAY DIFFRACTION	3
EE 303	ELEMENTS OF EE	5
HSS ELECTIVE		3
ELECTIVE		3
		17

SECOND QUARTER		
MIN E 465	OPAQUE MINERALS MICROSCOPY	2
MET E 472	MINERAL PROCESS PRACTICES	2
MET E 320	THERMODYNAMICS I.	3
HSS ELECTIVE		3
ELECTIVES		6
		16

THIRD QUARTER		
MIN E 306	EXCURSION	1
MET E 471	HYDROMETALLURGY	3
MET E 473	PLANT DESIGN	2
HSS ELECTIVE		3
ELECTIVES		7
		16

Graduate Programs

Graduate Program Adviser

Donald L. Anderson

223 Roberts Hall

Students who intend to work toward advanced degrees must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section of this catalog.

Master of Science in Mining Engineering

The requirements for this degree are a minimum of 39 credits, of which 30 must be in formal course work and 9 in thesis. A nonthesis program involving the substitution of approved courses may be followed with permission of the Graduate Program Adviser. Prospective candidates for the degree may elect work in mining, geological sciences, or mineral processing in accordance with their special interests. Special study in the fields of labor relations and management is available. The student may select courses in preparation for exploration and development, operation and management, engineering, or mining geology. Graduate studies in mineral processing cover the fields of metallic and nonmetallic minerals, with special work on advanced theory and practice. Graduates of accredited mining engineering curricula and graduates of other accredited engineering curricula who complete the basic undergraduate courses in mining engineering and geology may be accepted in this program.

NUCLEAR ENGINEERING

Chairman and Graduate Program Adviser

Albert L. Babb

303 Benson Hall

Professor

Albert L. Babb

Associate Professors

Robert W. Albrecht, Kermit L. Garlid, Maurice A. Robkin

Assistant Professors

Norman J. McCormick, Gene L. Woodruff

Research Associate Professors

Eugene D. Clayton, William C. Leith, George C. Vlases

Affiliate Associate Professors

John C. Fox, Battelle-Northwest

Peter L. Hofmann, Battelle-Northwest

Senior Nuclear Engineer

Albert W. Wakefield

Associated Faculty

Douglas H. Polonis (Mining, Metallurgical, Ceramic Engineering), Kenneth L. Jackson (Radiological Sciences), Peter Wootten (Radiology)

Nuclear engineering is directly concerned with the release, control, and utilization of all forms of energy from nuclear sources. This discipline did not exist until about twenty years ago when concerted effort was directed toward the use of nuclear energy for central station power, propulsion of naval vessels, outer space exploration, and the production of radioisotopes for industrial, medical, and agricultural uses.

The successful engineering of nuclear energy projects involves the use of skills and specialties in many areas such as heat transfer and fluid flow, metallurgy, stress analysis, automation and control, corrosion, thermoelectricity, thermionics, and chemical processing. The presence of nuclear reactions together with severe environmental conditions complicates otherwise conventional engineering problems. Thus, although the nuclear engineering program is administered by the Department of Nuclear Engineering, close relations exist with the Departments of Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Mining, Metallurgical, and Ceramic Engineering, and Radiology.

Because one purpose of the program is to encourage students to become proficient in related areas, the Department offers only graduate degrees. A special three-quarter sequence of courses (484, 485, and 486) is offered, however, for students in engineering, physical science, or life science programs who wish to obtain an orientation to the nuclear energy field, with a minimum of prerequisite courses.

Master of Science in Engineering (Nuclear)

A student with a bachelor's degree in engineering, mathematics, physics, or chemistry is eligible for admission. Since a good background in mathematics and physics is desirable, a student entering the program is encouraged to establish a strong foundation in atomic and nuclear physics and in advanced mathematical analysis during his undergraduate studies.

A minimum of 39 credits is required for the degree. Of these, 30 credits are in formal course work and 9 in a thesis project. The course work usually is divided in the ratio of two to one between Nuclear Engineering courses and courses from other departments. To acquire the necessary base in nuclear engineering, the student's program normally will include 500, 501, 505, 506, 510, 512, and seminar. If he has a bachelor's degree in Nuclear Engineering, the course program will be modified to meet his needs. A foreign language is not required.

Courses outside the Nuclear Engineering Department may be chosen from several fields of study. Advanced

physics and mathematics often are recommended, but many other possibilities exist.

Doctor of Philosophy

The doctoral program consists of lectures, seminars, informal discussions, and independent study and research that enable the student to become expert and make original contributions in his field. Approximately one full year of course work beyond the master's degree is usually essential. Courses are selected on the basis of a student's interest and background, and may be chosen from offerings of other departments, as well as the Department of Nuclear Engineering. A student may specialize in several areas, each representing an important aspect of nuclear technology.

1. Neutronic Analysis of Nuclear Systems

This area is primarily concerned with the analysis of fission reactors and other neutronic systems from a fundamental point of view. It would include topics such as neutron transport theory; the slowing down, thermalization, and diffraction of neutrons; fast reactor systems; criticality; and mathematical and computational methods. Auxiliary courses such as advanced physics, quantum mechanics, and advanced mathematics are offered by the Departments of Physics and Mathematics.

2. Nuclear System Dynamics

In this area a student would concentrate on the time-dependent behavior of reactors and on other nuclear engineering systems. The stability and control of nuclear reactors, noise analysis, and pulsed neutron source analysis would be included. Auxiliary courses in the analysis of random processes, in control system analysis, and in applied mathematics are available in the Departments of Electrical Engineering and Mathematics.

3. Thermonuclear Systems and Plasmas

This area includes the study of plasmas and their behavior, and explores the problems and promises associated with fusion reactors. Emphasis is on the fundamental characteristics of plasmas, and both theoretical and experimental work is possible. Auxiliary courses in advanced physics, electricity and magnetism, and collision theory are available in the Department of Physics.

4. Engineering Analysis of Nuclear Systems

This program is concerned with the engineering aspects of nuclear systems. Some of the possible areas are:

Thermal-Hydraulics, concerned with heat transfer to different fluids, such as boiling liquids and liquid metals, combined conduction-radiation heat transfer, and steady-state and transient flow problems in single-phase and two-phase flow. Auxiliary courses in ad-



vanced heat transfer and fluid mechanics are available in the Departments of Mechanical Engineering and Chemical Engineering.

Materials, concerned with the effect of neutrons and ionizing radiation on materials, and the properties of materials used in nuclear engineering systems. Auxiliary courses are available in the Department of Mining, Metallurgical, and Ceramic Engineering.

Chemical Engineering, concerned with the separation and recovery of nuclear fuels and products, with fuel management, with optimization of separations processes, and with process control. Auxiliary courses are available in the Department of Chemical Engineering.

Environmental Engineering, concerned with the application and control of nuclear energy systems and with nuclear radiations in our environment. It includes atmospheric and water pollution; control, disposal, and possible uses of radioactive by-products; and thermal effects. Auxiliary courses are available in the Departments of Civil Engineering and Atmospheric Sciences.

5. Bionuclear Engineering

The program in Bionuclear Engineering will involve the student in the application of the methods and techniques of nuclear engineering to the study of biological systems. It includes the use of trace-element analysis by neutron activation, treatment and diagnosis of disease using nuclear energy, and the interaction of nuclear radiation with biological materials. Auxiliary courses are available in the Departments of Physiology and Biophysics and Radiology.

6. Other Areas

Other areas in which nuclear engineering systems and principles may be applied are oceanography, marine sciences, forensic sciences, and direct energy conversion. In these areas specific programs can be designed to meet the student's interests and goals.

Aspirants to the degree of Doctor of Philosophy must pass, successively, a written and oral qualifying examination, a General Examination for admission to candidacy, and a Final Examination. The qualifying examination may be taken after 30 credits of graduate work have been successfully completed, and should be completed during the second year of regular graduate study. The qualifying examination is given once during each Autumn Quarter and each Spring Quarter. It is designed to assess the student's understanding of the basic scientific and engineering concepts upon which his doctoral work will be based. The subject material includes undergraduate fundamentals in mathematics, physics, and the engineering sciences, as well as the material in the first year of graduate work in nuclear engineering.

In the oral General Examination the student is examined on topics related to his field of specialization in nuclear engineering and the area in which he plans to do his dissertation research. A student is not permitted to take the General Examination until he has been accepted by a member of the faculty as a research student and has demonstrated proficiency in one foreign language. A student should take the General Examination soon after passing the qualifying examination, usually within one year. Passing the General Examination constitutes admission to candidacy for the Ph.D. degree.

A prospective candidate for the degree is expected to conduct an original and independent investigation in one of the fields of nuclear engineering. The results of this research, which must yield a significant contribution to knowledge, are submitted as a dissertation. In his Final Examination, the student presents and defends these results orally.

Departmental brochures, available on request, furnish detailed accounts of the requirements and procedures involved in the programs for advanced degrees as well as the current research interests of the faculty.

INTERCOLLEGE PROGRAM

BIOENGINEERING

Director

Robert F. Rushmer
Aerospace Research Laboratory

Assistant Director for Engineering

Curtis C. Johnson
Aerospace Research Laboratory

Graduate Student Advisers

Colin Daly, Assistant Professor (Mechanical Engineering); Gordon Oates, Associate Professor (Aeronautics and Astronautics); Robert Pinter, Assistant Professor (Electrical Engineering); D. H. Polonis, Professor (Mining, Metallurgical, and Ceramic Engineering); Maurice Robkin, Associate Professor (Nuclear Engineering); Charles Sleicher, Professor (Chemical Engineering)

At the University of Washington, bioengineering is operationally defined as the application of engineering principles, practice, and technology to the broad spectrum of problems in health sciences. The basic ap-

proach to these problems involves collaborative research by engineering faculty in close cooperation with life scientists who often share in the supervision of engineering graduate students. During these early years of the program the major objective is to establish a broad research base that incidentally provides a wide variety of potential thesis problems for engineering graduate students. The diversity of problem areas is not consonant with a well-defined graduate program of study. Instead, the program is designed to produce a well-educated engineer with a supplemental education in biology of a type and depth appropriate to his long-range professional goals and his chosen thesis area.

Undergraduate students interested in bioengineering should consult appropriate advisers regarding the opportunities to take biology courses as technical elec-

tives. By this process a valuable introduction to biology can be initiated before baccalaureate degree requirements are completed.

Involvement in bioengineering during studies for the master's degree requires that a selection of courses in biological function and structure be worked into the program of engineering study in preparation for research on the chosen thesis topic. The biological education is designed to prepare the student to participate in collaborative research with men of biology or medicine. Programs of study for the degree of Doctor of Philosophy will involve a full course of study in engineering, plus a much deeper involvement in biological course work selected in consultation with engineering and life sciences advisers and a research problem that constitutes a substantial contribution to knowledge.



FISHERIES

Dean

Richard Van Cleve
204 Fisheries Center

Associate Deans

Hiroshi Kasahara
214 Fisheries Center

William F. Royce
212 Fisheries Center

Professors

Milo C. Bell, Donald E. Bevan, Robert L. Burgner,
Douglas G. Chapman, Allan C. DeLacy, Lauren R.
Donaldson, John Liston, James E. Lynch (emeritus),
Ole A. Mathisen, Gerald J. Paulik, Ernest O. Salo,
Allyn H. Seymour, Arthur D. Welander

Associate Professors

George W. Brown, Jr. Kenneth Chew, G. Ivor Jones,
George Pigott, Brian Rothschild, Lynnwood S. Smith,
Richard Whitney

Assistant Professors

B. Bruce Bare, Don W. Hagen, Victor Riddle, Todd
Thorslund, Richard S. Wydoski

Research Professors

Kelshaw Bonham, Edward E. Held, Max Katz

Research Associate Professors

Thomas Beasley, Jack R. Matches, Frieda Taub

Research Assistant Professors

Donald A. McCaughran, Sigurd Olsen, Donald Rogers,
James Saddler, Quentin Stober

In a hungry world, contemporary man turns more and more to the living resources of the waters. He farms the seas, lakes, and rivers as he has farmed the land: breeding his stock, harvesting his crops, using science and knowledge to develop and preserve an increasingly important food supply.

Until recently, conservation and cultivation of fish have been of minor importance, but the population growth combined with rapid depletion of fisheries stocks has focused attention on a worldwide problem. The College of Fisheries is concerned, through both its faculty and its students, with the investigation of possible ways to use well-known stocks of fish more effectively, how to make better use of all waters to produce more food from living organisms, how to culture aquatic plants and animals more effectively.

In the United States, a decreasing work week and increasing leisure have meant an even further demand on fisheries. Recreational fishing is rapidly becoming a major factor in the need for increased production, and for the well trained management biologist. To meet this need, the College has broadened its base of training to include, in the undergraduate curricula, a much greater emphasis on fisheries administration.

Founded in 1919, the College of Fisheries has been intimately associated with the development and conservation of the fisheries of the northeastern Pacific Ocean.

The College attempts, always, to deal with whole problems rather than with isolated technical questions, an approach which involves many phases of biology with particular emphasis on the quantitative aspects. Full attention is given to political, social, legal, and economic problems associated with the use of resources. Although fishery problems of the Northwest are emphasized, they are examined as case histories, with many features applicable to problems of harvesting aquatic resources throughout the world, and, as a result, many foreign students register in the College.

Since commercial fishing is so closely related to the food industry, the College maintains an Institute for Food Science and Technology to prepare food scientists for careers in both industry and government. Both the graduate and undergraduate programs emphasize the role of the basic physical and biological sciences in the solution of problems that have resulted from the recent technological revolution in the food industry.

Although the Food Science program concentrates on general principles applicable to a wide range of food products, the extensive research program is largely concerned with marine and freshwater products of the Pacific Northwest. The program attracts many out-of-state and foreign students, particularly at the graduate level. The College of Fisheries offers courses leading to the degrees of Bachelor of Science in Fisheries, Bachelor of Science with a major in Fisheries, Bachelor of Science with a major in Food Science, Bachelor of Science with a major in Wildlife Science, Master of Science, and Doctor of Philosophy.

The College programs are designed to provide both the scientific training and the professional competency necessary for graduates to satisfy the various needs of their chosen fields. A Bachelor of Science in Fisheries is granted to students successfully completing a prescribed curriculum. Two options are offered: fishery biology and fishery management and administration. A Bachelor of Science with a major in fisheries is granted to students successfully completing an elective curriculum including at least 36 fisheries credits. A Bachelor of Science with a major in food science is granted to students successfully completing a specified core curriculum and appropriate electives. Further specialization within these areas may be undertaken in graduate studies as preparation for careers in teaching and research. In addition, training programs at the graduate level are offered in shellfish sanitation and biological aspects of water pollution.

College Facilities and Services

The College of Fisheries combines laboratory and classroom study with practical experience to offer the

student the maximum preparation for a career in fisheries.

The College is located in the Fisheries Center, which was built in 1949 on the edge of the Lake Washington Ship Canal and enlarged in 1968. The Ship Canal connects the large, freshwater body of Lake Washington with the salt water of Puget Sound.

The Center houses classrooms, laboratories, and general facilities, as well as several research organizations. The Fisheries-Oceanography Library, a branch library of research materials in fisheries, food science, oceanography, and wildlife science, is located in the Oceanography Teaching Building. With more than twenty thousand bound volumes and forty thousand technical reports, translations, reprints, and pamphlets, the library currently receives more than nine hundred serial publications. All the major abstract journals in the subject fields are also available, as are indexes to government research reports. Further material needed for research work is obtained from other library collections on the campus or by interlibrary loan.

The collection of fishes maintained by the College for research and teaching purposes contains over three hundred thousand cataloged specimens. These are mainly North Pacific marine fishes and northwestern freshwater fishes. However, the collection also includes extensive material from the Philippine Islands and the South Pacific, as well as representative collections from other parts of the world.

An annual run of several thousand salmon has been developed and is maintained at the College by the release of thousands of fingerlings each spring. Returning adults utilize a fish ladder to enter the College's experimental fish hatchery. The run is the basis for both instruction and research on the life cycle of Pacific salmon. Long term studies are in progress on the effects of chronic irradiation of salmon during embryonic development, on dietary requirements of the young fish, and on the selective breeding of both salmon and rainbow trout. A salt water aquarium is also maintained by the College. Cold or warm recirculated sea water may be supplied to a battery of aquaria, as well as to a unique 2,000-gallon annular tank.

Other laboratories provide for the study of the physiology and behavior of fish. These include a separate room containing troughs and tanks in which water temperature may be maintained at various levels. Physiological facilities include equipment for surgical procedures and biochemical analysis of body fluids from both freshwater and marine fish.

Equipment for the study of the effects of pollutants on fish is housed in a room where the temperature can



be maintained at any level between 50° and 75° F. This laboratory is supplied with water from several different sources and is used for both class demonstrations and research.

The College of Fisheries and the Fisheries Research Institute maintain an extensive library of computer programs for processing biological data. Included in this collection of programming materials are a number of simulation compiler programs that enable students to use the IBM 7094 computer for study of the structure and dynamic behavior of biological systems. Students have access to a Burroughs B5500, an IBM 360-50 and 7094 direct coupled system, and peripheral data processing equipment of the Pacific Northwest Research Computer Laboratory at the University of Washington.

A 67-foot diesel-powered boat, with cabin laboratory, is operated by the College. The vessel, the "Commando," is used for instruction and research in Lake Washington, Puget Sound, and the North Pacific Ocean. It is capable of trawling to a depth of 1,000 fathoms and is equipped for other types of fishing carried on in the North Pacific, as well as for handling a wide variety of experimental gear. There are facilities for marine microbiological studies and for technological investigations at sea on the M.V. "Commando." These include freezing and other refrigeration equipment and a small laboratory unit. Periodic training cruises introduce students to shipboard operations, including the use of various types of sampling equipment and acquaintance with a diversity of marine habitats.

The headquarters of one of the Pacific Coast's largest fishing fleets is located within two miles of the campus. Puget Sound, besides serving as a base for the world-famous salmon and halibut fisheries, has extensive bottom fish, commercial oyster, clam, crab, and shrimp operations. Sport fishing, particularly for trout, is available in the Northwest's many lakes and streams. Full advantage is taken of the proximity of these natural resources in research and teaching. A College of Fisheries field station at Big Beef Creek on Hood Canal provides additional opportunities for class field studies and research in stream and estuarine ecology. The stream contains established runs of chum and coho salmon and steelhead trout. Research facilities include a salmonid spawning channel, estuarine rearing ponds, and stream observation channels. Other field activities are carried on at the College's Fern Lake station in Kitsap County where special attention is given to limnology and to the influence of the watershed on the lake.

Food Science facilities include separate, well-equipped laboratories for food microbiology, food biochemistry, and food analysis. The food-processing and food-

engineering laboratory complex is composed of several separate facilities containing equipment for teaching and experimental work in thermal processing (including canning), drying, smoking, and freezing foods. A particularly wide variety of low-temperature equipment and cold rooms is available.

A unique feature of the Food Science laboratories is the Cobalt-60 research food irradiator (Mark II). This radiation unit contains a source of about 30,000 curies strength. Food or other materials to be irradiated are loaded into metal containers which are moved mechanically into proximity to the source. Operational safety is ensured by a water shield. The containers are designed to provide for temperature and atmosphere control during irradiation.

Facilities for graduate studies in nutrition, including experimental work with vertebrates and invertebrates, are provided in the Institute for Food Science and Technology. Laboratory and shipboard facilities, including simulated sea-bed equipment, pressure bomb incubators, deep-sea sampling equipment, etc., are maintained in the Institute for Food Science and Technology for graduate studies in the field of Marine Microbiology.

In 1968 the University of Washington qualified for Sea Grant Institutional Support under the national Sea Grant College and Program Act which is administered by the National Science Foundation. The College of Fisheries participates actively in this program, with research projects concerned with the living resource of the Northeastern Pacific and the changing environment of Puget Sound, with advisory services to industry, and with a variety of courses.

Fisheries Club

The students of the College of Fisheries formed the Fisheries Club in 1922. Since its beginning, the Club has been the center of extracurricular social and educational activities for the College students.

Meetings are held monthly, usually with prominent speakers from the various fields of the fishing industry. Frequently motion pictures are shown that deal with fisheries all over the world. In the past years the students have organized the Open House of the College of Fisheries. In addition the Club has an annual salmon bake and other social gatherings. The Club has aided in procuring summer employment for many College of Fisheries students.

Related Activities

In the city of Seattle are offices and laboratories of the U.S. Fish and Wildlife Service, and the headquarters of the International Pacific Halibut Commission is located

on the campus. The Washington State Department of Fisheries maintains offices in the Fisheries Center.

The Friday Harbor Laboratories on San Juan Island, about eighty miles north of Seattle, are under the administration of the Division of Marine Resources and provide unique opportunities for teaching and research in the marine sciences. During the summer, courses in algology, marine zoology, fisheries, and oceanography are offered for advanced undergraduate and graduate students.

The College of Fisheries is actively engaged in water resource management activities, with the faculty participating in interdisciplinary programs. The College is represented on the joint scientific committee of the state of Washington Water Research Center.

The Fisheries Research Institute

Staff

Robert L. Burgner, Director, John W. Anderson, Ronald M. Bush, Michael B. Dell, Allan C. Hartt, Edwin K. Holmberg, John S. Isakson, Ole A. Mathisen, Gary W. Miller, Remedios W. Moore, William H. Parr, Jr., Donald E. Rogers, Brian J. Rothschild, James B. Saddler, Ernest O. Salo, Dell H. Siler, Lynwood S. Smith, Quentin J. Stober, Gregory J. Tutmark, Richard W. Tyler

Affiliated Faculty

Donald E. Bevan, Kenneth K. Chew, Donald W. Hagen, Max Katz, Albert K. Sparks, William F. Royce

The Fisheries Research Institute is a research branch of the College of Fisheries. The College's larger grants and contracts in the field of fishery biology are handled by the Institute under the direction of both teaching and research faculty. Employment on contracts and grants is given first to graduate or undergraduate students, and many students who are working toward their graduate degrees on major fishery problems are being supported by contracts or grants.

The Institute was established in 1947 under the sponsorship of the Alaska Salmon Industry, Inc., and the research on salmon has continued and expanded under various industry, state, and federal contracts. Currently, the principal salmon studies are: (1) population dynamics and ecology of lakes producing sockeye salmon; (2) migrations and abundance of salmon on the high seas; (3) parasite studies; (4) ecology of nursery areas in pink and chum salmon streams; (5) regulation for optimum yield; (6) ecology of Puget Sound salmon stocks under natural and altered environmental conditions in fresh water and estuaries; (7) spawning channel rearing of chum salmon; and (8) a literature compilation. Much of this work on salmon is important to the

United States section of the International North Pacific Fisheries Commission, and members of the Institute staff participate in the meetings of the Commission.

Research on problems other than salmon has been expanding rapidly. Current projects include several studies on oysters, parasites of fish, simulation of watershed management, marine ecology of an Aleutian island, and physiology and biochemistry of local marine fishes.

The Institute maintains headquarters and laboratory facilities on the University campus and semipermanent field stations at five locations in Alaska. The campus headquarters and the Big Beef station are used for work in Washington. A large amount of field and laboratory equipment is available, together with an extensive collection of fishery records from the Pacific Northwest and Alaska. Provision is made to conduct research on fishery problems in collaboration with other colleges and departments of the University, especially Engineering, Economics, Law, and Oceanography.

The "Kumtuks," a new 99-foot floating physiology laboratory, is used in Puget Sound and nearby waters for the study of biochemistry and physiology of fish. It contains large well-equipped laboratories, aquaria, and living quarters for several students and staff.

The motor vessel "Malka," 38 feet long, is used for inshore oceanographic and biological work in Washington and Alaska. It is equipped with a small laboratory and winches for handling specialized fishing or sampling gear.

The 32-foot "Iliamna," 30-foot "Sa-yak," and 30-foot "Kakhonak" are stationed on Lake Iliamna, the largest lake in Alaska and a major producer of sockeye salmon in North America. They are equipped for studies of limnology and of the fish population.

Institute for Food Science and Technology

Staff

J. Liston, Director, G. Ivor Jones, Jack R. Matches, George M. Pigott, Victor M. Riddle, Frieda B. Taub

The Institute incorporates the teaching, research, and advising programs in Food Science into a single unit. The teaching program, which includes undergraduate and graduate instruction, is clearly described in other parts of this catalog.

The research activities within the Institute are concentrated in food microbiology, food safety, radiation processing of foods and seeds, food process engineering, biochemical processes in foods, marine microbiology, aquatic microecosystems, seafood technology, and nutrition. At least one specific research project usually funded by federally derived grants from agencies such



as the Public Health Service, Office of Naval Research, Water Pollution Control Administration, Atomic Energy Commission, and National Science Foundation is active within each of these areas. These projects provide opportunities for research training for both undergraduate and graduate students in food science.

Industrial research is carried out on an *ad hoc* basis by the Institute at the request of food companies. Such research, which is paid for by the companies, is encouraged.

Advice and consultation, particularly on problems of seafood technology, are provided under formal and informal arrangements. Formally, there are two main advising programs operating in the Institute. One, for the food industry in general, is supported under the State Technical Services Act and has concentrated heavily on radiation processing and new process development. The other program operates under the Sea Grant College and is aimed at the seafood industry. It includes workshops, personal discussions and demonstrations, bulletin preparation, and the development of a seafood information service. The involvement of students in these industry-contact programs is encouraged to the greatest extent possible, since it provides them with excellent experience in industrial conditions and operations.

The Laboratory of Radiation Ecology

Staff

Allyn H. Seymour, Director, Thomas M. Beasley, Marion Chase, Rodney J. Eagle, Edward E. Held, Terrence A. Jokela, Raymond T. Lusk, Marguerite E. McAlpin, Charles E. Vick, Arthur D. Welander

The Laboratory of Radiation Ecology under contracts with the U.S. Atomic Energy Commission conducts basic and applied research related to radionuclides in the marine environment. The research programs, supervised by the faculty, are interdisciplinary in nature and require the cooperation of faculty and graduate students both from the College of Fisheries and from other colleges and departments on and off campus. Graduate assistantships are available to students working on thesis problems related to radiation or radionuclides and aquatic organisms.

The Laboratory is the outgrowth of the Applied Fisheries Laboratory, which was established in 1943 to study problems associated with the installation of nuclear reactors on the Columbia River. The first nuclear tests, Operation Cross Roads at Bikini Atoll in 1946, marked the beginning of an increasing scope of the Laboratory's studies. Field studies have taken members of the staff from the Pacific Coast to the China Sea, and from the Arctic Ocean to the Tropic of Capricorn. With the cessation of the atmospheric tests of nuclear de-

vices, the emphasis of the Laboratory's research has been shifted from studies of the distribution of fallout radionuclides to experiments on the effects of irradiation and the metabolism of radionuclides.

Graduate students are encouraged to undertake original research related to the Laboratory's projects, which include the following types of studies:

1. The distribution of fallout radionuclides at Johnston Atoll and other areas of the Pacific.
2. The distribution of reactor-produced radionuclides along the Washington coast and in Puget Sound.
3. The concentrations of naturally occurring radionuclides in marine foodstuffs.
4. The effects of radionuclides on aquatic organisms.
5. The interaction of acute doses of radiation, embryonic stage, and environmental conditions in the production of morphological and cytological anomalies in fish.
6. The development of methods for the delineation of radioactive water masses in the sea.
7. The development of techniques in radiation dosimetry in the marine environment and organisms.
8. The turnover times of trace elements and their radioisotopes in aquatic organisms.

Facilities are available at the College for chemical and radiometric analyses. Sophisticated instruments in the counting room make possible the use of a wide variety of techniques, including alpha, beta, and gamma spectroscopy. In addition, a mobile laboratory is equipped for sample preparation and gamma-ray spectroscopy of prepared samples or small living animals. X-ray machines, radioactive sources, and facilities for handling radioactive solutions at the Laboratory provide the physical tools for the experimenter.

The Washington Cooperative Fishery Unit

Staff

Richard R. Whitney, Richard S. Wydoski

The Washington Cooperative Fishery Unit was established in 1967 as the twenty-third such Unit in the United States. The Units exist to facilitate cooperation among the federal government, colleges and universities, the states, and private organizations for cooperative unit programs of research and education relating to fish and wildlife.

The Washington Cooperative Fishery Unit is supported by the Department of the Interior's Bureau of Sport Fisheries and Wildlife, by the Washington Department of Fisheries, Washington Department of Game, as well as the University of Washington. Funds contributed by these agencies are used to support research projects carried out by graduate students and the staff. The em-

phasis is on problems associated with sport fisheries. Currently under way are studies of (1) the geoduck, Washington's largest sport clam; (2) the interaction of juvenile steelhead and coho salmon in a Puget Sound stream; (3) the role of warm-water fishes as sport fish in Washington; and (4) some other potentially important sport fishes that are now under-utilized, such as the American shad.

Offices of the Unit are in the Fisheries Center. Facilities of the cooperating agencies can be made available for use by students through the Cooperative Fishery Unit.

Inter-College Programs With the College of Forest Resources

QUANTITATIVE SCIENCE

Center for Quantitative Science in Forestry, Fisheries, and Wildlife

Staff

Douglas G. Chapman, Director, Bruce Bare, Donald A. McCaughran, William Hatheway, Gerald J. Paulik, Brian Rothschild, Todd Thorslund, Kenneth J. Turnbull

The Center for Quantitative Science in Forestry, Fisheries, and Wildlife was established in 1968 in recognition of the trend towards the use of mathematical methods and models in the utilization and management of our renewable resources and in the biological field in general. Problems of sampling and the statistical analysis of data have long been of importance in the utilization and management of fisheries and forest resources. Operations research tools and dynamic programming methods may provide better ways to manage these resources in the face of increased human pressure on them and in the face of growing needs to balance multiple and competing demands. Finally, development of mathematical models represents an important step in the increased understanding of natural phenomena. Because of the complexity of the ecosystems in nature, because of the many variables and the interactions between them, systems analysis methods and high speed computers are necessary in such model building. In fact, computer-based models have already demonstrated their usefulness in the management of salmon and halibut populations, in the control of insect pests, and in the understanding of the behavior of prey and predator systems.

The Center serves as a focus for this activity in the Colleges of Fisheries and Forest Resources and will provide consultation and teaching in applied mathematics and applied statistics and conduct research in both the methodology of model building and ecological and resource management problems.

Support for this general area is provided by a Ford Foundation Grant that, in particular, provides graduate

fellowships. These are for students who are working for the Ph.D. and who may major in any of a number of selected disciplines. Such students must take part of their programs in quantitative science, and are expected to apply quantitative methods in their dissertation research to a problem in ecology or resource management. The grant program is administered by a committee consisting of Prof. Earl Bell and Prof. William Newell of the School of Business Administration, Prof. James Crutchfield of the Department of Economics, and Prof. Douglas G. Chapman (Committee Chairman), Prof. Gerald J. Paulik, and Prof. Kenneth Turnbull of the Center. Information on the program may be obtained from any of the members of the committee.

WILDLIFE SCIENCE

Committee

Douglas G. Chapman, Chairman, Donald E. Bevan, Donald A. McCaughran, David R. M. Scott, and Richard Taber

The Colleges of Fisheries and Forest Resources have established a new undergraduate degree program in wildlife science. Students interested in the aquatic aspect of wildlife will register in the College of Fisheries. The student who obtains a Bachelor of Science with a major in wildlife science will be able to apply his training to management of wildlife resources and the related environment or to proceed to do graduate work for advanced management or research positions. Students seeking further information should contact a member of the Committee.

Admission as Freshmen

In addition to the University requirements for entrance from high school, intermediate algebra and trigonometry are prerequisites for the first courses in mathematics included in all College of Fisheries curricula. Students who plan to enter this College can, and preferably should, complete these courses in addition to elementary algebra and plane geometry, which normally are the two units of college preparatory mathematics. Without this additional preparation, students will probably find it necessary to spend an extra quarter at the University in completing work for the baccalaureate degree. It is recommended also that students study chemistry, physics, and, if possible, biology while in high school.

Because an appropriate choice of high school electives serves to strengthen a student's preparation, the University will give this part of a student's record the same careful attention it gives to other aspects of his qualifications.

Advising

After notification of admission by the University's Office of Admissions, and before registration, new students



should visit or write to the College of Fisheries for help in planning their course programs. Academic and other counseling of fisheries students is given by faculty advisers in the College of Fisheries.

Admission with Advanced Standing

A qualified student in good standing at an accredited institution may apply for admission with advanced standing. Such an applicant is expected to have the same high school preparation as the student who enters as a freshman, or equivalent introductory college courses, and a college grade-point average that meets the standard specified for the University. Students who plan to complete their first two years of college work at a junior college should consult their advisers concerning junior college courses that are acceptable to the College of Fisheries. These courses are listed in the booklet *University of Washington Community College Transfer Programs*. The latest issue should be consulted.

Admission to the Graduate Program

Basic requirements for admission to the graduate program in the College of Fisheries are a bachelor's degree from an institution of recognized standing, a grade-point average of 3.00 in the junior and senior years of college work, approval of the College of Fisheries, and approval of the Graduate School. Students entering the graduate program in either Fishery Biology or Food Science must have completed the equivalent of an undergraduate major in Fisheries or Food Science or have completed an undergraduate program acceptable to the College of Fisheries. The Graduate Record Examination is required of all graduate students and should be taken prior to admission. A student admitted with a bachelor's degree is accepted initially for a Master of Science degree program.

Financial Aids

The College offers financial assistance to undergraduates and graduates through industrial and private scholarships. The *Handbook of Scholarships*, available from the Office of Financial Aids, 3939 University Way, or the departmental advising offices, list available scholarships. Qualified graduate students may obtain financial assistance through governmental fellowships, National Science Foundation, National Aeronautics and Space Administration, and Public Health Service traineeships, research assistantships, or teaching assistantships. Students seeking such aid should apply at the office of their major departments.

Employment

The College of Fisheries assists its students to obtain summer employment and also helps them to secure

permanent employment when they graduate. A number of Research Assistantships associated with grant and contract research are available for graduate students in the College. Both summer and part-time employment during the scholastic year are frequently available with the research organizations that are associated with the College of Fisheries on or near the campus and elsewhere in the Northwest. The Fisheries Research Institute normally hires students for summer work in the field and usually has several part-time positions available during the school year. Similar work is available in the Washington State Department of Game, Washington State Department of Fisheries, the U.S. Fish and Wildlife Service, the International Pacific Halibut Commission, Laboratory of Radiation Ecology, Oregon Fish Commission, the International Pacific Salmon Fisheries Commission, and the Alaska Department of Fisheries. These jobs may be located within the state of Washington but frequently take students to Alaska or elsewhere in the United States. These agencies normally interview students at the College of Fisheries during the Winter Quarter for the purpose of choosing both permanent employees and employees for summer work. Fisheries students are encouraged to seek summer work in the field to gain valuable experience in both fishery biology and fisheries or food technology.

The specific fishery orientation of the College program is supported by a unique combination of subject interests among the faculty, and a wide range of equipment and physical facilities. These factors, together with the active research program, put graduate students in a very favorable position to pursue programs leading to advanced degrees.

In addition to the opportunities for graduate work at the College of Fisheries, the international fishery commissions, federal government, and state fishery and water research agencies have staffs working in laboratories on or near the campus. Many of the senior research members of the cooperating laboratories and a number from industry are lecturers in the College. Graduate students, besides finding financial support in such laboratories, may, under special arrangements, carry out research which, upon approval, may be used to satisfy the thesis requirements for the advanced degree.

Undergraduate Programs

Students working toward bachelor's degrees must qualify for admission to the University and the College. Students who do not include two units of foreign language in their college preparatory programs will be required to achieve equivalent competence in a foreign language as a graduation requirement. This require-

ment may be fulfilled by successful completion in the University of 10 credits of a foreign language or by passing an appropriate placement examination.

GRADUATION REQUIREMENTS

Students should apply for bachelor's degrees during the first quarter of the senior year. If not more than ten years have elapsed since the date of a student's entry into the College, he may choose to graduate under the requirements set out in either the bulletin published most recently prior to the date of his entry or that published prior to his anticipated date of graduation; provided that when, in the opinion of the faculty of the College, substantial changes have been made in the curriculum since the student's entry, the student's choice shall be subject to the approval of the faculty or dean.

Disapproval of the student's choice shall be faculty action and subject to the procedures of the Faculty Code. All responsibility for fulfilling graduation requirements shall rest with the student concerned.

The University credit requirement for graduation is 180 academic credits and the required quarters of physical education activity. The College of Fisheries requires that 6 credits or the equivalent in English 101 and 102 or 103 (Introductory English) be included in the total. At least 60 of the 180 credits must be in upper-division courses, those numbered 300 and above. A total of at least 36 credits in fisheries and food science is required. For graduation, students must have a cumulative average of 2.00 (C) in fisheries and food science courses and an over-all average of 2.00 (C) in all courses. Advanced ROTC courses do not count as upper-division credit, and no more than 18 credits in advanced ROTC courses may be counted toward graduation.

Students who transfer from other institutions to the College of Fisheries are normally required to earn at least 10 credits in their major subject in this College.

FISHERY BIOLOGY

Adviser

A. C. DeLacy
248 Fisheries Center

BACHELOR OF SCIENCE IN FISHERIES

A student may major in fishery science or fishery management and administration. He must take the courses required for all options and complete the required courses for his selected option.

Required Courses for Fishery Options A and B

Biology 210, 211, 212 (Introductory Biology) or Zoology 111-112 (General Zoology); Chemistry 140, 150,

151 (General Chemistry and General Chemistry Laboratory); English 101, 102 or 103 (Introductory English); Fisheries 101, 240, 311, 314, 401, 456, 457, 495 (4 credits); Mathematics 105 (College Algebra); Quantitative Science 281 (Elements of Statistical Method)

Option A: Fishery Science

ADDITIONAL REQUIRED COURSES

Chemistry 160 (General Chemistry), 170 (Qualitative Analysis), 231, 232 (Organic Chemistry); Fisheries (6 credits); Humanities (10 credits); Quantitative Science 291 and 292 (Analysis for Biologists) or Mathematics 124 (Calculus with Analytic Geometry); Quantitative Science 382, 383 (Statistical Inference in Applied Research); Social Sciences (10 credits)

RECOMMENDED COURSES (Selection of 36 credits is required)

Biochemistry 405, 406 (Introduction to Biochemistry I, II), 440, 441, 442 (Biochemistry); Biology 472 (Principles of Ecology), 474 (Ecology Laboratory), 473 (Limnology), 475 (Limnology Laboratory); Botany 113 (Elementary Plant Classification); Chemistry 221 (Quantitative Analysis), 241, 242 (Organic Chemistry Laboratory), 335, 336, 337 (Organic Chemistry), 345, 346 (Organic Chemistry Laboratory), 347 (Organic and Qualitative Organic Laboratory); Economics 435 (Natural Resource Utilization and Public Policy); Genetics 451 (Genetics); Geological Sciences 101 or 205 (Physical Geology); Mathematics 125, 126 (Calculus with Analytic Geometry), 302, 303 (Elementary Linear Algebra), 391 (Elementary Probability), 392 (Elements of Statistics); 485 (Analysis of Variance); Oceanography 203 (Introduction to Oceanography), 401 (General Physical Oceanography I), 433 (Biological Oceanography: Organisms and Processes), 435 (Biological Oceanography: Quantitative Aspects); Philosophy 120 (Introduction to Logic); Physics 114, 115, 116 (General Physics), 117, 118, 119 (General Physics Laboratory); Wildlife Science 401 (Wildlife Biology), 402 (Wildlife and Man), 403 (Wildlife and Land Use); Zoology 330 Natural History of (Marine Invertebrates), 409 (Ethology), 433, 434 (Invertebrate Zoology), 435 (Parasitology), 453-454 (Comparative Anatomy of Chordates), 456 (Developmental Biology of Animals)

Option B: Fishery Management and Administration

ADDITIONAL REQUIRED COURSES

Chemistry 102 (General and Organic Chemistry); Communications 338 (Public Relations); Economics 211 (General Economics), 435 (Natural Resource Utilization and Public Policy), English 271, 272 (Expository Writing), Fisheries 379, 405 or 406, 425, 450, 451, 452, 453, 460; Food Science 380; Quantitative Science 291 (Analysis for Biologists) or Mathematics



157 (Elements of Calculus); Speech 220 (Introduction to Public Speaking), 320 (Public Speaking)

RECOMMENDED COURSES (Selection of 15 credits is required)

Biology 472 (Principles of Ecology), 474 (Ecology Laboratory), 473 (Limnology), 475 (Limnology Laboratory); Botany 113 (Elementary Plant Classification); Chemistry 160 (General Chemistry), 170 (Qualitative Analysis), 221 (Quantitative Analysis); Food Science 378 (Principles of Fishing Gear and Vessel Development), 381 (Principles of Fisheries Technology II); Forest Resources 350 (Wildlife Management); Geological Sciences 101 or 205 (Physical Geology); Oceanography 203 (Introduction to Oceanography); Political Science 470 (Public Bureaucracies in the Political Order), 471 (Administrative Processes), 472 (Introduction to Administrative Law); Quantitative Science 292 (Analysis for Biologists), 382, 383 (Statistical Inference in Applied Research).

BACHELOR OF SCIENCE

An elective curriculum is available for students desiring a Bachelor of Science with a major in fisheries. The student must complete 36 credits in fisheries and sufficient electives to meet University graduation requirements. This degree is specifically intended for students desiring a strong minor (minimum of 30 credits) in a related field. The choice of electives is subject to approval by the College.

Prospective students are invited to inquire about additional areas of emphasis in which undergraduate preparation may be made. Such areas include behavior, biometrics, economics, water pollution, and wildlife science. Study in some of these topics can be undertaken only at the graduate level.

FOOD SCIENCE

Adviser

John Liston

221 Fisheries Center

BACHELOR OF SCIENCE

The food science program provides a curriculum leading to a Bachelor of Science degree with a major in Food Science. It is recommended that the entering student will have completed mathematics to include advanced algebra and trigonometry, and laboratory science to include chemistry and physics.

The normal program to be followed by students studying for a Bachelor of Science with a major in Food Science is outlined below. At least 10 credits in humanities or social sciences and 10 credits in biological sciences should be included.

More advanced courses may be substituted for listed requirements in basic science areas. (See recommended courses further on in this section.)

CURRICULUM IN FOOD SCIENCE

First Year

FIRST QUARTER		CREDITS
ENGL 101	INTRODUCTORY ENGLISH	3
CHEM 140	GENERAL	3
MATH 105	COLLEGE ALGEBRA	5
ELECTIVES		4
		15

SECOND QUARTER

ENGL 102	INTRODUCTORY ENGLISH	3
CHEM 150	GENERAL	3
CHEM 151	GENERAL CHEM. LABORATORY	2
ELECTIVES		8
		16

THIRD QUARTER

MATH 157	ELEMENTS OF CALCULUS	4
CHEM 160	GENERAL	3
CHEM 170	QUALITATIVE ANALYSIS	3
ELECTIVES		5
		15

Second Year

FIRST QUARTER

CHEM 231	ORGANIC	3
CHEM 241	ORGANIC CHEM. LABORATORY	2
PHYSICS 114	GENERAL	4
ELECTIVES		6
		15

SECOND QUARTER

CHEM 232	ORGANIC	3
CHEM 242	ORGANIC CHEM. LABORATORY	2
PHYSICS 115	GENERAL	4
ELECTIVES		6
		15

THIRD QUARTER

CHEM 221	QUANT. ANAL.	5
Q SCI 281	ELEM. STAT. METH.	5
PHYSICS 116	GENERAL	4
ELECTIVES		1
		15

Third Year

FIRST QUARTER

MICRO 400	FUND. BACTERIOL.	6
P MED 440	WATER & WASTE SAN.	4
ELECTIVES		5
		15

SECOND QUARTER

P MED 441	MILK & FOOD SAN.	4
FD SC 380	PRIN. FISH. TECH. I	3
BIOC 405	INTRO. BIOCHEM. I	3
CHEM 350	ELEM. PHYS. CHEM.	3
ELECTIVES		2
		15

THIRD QUARTER

FD SC 481	INTRO. FOOD TECH.	5
BIOC 406	INTRO. BIOCHEM. II	3
BIOC 408	INTRO. BIOCHEM. LAB.	3
ELECTIVES		4
		15

Fourth Year

FIRST QUARTER

FD SC 482	FOOD ANAL. I	4
FD SC 484	PRIN. FOOD PROC. I	5
FD SC 498	UNDERGRAD. THESIS	2
FISH 495	INTRO. FISH. & FOOD SCI. LIT.	2
ELECTIVES		2
		15

SECOND QUARTER		CREDITS
FD SC 483	FOOD ANAL. II	4
FD SC 485	PRIN. FOOD PROC. II	5
FD SC 498	UNDERGRAD. THESIS	2
ELECTIVES		4
		<hr/> 15

THIRD QUARTER		CREDITS
FD SC 486	DETERIORATIVE PROC. FOODS	5
FD SC 487	FOOD ANAL. III	4
FD SC 498	UNDERGRAD. THESIS	2
ELECTIVES		4
		<hr/> 15

RECOMMENDED COURSES

Accounting 210, 220 (Fundamentals of Accounting); Biochemistry 440*, 441*, 442* (Biochemistry), and 444* (Biochemistry Laboratory); Biology 210, 211, 212 (Introductory Biology); Botany 111 (Elementary Botany), 112 (The Plant Kingdom), Chemistry 151 (General Chemistry Laboratory), 335*, 336*, 337* (Organic Chemistry), and 345*, 346* (Organic Chemistry Laboratory), 347* (Organic and Qualitative Organic Laboratory), 426 (Instrumental Analysis); Fisheries 101 (Introduction to Fisheries Science), 379 (Fisheries of the World), 405 (Economically Important Mollusca), 406 (Economically Important Crustacea); Food Science 378 (Principles of Fishing Gear and Vessel Development), 381 (Principles of Fisheries Technology II), 490 (Space Biology: Sealed Life-Support Systems); General Engineering 111 (Engineering Problems); Home Economics 300, 307 (Nutrition); Marketing 301 (Marketing Concepts); Mathematics 114 (Elementary Computer Programming), 124, 125, 126 (Calculus with Analytic Geometry), 374 (Principles of Digital Computers and Coding); Microbiology 430 (Microbial Metabolism); Philosophy 120 (Introduction to Logic), 460 (Philosophy of Science); Physics 117*, 118*, 119* (General Physics Laboratory), 121* (Mechanics), 122* (Electromagnetism and Oscillatory Motion), 123* (Waves); Operations Management 301 (Principles of Operations Management); Quantitative Science 291, 292 (Analysis for Biologists), 382, 383 (Statistical Inference in Applied Research); Zoology 111-112 (General Zoology)

* Students intending to proceed to graduate study are advised to take these courses.

Graduate Programs

Graduate Program Adviser
Richard Van Cleve
204 Fisheries Center

Graduate students specializing in each option of the College of Fisheries are required to take a minor or a minimum number of supporting courses in other selected departments of the University. The nature and number of such courses are determined by the student's Supervisory Committee. All graduate students must complete 6 credits (three quarters) in Fisheries 520.

MASTER OF SCIENCE

Students must have a Bachelor of Science degree in biological or physical science or fisheries or food science or the equivalent. At least one year of approved study, with the completion of a research project, leads to the master's degree.

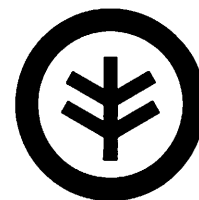
A minimum of 45 upper-division or graduate credits must be presented, including 18 credits in Fisheries 700 or Food Science 700, 6 credits in Fisheries 520 or Food Science 521, and 3 additional credits in courses numbered 500 or above. The student must present a certificate of proficiency in one foreign language. The language examination is to be taken not later than during the third quarter of residence.

DOCTOR OF PHILOSOPHY

Students must complete at least three years of graduate study including a dissertation. Credits earned for a master's degree may be applied toward the doctor's degree. Preparation of a Ph.D. dissertation requires registration for 36 credits in Fisheries 700 or Food Science 700.

The student must present a certificate of proficiency in two foreign languages (one in addition to the Master of Science requirement) or obtain a certificate of proficiency in one foreign language and demonstrate an additional competence in that language by the preparation of a satisfactory translation of scientific works.

For further information, see the *Graduate Study* section of this catalog.



FOREST RESOURCES

Dean

James S. Bethel
206 Anderson Hall

Associate Deans

Stanley P. Gessel, Benjamin A. Jayne

Professors

James S. Bethel, C. Frank Brockman (emeritus), Benjamin S. Bryant, Douglas G. Chapman, Charles H. Driver, Harvey D. Erickson, Howard S. Gardner, Stanley P. Gessel, Bror L. Grondal (emeritus), Benjamin A. Jayne, Gordon D. Marckworth (emeritus), J. Kenneth Pearce (emeritus), James C. H. Robertson (emeritus), K. V. Sarkanen, Walter H. Schaeffer, David R. M. Scott, Grant W. Sharpe, George Stenzel, Richard D. Taber, David P. Thomas

Associate Professors

G. Graham Allan, Dale W. Cole, Barney Dowdle, George R. Fahnestock, Leo J. Fritschen, Robert I. Gara, William H. Hatheway, Lawrence Leney, Hilton Lysons, James L. Murphy, Reinhard F. Stettler, Kenneth J. Turnbull, Fiorenzo C. Ugolini, J. Alan Wagar, David D. Wooldridge

Assistant Professors

B. Bruce Bare, John C. Hendee, Bjorn F. Hrutfiord, Todd W. Thorslund, Thomas R. Waggener

Research Assistant Professor

Hans Riekerk, T. N. Storate

Lecturers

Edwin F. Heacox, Reid M. Kenady, Kenneth M. Macdonald, Brian O. Mulligan, Joseph A. Witt

Forestry is based on both the natural and social sciences and is concerned with their application to an understanding of the characteristics, processes, productive capacities, and uses of forest, range, and recreational lands. This includes development of the principles governing the dynamics of biotic populations and of methods through which these can be controlled. Forestry is also concerned with the development and application of managerial techniques to the simultaneous production, on both private and public lands, of a wide variety of goods and services.

Founded in 1907, when forestry education in the United States was in its infancy, the University's College of Forest Resources has evolved to provide instruction in this substantial array of science, social science, and humanistic knowledge, both as applied in the several professional areas in forestry and as subjects for advanced study and research. Because the University of Washington is located centrally in one of the world's most important forest regions, there are unique opportunities to integrate into the instructional program on all levels the nearby public and private forest land, extensive and diverse industrial facilities, numerous research centers, and the regional corps of practitioners and research workers.

The College of Forest Resources emphasizes in its curricula a thorough and appropriate academic preparation during the first two years, followed by one of several professional upper-division programs, dependent on the

individual student's inclination. In all curricula there are elective possibilities. Opportunities for independent study and research are available for gifted students. Because of the modest size of the undergraduate enrollment in forestry, there exists, in classroom and laboratory, an atmosphere of close association between students and faculty members. The diversity of educational experiences and the superior facilities found only in a large university are also available to forestry students at the University of Washington.

The College of Forest Resources is accredited by the Society of American Foresters. It offers curricula leading to the degrees of Bachelor of Science in Forest Resources and, through the Graduate School, to the Master of Forest Resources, Master of Science, and Doctor of Philosophy.

College Facilities and Services

The College occupies a complex of three buildings: Alfred H. Anderson Hall, the Hugo Winkenwerder Forest Sciences Laboratory, and a new building to be completed during 1970.

Alfred H. Anderson Hall, the gift of Mrs. Agnes H. Anderson in honor of her husband, a pioneer lumberman and civic leader in the state of Washington, has been the center of the College since 1925. The Hugo Winkenwerder Forest Sciences Laboratory, named after the distinguished Dean of the College from 1912 to 1945, was completed in 1964. With the completion of the newest building, designed primarily as a laboratory facility for physical sciences research, this three-building complex will house administrative offices, classrooms, seminar rooms, the Forest Club Room, laboratories, the library, herbarium, and the wood collection.

The laboratory facilities of the College, designed for both graduate and undergraduate use, include an extensive array of modern equipment for biological, chemical, and physical research. Optical equipment, electronic instrumentation for a wide variety of uses, gas chromatographs, spectrophotometers, physical test equipment, and an electron microscopy facility are but a few of the many research tools available. Specific laboratories are designed for soil chemistry and soil physics, polymer chemistry, meteorology, tree physiology, genetics, wood and extractives chemistry, physics of fibrous composites, applied mechanics, wood process technology, pulp and paper technology, pathology, and entomology.

The library, a branch of the University's Henry Suzallo Library, consists of more than 23,000 bound volumes and 30,000 pamphlets, reports, and monographs. It also has an excellent collection of approximately 2,500 periodicals and many indexes to current literature in forestry and supporting sciences. Under the nationwide

Farmington Plan sponsored by the Special Library Association, the forest library has assumed responsibility for collecting foreign material published in the fields of forestry and pulp and paper technology, providing unusual opportunity for academic research.

The herbarium supplements forestry students' field work in dendrology. The collection contains representative plant material from all parts of the United States and includes dried, mounted specimens of shrubs, hardwood trees, and conifers. Fruit specimens and a complete cone collection of American conifers are maintained apart from the mounted collection. Another herbarium, complete in range plants, is maintained by the Botany Department and is available for use by forestry students.

The *University Arboretum* is a 200-acre park planted with trees and shrubs from all over the world. The diversified topography of the Arboretum together with the mild climate of the Puget Sound region permit the growth of a greater number of species and varieties than is possible in almost any other area of the Northern Temperate Zone. The Arboretum is a ten-minute walk from the campus.

The *Charles Lathrop Pack Demonstration Forest*, an enlargement and development of an original gift from the Charles Lathrop Pack Forestry Trust, is a tract of more than twenty-three hundred acres. It extends along both sides of the Mount Rainier National Park highway at La Grande, Washington, 65 miles from the University. Pack Forest is an excellent terrestrial ecology area and a general natural science research laboratory. The Forest also serves as a demonstration area for advanced forest practices. An extensive arboretum area was established in the 1930's and has been constantly added to. Forest growth research plots have been maintained on the forest since 1928. Recent major research expansion has been in forest ecology, forest soils, tree physiology, genetics, and pathology. Field laboratory facilities are available. In addition, complete facilities for classwork and living accommodations are available to students and faculty-in-residence working at the Pack Forest.

The *Lee Memorial Forest* is a young forest in Snohomish County, near Maltby, about twenty-two miles from the University. The 158-acre property was deeded to College of Forest Resources in the early 1930's by Mr. and Mrs. George O. Lee in memory of Mr. Lee's parents, Mr. and Mrs. O. H. Lee, Snohomish County pioneers. An experimental and demonstration area, the Lee Memorial Forest is used for teaching and research in mensuration, silviculture, ecology, and forest soils. The accessibility, stocking, age, and site of the Lee Memorial Forest make it exceptionally valuable for studies and



demonstrations of forestry practices applicable in Western Washington.

The *Winnifred Denney Moore Memorial Forest* was a gift to the College of Forest Resources from Dr. Raymond C. Moore, professor of geology at the University of Kansas. The 450-acre tract is situated in the eastern Cascade Mountains, about twenty miles northwest of Cle Elum, in the Boulder Creek area of the Wenatchee National Forest. The tract is forested with ponderosa and lodge-pole pine, spruce, and fir. It is especially useful for ecological studies in eastern Cascade timber types and land management studies applicable to the high altitude sections of Eastern Washington.

On May 20, 1967, the *Gordon Marckworth Experimental Forest* became the newest educational and research facility of the College. The 6,900-acre forest was set aside from state-owned lands by the State Department of Natural Resources and is managed jointly by the State Department and the University. A close-in location (about twenty miles from campus) and the wide variety of forest and soil conditions make it an ideal site for teaching and research. In addition, its numerous ponds, beaver dams, streams, and swamps make excellent study areas for all types of recreation use. The area was logged about fifty years ago by the Cherry Valley Logging Company and is covered with typical second-growth stands of hemlock, fir, cedar, and alder. Records of the company increase its research value from the economic and management standpoint.

The College of Forest Resources, in cooperation with the Water Department of the City of Seattle, maintains a research station in the Cedar River Watershed for studies in forest hydrology and mineral cycling in the forest ecosystem.

The *Forest Club* is the service and social organization for forestry students. Membership is open to everyone matriculated in the College. The Club holds a number of meetings and social events during the academic year. Members also participate in service programs.

Xi Sigma Pi, the national forest honorary fraternity, was founded at the University of Washington in 1908. Election to membership is recognition of outstanding academic achievement and professional promise.

The *Washington Foresters Alumni Association* is composed of graduates of the College. An annual meeting and seminar and a periodic newsletter keep alumni and College in close contact with mutual benefit.

The Institute of Forest Products

Staff

G. Graham Allan, James S. Bethel, Benjamin S. Bryant, Douglas G. Chapman, Dale W. Cole, Barney Dowdle,

Charles H. Driver, Harvey D. Erickson, Leo J. Fritschen, Robert I. Gara, Howard S. Gardner, Stanley P. Gessel, Bjorn F. Hrutford, Benjamin A. Jayne, Reid M. Kenady, Lawrence Leney, Kenneth M. Macdonald, James L. Murphy, Hans Riekerk, Kyosti V. Sarkanen, Walter H. Schaeffer, David R. M. Scott, Grant W. Sharpe, Reinhard F. Stettler, Theodore N. Stoate, Richard D. Taber, David P. Thomas, Kenneth J. Turnbull, Thomas R. Waggener, Fiorenzo C. Ugolini, J. Alan Wagar, David D. Wooldridge

The Institute of Forest Products is the research, continuing education, and information dissemination branch of the College of Forest Resources. Grants, contracts, and fellowships awarded to the College are administered by the Institute. Technical supervision of research and continuing education programs is vested in the teaching and research faculties of the College and Institute who serve as principal investigators or project directors. The employment of graduate and undergraduate students on grants and contracts is handled by the Institute. Many students earn research and thesis credit toward advanced degrees by working on major forest resources problems, supported by grants or contracts.

The Institute administers both the McIntire-Stennis Cooperative Forestry Research Program of the Cooperative State Research Service, U.S. Department of Agriculture and cooperative work with the U.S. Forest Service authorized by the McSweeney-McNary Forest Research Act. Under the latter legislation, the Institute administers two federally funded cooperative programs directed toward the development of graduate courses and research activities relating to forest fire science and outdoor recreation.

Other research programs include forest resource economics, forest production, quantitative ecology, soil and water, tropical forestry, wildlife, forest insects and diseases, chemical utilization of wood, and mechanical utilization.

The Institute exercises supervision over all activities associated with the Peace Corps/Chile Forestry Program, including the training of volunteers for service in Chile and follow-up host-country support on a year-round basis. Peace Corps volunteers who qualify for admission to the graduate school have the opportunity to work out degree-oriented research projects which are mutually satisfactory to the cooperating Chilean forestry agencies, the College of Forest Resources, and the individual student. Degree credit, commensurate with productivity and effort, may be granted.

The Continuing Education Division of the Institute conducts a wide variety of programs directed to the introduction and more effective application of new tech-

nology in the forest industries and the solution of contemporary problems related to the use of forest resources. Symposia, conferences, and short courses are designed to meet these objectives.

Center for Quantitative Science in Forest Resources, Fisheries, and Wildlife

Staff

B. Bruce Bare, Douglas G. Chapman, Barney Dowdle, William H. Hatheway, Benjamin A. Jayne, Ole A. Mathisen, Donald McCaughran, Gerald J. Paulik, Bryan Rothschild, Todd Thorslund, Kenneth J. Turnbull

The Center for Quantitative Science was established in 1968 in recognition of the trend towards the use of mathematical methods and models in the utilization and management of our renewable resources and in the biological field in general. Problems of sampling and the statistical analysis of data have long been of importance in the utilization and management of forest resources. Operations research tools and dynamic programming methods may provide better ways to manage these resources in the face of increased human pressure on them and in the face of growing needs to balance multiple and competing demands. The development of mathematical models represents an important step in the improved understanding of natural phenomena. Because of the complexity of the ecosystems in nature, because of the many variables and the interactions between them, systems analysis methods and high speed computers are necessary in such model building. Computer-based models have already demonstrated their usefulness in the management of forest stands, in the control of insect pests, and in the understanding of the behavior of prey and predator systems.

The Center serves as a focus for this activity in the Colleges of Forest Resources and of Fisheries and provides consultation and teaching in applied mathematics and applied statistics, as well as conducts research in both the methodology of model building and in ecological and resource management problems.

The Colleges of Fisheries and of Forest Resources have established a new undergraduate-degree program in Wildlife Science. This interdisciplinary program requires training in biological and quantitative science as well as work in fisheries and forest resources. The student who obtains a Bachelor of Science with a major in Wildlife Science will be able to apply his training to management of wildlife resources and the related environment or to proceed to do graduate work for advanced management or research positions. Students seeking further information should contact a member of the Committee. Members of the Committee include:

Douglas G. Chapman (Chairman), Donald E. Bevan, Ernest Salo, David R. M. Scott, and Richard D. Taber.

Scholarships and Financial Aids

Undergraduate and graduate scholarships, fellowships, assistantships, and awards specifically for students in the College of Forest Resources are included in the handbook listing the current awards, available in the Office of Financial Aids, 3939 University Way.

The Washington Pulp and Paper Foundation, Inc. provides scholarships for students preparing for careers in the pulp and paper industry. Awards are based upon professional promise and financial need. The Foundation is supported by companies of the pulp and paper industry and their supplier companies.

Employment

The College of Forest Resources faculty helps forestry students to obtain summer employment while in the University and permanent employment upon graduation. Summer work is available through the several federal and state public agencies or the numerous private companies in the wood-using industry of the region. Many of these agencies and companies send representatives to the College to interview prospective employees. All students are encouraged to seek suitable summer employment because such work offers an excellent opportunity for practical experience as well as financial help.

Undergraduate Programs

Associate Dean

Benjamin A. Jayne
201 Anderson Hall

In addition to meeting the admission requirements for all undergraduate students to the University, students planning to enter the College of Forest Resources should have completed the following: Algebra III (intermediate) and a course in trigonometry. It is recommended that students also complete at least one unit of biological science and one unit of physical science while in high school. Students who enter the College with a thorough academic preparation will have the least problems in successfully completing one of the programs and receiving the Bachelor of Science in Forest Resources degree in the shortest possible time.

Because an appropriate choice of high school electives serves to strengthen a student's preparation, the University will give this part of his record the same careful attention it gives to other aspects of his qualifications.

Bachelor of Science in Forest Resources

The College of Forest Resources offers eight different curricula in its undergraduate program. An additional



means of implementing the individual student's educational objectives is possible through the use of elective credits available in all eight curricula. Elective credits can be taken in the College of Forest Resources or in other colleges and departments at the University. Students are generally encouraged to take their elective credits outside the College of Forest Resources in order to broaden their education beyond that provided in the specialized curricula.

Students interested primarily in professional careers in forestry or the forest products industries are advised to elect one of the following curricula: forest management, forest engineering, wood technology, or pulp and paper technology. Common emphasis in all these curricula is on the application of physical, biological, and social sciences to forestry and forest industries problems.

Forest management pertains primarily to the management of forest land. Forest engineering is directed towards the planning, layout, and supervision of timber harvesting operations. Wood technology is concerned with the chemical, mechanical, and physical processing of wood, and the management of wood-conversion, distribution, and marketing facilities. Pulp and paper technology emphasizes principles related to the chemical and mechanical production of wood pulp, the manufacturing of paper, and the management of firms in the pulp and paper industry.

In order to meet the needs of a rapidly growing demand for the recreational use of forest land, the College of Forest Resources provides a curriculum in outdoor recreation. Outdoor recreation consists of the application of biological and social sciences to the planning and management of outdoor recreational facilities as well as the interpretation of natural phenomena.

The newest curriculum offered by the College is in Wildlife Sciences. The program is concerned with application of the social, biological, and management sciences to the conservation and manipulation of wildlife populations. Career opportunities are available in both the public and private sectors.

Students interested in a career in one of the sciences related to forestry or the forest products industries may elect the forest sciences or the wood and fiber sciences curriculum. These curricula are especially desirable for students who anticipate graduate studies. Both provide greater depth in scientific disciplines than is possible in the professional curricula. Students who plan graduate studies should also include in their programs an appropriate foreign language.

Primary emphasis in the forest science curriculum is on biological and social sciences related to forestry. The

wood and fiber science curriculum provides the student an opportunity to develop depth of knowledge in the structure, behavior, and physical and chemical properties of wood. Both physical and biological sciences are emphasized in the wood and fiber sciences curriculum.

Students in Forest Resources should plan their choice of a curriculum and schedule their courses carefully in order to avoid later changes which may delay obtaining their degree. Forest management, forest engineering, forest sciences, outdoor recreation, and wildlife science have a substantial common core; hence a decision among these five curricula can be delayed until the second year. Wood technology, pulp and paper technology, and wood and fiber sciences include similar course content for the first two years. A decision among these five curricula can be postponed until a student's second or third year.

All students eligible to take the Chemistry 140, 150 sequence are encouraged to do so even though these courses may not be required in their elected curriculum.

Students in all curricula must meet certain general requirements of the University and the College as well as the particular curriculum requirements which are described below. General requirements for the bachelor's degree include physical education, scholarship and minimum credits, and senior-year residence.

Honors Program

The Honors Program in the College of Forest Resources provides opportunity for the gifted student in any of the eight curricula to develop his special abilities to the fullest extent. Privileges enjoyed by honors students include the opportunity for accelerated self-study programs and special seminars; flexibility in selecting interdisciplinary course programs; an excellent possibility of receiving financial assistance; special personal contact with individual faculty members; and the chance to gain experience in research. Honors students will be guided by two faculty members.

A student may be granted an honors status at an early stage of his study on the basis of performance in high school, in college placement examinations, and other pertinent information, or later, on the basis of having demonstrated the necessary academic ability at the university level. Maintenance of a minimum grade-point average of 3.00 is mandatory for all honors students.

During his senior year, the honors student is required to complete a special research project or independent literature study and to present his findings in the form of an honors senior thesis. Alternatively, the senior honors student can elect to sit for a special honors examination.

Participation in the Honors Program is of particular value to students contemplating graduate studies toward an advanced degree.

Curricula

Curricula of the various fields of specialization are as follows:

Forest Resources Production and Management Group FOREST MANAGEMENT CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 281; *Sciences:* Chemistry 101, 102, Physics 114 and 117, 115 and 118. Botany 111, 112, Zoology -112, Geological Sciences 205; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200, Political Science 202; *Professional Courses Other Than Forest Resources:* Accounting 210, General Engineering 121; *Forest Resources* 101, 102, 103, 204

(Upper-Division Course Requirements)

Forest Resources: 306, 310, 320, 321, 322, 331, 340, 341, 360, 361, 374, 430, 435, 450, 460, 461, 462, 465, 466, 467, 468, 469; plus electives for a total of 189 credits.

FOREST ENGINEERING CURRICULUM (Lower-Division Course Requirement)

Mathematics: 105, 124, 281; *Sciences:* Chemistry 101, 102, Physics 114 and 117, 115 and 118, Botany 111, 112, Geological Sciences 205; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200, Political Science 202, Speech 327, Humanistic-Social Studies 270; *Professional Courses Other Than Forest Resources:* Accounting 210, General Engineering 104, 121; *Forest Resources:* 101, 102, 103, 204.

(Upper-Division Course Requirements)

Forest Resources: 306, 310, 320, 321, 322, 340, 360, 361, 374, 377, 430, 440, 441, 442, 443, 446, 447, 448, 449, 460, 461, 465; *Professional Courses Other Than Forest Resources:* Civil Engineering (CIVE) 310, Transportation, Construction, and Materials Engineering (CETC) 417; plus electives for a total of 189 credits.

WOOD TECHNOLOGY CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 125, 126, 281; *Sciences:* Chemistry 140, 150, 231, 232; Physics 121, 122, 123**; Botany 111; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200, *Forest Resources:* 101, 102, 103.

(Upper-Division Course Requirements)

Forest Resources: 323, 324, 325, 400, 401, 407, 464, 485, 488; plus electives for a total of 180 credits.*

PULP AND PAPER TECHNOLOGY CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 125, 126, 224, 238, 281; *Sciences:* Chemistry 140, 150, 151, 160, 170, 231, 232, 241, Physics 121, 122, 123**, Botany 111; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200; *Professional Courses Other Than Forest Resources:* Chemical Engineering 210; General Engineering 115; *Forest Resources:* 101, 102, 103

(Upper-Division Course Requirements)

Forest Resources: 323, 324, 325, 400, 401, 403, 407, 464, 476, 477, 485, 488; *Sciences:* Chemistry 350, 351; *Professional Courses Other Than Forest Resources:* Chemical Engineering 325, 330, 340, 436; plus electives for a total of 185 credits.†

Forest Resources Sciences Group

FOREST SCIENCES CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 281; *Sciences:* Chemistry 140, 150, 151, 231, Physics 114 and 117, 115 and 118, 116 and 119, Botany 111, 112, Zoology -112, Geological Sciences 205; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200; *Forest Resources:* 101, 102, 103, 204

(Upper-Division Course Requirements)

Forest Resources: 306, 310, 320, 321, 322, 331, 340, 360, 361, 374, 435, 460, 461, 462; *Electives:* Mathematics or Physical Sciences—15 credits, Biological Sciences—20 credits, Humanities-Social Sciences—15 credits; plus electives for a total of 190 credits.

WOOD AND FIBER SCIENCE CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 125, 126, 281; *Sciences:* Chemistry 140, 150, 231, 232**, Physics 121, 122, 123, Botany 111, *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200, *Forest Resources:* 101, 102, 103

(Upper-Division Course Requirements)

Forest Resources: 323, 324, 325, 400, 401, 402, 403, 407, 408, 464, 485, 488; plus 69 credits of science or professional electives and additional electives for a total of 180 credits.‡

Forest Resources Conservation Group

OUTDOOR RECREATION CURRICULUM (Lower-Division Course Requirements)

Mathematics: 105, 124, 281; *Sciences:* Botany 111, 112, Zoology -112, Geological Sciences 205; *Humanities-Social Sciences:* English 101, 102 or 103, Economics 200, 201, Political Science 201 or 202, Sociol-



ogy 110, Humanistic-Social Studies 270; *Forest Resources*: 101, 102, 103, and 204 or Botany 313.

(Upper-Division Course Requirements)

Forest Resources: 310, 320, 321, 340, 354, 360, 450, 451, 453, 454, 455, 457, 461, 463, 465, 490, and one of 430, 433 or 435; *Communications*: Communications 338, Speech 220; *Sciences*: Atmospheric Sciences 329; Administrative Theory and Organizational Behavior 440; *Electives*: 10 credits from Sociology, Psychology, Anthropology, Philosophy, History, or Geography, 21 credits contributing toward one of the three Outdoor Recreation options: Interpretive Specialist (Naturalist), Recreation Manager, or Recreation Planner; plus electives for a total of 195 credits.

WILDLIFE SCIENCE CURRICULUM

(Lower-Division Course Recommendations)

Mathematics: 105; *Sciences*: Chemistry 140, 150, 151, and 231, 232 or Physics 114, 115, Geological Sciences 205, Biology 210, 211, 212, or 101-102 and Botany 112 or 113, Quantitative Science 281, 291, 292; *Humanities-Social Sciences*: English 101, 102, Economics 200, 201; *Electives* 15 credits; *Fisheries*: 240

(Upper-Division Course Requirements)

Fisheries: 456, 457 and 401 or Zoology 458 or 409; *Forest Resources*: 310, 321, 322, or 323, 324, 325; *Wildlife Sciences*: 401, 402, 403; *Sciences*: Zoology 462 or 464 or 465, Biology 472 or Botany 450, Atmospheric Sciences 329, Quantitative Science 382, 383; *Humanities-Social Sciences*: Economics 435; plus electives for a total of 180 credits.

Graduate Programs

Graduate Program Adviser

Richard D. Taber

206 Anderson Hall

Graduate programs in forest resources are designed to accommodate a wide range of educational objectives. It is possible either to concentrate upon advanced professional training or upon appropriate science or social science disciplines which are related to forestry in special or underlying roles.

In forest biological sciences, graduate study and research are offered in wood anatomy and morphology, genetics of forest trees, forest tree physiology, tree nutrition, the ecology of forest tree species and communities, forest soils, forest meteorology, forest influences, forest entomology, forest pathology, forest biometry, forest hydrology, silviculture, and wildlife.

Included in forest physical sciences are physics of wood and fiber composites, wood and extractives chemistry, wood technology, pulp and paper technology, plywood,

adhesives, synthetic boards, milling, forest photogrammetry, forest engineering, and forest fire science.

Forest production and management graduate education programs include the economics of forest land management, economics of the forest products industry, forest fire protection, forest policy, mensuration, watershed management, logging planning, cost analysis operations, transportation, and forest resources conservation.

Forest resources conservation includes areas of forest recreation, conservation, and wildlife study. Other special programs can be developed in these disciplines in response to particular graduate needs.

In all areas of study the College maintains a close working relationship with faculties in associated colleges and departments throughout the University, including service on graduate committees.

The College of Forest Resources is a participant in a number of national and international programs related to research and graduate training. The University is a member of the Organization for Tropical Studies and the College currently has a major tropical ecology research program in O.T.S. centered in Costa Rica. Opportunities are available for graduate students to carry on research at field sites in Costa Rica.

The College is a member of the International Biological Program and has a number of research projects related to the I.B.P., especially in coniferous and tropical forest ecology covering a wide variety of research disciplines.

In hydrology the College is represented on the University Council of Water Resources and also on the Washington State Water Research Center, with research program related to the activities of both organizations. The College also participates in the Quaternary Research Center recently established at the University. All of these programs give the student opportunity to study in any of the forest science disciplines.

Admission

Students who intend to work toward an advanced degree must apply for admission to the Graduate School and meet the requirements set forth by the Graduate School and the College of Forest Resources. Programs are offered leading to the Master of Forest Resources, Master of Science, and Doctor of Philosophy degrees.

* A total of 9 credits of approved science and engineering electives, of which 4 must be laboratory; 28 credits of approved Forest Resources electives.

† A minimum of 25 credits of approved electives must be taken in humanities and/or social sciences.

‡ A total of 18 credits of approved science and engineering electives, of which 6 must be laboratory.

** Physics 114, 115, 116 may be substituted for 121, 122, 123 with adviser's approval.

Basic requirements for admission to the Graduate School are a bachelor's degree from an institution of recognized standing, a grade-point average of 3.00 in the junior and senior years of college work, approval of the Dean of the Graduate School, and approval of the department in which the work is to be taken. For complete information, see the *Graduate Study* section.

In addition to requesting admission forms from the University Admissions Office, admission forms also should be obtained from the Dean, College of Forest Resources. These provide supplementary information required by the College.

Master of Forest Resources

The Master of Forest Resources is a professional degree designed for the student who desires to acquire a greater competence in a specific subject area of forest resources. Course work may be in forest resources and in appropriate natural sciences and social sciences. There are both thesis and nonthesis options. There is no foreign language requirement.

Master of Science

The Master of Science is a learned degree, often precursory to the Ph.D. Its requirements include a minor

of at least 9 credits in a field outside the major and proficiency in a foreign language. There are both thesis and nonthesis options.

Doctor of Philosophy

The Doctor of Philosophy degree may be preceded by baccalaureate education in forest resources or in another discipline. The program of course work is designed around an appropriate selection of forest resources and related science or social science courses, with a view to successful preparation for the General Examination in forest resources and the research and dissertation required for the degree. The time required, beyond minimum limits, for this preparation, depends on the thoroughness and applicability of prior course work. Proficiency is required in one foreign language, subject to supervisory Committee approval of the language choice. The language examination should be passed within two years of the baccalaureate or one year of the master's degree, whichever has preceded the doctoral work, and must be passed before the General Examination. The General Examination, which may be oral or a combination of written and oral, centers on the specific areas of forest resources and science or social science in the student's major field and covers most of the remaining subject matter of forest resources.



HEALTH SCIENCES

The art of healing is as old as man. In today's world, the health sciences are, literally, a phenomenon. Research probes closer and closer to the heart of the life puzzle, and of disease; it enlarges the limits of life, gives insight to the disturbed. Aspects of the physical and mental, and sociocultural well-being of man are the intimate concern of the healer and of the schools that teach him.

The Division of Health Sciences at the University of Washington was founded in 1945, when the new Schools of Dentistry and Medicine were joined with the already existing School of Nursing and the College of Pharmacy.

The University has offered instruction in nursing since 1917. The School of Nursing has offered programs leading to bachelor's and advanced degrees since 1931. The College of Pharmacy, founded in 1894, established a four-year curriculum in 1904 leading to a bachelor's degree, began granting post-graduate degrees in 1912, and in 1957 expanded the undergraduate curriculum to five years.

The present Health Sciences Division coordinates development, research, and teaching activities to strengthen and reinforce the work of each independently organized unit.

In 1968 the School of Social Work became a member of the Health Sciences Division. Originally a unit of

the Graduate School, it became a separate school in 1958.

The Health Sciences Building was occupied in 1949, and overlooks the Portage Bay Yacht Basin between Lake Washington and Lake Union. The building complex houses administrative units, research units, and classrooms of the three schools, library and auditorium, and clinical facilities of the School of Dentistry. The College of Pharmacy and the School of Social Work are both located outside the complex. The College of Pharmacy is in Bagley Hall, the School of Social Work in Eagleson Hall.

The second unit of the University Hospital, completed in 1959, is a 320-bed unit. It includes inpatient and outpatient facilities, classrooms, laboratories, X-ray facilities, an emergency department, a physical medicine and rehabilitation unit, premature nursery, etc. The unit is contiguous to the first unit of the Hospital, completed in 1954, that houses the office and research areas of the eight clinical departments of the School of Medicine and the School of Nursing teaching offices.

The Samuels Research Wing, opened in 1960, houses additional laboratories of the clinical departments. A regional primate center, a biochemistry-genetics wing, and a preventive medicine-environmental health wing have been added to the original building, giving the University one of the finest health centers in the United States. The Child Development and Mental Retardation

Center, completed in 1969 in an area adjoining University Hospital, provides facilities for the multidisciplinary study of growth and learning.

Facilities and Services

The Health Sciences Library, designated the Pacific Northwest Regional Health Sciences Library in 1968, serves not only the University schools of Dentistry, Medicine, Nursing, Social Work, and the College of Pharmacy, but also researchers, practitioners, and educators throughout Alaska, Idaho, Montana, and Oregon.

Used by many researchers in other sections of the University, the Library has nearly 100,000 carefully selected volumes, and subscribes to more than 3,000 periodicals. Included in the facilities are ten glass-paneled, soundproofed rooms for reading, study, and conferences, as well as space for microfilm and micro-card readers and self-teaching carrels. In addition, the resources of the main University Library and the interlibrary loan service can make available all the medical resources of the country.

Clinical teaching programs of the Schools of Medicine, Dentistry, Nursing, and the College of Pharmacy are conducted not only in the University Hospital, but also in hospitals affiliated with the individual schools.

In conducting the undergraduate and graduate clinical teaching programs, the School of Nursing utilizes the facilities of 21 hospitals and public health agencies.

Other community facilities are used as necessary to provide selected learning experiences for students.

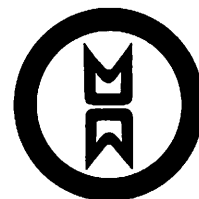
Many aspects of the clinical teaching program in medicine and Nursing are centered at Harborview Medical Center. Offices, laboratories, and classrooms at the hospital accommodate many of the activities of the clinical departments. Faculty members with full-time status, including chairmen of clinical departments, are appointed in teaching and service capacities.

The United States Veterans Administration Hospital in Seattle is closely integrated with other teaching facilities of the Division. The Veterans' Administration operates this hospital as a "Dean's Committee Hospital," with the cooperation of Seattle physicians and the Health Sciences faculty.

The U.S. Public Health Service Hospital is also a major clinical area. It affords many teaching opportunities, and houses important University-related research.

The Children's Orthopedic Hospital and Medical Center, and Firland Sanatorium also are affiliated with the Division. Children's Orthopedic has excellent facilities in all branches of pediatrics. Firland Sanatorium offers unusually fine opportunities for the study and treatment of tuberculosis.

Many other hospitals throughout the state participate in the teaching programs of the University's Health Sciences Division.



DENTISTRY

Dean

Maurice J. Hickey
C301 Health Sciences Building

Associate Deans

Alton W. Moore
B320 Health Sciences Building

Saul Schluger
B327 Health Sciences Building

Assistant Deans

Thompson M. Lewis
B322 Health Sciences Building

James R. Hooley
110 Health Sciences Annex 2

Professors

Oscar E. Beder, Charles L. Bolender, Jan Diepenheim, John D. Gehrig, Robert E. Guild, A. Ian Hamilton, Maurice J. Hickey, Jean T. Hodson, Patricia Keller, David B. Law, Benjamin C. Moffett, Alton W. Moore, Kenneth N. Morrison, Alfred O. Ogilvie, Russell Ross, Saul Schluger, Leo M. Sreebny, Irving B. Stern, Gerald D. Stibbs

Associate Professors

Charles I. Degering, Martha H. Fales, Walter B. Hall, Paul J. Heins, James R. Hooley, F. Lloyd Jacobson, Thompson M. Lewis, Eugene Natkin, Richard A. Riedel, Ivens A. Siegel, Arnold Tamarin, Myron E. Warnick, Walter A. Wykhuis, Ralph A. Yuodelis

Assistant Professors

Robert C. Canfield, John M. Davis, George A. Drennan, Cyril O. Enwonwu, Gaither B. Everett, Edward C. Funk, Herbert P. Gordon, Richard C. Gordon, Jack Keller, Robert William McNeill, Albert F. Morgan, Roy C. Page, John Charles Peterson, Jr., Murray R. Robinovitch, James C. Steiner, Charles C. Swoope, Jr., W. Stephen Teel, Henry J. Van Hassel

Instructors

Robert D. Allen, Virginia Anderson, Gary G. Cooley, Linda K. Decker, E. Cary Halpin, Gerald W. Harrington, Sheila F. Hoople, James L. Lord, Don E. Nolan, Sharon L. Polster, Marsha J. Rehm, Richard R. Rolla, Curtis D. Smith, Gregory E. Smith, Eleanor M. Vonesh, Joan S. Voris, Norma J. Wells

Research Associate Professor

Jay D. Decker

Lecturer

Dan G. Middaugh

In the School of Dentistry the student learns fundamental principles significant to the entire body of dental knowledge, and is expected to acquire habits of reasoning and critical judgment enabling him to implement that knowledge. To the School of Dentistry, the future development of the student is as critical as his professional training, and the program of instruction is designed to equip him, as a practicing dentist, with the knowledge and qualities necessary for solving problems of dental health and disease.

The School of Dentistry expects its students to learn the fundamentals of the basic health sciences, to master certain clinical skills, and to acquire a thorough understanding of professional and ethical principles. The four-year program encompasses these objectives.

The School of Dentistry is approved by the Council on Dental Education of the American Dental Association and is a member of the American Association of Dental Schools. It is a participating member of the Western Interstate Commission for Higher Education.

The School of Dentistry offers a four-year program of courses leading to the degree of Doctor of Dental Surgery (D.D.S.) and programs leading to the Master of Science in Dentistry (M.S.D.) for students in the Graduate School. Faculty in Oral Biology offer a graduate program leading to the Master of Science degree.

The four-year curriculum for the D.D.S. degree includes study in two main areas: basic sciences and clinical dental sciences. Instruction in the basic sciences is provided by the Departments of Biological Structure, Biochemistry, Microbiology, Pathology, Pharmacology, Physiology and Biophysics, and Preventive Medicine of the Health Sciences Division. In the clinical dental sciences the Departments of Community Dentistry, Fixed Partial Dentures, Operative Dentistry, Oral Diagnosis and Treatment Planning, Oral Biology, Oral Surgery, Orthodontics, Periodontics, Endodontics, Pedodontics, and Prosthodontics provide instruction in the fields of general dental practice and dental specialization.

As an integral part of the School of Dentistry, the Department of Dental Hygiene has the same basic objectives and offers courses of instruction leading to a Bachelor of Science degree with a major in Dental Hygiene.

Admission

The Council on Dental Education of the American Dental Association has specified these minimum requirements for admission to an approved school of dentistry:

"... the successful completion of two full academic years of work in an accredited college of liberal arts and science. . . . The college course must include at least a year's credit in English, in biology, in physics, and in inorganic chemistry, and a half-year's credit in organic chemistry. All courses in science should include both class and laboratory instruction. . . ." The University of Washington School of Dentistry requires at least three years minimum of pre dental study at the university level.

The Committee on Admissions of the School of Dentistry requires the following courses given at the University of Washington. Students taking pre dental work at other institutions may compare these courses with those given in their schools by consulting the *Description of Courses* section of this catalog.

COURSES	CREDITS
ENGL 101, 102 (COMPOSITION)	6
CHEM 140, 150 AND 151, 160 AND 170 (GENERAL AND QUALITATIVE ANALYSIS)	14
CHEM 231, 232, 241, 242 (ORGANIC)	10
PHYS 114, 115, 116, 117, 118, 119 (GENERAL AND LAB)	15
ZOOL 111-112 (GENERAL)	10
ZOOL 456 (DEVELOPMENTAL BIOLOGY OF ANIMALS)	5
or	
ZOOL 453-454 (COMPARATIVE ANATOMY OF CHORDATES)	10

The Committee on Dental Admissions recommends that pre dental students choose electives with the aim of broadening their background in human relationships and understanding. Laboratory drawing, sculpture, American literature, modern literature, music appreciation, speech, anthropology, economics, philosophy, psychology, and sociology are suggested, but students should survey the courses offered in their respective schools for other possible electives. Applicants from the University of Washington must have satisfied the physical education activities requirement.

Students presenting evidence of scholastic attainment over the required minimum generally have the advantage at the time of selection.

Application Procedure

Applications and all credentials should be sent to the Committee on Dental Admissions, University of Washington School of Dentistry. The final date on which applications for entrance in Autumn Quarter may be submitted is January 1. Prior to that date, each applicant must submit the following:

1. Formal application for admission on the form furnished by the School of Dentistry.
2. Two official transcripts from *each* college attended (one copy if attending the University of Washington) sent directly from the registrars of the institutions where preprofessional training was taken to the Committee on Dental Admissions. Transcripts should show (a) a complete college record, with grades and credits; (b) subjects the applicant is taking or will take to complete his preprofessional training before entering the School of Dentistry (if this information is not shown on the transcript the applicant must forward a separate schedule). It is the applicant's responsibility to see that transcripts are forwarded to the Office of Dental Admissions at the end of each quarter or semester.
3. One official transcript from high school attended. (University of Washington students excepted.)



4. At least four letters of recommendation, two of which must contain personal evaluation by science instructors (one letter if forwarded by the preprofessional committee of the school), and two from business or professional persons. The School of Dentistry does not provide a form for recommendations.

5. Physician's statement of physical examination taken within the last twelve months.

6. A list by title and credit of those courses that are presently being taken and that are planned to be taken in the future.

Processing of Applications

The Committee on Dental Admissions examines the credentials and bases its decision on the objective evaluation of these factors: preprofessional training, evidences of scholarship, residence of the applicant, dental aptitude test rating, and personal evaluation of the student by predental instructors and members of the Committee on Dental Admissions.

Washington participates in the student exchange program of the Western Interstate Commission for Higher Education, under which legal residents of certain Western states that do not have dental schools may pay the tuition and fees charged to legal residents of Washington, rather than the higher nonresident rate. These states are Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. To be eligible for this program, the student must be certified by his home state. State eligibility requirements vary, and the number of students who can be included in the program each year depends on appropriations by the legislature of each state. A student interested in this program must apply to the certifying officer in his home state, whose address may be obtained by writing to the Western Interstate Commission for Higher Education, P. O. Drawer P, Boulder, Colorado 80302.

Dental Aptitude Test

Each predental student who applies for admission to the School of Dentistry is required to take the dental aptitude test given under the auspices of the Council on Dental Education of the American Dental Association. This test is given in October, January, and April at the University of Washington and at other schools throughout the country. Full information about the test is sent to each applicant for admission. It is required that the applicant participate no later than the January testing period preceding Autumn Quarter enrollment.

Personal Interview

After all material pertinent to the application has been received and reviewed, the candidate may be requested to appear for a personal interview.

Notification of Acceptance or Rejection

Each candidate is given written notice of the acceptance or rejection of his application as soon as possible after the Committee on Admissions has reached a decision. Each applicant generally is informed of the Committee's decision sometime prior to June 30.

Honor Code

Each student accepted by the School of Dentistry is expected to indicate his willingness to participate in the School's Honor Code.

Tuition Fee Deposit

When a candidate has been notified that he is accepted by the School of Dentistry, he must deposit \$50.00 with the Comptroller of the University. This deposit is applied to the first quarter's tuition. It is refundable only in cases of withdrawal for bona fide illness, failure to complete basic predental requirements, induction into military service, or failure to pass the physical examination required of all students at the time of registration.

Promotion

At the end of each academic year the Executive Committee of the School of Dentistry evaluates the accomplishments of each student during the year and determines his fitness for promotion. When promotion is not recommended, the student is subject to dismissal from the School. The School of Dentistry reserves the right to dismiss any student from the School for any reason it deems sufficient. Scholastic standing is not the only requirement for promotion. Students are advanced only when their general attitude, scholastic progress, and personal attributes are considered satisfactory.

Awards and Honors

Mosby Book Awards. These scholarship book awards are presented to five senior students who have made significant contribution to general research. These certificates of award will permit selection of any one Mosby book with a catalog list price not exceeding \$30.00.

The American Society of Dentistry for Children. This award is presented by the Department of Pedodontics to a senior dental student who has shown outstanding interest and achievement in clinical pedodontics. The award consists of a certificate of merit, a one-year membership in the American Society of Dentistry for Children, and a one-year subscription to the *Journal of Dentistry for Children*.

The American Academy of Periodontology Award. For exceptional interest and ability in the field of periodontics, the American Academy of Periodontology awards to a senior student a one-year subscription to the *Journal of the American Academy of Periodontology*.

The American Academy of Oral Medicine Award. A certificate of merit is presented to the senior student demonstrating unusual ability in this phase of dentistry.

Department of Prosthodontics Award. A one-year subscription to the *Journal of Prosthetic Dentistry* and a plaque are presented to a senior student for academic and clinical excellence in prosthodontics.

Washington State Dental Association Award. This certificate is presented to the senior student who has demonstrated character and leadership together with high scholastic achievement during the four-year dental course.

American Academy of Gold Foil Operators. A certificate is presented each year to the senior student demonstrating greatest skill in gold foil performance.

American Dental Society of Anesthesiology Award. A certificate of merit and a one-year subscription to *Anesthesia Progress* are given to the senior student who has shown outstanding ability and interest in the field of pain control.

American Association of Endodontists Award. A certificate of merit and a one-year subscription to *Oral Surgery, Oral Medicine, and Oral Pathology* are presented to the senior student showing the highest degree of proficiency and interest in the field of endodontics.

The Alpha Omega Fraternity Award. This plaque is presented to the senior student with the highest scholastic average for his four years of dental studies.

Washington State Dental Hygienists' Association Award. A plaque and a one-year complimentary membership to the Washington State Dental Hygienists' Association are presented to the senior dental hygiene student whose activities have been outstanding and who shows promise of those qualities of leadership necessary for the advancement of the profession.

Omicron Kappa Upsilon is the national dental honorary society, founded in 1914. **Sigma Sigma** Chapter at the University of Washington was chartered in the spring of 1950 when the first class in dentistry was graduated. Each year the Chapter elects to membership 12 per cent of the graduating class in dentistry. These students have distinguished themselves in scholarship and character and possess potential qualities for future professional growth and attainments.

Sigma Phi Alpha is the national dental hygiene honor society, founded in 1958. **Sigma** Chapter at the University of Washington elects to membership each year 10 per cent of the graduating class in dental hygiene.

These students have distinguished themselves in scholarship and demonstrate potential outstanding qualities for future professional growth.

Dennis P. Duskin Inspirational Award. Winner is selected by a majority of the Senior Class. The award is given to a senior who has shown outstanding character, personality, and integrity throughout his dental education.

Fellowships

Student Part-Time Research Fellowships

Awards in the amount of \$900 are available to a limited number of undergraduate dental students who are interested in undertaking research. The research may be on a part-time basis during the academic year or full time during the Summer Quarter. The grants are made upon the recommendation of the department heads concerned and the Dean. Funds for this purpose are provided on an annual basis by the Division of Research Grants, National Institutes of Health, and the United States Department of Public Health.

Information concerning other scholarships and fellowships for University students may be obtained from the Office of the Dean of Students.

Research Grants

Grants-in-aid for sponsored research and special projects in the School of Dentistry totaled approximately \$928,000 during the past year. Approximately \$379,000 was received from government agencies and private sources, and \$13,000 from the state of Washington under Initiative 171. In addition, \$536,000 was received for Training Grants and Contracts.

Financial Aid to Students

Loan-fund information may be obtained through the Office of Student Financial Aid, 3939 University Way N.E., Seattle, Washington 98105.

Fees

	Resident	Nonresident
Per quarter throughout the academic year	\$208.00	\$383.00
Summer Quarter dental and graduate students, regardless of the number of credits carried		208.00
Summer Quarter (graduate dental students registered for thesis 700 only)		130.00

Depending upon the course work, additional charges, payable at the School of Dentistry, may be assessed for microscope rental, \$7.00, and for dental engine rental, \$3.50.



DEPARTMENTAL PROGRAMS

The School of Dentistry offers courses leading to the degrees of Doctor of Dental Surgery (D.D.S.), Bachelor of Science, Master of Science in Dentistry (M.S.D.), as well as Certificates in Orthodontics, Pedodontics, Periodontics, Endodontics, and Restorative Dentistry.

Degrees

Doctor of Dental Surgery

Upon completion of the four-year curriculum of the School of Dentistry, the D.D.S. degree is awarded to candidates who have (1) given evidence of good moral character; (2) completed the last two years of dental training as regularly matriculated students in the School of Dentistry; (3) satisfactorily completed all the required work with a grade-point average of at least 2.00; (4) fulfilled all special requirements; and (5) discharged all indebtedness to the University.

Work leading to the degrees listed below is also offered in the School of Dentistry.

Bachelor of Science

The curriculum leading to this degree is given by the Department of Dental Hygiene.

Master of Science in Dentistry

Work leading to this degree is available in the Graduate School.

Certificates in Clinical Divisions of Dentistry

Programs are not administered by the Graduate School; no thesis is required.

The School also provides professional training in the areas of basic science, for which the Bachelor of Science degree may be awarded by the College of Arts and Sciences, upon completion of the requirements for a major and approval of the department concerned.

Licensure

Admission to the practice of dentistry in any state is conditional upon the candidate's meeting the requirements of the State Board of Dental Examiners. In the state of Washington, admission to practice is dependent upon the candidate's having a D.D.S. or a D.M.D. degree and passing the examination conducted semi-annually by the State Board of Dental Examiners. The basic science examination may be waived if the candidate presents credentials showing he successfully passed Part I of the National Board Dental Examination.

Further information about licensure requirements and time of examinations may be obtained from the Division of Professional Licensing, Olympia, Washington 98501.

PROGRAMS IN CLINICAL DENTAL SCIENCES

Please find Basic Sciences in Dentistry listed in the *School of Medicine* section of this Catalog under Departments of Biochemistry, Biological Structure, Microbiology, Pathology, Pharmacology, Physiology and Biophysics.

Community Dentistry

Chairman

Alton W. Moore

B320 Health Sciences Building

The Department of Community Dentistry teaches the fundamentals of the dental profession, such as legal problems, ethics, office management, and scientific writing.

Endodontics

Chairman

Eugene Natkin

B522 Health Sciences Building

Students in this Department are taught the basic knowledge and technics necessary for diagnosis and treatment of disease of the pulp of teeth.

In addition to the courses for undergraduate dental students the Department of Endodontics offers a graduate program for students working toward the degree of Master of Science in Dentistry with a specialization in endodontics.

Fixed Partial Dentures

Chairman

K. N. Morrison

B528 Health Sciences Building

The teaching in this Department is directed toward the maintenance or attainment of oral health through the fixed replacement of missing teeth, the restoration of badly involved teeth, or by the correction of occlusal discrepancies through restoration that are not amenable to orthodontic treatment.

Operative Dentistry

Chairman

Gerald D. Stibbs

B404 Health Sciences Building

Operative dentistry is primarily concerned with maintaining the natural dentition in good health. It has to do with preventing the ravages of dental caries and with restoring to health and function carious and mutilated teeth by the use of various restorative materials and means.

In addition to the courses for undergraduate dental students, the Department of Operative Dentistry offers,

through the restorative dentistry graduate program, a specialization for students in the Graduate School working toward the degree of Master of Science in Dentistry.

Oral Diagnosis and Treatment Planning

Chairman

Frederic L. Jacobson

B309 Health Sciences Building

The Department of Oral Diagnosis and Treatment Planning provides training in diagnostic techniques, such as interrogation, examination, and X ray. The student learns to correlate information gained in the various departments and to plan both ideal and practical treatment for the patient.

Oral Biology

Chairman

Leo M. Sreebny

B122 Health Sciences Building

Oral Biology is the division of general pathology that is concerned with the understanding of the cause and mechanism of diseases of the oral cavity and associated structures. In addition to the courses for undergraduate dental students, the Department of Oral Biology offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in oral biology.

Oral Surgery

Chairman

John D. Gehrig

B348 Health Sciences Building

The Department of Oral Surgery provides training and clinical experience in the procedures used for all types of operations in the oral cavity. In addition to the courses for undergraduate dental students, the Department of Oral Surgery offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in oral surgery.

Orthodontics

Chairman

Richard A. Riedel

B374 Health Sciences Building

The objective of orthodontics is the prevention and correction of malocclusion of the teeth. In addition to the courses for undergraduate dental students, the Department of Orthodontics offers graduate study for students in the Graduate School working toward the degree of Master of Science in Dentistry with a specialization in orthodontics.

Pedodontics

Chairman

David B. Law

B343 Health Sciences Building

The objective of the Department of Pedodontics is to provide the student with a broad understanding of the growth and development of the child and the principles of preventive dentistry plus a working knowledge of the skills necessary for the maintenance of optimal dental health. In addition to the courses for undergraduate dental students, the Department of Pedodontics offers graduate study for students in the Graduate School interested in working toward the degree of Master of Science in Dentistry with a specialization in pedodontics.

Periodontics

Chairman

Walter B. Hall

B412 Health Sciences Building

In the Department of Periodontics, students learn about the periodontium in health and disease, how to diagnose periodontal diseases, and how to treat diseases that affect the periodontal tissues. The Department also offers graduate study and training in Periodontics at the certificate and advanced-degree levels.

Prosthodontics

Chairman

Charles L. Bolender

C402 Health Sciences Building

The Department of Prosthodontics provides instruction in the fabrication and maintenance of removable complete and partial dentures. In addition to the courses for undergraduate dental students, the Department of Prosthodontics offers, through the restorative dentistry graduate program, a 21-month specialization program for students in the Graduate School working toward the degree of Master of Science in Dentistry or a Certificate of Achievement.

Maxillofacial Prosthesis Clinic

Director

Oscar E. Beder

A407 Health Sciences Building

This clinic is a service clinic available to the public and all departments of the University for treatment falling in the maxillofacial field of prosthodontics. Treatment usually consists of constructing and fitting planned remedial and restorative appliances for losses or defects in the oral or facial regions. Expedient prosthodontic



appliances are fabricated for losses and defects of other body areas and for adjunctive therapy of patients. Assistance is also rendered in developing special devices used for research and teaching by various departments.

Prosthodontic Laboratory

Chief Technician

Bernard Langdon

Technicians

Robert Jacobsen, Alviron Kleber

This laboratory furnishes prosthodontic technician services to undergraduate students of the Department of Prosthodontics and for the Department's maxillofacial section. The laboratory furnishes its services to other departments of the School and to graduate students, when requested.

Conjoint Courses

Conjoint courses are offered cooperatively by departments in the School of Dentistry. They are designed to integrate clinical training in two or more fields.

Dental Hygiene

Director

Martha H. Fales

B214B Health Sciences Building

The curriculum offers a professional program leading to a baccalaureate degree that emphasizes the liberal arts and the sciences and prepares the student for a career in Dental Hygiene. Provision has been made for courses to provide a minor in dental hygiene as part of the College of Education master's degree program for Community College teachers of technology. Further information about this program is available from the College of Education.

The Bachelor of Science degree with a major in dental hygiene requires two academic years of pre dental hygiene courses followed by two additional years of enrollment in the dental hygiene program. This basic curriculum provides a background in the educational, communicative, and clinical skills necessary for professional practice. The program is approved by the Council on Dental Education of the American Dental Association.

The student in dental hygiene learns and practices a future role as a member of the dental health team. The student learns to provide clinical and educational services that include the oral prophylaxis (cleaning and polishing of teeth), the taking and processing of dental radiographic surveys, the application of fluoride solu-

tions for prevention of dental caries, and the teaching of dental health facts to children and adults. The program is planned to give the student the wide range of professional experience available in a health sciences center.

The dental hygiene student is encouraged to develop habits, interests, and attitudes favorable to continued professional growth.

Dental hygiene students are eligible to apply for scholarships offered through the Office of the Dean of Students. In addition, the American Dental Hygienists' Association administers national scholarships for students enrolled in dental hygiene programs. Current scholarship information is available from the Department of Dental Hygiene.

BASIC CURRICULUM IN PREDENTAL HYGIENE

The basic curriculum is open to applicants who meet the requirements of this Catalog as outlined in the *College of Arts and Sciences* section and who complete 90 credits scheduled to include courses listed below, plus the required quarters of physical education activities.

COURSES		CREDITS
BIOL 101-102, OR ZOOL 111-112		10
CHEM 101	GENERAL CHEMISTRY	5
CHEM 102	GENERAL AND ORGANIC CHEMISTRY	5
PSYCH 100	GENERAL PSYCHOLOGY	5
SOC 110	SURVEY OF SOCIOLOGY	5
SPCH 103	BASIC PRINCIPLES OF ORAL COMMUNICATION	5
PLUS ELECTIVE SUBJECTS CHOSEN TO MEET DISTRIBUTION REQUIREMENT OF THE COLLEGE OF ARTS AND SCIENCES		52
PHYSICAL EDUCATION ACTIVITY		3

Students taking their preprofessional training at the University of Washington follow the two-year pre dental hygiene program offered in the College of Arts and Sciences (see the *College of Arts and Sciences* section). Students in other institutions should consult *Description of Courses* section of this catalog, compare the above listed courses with those given in their schools, and seek the advice of the Director of Admissions for course equivalents. It is recommended that students who anticipate transferring to the University of Washington request an evaluation of their credits earned during their first year of study. This may be accomplished by writing directly to the Department of Dental Hygiene.

APPLICATION PROCEDURE

One class of dental hygiene students is accepted each spring. On or before April 1 each applicant must submit the following:

1. Formal application on the form provided by the Department of Dental Hygiene, School of Dentistry.
2. Official transcripts of high school and college records. Transcripts must be sent directly to the Department of

Dental Hygiene, School of Dentistry, from the registrar's office of each institution in which predental hygiene education was obtained.

3. A written list of subjects that the applicant is taking or will take to complete the requirements.
4. At least two letters of recommendation.

Additional transcripts must be provided by the applicant to show courses completed during each subsequent quarter following application.

PROCESSING OF APPLICATIONS

Evaluation of Credentials

The Committee on Dental Hygiene Admissions reviews the credentials and bases its decision on the objective evaluation of preprofessional education, scholastic records, residence of the applicant, and personal characteristics of the applicant.

Personal Interview

Eligible applicants are interviewed by the Committee on Dental Hygiene Admissions. The interview is held at the School of Dentistry, and the applicant is notified of the date and time.

Notification of Acceptance or Rejection

Candidates are given written notice of acceptance or rejection of their application as soon as possible after the Committee on Admissions has completed the necessary interviews.

TUITION AND CHARGES

Students in the dental hygiene curriculum pay the regular tuition of the School of Dentistry. Expenses for uniforms, instruments, and other equipment are additional to the tuition fee.

BASIC CURRICULUM FOR MAJOR IN DENTAL HYGIENE

This program includes specific courses in the Schools of Dentistry and Medicine and the Colleges of Pharmacy and of Arts and Sciences. The student takes in sequence all the courses offered for undergraduates in the Department of Dental Hygiene and the following additional courses: Conjoint (Medical) 316, 317-318 (Introductory Anatomy and Physiology); Home Economics 319 (Family Nutrition); Microbiology 301 (General Microbiology); Oral Biology 200 (Dental Caries); Pathology 310 (General Pathology); Pedodontics 200 (Preventive Dentistry); Periodontics 407, 408 (Principles of Periodontology); Pharmacy 362 (Fundamentals of Pharmacotherapeutics); Psychiatry 450 (Principles of Personality Development).

Graduation Requirements

To qualify for the Bachelor of Science degree with a major in dental hygiene, a student must meet both the

basic proficiency and distribution requirements of the College of Arts and Sciences and of the curriculum in dental hygiene. A total of 180 academic credits is required for graduation.

Curriculum for Certificate Dental Hygienists

This program provides dental hygienists with the opportunity to broaden their previous education with courses in liberal arts, humanities, and basic sciences so that they may go on to graduate study or to positions in administration, teaching, or community health. The requirement for graduation in this curriculum is also a total of 180 academic credits.

Students entering this curriculum must have successfully passed National Board Examinations for Dental Hygiene and present, at the time of application, a valid license to practice dental hygiene. These students must complete a minimum of 10 credits in the Department of Dental Hygiene, including the successful completion of one advanced course in clinical dental-hygiene techniques.

CONTINUING DENTAL EDUCATION

Director

Thompson M. Lewis
B322 Health Sciences Building

To provide for the ever-expanding developments in method and related subject matter in dentistry, a number of short, intensive courses ranging from one day to two weeks or longer are offered at various times in each special area of dentistry. Instructors are chosen from local, national, and international sources to provide this service. Since these courses are highly specialized, no specific course content can be conveniently listed. A list of forthcoming courses may be obtained from the Office of the Director.

GRADUATE PROGRAMS

Associate Dean and Graduate Program Adviser

Saul Schluger
B327 Health Science Building

MASTER OF SCIENCE IN DENTISTRY

The School of Dentistry offers course work leading to a Master of Science in Dentistry degree in the Graduate



School, with specializations in endodontics, oral biology, oral surgery, orthodontics, pedodontics, periodontics, or restorative dentistry (fixed partial dentures, operative dentistry, prosthodontics).

Application Procedure

Applications are received and processed throughout the school year from applicants desiring to work for a Master of Science in Dentistry degree with a specialization in any one of the fields previously listed. Applications for admission to the graduate dental curriculum, with all necessary credentials, must be submitted on or before December 1 for consideration for entrance in the following Autumn Quarter. This applies to all new students seeking admission to graduate study in dentistry. It is imperative that applicants observe this deadline in order to ensure prompt attention to credentials and replies to correspondence.

Admission

An applicant may be admitted to the Graduate School for work leading to a Master of Science in Dentistry degree provided he meets the admission requirements of the University of Washington Graduate School, and provided he is a graduate of a school of dentistry approved by the Council on Dental Education of the American Dental Association, or of a university dental school located outside of the North American continent whose curriculum and admission requirements are similar to those of the University of Washington School of Dentistry.

An applicant's acceptance as a student must be approved by the Graduate Admissions Committee of the School of Dentistry. Such approval will be based upon the availability of places in the various classes. The capacity number of students for each specialization commencing Autumn Quarter is as follows: eleven in orthodontics, two in pedodontics, five in periodontics, two in endodontics, two in oral biology, one in oral surgery, and varying numbers, not to exceed five, in each of the three phases of restorative dentistry, depending upon availability of teaching and research staff members. Applicants selected by the Graduate Admissions Committee in Dentistry will be recommended to the Dean of the Graduate School for admission to the Graduate School.

Residence

A minimum of seven consecutive quarters (21 months) of residence is required for the Master of Science in Dentistry degree with specialization in orthodontics and pedodontics; eight quarters (24 months) in endodontics

and oral biology; twelve quarters (36 months) in periodontics; three quarters (9 months) of residence for oral surgery, plus two-year hospital residency, combined academic and hospital work. In restorative dentistry, the student determines his specialization, (operative dentistry, fixed partial dentures, or prosthodontics) by the electives he selects. Eight quarters (24 months) of residence are required for fixed partial dentures or seven consecutive quarters of residence for prosthodontics and for operative dentistry. No foreign language is required for the degree of Master of Science in Dentistry. New students for graduate training in periodontics will be accepted on the basis of a dual program consisting of certificate (residency) training in the clinical discipline progressing parallel to graduate study in a basic science field selected by the student. Such students must be admitted to the Graduate School and meet the requirements for the master's or doctor's degree in the basic science field.

A program leading to the Master of Science degree is offered by the faculty in Oral Biology. The requirements for this degree are a Bachelor of Science or higher academic degree, a foreign language proficiency, and a minimum of seven quarters in residence. The aim of this graduate program is to train qualified teachers and investigators in the clinical and basic science disciplines. The program is designed to accommodate the interests and abilities of individual students.

Programs of Study

The programs are planned to prepare students to think independently, to evaluate their own services and the literature of the programs, and to develop their clinical operative skills to a level to permit the successful practice of their chosen specialty. Emphasis is placed on the basic principles of diagnosis and treatment, which comprise one of the clinician's most valuable assets. The seminar method of teaching is generally used. The purpose of the programs is not only to train students in the art of their respective specialties, but also to encourage basic science research in the specialties on a graduate level in possible preparation for academic careers or for research. The research may be undertaken in the field of specialization or in cooperation with other departments. The opportunity for collaborative research is excellent because of the proximity of the other colleges and departments in the University.

Class Schedules

The graduate programs of the School of Dentistry operate on the quarter system of the University. There are three 11-week quarters in the academic school year.

In order for the graduate dental programs to be continuous, the Summer Quarter has also been made an 11-week quarter, or equivalent in length to the other quarters in the school year.

POSTDOCTORAL TRAINING

Requirements for admission to the postdoctoral training programs of study for certificates in the various major clinical fields are similar to those for admission to graduate study for the master's degree. The postdoctoral student is required, during six consecutive quarters of residence, to maintain the same academic standards as the graduate student. These programs are not administered by the Graduate School, and a thesis is not required. The course content may vary somewhat from the graduate program, depending upon the department in which the program is taken.

Following the successful completion of the prescribed courses by the postdoctoral student during the required residency, a Certificate in Orthodontics, Pedodontics, Periodontics, Endodontics, Oral Surgery, or Restorative Dentistry will be granted him by the School of Dentistry. The fees each quarter are the same as for graduate training, and the residency requirements remain the same. For further information, address: University of Washington School of Dentistry, Associate Dean for Graduate Studies, Seattle, Washington 98105.



MEDICINE

Dean

August G. Swanson (Acting)
C304 Health Sciences Building

Associate Deans

Harold E. Laws, John N. Lein, Clayton Rich, William
O. Robertson, Robert L. VanCitters

Assistant Deans

Roger J. Bulger, Willard P. Johnson, Thomas E. Mor-
gan, Jr., Lindbergh S. Sata, Roy M. Schwarz

Rapid advances in basic knowledge and in the technology relating to medicine during this century have rendered the traditional medical curriculum obsolete. It is no longer possible to train all physicians in an identical fashion. Fundamental knowledge and concepts common to the needs of all who are physicians must be identified and taught in a relevant and coherent fashion. Beyond this minimum requirement, opportunities must be provided to allow students from a variety of backgrounds and with a variety of talents to pursue their educations along different pathways. Those who are motivated toward service must be allowed to prepare themselves for the great variety of opportunities developing in our modern health care system. Those motivated toward investigation must be provided opportunities for testing their talents at an early stage in their careers and be provided with educations that prepare them to be competent investigators. All must be stimulated to take responsibility for their educations throughout their lives, for the rapid changes of the past

are a prediction of still more rapid changes in the future. Education only begins in the School of Medicine. It extends throughout life.

THE CURRICULUM

The curriculum is divided into two major divisions, the basic curriculum, which must be completed by all students who are candidates for the M.D. degree, and the pathway curriculum, which provides an opportunity for students to complete their degree requirements by taking courses in one of four pathways—family practice, clinical specialist, behavioral specialist, and medical scientist. Attainment of the M.D. degree is based upon credits earned and is not dependent upon a specific time requirement. Capable students who take a maximum load per quarter may complete their degree requirements in ten to eleven academic quarters. Such students, by utilizing summer quarters, may finish their requirements in three years. Other students may proceed at a slower pace and take four to five years to complete their requirements. The curriculum thus offers flexibility in educational experience and flexibility in individual programming.

Admission to the University and to the School

The faculty of the School of Medicine believes that the appropriate level of scholarly achievement and preparation for medicine can best be developed in a liberal arts program with the emphasis on a major area of interest

selected by the student in any field sufficiently demanding in scholastic discipline. No particular major is given preferential attention in selection.

Before admission each applicant must have completed the minimum requirements listed below and must have demonstrated his academic proficiency in these subjects by obtaining an acceptable grade-point average. In addition to the following credits, proficiency in English and basic mathematics is expected of every applicant. Applicants from the University of Washington must have satisfied lower-division physical and health education requirements. A bachelor's degree is encouraged, but it is not required for admission.

	<i>Quarter Credits</i>	<i>Semester Credits</i>
BIOLOGY	12	8
CHEMISTRY	18	12
PHYSICS	12	8

In recognition of the diverse opportunities afforded the graduate in medicine, the specified requirements are purposely kept to a minimum. In this manner each student has the opportunity to pursue, as his major field of study, any area of special interest to him—the physical sciences, biological sciences, or humanities—and still acquire the intellectual skills necessary to the regular medical curriculum. Throughout the medical program, elective time as well as time for research and thesis affords the student an opportunity to apply the knowledge and concepts acquired in his major field to the appropriate areas of medicine.

Application Procedure

Applications and all credentials should be sent to the Admissions Committee. Because the Committee begins examining applications a year ahead of the time of entrance, *early application is advisable*. Applications will be accepted beginning April 1, and should be returned before October 1. Applications received after November 15 will not be given consideration for the following academic year. An application fee of \$5.00 is required of all applicants who are not residents of the state of Washington. On or before November 15 each applicant must submit the following:

1. Formal application for admission on the form furnished by the School of Medicine.
2. Official transcripts (two copies) of previous college record (sent directly from the registrars of the institutions where preprofessional training was taken to the Admissions Committee) showing the complete college record, with grades and credits. Each applicant is required to include a list of the courses he is taking and plans to take to complete his preprofessional study before entering the School of Medicine.

3. Names, addresses, and departments of three science and two nonscience instructors to whom recommendation forms may be sent. (University of Washington premedical students should consult the premedical adviser about recommendations.)

4. The score received in the Medical College Admission Test. Arrangements for this test may be made with the premedical adviser at the institution where premedical training is being taken. Medical aptitude tests are customarily given in May and October of each year. The student is advised to take the test in May if at all possible. When the student takes the test, he should request that his scores be sent directly to the Admissions Committee. Further information on this test may be obtained by writing to the Psychological Corporation, 304 East 45th Street, New York, New York 10017.

5. A short autobiography.

6. A 500-word essay.

Primary consideration is given to applications from residents of Washington and from students certified by the Western Interstate Commission for Higher Education. A certain number of out-of-state applicants are accepted each year, with preference given to qualified applicants from neighboring states and territories where no medical school exists. Applicants from states outside the Pacific Northwest are accepted only when they present exceptional academic records.

It is the policy of this school not to accept for admission students who have failed in other medical schools or who have been dismissed from them.

All applicants are given consideration on the same basis regardless of race, color, sex, religion, or parental occupation.

Students taking their premedical undergraduate work at the University of Washington customarily enroll in the College of Arts and Sciences and consult the premedical adviser, B21 Padelford Hall, for help in planning their programs.

Information concerning admission to the curriculum in Physical Therapy and in Occupational Therapy is included under the Department of Physical Medicine and Rehabilitation, and in Medical Technology under the Department of Pathology.

Transfer Students

Transfer students are accepted for clinical training. The number of credits required for completion of the course of study for transfer students and policies about Pathway selection have not yet been determined for the new curriculum. Students should contact the Admissions Committee for the latest information.



Processing of Applications

Evaluation of Credentials. The Admissions Committee examines each applicant's credentials and bases its decisions on the objective evaluation of these factors: preprofessional training, evidences of scholarship, place of residence, Medical College Admission Test rating, and personal evaluation of the student by premedical instructors in their letters of recommendation.

Personal Interview. If an examination of the credentials shows them to be satisfactory and within the competitive group, the applicant may be requested to appear for a personal interview by the Admissions Committee. At the time of interview the applicant is requested to submit two unmounted photographs (2 by 3 inches). A personal interview will not be requested if the credentials are not satisfactory. Applicants who are in school a considerable distance from Seattle may request that their interviews be held at some more convenient location; out-of-state interviews are arranged by the Committee.

Notification of Acceptance or Rejection. All candidates are given written notification of the acceptance or rejection of their applications as soon as possible after the Admissions Committee has reached a decision. Acknowledgment of notification of acceptance should be made in writing by the successful applicant within a reasonable length of time.

Acceptance of Appointment. Within several weeks after a candidate has accepted the position offered to him in the School of Medicine, the Comptroller of the University will request a deposit of \$50.00. This deposit is applied to the first quarter's tuition. If the student wishes to withdraw, the deposit is refundable for any reason before the deadline set by the Association of American Medical Colleges. After this date, it is refundable only in case of withdrawal for bona fide illness, failure to complete basic premedical requirements, induction into military service, or failure to pass the physical examination required of all students at the time of the first registration.

Student Evaluation and Promotion

Student evaluation is based upon the faculty's observations of the student's work, and upon written papers and examinations. Periodic review of student progress is made and students are informed of their deficiencies and of their strong qualities. Dismissal from the school may occur if a student fails to maintain an acceptable academic record. Opportunities to make up unsatisfactory work are allowed at the discretion of the Dean and the Executive Committee of the School of Medicine. Dismissal may also occur if qualities of character and personality not deemed commensurate with

a career as a physician come to light at any point. Once dismissal has occurred, readmission requires the approval of the Executive Committee of the School of Medicine. Readmission after dismissal will not be considered unless there is substantial evidence that the problems causing dismissal have been resolved.

All students are required to take Parts I and II of the National Board Examinations. They are also required to participate in surveys and examinations directed toward the evaluation of the educational objectives of the School of Medicine.

Fees, Extra Service Charges, and Rentals

All fees, extra service charges, and rentals are payable in United States dollars at the time of registration. The University reserves the right to change any of its fees and charges without notice.

		PER QUARTER
MEDICINE		
FULL TIME		
RESIDENT		\$208.00
NONRESIDENT		383.00
PART TIME		
RESIDENT	7-12 CREDITS, INCLUSIVE	\$167.00
NONRESIDENT		292.00
RESIDENT	0-6 CREDITS, INCLUSIVE	\$121.00
NONRESIDENT		201.00
PHYSICAL THERAPY, OCCUPATIONAL THERAPY		
FULL TIME (MORE THAN 6 CREDITS)		
RESIDENT		\$145.00
NONRESIDENT		305.00
PART TIME		
RESIDENT	3½-6 CREDITS, INCLUSIVE	\$105.00
NONRESIDENT		170.00
RESIDENT	0-3 CREDITS, INCLUSIVE	\$ 61.00
NONRESIDENT		86.00
STUDENTS OTHER THAN MEDICAL		
FULL TIME (MORE THAN 6 CREDITS)		
RESIDENT		\$133.00
NONRESIDENT		293.00
PART TIME		
RESIDENT	3½-6 CREDITS, INCLUSIVE	\$ 97.00
NONRESIDENT		162.00
RESIDENT	0-3 CREDITS, INCLUSIVE	\$ 56.00
NONRESIDENT		81.00

MEDICAL TECHNOLOGY—Same as students other than medical.

Information concerning resident, nonresident, and veteran status can be found in the *Rules and Regulations* section in this Catalog. General student body fees are also listed there.

Western Interstate Commission for Higher Education: The School of Medicine participates in the student exchange program of the Western Interstate Commission for Higher Education, under which legal residents of certain Western states that do not have medical schools may pay the tuition and fees charged to legal residents

of Washington State rather than the higher nonresident rate. These states are Alaska, Arizona, Idaho, Montana, Nevada, and Wyoming. To be eligible for this program, the student must be certified by his home state. State eligibility requirements vary, and the number of students who can be included in the program each year depends on appropriations by the legislatures. A student interested in this program must apply to the certifying officer in his home state, whose address may be obtained by writing to the Western Interstate Commission for Higher Education, University East Campus, Boulder, Colorado.

Books and Supplies. The average annual cost for medical students is \$100-\$150.

Transportation. Students are responsible for providing their own transportation and paying the parking fees required at the University and the several affiliated hospitals. Budgets should be planned accordingly.

Financial Aid

The lengthy training required to master the accumulated knowledge necessary to the practice of medicine has resulted in costs which seem prohibitive to many prospective students. No student interested in becoming a physician should be deterred from applying to the University of Washington School of Medicine for financial reasons. Both public and private endowments have been given to the School to provide financial aid to deserving medical students. During the academic year, scholarships, grants-in-aid, loans, and traineeships are available.

Application for Aid Procedures

Unless otherwise specified, application for fellowships, scholarships, and grants-in-aid should be directed to the Office of the Dean of Medicine before March 1 of each year. Application forms and related information may be obtained from the Office of the Dean of Medicine upon request. The student must be willing to submit a detailed and realistic analysis of his complete financial situation. In case of emergency or special need, an application for grant-in-aid may be made at any time. Application for a loan may also be made at any time to the Office of the Dean. Application for assistantships should be made to faculty members. All payment of monies concerned with endowment awards, prizes, stipends, grants-in-aid, and loans are made by the University comptroller.

Scholarships and Grants-in-Aid

A scholarship is an academic award based upon both scholarship and need and is designed to aid and encourage the student in the furtherance of his studies or research.

Grants-in-aid are made to students in good standing on the basis of need only.

The recipient of either a scholarship or a grant-in-aid may engage in remunerative employment only with the written consent of the Scholarship Committee. The Committee may cancel either award at any time.

Stipends of the various scholarships listed in the *Handbook of Scholarships* range from full tuition and fees to larger amounts sufficient to cover the entire financial needs of the student through four years of medical school.

A limited number of four-year scholarships have been established for the purposes of meeting the full needs of especially gifted and promising students who would otherwise be unable to finance their medical education. Continuance of the scholarship is contingent upon satisfactory scholastic standing, need, and application.

Research and Training Grants

Each year grants from various public and private sources are received by individual faculty members and by the School of Medicine to support medical research and training in teaching and research. Extensive training programs, supported largely by the National Institutes of Health, provide training in teaching and research to individuals at the undergraduate, graduate, and post-doctoral levels.

Traineeships

A traineeship is an academic award of honor, based upon scholastic achievement, designed to aid and encourage the student in his studies or research. In cases in which the trainee collaborates with a faculty member, the trainee is expected to take the lead as principal investigator. The trainee is allowed freedom of publication of his results as a condition of the grant. He is expected to devote his full time and energy to his project and may not be otherwise gainfully employed during the period of his traineeship. A traineeship may be canceled at any time by the Scholarship Committee. Ordinarily, the traineeships cover the three months of a free quarter, often the summer. Under certain circumstances, investigative work may be continued throughout the year at a reduced stipend.

Assistantships

A number of positions with individual faculty members are usually available to medical students during the summer months. Most of these positions involve laboratory work on research projects.

Information relative to the complete list of grants available in medicine is contained in the *Handbook of Scholarships*, Office of Financial Aids, 3939 University Way, Seattle, Washington 98105.



Honors

A charter as Alpha of Washington was granted to the School of Medicine in 1950 by *Alpha Omega Alpha*, the honorary medical fraternity. Members are elected by the membership of Alpha Omega Alpha on the basis of high scholarship and good moral character.

Medical Thesis Program

The medical thesis program of the School of Medicine is voluntary, and participation in it is initiated by the student. Often a student will become especially interested in some particular field in medicine. This interest will lead him to a desire to learn more about the field or to do special work in it. The thesis program is a means of fulfilling his desire. A prize is awarded for the best thesis submitted each year, and certain departments have available prizes for the best thesis written under that department's supervision. The preparation of a satisfactory thesis generally carries with it honors in the department. Further information concerning the thesis program may be obtained from the chairman of the Medical Thesis Committee or from the Dean's Office.

Graduation With Honors

A degree of Doctor of Medicine with highest honor or with honor may be awarded to students with high achievement who, in addition, have demonstrated initiative and success in scholarly pursuits related to medicine outside of the organized curriculum. Evidence of such scholarly achievement may be represented by a thesis of acceptable quality or a paper accepted for publication in a recognized scientific journal. Alternatively, a scholarly analysis of a clinical subject comparable to review papers and case reports, acceptable for publication in better medical journals, may be submitted.

Departmental Programs

Doctor of Medicine

Upon completion of the curriculum of the School of Medicine, the M.D. degree is awarded to candidates who have (1) given evidence of good moral character; (2) completed the last two years of medical training as regularly matriculated students in the School of Medicine; (3) satisfactorily completed the required work throughout the course; (4) fulfilled all special requirements; and (5) discharged all indebtedness to the University.

Bachelor of Science

Curricula leading to bachelor's degrees with a major in microbiology or in environmental health are offered through the College of Arts and Sciences. These courses may be found in the *Description of Courses*

section at the back of this Catalog, and the curricula are described in the *College of Arts and Sciences* section.

Bachelor of Science in Medical Technology

A curriculum in medical technology is offered by the Department of Pathology in the School of Medicine. It provides professional study in the biological sciences and clinical techniques in medical technology. Information concerning admission to the medical technology curriculum may be found under the *Department of Pathology* section.

Bachelor of Science in Physical Therapy

A curriculum in physical therapy is offered by the Department of Physical Medicine and Rehabilitation in the School of Medicine. It provides professional training in the basic sciences and the clinical use of accepted physical therapy modalities and procedures. Information concerning admission to Physical Therapy may be found under the Department of Physical Medicine and Rehabilitation.

Bachelor of Science in Occupational Therapy

A curriculum in occupational therapy is offered by the Department of Physical Medicine and Rehabilitation in the School of Medicine. It provides professional training in the basic sciences and the clinical use of occupational therapy. Information concerning admission to Occupational Therapy may be found under the Department of Physical Medicine and Rehabilitation.

Master of Science and Doctor of Philosophy

Work leading to master's degrees and doctoral degrees is offered, in accordance with the requirements of the Graduate School, in the Departments of Biochemistry, Biological Structure, Microbiology, Pathology, Pharmacology, Physiology and Biophysics, and Preventive Medicine. A master's degree program is offered by the Departments of Physical Medicine and Rehabilitation, and Surgery.

Students who intend to work toward one of these degrees should confer with the chairman of the department in which they intend to pursue their graduate study. Specific requirements for admission to work for advanced degrees are given in the *Graduate Study* section.

Medical Accreditation and Licensure

The University of Washington School of Medicine is approved by the Association of American Medical Colleges and by the Council on Medical Education and Hospitals of the American Medical Association.

Admission to the practice of medicine in any state is conditional upon the requirements of a state board of

examiners. Admission to practice in the state of Washington is dependent upon the candidate's having an M.D. degree, completing a one-year rotating internship, and passing the basic science and licensing examinations. For candidates who are already licensed to practice in another state, the licensing examination may be waived by reciprocity with that state or with the National Board of Medical Examiners. Completion of the basic science requirements may be arranged through reciprocity with the National Board of Medical Examinations and with certain specified states.

Further information about licensure requirements may be obtained from the Washington State Division of Professional Licensing, Olympia, Washington, 98501.

Postgraduate Medical Education

Internships and Residencies

Internships of one-year duration in clinical medicine are available at the University Hospital, Harborview Medical Center, and the Children's Orthopedic Hospital and Medical Center. All clinical departments participate in the training program for interns in one or more of these institutions. Residency training programs are available in the clinical fields of anesthesiology, cardiology, general surgery, medicine, neurology, neurosurgery, obstetrics, gynecology, orthopedic surgery, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, radiology, and urology. The residency programs vary in duration from two to five years and are integrated, providing for rotation through several of the University-affiliated hospitals during this period of training.

Postdoctoral Fellowships and Traineeships

Postdoctoral fellowships and traineeships are available in all departments. They are designed to provide further research and teaching experience for the advanced student who has already obtained his Ph.D. or M.D. degree.

For further information, consult the professional bulletin of the School of Medicine.

Continuing Education

Director

John N. Lein
AA320 University Hospital

The School of Medicine functions as a center for continuing medical education for physicians and allied health personnel in the region. Short courses (in general extending from one day to one week) are offered at various times throughout the year. The clinical faculty, with the assistance of basic science investigators, plan and give courses that provide the practicing physician and other health-care personnel with an oppor-

tunity to review fundamental concepts and to delve into recent advances in diagnosis and treatment in such specialized fields as cardiology, electrolyte and fluid balance, gastroenterology, hematology, infectious diseases, neurology, metabolism, allergy, practical psychiatry, emotional problems in children, and gynecologic and obstetric endocrinology.

The School cooperates with the Washington State Department of Health and other governmental agencies, physicians organizations, and voluntary organizations in developing refresher courses in cancer, diseases of the heart, diabetes, alcoholism, safety, etc.

Physicians are always welcome to participate in the regular rounds and conferences scheduled in the University Hospital and clinics and the hospitals affiliated with the University in the teaching program.

Refresher courses are extended to other health professions such as medical technologists, physical therapists, and occupational therapists.

Detailed information about courses and instruction is given in announcements describing the specific courses, the times they are scheduled, the number of students accepted, and the tuition fees.

All departments in the School of Medicine participate in the Continuing Medical Education Programs.

ANESTHESIOLOGY

Chairman

John J. Bonica
RR444 University Hospital

Professors

John J. Bonica, B. Raymond Fink, John M. Hansen

Associate Professors

Gerald D. Allen, Edward W. Crawford, Rudolph H. de Jong, Anibal H. Galindo, Thomas F. Hornbein, Robert W. Loehning, Richard J. Ward, Peter M. Winter

Assistant Professors

Geordis M. Aasheim, Toshio J. Akamatsu, Alice B. Basford, Stefano Brena, Frederick W. Cheney, Jr., Felix G. Freund, Barbara Kennedy, William F. Kennedy, Jr., H. Ralph Linden, Wayne E. Martin, A. Eugene Pflug, Gerald H. Pollack, Steven R. Wyte

Instructors

Peter U. Berges, Robert A. Boas, Josephine Davis, Anthony P. Rubin, Michael d'A. Stanton-Hicks, William J. Whitlock

The Department of Anesthesiology has broad responsibilities for the teaching of medical students throughout their four years of undergraduate training. Departmental faculty participate in the teaching of applied



anatomy to students during their first year. During the second year, faculty who also have joint appointments in physiology and pharmacology participate in teaching of students in these areas. During the clinical years, the students are taught the basic principles of anesthesiology, including artificial respiration and resuscitation. Instruction is provided by means of lectures, conjoint courses, and clinical clerkships. In addition, the Department carries out an active training program for interns and residents in anesthesiology and affords residents in surgery, obstetrics, and oral surgery experience in anesthesiology.

BIOCHEMISTRY

Chairman

Hans Neurath

J405 Health Sciences Building

Professors

Earl W. Davie, Edmond H. Fischer, Milton P. Gordon, Benjamin D. Hall, Alex Kaplan, Brian J. McCarthy, Hans Neurath, Kenneth A. Walsh, Philip E. Wilcox

Associate Professors

Paul Bornstein, David R. Morris, David C. Teller

Assistant Professors

David A. Deranleau, Stephen Hauschka, Jon R. Herriott, John M. Keller, William W. Parson, E. T. Young II

Associates

Lowell H. Ericsson, Betty McConaughy, Richard B. Olsgaard

Research Associate Professor

Koiti Titani

Acting Assistant Professor

Anna Pocker

Lecturers

Stephen Bard, Roger Wade

Biochemistry, the study of the chemistry of life processes, is one of the rapidly expanding branches of biological sciences. The Department of Biochemistry offers graduate degree programs at the postdoctoral level and the undergraduate level (particularly undergraduate students enrolled in the curriculum in molecular and cellular biology) for any regularly enrolled student or for professional students in Medicine, Dentistry, and Pharmacy.

Graduate Programs

Graduate Program Adviser

David R. Morris

J405 Health Sciences Building

Admission

The basic requirements for admission to the Department of Biochemistry are one year of organic chemistry, one year of physics, one year of physical chemistry,

including laboratory, and mathematics through integral calculus. Students must also meet the general admission requirements of the Graduate School. The course of advanced study is designed to give each student a firm foundation upon which to base further professional progress. In the first year of academic work most students attend courses in biochemistry and in related fields such as advanced chemistry, genetics, or microbiology. In the second and succeeding years, an increasing amount of time is devoted to research and to independent study. Each student is required to gain teaching experience, usually during part of the first and second years. Most students require approximately four years past the bachelor's degree to fulfill the requirements for the Ph.D. degree. Students entering with advanced training in biochemistry may complete their requirements in a shorter period of time.

Master of Science

Although the Department of Biochemistry does not have a formal program that terminates in the master's degree, under certain circumstances students seeking the master's degree are accepted.

Doctor of Philosophy

The Department of Biochemistry offers an advanced program leading to the Ph.D. degree. This graduate program prepares students for professional careers in universities and colleges, in research institutes, in medical schools and hospitals, and in government laboratories, such as those of the National Institutes of Health.

Dissertation research is carried out under the guidance of members of the graduate faculty in biochemistry. The laboratories of the Department of Biochemistry are excellently equipped for modern biochemical research.

Financial support is available to students in good standing throughout their graduate careers in the form of traineeships and assistantships. For further information, inquiring students should request from the Department of Biochemistry the pamphlet describing the graduate program in Biochemistry.

BIOENGINEERING

Head

Robert F. Rushmer

G213 Health Sciences Building

Associate Professor

Curtis C. Johnson, Electrical Engineering

Assistant Professors

Lee L. Huntsman, John M. Reid

Bioengineering is a new multidiscipline that presages dramatic changes in both biology and medicine through

the application of engineering science and technology. Bioengineering is a modern vehicle by which engineers and health scientists can be brought together in productive collaboration for solution of both basic and practical problems. At the University of Washington, a bioengineering program has emerged with an unusually comprehensive approach, involving active cooperation between faculty in many different departments in the College of Engineering and in a broad spectrum of the Health Sciences Division. A balanced program is being developed through appropriate emphasis on both pure and practical research and development, including acquisition of new knowledge, analysis of quantitative data, development of new nondestructive diagnostic instruments, and applications of engineering techniques to patient care.

Developing Programs for Graduate Students

The strong research base proposed above has the ingredients necessary to build training programs of high quality for graduate students. The ultimate graduate training program will include provisions for training of engineering graduate students for the Master of Science and Doctor of Philosophy degrees. Since the program is diverse and multidisciplinary, the graduate-study programs will be characterized by flexibility without sacrifice of high standards.

Postdoctoral Training and Research Experience

Diverse collaborative projects involving engineering and health sciences faculty provide many opportunities for training and experience for engineers, health scientists, and basic medical scientists with advanced degrees.

BIOLOGICAL STRUCTURE

Chairman

Newton B. Everett

G511 Health Sciences Building

Professors

Richard J. Blandau, Newton B. Everett, Lyle H. Jensen, John H. Luft, George F. Odland, Edward C. Roosen-Runge

Associate Professors

James K. Koehler, Earl P. Lasher, Julia G. Skahen, M. Roy Schwarz, Daniel G. Szollosi

Assistant Professors

Daniel O. Graney, Herbert K. Kashiwa, Barbara Landau, Raymond D. Lund, John W. Prothero, Cornelius Rosse, Thomas A. Stebbins, John W. Sundsten, Lesnick E. Westrum

Instructor

Stevan H. Broderson, Ursula B. Storb, Donald M. Wright

Research Professor

Edward A. Boyden

Research Associate Professor

Ruth E. Rumery

Research Associates

Penelope Gaddum, Jean Leik, Carolyn A. D. Mitchell, Barbara Szubiaska-Pigon, Isao Tsutsui, Ruth Wade Tyler

Lecturer

Alexander I. Hamilton

In the Department of Biological Structure, courses are offered that comprise all levels of structural organization of the body, from the gross to the molecular.

Graduate Programs

Graduate Program Adviser

John W. Prothero

G515A Health Sciences Building

The traditional major fields of anatomy are represented in the Department by three divisions: Gross Anatomy and Neuroanatomy, Growth and Development, and Histology. The submicroscopic and molecular levels are represented by the Division of Ultrastructure.

In addition to courses for students in medicine, dentistry, dental hygiene, nursing, physical therapy, and occupational therapy, a graduate program is offered to provide the background necessary for pursuing a professional career in a variety of fields relating to the morphological sciences, e.g., anatomy, biology, and biophysics. Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog.

Continuous Courses

The courses listed below are offered throughout the school year.

Gross Anatomical Dissection. Physicians who desire additional individual experience in the dissection of the entire cadaver or parts thereof may make arrangements through the Division of Continuing Medical Education and the Department of Biological Structure. Laboratory space and anatomical material will be provided (no staff participation). The fees are in proportion to the amount of gross material supplied.

BIOMEDICAL HISTORY

Chairman

Charles W. Bodemer

E311 Health Sciences Building

Professor

Charles W. Bodemer



Instructor
Philip R. Sloan

Research Associate
Mary T. Adams

The history of medicine and biology represents an integral part of the history of western civilization. Study of the history of the biomedical sciences provides simultaneously a greater understanding of these sciences and a heightened awareness of their relation to the social, economic, philosophic, and religious factors influencing and influenced by them at different times and places during their development. The biomedical sciences lend another dimension to history valuable to the scientist and nonscientist alike.

The Department of Biomedical History offers a program of studies leading to the degree of Master of Arts. Its courses and research sponsorship in the history of medicine and biology are available to undergraduates, medical students, graduate students, and postdoctoral fellows. Approximately twelve hundred rare books relevant to the development of the modern medical sciences provide a valuable adjunct to the teaching program.

CONJOINT COURSES

Conjoint courses are offered cooperatively by departments in the School of Medicine. They are designed to integrate basic medical training with clinical work and, in some cases, to integrate basic medical training in two or more fields. For the list of courses, see the *Description of Courses* section of this catalog.

EXPERIMENTAL ANIMAL MEDICINE

Chairman
William C. Dolowy
303 Showboat Apartments

Professors
William C. Dolowy, James A. Henson, Theodore C. Ruch

Associate Professor
Norman S. Wolf

Assistant Professors
W. Ellis Giddens, Jr., Mark C. Keyes

Research Assistant Professor
Joseph Roberts

This newly created department is responsible for the instructional, service, and research programs in experimental animal medicine.

Experimental animal medicine encompasses all areas of biomedicine that relate directly to the various animal species used in research. Investigation begins with normal values and environmental health factors and proceeds through diagnosis and treatment of disease; it includes investigation of physiological and pathological processes of animal diseases as models of related human forms of illness. For development of these different areas of study, the Department is divided into four subunits: (1) Research Division; (2) Teaching Division; (3) Service Division, consisting of the Vivarium and proposed animal farm; and (4) Diagnostic Laboratory. For further information, see the professional bulletin of the School of Medicine.

MEDICAL PRACTICE

For a list of courses, see the *Description of Courses* section of this catalog.

MEDICINE

Chairman
Robert G. Petersdorf
RR516 University Hospital

Professors
George N. Aagaard, Edwin L. Bierman, Robert A. Bruce, John Butler, Harold C. Dodge, Robert S. Evans, Clement A. Finch, Stanley M. Gartler, John R. Hogness, William M. M. Kirby, Seymour J. Klebanoff, Arno G. Motulsky, George Odland, Robert G. Petersdorf, Clayton Rich, Cyrus E. Rubin, Belding H. Scribner, E. Donnell Thomas, Paul VanArsdel, Jr., Wade Volwiler, Robert H. Williams

Associate Professors
John R. Blackmon, Paul Bornstein, Roger Bulger, Leonard A. Cobb, Robert D. Conn, Ralph E. Cutler, John W. Ensink, Philip J. Fialkow, Gilbert Frank, George R. Fraser, C. J. Goodner, William L. Green, Robert Hillman, Claude Lenfant, Mart Mannik, Thomas E. Morgan, Jr., Wil B. Nelp, Frank Parker, C. Alvin Paulsen, Daniel Porte, Donal B. Sparkman, George Stamatoyanopoulos, August G. Swanson, Philip D. Swanson, Marvin Turck, Francis C. Wood, Jr.

Assistant Professors
John W. Adamson, John Bagdade, Harry N. Beaty, Christopher Blagg, C. Dean Buckner, Coldevin Carlson, Hugh Clark, James Cook, Wayne Crill, F. Kingsbury Curtis, Robert S. Davidson, Robert Epstein, Donald Funk, John Gilson, Bruce C. Gilliland, John R. Green, Elsie Haff, Laurence A. Harker, John S. Holcenberg, Willard P. Johnson, J. Ward Kennedy, John Milner, John A. Murray, James J. Plorde, Charles E.

Pope II, Richard Sagebiel, David R. Saunders, Floyd Short, John M. Short, Jr., David P. Simpson, Mark Sumi, Heinrich Tenckhoff, J. Findlay Wallace, Stephan Yarnall

Instructors

Donald Belcher, Melvin E. Belding, John D. Brunzell, James Detter, Duane Espeland, Alexander Fefer, Robert A. Gotshall, Robert A. Gutman, Robert Haining, Glen Hamilton, William R. Hazzard, King K. Holmes, Leonard Hudson, Victor Lavis, Gary E. Leinbach, John McDonough, Richard D. O'Toole, Robert Rudolph, Saul Rosenstreich, Thomas Sawyer, Donald Sherrard, Stanley Shimoda, Sherrill Slichter, Peter Simkin, Martha E. Stauffer, Ralph Stoll, Rainier Storb, Kent Sullivan, Wilfred Weinstein, Robert Woodson, Larry J. Wright

Research Professor

Eloise Giblett, Akira Yoshida

Research Associate Professors

James M. Burnell, John A. Glomset, Loring B. Rowell

Research Assistant Professors

David Baylink, Roger Donohue, Patrick D. Goldsworthy, Kenneth Kraning, Lawrence Menahan, William Stahl

Research Instructors

T. G. Christopher, Laura Gutman, Amelia L. Schultz, Jon E. Wergedal

Research Associates

Sayers J. Boyd, Jean S. Bryant, Monserrat Carino, Reginald Clift, James J. Cole, Arden Forrey, Daniel G. Parrish, Dzidra Razevska

Lecturers

Konrad J. K. Buettner, George Marsaglia

An active teaching program is carried on at the Veterans' Administration, USPHS, and University hospitals, Firland Sanitarium, and Harborview Medical Center for medical students, interns, medical residents, and postdoctoral research fellows. More than forty medical residents rotate through the hospitals, and there are more than eighty postdoctoral research fellows working in various divisions of the Department.

MICROBIOLOGY

Chairman

Charles A. Evans

G305 Health Sciences Building

Professors

Howard C. Douglas, Charles A. Evans, Neal B. Groman, Bernard S. Henry (Emeritus), Erling J. Ordal, John C. Sherris, Peter K. Vogt, Russell S. Weiser, Helen R. Whiteley

Associate Professor

Eugene W. Nester

Research Associate Professor

Ingegerd Hellstrom

Assistant Professors

Robert G. Krueger, C. George Ray, Fritz Schoenknecht

Research Assistant Professor

Velma C. Chambers

Research Associate

Sylvia Pollack

Lecturers

Glover W. Barnes, Patricia Bevan, Dorothy I. Cramer, Carol Laxson, Ramona Memmer, Dale Parkhurst

Microbiology is the science of microscopic organisms, their biological characteristics, chemical activities, industrial uses, and disease-producing mechanisms. The related fields concerned with parasites, viruses, and immunity are included in the work of this Department.

Undergraduate Programs

In addition to courses for medical students, the Department of Microbiology offers programs in microbiology leading to a bachelor's degree in the College of Arts and Sciences. (See *College of Arts and Sciences* section.) The undergraduate degree prepares the individual for the responsibilities of a microbiologist upon graduation and provides him with the background for advanced study. An honors program leading to a bachelor's degree with honors or distinction in microbiology is available for qualified undergraduates (see *College of Arts and Sciences* section, Honors in Microbiology).

Graduate Programs

Graduate Program Adviser

Howard C. Douglas

H309 Health Sciences Building

Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section. The fields of specialization for advanced degrees are general and medical bacteriology, immunology, virology, and microbial physiology and genetics. Course requirements vary according to the field chosen.

NEUROLOGICAL SURGERY

Chairman

Arthur A. Ward, Jr.

RR744 University Hospital

Professors

Arthur A. Ward, Jr.

Associate Professors

Gian E. Chatrian, Lowell E. White, Jr.



Assistant Professors

William H. Calvin, Eberhard E. Fetz, A. Basil Harris, William A. Kelly, June S. Lockard, John D. Loeser, Raymond D. Lund, George A. Ojemann, Lesnick E. Westrum

Instructors

John M. Havlina, Jr., Linda Ojemann, John T. O'Neal, Jacques Palmer, Randall W. Smith

Research Assistant Professor

June L. DeVito

Research Associate

Ettore Lettich

The Department of Neurological Surgery is concerned with teaching and research in the entire spectrum of surgical diseases of the central and peripheral nervous system. Instruction in this area is provided for medical students and postgraduate physicians.

The Department's medical student instruction includes participation in the neurosciences core course for all medical students, providing them with a basic foundation in neurophysiology and neuroanatomy, clinical neurology, and neurologic physical diagnosis, as well as the required and elective courses for those medical students who have selected the behavioral science pathway in their degree programs. A neurological surgery inpatient clerkship two weeks in duration is included in the required portion of this pathway where the student participates with the other members of the professional staff in the diagnostic workup and pre- and post-operative care of neurosurgical patients. Clinical facilities for this clerkship are provided at the University Hospital, Harborview Medical Center, and Veterans' Administration Hospital. In addition to this course, a more extensive four-week neurosurgical clerkship is available to medical students who have completed core requirements. There is also a clinical elective in electroencephalography. The Department's neurosciences research seminar is available as a basic science elective for those students interested in correlating research and clinical problems in the nervous system.

Selected medical students may also elect research experience within the Department of Neurological Surgery. The departmental research facilities are housed in the Medical Research Tower of the University Hospital where investigations are under way in all types of neurophysiology, behavioral research with primates, and light and electron microscopic examination of the anatomy of the nervous system. Particular research interests include the basic aspects of animal models of such disease processes as epilepsy, including confirmation from human material. Interdisciplinary arrange-

ments with the Departments of Physiology and Biophysics, Bioengineering, and Biological Structure are maintained whereby selected students from these related basic science departments can participate in the Neurosurgical Department's multidisciplinary research activity.

In addition to the undergraduate instruction, a fully certified residency program in Neurological Surgery, with particular emphasis on preparation for careers in academic neurosurgery, is available for selected postgraduate physicians.

OBSTETRICS AND GYNECOLOGY

Chairman

Walter L. Herrmann
BB615 University Hospital

Administrative Officer

Leon R. Spadoni
BB639 University Hospital

Professor

Walter Herrmann

Associate Professors

John T. Conrad, David C. Figge, W. LeRoy Heinrichs, John N. Lein, Ronald J. Pion, Leon R. Spadoni, Kent Ueland, Nathaniel N. Wagner

Assistant Professors

Donald C. Smith, E. Archer Dillard, Jr.

Instructors

Julius C. Butler, Jr., David C. Child, Richard Depp, Louis A. Vontver

Research Assistant Professor

Suzanne H. Conrad, Roger P. Donahue

The Department of Obstetrics and Gynecology encompasses the study of normal and abnormal human reproduction: growth and development of the fetus, normal and complicated obstetrics, and surgical and medical diseases of the female reproductive system, including endocrinology. The Department teaches at three main education levels: (1) medical students who seek a basic core of knowledge and understanding of obstetrics and gynecology; (2) doctors who will become specialists in the field through a clinical residency program; and (3) practitioners and specialists who participate in continuing education seminars and research fellowship programs. Major areas of research include the normal and abnormal endocrinology and physiology of pregnancy, the reproductive cycle, and fertility regulation. The Department maintains clinical services at Harborview Medical Center and at the USPHS Hospital as a part of its teaching facilities.

OPHTHALMOLOGY

Chairman

Robert E. Kalina (Acting)
RR806 University Hospital

Professor

John L. Downer

Associate Professor

Sidney Futterman

Assistant Professors

Anita Hendrickson, Robert Kalina

This Department is responsible for the instructional and research programs in diseases of the eye and related structures.

ORTHOPEDICS

Chairman

D. Kay Clawson
BB417 University Hospital

Professor

D. Kay Clawson

Associate Professors

Wayne H. Akeson, Donald R. Gunn

Assistant Professors

F. Richard Convery, Louis R. Fry, David W. Grainger (Acting)

Instructors

Edward Almquist, Sigvard T. Hansen, Jr., Stewart M. Scham, Malcolm B. Madenwald, Michael T. Phillips, Robert D. Schrock, Jr., Lynn T. Staheli

In addition to instruction for medical students, the Department of Orthopedics participates in the teaching program of students in the Schools of Nursing and of Dentistry, and in the Divisions of Physical and Occupational Therapy. A fully approved residency, with opportunities to carry out fundamental research, is offered. Residents may work toward the Master of Science degree by meeting the requirements of the Graduate School.

OTOLARYNGOLOGY

Chairman

James A. Donaldson
RR205 University Hospital

Professor

James A. Donaldson

Assistant Professors

Josef M. Miller, Joseph Walike

Instructors

Alvin L. Cain, John M. Fox, Winsor V. Morrison

Research Instructor

Yuichi Nito

The Department of Otolaryngology is responsible for the teaching of the principles and practical aspects of the diagnosis and treatment of diseases of the ear, nose, throat, and larynx to medical students during their first, second, third, and fourth years of training. In addition, the Department assumes responsibility for the organization and supervision of a residency training program and provides consultation and instruction to interns and members of the residency training programs at the University of Washington.

PATHOLOGY

Chairman

Earl P. Benditt
D511 Health Sciences Building

Professors

Ellsworth C. Alvord, Jr., Earl P. Benditt, Karl E. Hellstrom, David Lagunoff, George M. Martin, N. Karle Mottet, Russell Ross, Edward A. Smuckler, Leo M. Sreebny

Associate Professors

Victor E. Gould (Acting Chief, Pathology Services, University Hospital), Cheng-Mei Shaw, Norman S. Wolf

Research Associate Professor

Elizabeth K. Smith

Clinical Associate Professor

Gordon D. LaZerte (Chief, Pathology Services, Harborview Medical Center)

Assistant Professors

J. Bruce Beckwith, Ruth E. Bulger, W. Ellis Giddens, Jr. (acting), H. Thomas Norris, Roy C. Page, Dennis Reichenbach, Richard W. Sagebiel, Abraham I. Schweid (acting), Gary W. Striker, S. Mark Sumi, Rudolf Vracko (Chief, Pathology Services, Veterans' Administration Hospital), Louise Wiegenstein (acting)

Research Assistant Professor

Nils Eriksen

Clinical Assistant Professors

S. Allison Creighton (Chief, Pathology Services, Children's Orthopedic Hospital), William B. Hamlin (Chief, Pathology Services, Swedish Hospital)

Instructors

Janet B. Fry (acting), Nevenka Gould, Paul W. Kohnen, Carol N. LeCrone, Ned S. Moss



Clinical Instructors

Harold E. Hall, (Acting Chief, Pathology Services, USPHS Hospital)

Lecturer

Peggy V. Hamernyik

Pathology is both a basic science and a specialty of medicine. As a basic science, it deals with the natural history and mechanisms of initiation and expression of the basic disease processes. In its broadest sense, pathology encompasses the entire animal and plant kingdoms. The primary interests of the Department are diseases of vertebrates and especially of man and other mammals. The principle aim of the pathologist is to understand disease manifestations and processes in whatever terms are required. Therefore, the techniques of the pathologist may range from those of the physicist and physical chemist through those of the physiologist to the realm of the epidemiologist. Present emphasis in the Department is on cellular and molecular pathology, analysis of disease by light and electron microscopy, histochemistry and cytochemistry, analytical biochemistry, cell and organ culture, and immunology.

Courses are offered for medical students, dental students, and students of medical technology and other allied health sciences professions. A program leading to a Doctor of Philosophy degree in the field of experimental pathology is offered for both predoctoral students and those with degrees in medicine, dentistry, or veterinary medicine.

Central teaching and research facilities are located in the Health Sciences Building and University Hospital. Closely associated are the personnel and facilities of Harborview Medical Center, Veterans' Administration Hospital, United States Public Health Service Hospital, Children's Orthopedic Hospital and Medical Center, and Swedish Hospital.

Research programs in the Department include studies of the basic pathological process involved in such diseases as arteriosclerosis, cancer, and inflammation (including allergic diseases), and of the injurious effects of various drugs, toxins, foods, and things derived from the environment. Diseases of certain systems, including such organs as the heart, blood vessels, kidneys, lungs, liver, and skin, are studied with appropriate specialists in these areas. The approach to the study of these basic disease entities and specific systemic diseases utilizes the concepts and techniques of modern cell biology. The combination of modern morphologic techniques with chemical and functional studies is emphasized throughout.

Undergraduate Programs

Advisory Office

D511 Health Sciences Building

Bachelor of Science in Medical Technology

Coordinator

Carol N. LeCrone

BB222 University Hospital

The Medical Technology program is a four-year college program, supervised by the College of Arts and Sciences in the freshman and sophomore years (pre-professional) and by the Department of Pathology, School of Medicine, in the junior and senior years (professional).

The Medical Technology program is approved by the Council on Medical Education and Hospitals of the American Medical Association. Graduates are eligible for, and are encouraged to take, the examination of the Board of Registry of the American Society of Clinical Pathologists to become registered medical technologists.

Graduate Programs

Graduate Program Adviser

Earl P. Benditt

D511 Health Sciences Building

Master of Science and Doctor of Philosophy

Programs in the field of experimental pathology that lead to the Master of Science and Doctor of Philosophy degrees are offered through the Graduate School. Graduates of the program are qualified for research and academic appointments in medical, dental, or veterinary schools, as well as in experimental pathology in government laboratories and private industry, particularly in the pharmaceutical industry.

Postdoctoral Programs

Postdoctoral traineeships in experimental pathology include specialized programs in renal pathology, electron microscopy, immunopathology, tumor biology, genetic pathology, and connective tissue and vascular disorders, inflammation, and developmental pathology and neuropathology.

Residency Training Program

Director

N. Karle Mottet

BB232 University Hospital

The Department supervises an internship and residency training program in anatomic and clinical pathology for qualified medical doctors. Persons who complete the residency program are eligible for certification by the American Board of Pathology.

PEDIATRICS

Chairman

Ralph J. Wedgwood
RR314 University Hospital

Professors

Robert A. Aldrich, E. R. Alexander, Irving N. Berlin, Robert W. Deisher, Warren G. Guntheroth, Vincent C. Kelley, Robert F. Labbe, Bruce Mackler, Thomas K. Oliver, Jr., Thomas H. Shepard, David Smith, Nathan J. Smith, Ralph J. Wedgwood

Associate Professors

David Baum, Abraham Bergman, Marilyn Cowger, Starkey D. Davis, C. Benjamin Graham, Sherrel Hammar, Robert Igo, Beverly C. Morgan, Donald Pious, William O. Robertson, Michael Rothenberg, David B. Shurtleff

Assistant Professors

George Bolian, Virginia Campbell, Coldevin Carlson, Irvin Emanuel, Moira Feeney, Richard Gode, Patricia Hayden, William A. Hodson, Vanja Holm, Ronald J. Lemire, Richard Marshall, James Oakland, C. George Ray, Rogelio H. A. Ruvalcaba, Jane Schaller, C. Ronald Scott, Waldemar Wenner

Instructors

Nora Davis, Ruth Dillard, Nasrollah Hakami, Robert Hunter, Edward L. Kaplan, Frederick Lamson, Elizabeth Lefebvre, Hans Ochs, Brian O'Hara, Youssef Salama, Chandra Sareen, Marvin Scotvold, Diana Tattoni, Lore Tenckhoff, Richard Wennberg, Nick Wiltz, Lanita Wright

Research Associate Professor

Elizabeth K. Smith

Research Instructor

Laura Gutman

Research Associate

Doris Tippit

Lecturers

Imrich Bor, Mary Campbell, Norris Haring, Margaret Hill, Laura Newell, Rhessa Penn

Pediatrics involves the study of the physical and behavioral development of man, in health and disease, from conception to maturity. Alterations of the developmental process (from genetic and environmental causes), the changing response to stress during maturation, and the effect of nutritional, physical, and emotional stress on development, are the manifestations of child health of primary pediatric concern. The holistic approach to the ontogenetic and ecologic changes is intrinsic to understanding the changes (both of disease and function) occurring throughout the life span of man.

Instruction is provided through conjoint courses, lectures, conferences, clerkships, and electives.

PHARMACOLOGY

Chairman and Graduate Program Adviser

James M. Dille
F421 Health Sciences Building

Professors

George Aagaard, James M. Dille, Akira Horita, Ted A. Loomis

Associate Professors

Rudolph H. de Jong, Lawrence M. Halpern, Ivens A. Siegel

Assistant Professors

Paul W. Davis, Donald C. Dyer, Lawrence Halpern, John S. Holcenberg, Mont R. Juchau, Frank F. Vincenzi

Pharmacology deals with the mechanisms whereby modification of physiological function is produced by drugs, and with the application of these drugs to the relief and treatment of disease.

The Department of Pharmacology provides courses for medical, dental, and pharmacy students and for those doing graduate work in these fields. Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog and must also meet the special requirements of the Department of Pharmacology. Prospective candidates must present a bachelor's degree with a major in any of the sciences, such as zoology, chemistry, physics, pharmacy, psychology, or physiology. Applicants should communicate with the Graduate Program Adviser before registration.

PHYSICAL MEDICINE AND REHABILITATION

Chairman

Justus F. Lehmann
CC814 University Hospital

Professor

Justus F. Lehmann

Associate Professors

Wilbert E. Fordyce, Robert H. Jebesen, Walter C. Stolov

Assistant Professors

Barbara Delateur, Roy S. Fowler, Jr., Arthur W. Guy, George H. Kraft, Jo Ann McMillan, Patricia L. Sand, Roberta B. Trieschmann, Janet J. Whitmore



Instructors

Rosemarian R. Berni, Sandra Cunningham, Eugen M. Halar, Frederic A. Harris, Marian L. Johnson, Jennie A. Lucci, Alexander J. Masock, Martha Nelson, Eleanor P. Nystrom, Bernard C. Simons, Willard S. Snow, Neal Taylor, Martha J. Trotter, C. Gerald Warren

Acting Instructor

Darlene M. Hertling

Research Associate

W. Marcus Riddell

Lecturer

Janet K. Hart

Associate

Donald Pemberton

The Department of Physical Medicine and Rehabilitation provides instruction for medical students, interns, and residents in the comprehensive approach to rehabilitation problems. This includes special diagnostic and evaluative procedures; methods and rationale for use of physical therapy, occupational therapy, and other health professions; and advanced investigation of special problems encountered in the field. In addition, the Department conducts a residency training program for the specialty of Physical Medicine and Rehabilitation.

The Department offers curriculums leading to a Bachelor of Science in Occupational Therapy, a Master of Occupational Therapy, a Bachelor of Science in Physical Therapy, a program in Prosthetics and Orthotics leading to a Bachelor of Science degree, and a Master of Science for residents in Physical Medicine and Rehabilitation who wish to enter the academic field.

Occupational Therapy

Head

Jennie A. Lucci

EE803 University Hospital

Undergraduate Programs

Occupational therapy is the treatment, through planned activity, of persons who are physically or mentally ill or disabled by accident, disease, or birth defects. Activities used for treatment include creative and manual arts, recreational, educational, and prevocational activities, and skills of independent daily living.

The curriculum in Occupational Therapy is planned to give the student a broad base in the liberal arts and humanities as well as specialized training. Since judgment is basic to effective application of skill and knowledge, the student is encouraged to develop the habits of investigation and continued study.

The Department offers courses leading to the degree of Bachelor of Science in Occupational Therapy in the School of Medicine. The program is accredited by the American Occupational Therapy Association and the Council on Medical Education and Hospitals of the American Medical Association.

The trained therapist may look forward to a wide range of employment in rehabilitation centers and hospitals for the physically ill and disabled; in special programs such as public schools for handicapped, socially deprived, or mentally retarded children; in private, state, federal, and community programs for the mentally ill; in self-employment, teaching, and research. Salaries compare with those of other service professions, and with the present critical shortage of qualified men and women for administrative, consultant, research, and teaching positions, the advancement opportunities are excellent.

Admission

Professional preparation includes four years of academic courses and eight months of clinical internship. During the first two academic years, the student is registered in the College of Arts and Sciences as a pre-occupational therapy major. Generally, during this phase, proficiency, distribution, and specific requirements are completed.

Admission requirements to the College of Arts and Sciences for the preprofessional years (freshman and sophomore) are prescribed by the University, and one should consult the Advisory Office of the College of Arts and Sciences for this information. Students should arrange their current courses of study for admission to that College. Transfer students should consult the Division of Occupational Therapy at the University Hospital to determine their eligibility for the preprofessional program. University of Washington freshmen should enroll in the orientation course Physical Medicine and Rehabilitation 107. Sophomores take Physical Medicine and Rehabilitation 290, with permission from the Division of Occupational Therapy.

Students are admitted to the professional curriculum at the junior level and, among other qualifications, must ordinarily have completed the specific requirements or their equivalent, with a cumulative grade-point average of 2.50. Exceptional cases will be considered when application is supported by adequate evidence of qualification.

The final two years of the curriculum *must* be taken at the University of Washington in the School of Medicine. Entrance to this part of the program is dependent

upon the decision of the Advisory and Evaluation Committee for Occupational Therapy. Students who plan to enter the program of study must make application to this Committee before March 1 of the same year. Students are evaluated and admitted on the merits of demonstrated academic abilities and various measured aptitudes. Application forms are available in the departmental office.

Course requirements for the third and fourth years are outlined in the professional bulletin of the School of Medicine.

Physical Therapy

Head

Jo Ann McMillan

BB805E University Hospital

Physical therapists participate in the evaluation of the capabilities and disabilities of patients; they administer treatments to alleviate pain, correct or minimize deformity, and improve the general health status of the individual. Based on knowledge of the patient's condition and the factors influencing it, a treatment program will be developed consisting of teaching a patient to walk or use an artificial limb, teaching him exercises that will help him gain strength or better coordination of movement. Treatment may also center around administering forms of heat, cold, electricity, ultrasound, or massage. It includes teaching the patient, his family, or other personnel procedures for his continuing care. Physical therapists may delegate some functions to supportive personnel who are prepared to assume these responsibilities. Physical therapists receive referrals of patients from licensed physicians and maintain contact with them regarding their progressive care.

After completing an approved physical therapy program, the therapist will find a wide variety of opportunities for employment. Positions are open in general and special hospitals, rehabilitation centers, physicians' offices and clinics, and schools or institutions for handicapped children. Other opportunities exist in the area of home care programs, nursing homes, and other convalescent centers. The experienced therapist may choose to teach in a school of physical therapy. Research opportunities exist in many of the above-mentioned positions.

Bachelor of Science in Physical Therapy

The entire program requires a minimum of four college years plus thirteen weeks of clinical affiliation for completion. For the first portion, students enroll for a minimum of two years as pre-physical therapy majors in the College of Arts and Sciences in addition to taking work, students complete proficiency and distribution

specific course requirements preparatory to advanced requirements. Completion of part or all of the pre-physical therapy coursework at another college or university is acceptable.

Admission requirements to the College of Arts and Sciences for the preprofessional years (freshman and sophomore) are prescribed by the University, and students should consult the Advisory Office of the College of Arts and Sciences for this information.

The final two years of the curriculum *must* be taken in sequence at the University of Washington in the School of Medicine. Entrance to this part of the program is dependent on the decision of the Advisory and Evaluation Committee for Physical Therapy. Students who plan to enter the third year in the Autumn Quarter must make application to this committee before March 1 of the same year. Applications are available in the departmental office. Currently, a cumulative grade-point average of 2.50 is required for admission, promotion, and graduation.

Upon completion of two years of professional coursework and thirteen weeks of full-time clinical affiliation, in addition to stated proficiency and distribution requirements, students receive a Bachelor of Science in Physical Therapy degree from the School of Medicine. The program is approved by the American Physical Therapy Association and the Council on Medical Education of the American Medical Association.

Program Requirements

Proficiency Requirements: These courses should be completed within the first two years—English 101 and 102 or 103 (Introductory English); Mathematics 101 (Intermediate Algebra) or a score of 50 or above on Mathematics Achievement section of the Washington Pre-College Test or present grades of B or better in three high school years of college-preparatory mathematics; Mathematics 104 (Trigonometry) or satisfactory completion of trigonometry in high school. Effective July, 1969, the previous foreign language requirement was dropped.

Distribution Requirements: A total of 50 credits must be completed before graduation. These must be distributed in the following way: humanities—20; social sciences—20; other courses outside the major department—10. Selections from the humanities and social sciences must be made from the College List found in the *College of Arts and Sciences* section of the General Catalog. Credits in foreign language courses may be counted toward the humanities requirement. (Natural sciences distribution requirements are met by completion of specific prerequisite courses.)



Specific Prerequisites: To be completed before the third year. *Social Sciences*—Psychology 100 and one additional psychology or psychiatry course. *Natural Sciences*—Biological Structure 301 (Human Anatomy); Chemistry 101 (General) and 102 (Organic); Microbiology 301 (General); Physics 114, 115, 117, and 118 (lectures and laboratory including mechanics, sound, heat, and electricity); and Zoology 208 (Human Physiology).

Students enrolled in other institutions should compare the catalog descriptions of the above courses to assure equivalency of content.

Course requirements for the third and fourth years are outlined in the professional bulletin of the School of Medicine.

Comparison of Curricula in Occupational and Physical Therapy

The educational programs in Occupational Therapy and in Physical Therapy share a common need for studies in human anatomy and physiology with a special emphasis on the musculoskeletal and nervous systems and a need for basic studies in pathological physiology and medical sciences. In these areas of study, the two curricula share identical courses. In other areas, the two curricula are independent programs, with separate faculties for instruction in the professional courses and separate Advisory and Evaluation Committees.

The application procedures, student promotion policies, and fees apply to both curricula except where exceptions are specifically noted.

Admission to the Professional Curricula

For entrance to the professional curricula, the applicant must initiate the following steps on or before March 1: (1) Arrange a personal interview with a member of the teaching staff of the Division concerned; this may be waived under certain conditions. (2) Submit formal application to the Advisory and Evaluation Committee of the division concerned, University of Washington Department of Physical Medicine and Rehabilitation, CC814 University Hospital, Seattle, Washington 98105. Application forms are available from the Department. (3) Arrange for official transcript(s) to be sent directly from the registrar(s) of previous college(s) to the Advisory and Evaluation Committee, including complete record with grades and credits to date. When college transcripts do not include a complete list of high school courses and credits, such a list must be submitted with the application. Also include a list of courses the applicant is currently taking or will take to complete preprofessional requirements. An official record of grades for such courses must be submitted when avail-

able. (4) An unmounted recent photograph, 2x2 inches, is desirable but not required.

The Advisory and Evaluation Committee bases its decision on the objective evaluation of the applicant's residence, preprofessional training, evidences of scholarship, and evidences of personal qualification for the work. The Committee or any one of its members may request a personal interview with the applicant to supplement the above information.

The Committee gives written notice to the applicant as soon as possible after a decision is made.

Student Achievement and Promotion

A student must maintain a satisfactory academic standing to be graduated. A University of Washington cumulative grade-point average of 2.50 is currently required.

At the end of each academic year the Advisory and Evaluation Committees evaluate the accomplishment of the student during the year and determine his fitness for promotion. When promotion is not recommended, the student is subject to dismissal from the curriculum. The Advisory and Evaluation Committees reserve the right to dismiss a student from the curriculum for any reason deemed sufficient. A student is advanced only when his general attitude, scholastic progress, and personal attributes are considered satisfactory.

Prosthetics-Orthotics

Undergraduate Program

Adviser

Bernard C. Simons

The Prosthetics-Orthotics program leads to the degree of Bachelor of Science.

A prosthetist-orthotist is part of a professional medical team devoted to the evaluation and treatment of the physically handicapped. He is responsible for the design and fabrication of prosthetic and orthotic devices (artificial limbs and braces) and for helping handicapped patients of all ages to enjoy more functional and independent lives.

Admission

Students are admitted to this curriculum at the junior level and, among other qualifications, must ordinarily have completed the specific requirements or their equivalent with a minimum cumulative grade-point average of 2.50. Exceptional cases will be considered when applications are supported by adequate evidence of qualifications.

Program Requirements

The last two years of the curriculum must be taken at the University of Washington School of Medicine. Entrance to this part of the program is dependent on the decision of the Prosthetic and Orthotic Laboratory Advisory Committee.

Proficiency requirements for the program are completion of the freshman English requirement; and Mathematics 101 or equivalent by test score, trigonometry in high school or college.

For a listing of required courses, see the professional bulletin of the School of Medicine.

Advising

Students who are interested in pursuing this program should contact the Director of Prosthetics-Orthotics, BB12 University Hospital, Seattle, Washington 98105.

Graduate Programs in Physical Medicine and Rehabilitation

Graduate Program Adviser

Justus F. Lehmann
CC814 University Hospital

The graduate programs in Physical Medicine and Rehabilitation lead to the degrees of Master of Science and Master of Occupational Therapy. Applicants for admission to the program must meet the requirements of the Graduate School. (See the *Graduate Study* section of this catalog.)

Master of Science

It is anticipated that graduate students working toward the Master of Science degree will take some of the course work during the three-year residency and devote an additional one to two years to the master's program. Opportunity will be given to students who have already completed their residencies to combine the course work and research in a two- to three-year program.

Master of Occupational Therapy

The graduate program is designed for the registered occupational therapist to prepare him as an academic or clinical educator, administrator-supervisor, or researcher in the field of occupational therapy. Departmental requirements include the established core courses and an approved thesis. Remaining credits may be earned through appropriate elective courses directed to the student's area of interest. Opportunities for supervised teaching, as well as administrative practice, will be incorporated in coursework. Based on an applicant's needs and prior preparation, the program can be planned to cover a span of one to two academic years.

A prospective candidate must be a registered occupational therapist and have graduated from an accredited institution. A minimum of one year's experience is desirable, but will not be required if the student is otherwise acceptable.

PHYSIOLOGY AND BIOPHYSICS

Chairman

Harry D. Patton
G412 Health Sciences Building

Professors

Harry D. Patton, Theodore C. Ruch, Allen M. Scher, Orville A. Smith, Arnold L. Towe, J. Walter Woodbury, Allan C. Young

Associate Professors

Arthur C. Brown, John T. Conrad, Eric O. Feigl, Thomas F. Hornbein, Theodore H. Kehl, Thelma T. Kennedy, Claude J. Lenfant, Julia G. Skahen, Charles F. Stevens, Robert L. Van Citters, Curt A. Wiederhielm

Assistant Professors

George L. Brengelmann, William H. Calvin, Wayne E. Crill, Eberhard Fetz, Albert F. Fuchs, Charles C. Gale, Albert M. Gordon, Bertil Hille, Barbara R. Landau, Erich S. Luschei, Josef M. Miller, Charles Stirling, Henry J. Van Hassel

Instructors

Fredric A. Harris, Cyril S. Ito

Research Assistant Professor

William L. Stahl

Research Associate

Judith R. Hildebrandt

Research Instructor

Maria A. Biedenbach

Lecturers

Ann Haight, E. Renella Taylor

Physiology deals with the processes, activities, and phenomena incidental to and characteristic of life and living organisms. Based upon zoology, physics, chemistry, and mathematics, physiology interlocks closely with the other basic medical sciences—biological structure, biochemistry, pharmacology, and pathology—and with psychology. For this reason, physiology appeals to students with diverse backgrounds and goals. Courses in this field are given for medical, dental, pharmacy, and nursing students, and for graduate students.



Biophysics emphasizes the physical aspects of organs and control systems, studied by the instruments and methods of thinking used by physicists.

Graduate Programs

Graduate Program Adviser

Julia G. Skahen

G405 Health Sciences Building

Admission

Students who intend to work toward a degree of Master of Science or Doctor of Philosophy must meet the requirements of the Graduate School. Students with a bachelor's degree in zoology, psychology, chemistry, engineering, or physics, or with an M.D. degree, are acceptable as prospective candidates for M.S. and Ph.D. degrees.

Graduate students in physiology and biophysics with a medical degree will have their curricula adjusted in accordance with their training.

Programs of Study

In the organization of the graduate program in physiology and biophysics, several specializations within the broad field of physiology are recognized, and the requirements and curricula are different for each, although there is considerable overlapping. The areas of specialization may be described as (1) mammalian physiology; (2) biophysics, for which undergraduate mathematics and physics are prerequisites; (3) physiology of behavior, in which undergraduate psychological training is a prerequisite; (4) cardiovascular physiology, and general and comparative physiology conducted conjointly with the Department of Zoology.

For students wishing a program equally distributed between physiology and psychology, an interdisciplinary Ph.D. degree program in these subjects is administered by the Physiology Psychology Group of the Graduate School. The basic graduate courses include Physiology and Biophysics 410, 411, 412, 413, 414, 415. See *Interdisciplinary Graduate Degree Programs* section.

PREVENTIVE MEDICINE

Chairman

J. Thomas Grayston

F358A Health Sciences Building

Professors

E. Russell Alexander, John P. Fox, N. Robert Frank, J. Thomas Grayston, John A. H. Lee, James R. McCarroll, Edward B. Perrin, Donovan J. Thompson.

Associate Professors

Blair M. Bennett, Abraham Bergman, Robert W. Day, David P. Discher, George E. Kenny, G. Spencer Reeves, Richard Smith (acting), Sanpin Wang

Assistant Professors

Gerald Bassett, R. Palmer Beasley, Norman Breslow, Marion K. Cooney, Irvin Emanuel, Charles Dohner, Polly Feigl, Hjordis M. Foy, James L. Gale, Betty Gilson, Carrie E. Hall, Jack B. Hatlen, Richard A. Kronmal, Morley K. Leyton, Caswell A. Mills, John E. Milner, Joseph Patterson, James J. Plorde, Bertina Wentworth

Instructors

John Fish, Patricia K. Patterson, Larry Wright

Lecturers

James Anderson, Seymour Standish

Research Associate Professors

Sen-Itiroh Hakomori, W. Daniel Kundin

Research Assistant Professors

Edwin S. Boatman, Harley H. Bovee, Peter Breysse, Kenneth S. W. Kim

Research Associates

Sanittar P. Dhir, William Freeman, Michael D. Lebowitz, Ruth McMahan, Carnick Markarian, Virginia L. Richmond, Hung-ju Yang

Research Instructors

Ann P. Carter, Glen Fairchild

The major areas of interest in the Department of Preventive Medicine are represented in the five divisions: Biostatistics, Environmental Health, Epidemiology and International Health, Experimental Laboratories, and Health Services. The Department provides required courses as part of the School of Medicine curriculum. In addition, courses are provided for undergraduate and graduate students in the areas listed above.

An environmental health curriculum leading to a B.S. degree is offered by this Department through the College of Arts and Sciences. A health education curriculum leading to a B.A. degree with a teaching certificate is offered through the School of Physical and Health Education.

Graduate Programs

Graduate Program Adviser

J. Thomas Grayston

F358A Health Sciences Building

The Department offers graduate programs leading to the degree of Doctor of Philosophy in the field of epidemiology or to the degree of Master of Science in the field of preventive medicine. It also provides an

approved residency program in preventive medicine, as well as postdoctoral research training. (For additional details, please see the professional bulletin of the School of Medicine.)

The faculty in Preventive Medicine participates in an interdisciplinary training program in Biostatistics, offered by the Biomathematics Group of the Graduate School, which leads to an M.S. or Ph.D. degree. For further information, see the *Interdisciplinary Graduate Degree Programs* section of this catalog.

PREVENTIVE MEDICINE— ENVIRONMENTAL HEALTH

Chairman

J. Thomas Grayston, M.D.
F358A Health Sciences Building

Preventive medicine is dedicated to the preservation of man's health and well-being through disease prevention. Environmental health is an area in the field of preventive medicine which is concerned with the influences of the total environment on man.

Undergraduate Program

Adviser

Jack B. Hatlen
F350 Health Sciences Building

The Department of Preventive Medicine offers a curriculum in environmental health leading to a Bachelor of Science degree from the College of Arts and Sciences. This program provides a combined liberal and technical orientation which has many practical applications. The technical aspects of the program in the natural sciences and health sciences prepares the environmental health major to evaluate and prescribe modifications of those environmental conditions which are detrimental to society. Areas of technical application include food and milk sanitation, air and water pollution, housing, vectors, industrial hygiene, and occupational health. Studies in the humanities and social sciences enable the environmental health major to communicate and relate to the people in the community. A major application of knowledge in the humanities and social sciences lies in motivating people to want to make changes which will modify the environment to the betterment of man's health and well-being.

GRADUATION REQUIREMENTS

Bachelor of Science

All requirements for a degree from the College of Arts and Sciences must be met.

Required courses include: Chemistry 140, 150, 151, 160, 170, and 231 or 102; Biology 101-102 or Zoology 111-112; Physics 114, 115, and 116, and Mathematics 105 or 124.

A total of 50 credits in preventive medicine and closely related subjects is required, including Preventive Medicine 323, 420, 422, 440, 441, 442, 450, 453, 472, 480, and/or 499. Related courses, which may be counted toward the necessary 50 credits, are Microbiology 301 or 400, Civil Engineering (CIVE) 350, Business, Government, and Society (BG&S) 200 or 307, Economics 200 or 211, Urban Planning 400.

PSYCHIATRY

Acting Chairman

Cornelis B. Bakker
BB869 University Hospital

Professors

Joseph Becker, Irving N. Berlin, Thomas H. Holmes, Herbert S. Ripley, Charles R. Strother

Associate Professors

Cornelis B. Bakker, John L. Hampson, Merlin H. Johnson, Kate L. Kogan, Minoru Masuda, Michael B. Rothenberg, Lindbergh S. Sata, Nathaniel N. Wagner

Assistant Professors

Hubert E. Armstrong, Jr., George C. Bolian, Douglas M. Bowden, Albert S. Carlin, John E. Carr, Hans O. Doerr, James A. Oakland, E. Mansell Pattison, Caroline E. Preston, Otto H. Spoerl, Ann P. Streissguth, James P. Spradley

Instructors

Frank I. Backus, Muriel King, Jackson D. Nickols, Werner H. Schemmelbusch, William M. Womack

Lecturer

Mary M. Campbell

Predoctoral Instructor

John C. Weschler

The Department of Psychiatry aims to provide a scientific grasp of psychiatric principles for students of medicine, nursing, psychology, social work, education, and others concerned with human problems. The emphasis is on the psychological aspects of the total functioning of the individual. This includes the study of personality development, with special recognition of the importance of environmental and social interaction factors for human behavior. Basic knowledge of the physical basis of the individual's functioning is assumed and integrated into the study of his behavior in health and disease.



Instruction in psychiatry is given during each of the four years of the medical course and is coordinated and integrated with the various disciplines in medicine. Thus, from the beginning of his medical career, the student is stimulated to think in terms of understanding the totally functioning human being.

RADIOLOGY

Chairman

Melvin M. Figley
SS230 University Hospital

Professors

Melvin M. Figley, Robert G. Parker, Frederic E. Templeton

Associate Professors

Hans Brichsee, Gerald M. Christensen, C. Benjamin Graham, Kenneth L. Jackson, Robert S. Leighton, John W. Loop, Wil B. Nelp, Leon A. Phillips, Peter Wootton

Assistant Professors

Arthur J. Gerdes, Mark Hafernian, Howard J. Ricketts, Rosalind H. Troupin

Instructors

Arthur S. Geller, Robert E. Schaefer, Lore Tenckhoff

Lecturer

William J. Bair, Ralph M. Baltzo

Radiology is the branch of clinical medicine that applies electromagnetic and nuclear radiations to the detection and treatment of disease. In diagnostic radiology, the differential absorption of penetrating radiation is detected by fluorescent crystals (fluoroscopy) or by photographic emulsions (radiography). The majority of important diseases have some radiologic expression. The diagnostic radiologist is, in effect, a general pathologist with special methods for nondestructive internal examination.

Therapeutic radiology depends upon the differential destruction of neoplastic cells by radiations. Many forms of cancer are best treated by radiation either for primary cure or palliation of symptoms. Of necessity, the therapeutic radiologist is a specialist in dealing with cancer.

The radiations emanating from disintegrating radioactive isotopes can be measured in quantity and energy and plotted spatially in living tissues as well as in samples of body fluids. Nuclear medicine is that branch of radiology which concerns itself with isotopes in organs and metabolic systems for diagnosis and treatment.

Radiation biology and radiation physics are the basic sciences related to clinical radiology having to do with study of the effect of radiations on living systems and the description of radiation fields in terms of geometry and intensity. Research in these aspects, including the development of instrumentation, is basic to progress in clinical radiology.

The Department of Radiology is represented in each of these divisions by senior staff with extensive practical experience. Instruction is provided in each area for medical students, residents, and other physicians. Certain courses are open to graduate students. The staff and its teaching and research activities are represented in each of the hospitals affiliated with the University.

SURGERY

Chairman

K. Alvin Merendino
BB479 University Hospital

Professors

John W. Bell, James R. Cantrell, David H. Billard, T. Lloyd Fletcher, Thomas L. Marchioro, K. Alvin Merendino

Associate Professors

John K. Stevenson, D. Eugene Strandness, Jr., Loren C. Winterscheid

Assistant Professors

Edwin C. Brockenbrough, J. Roland Folse, Eugene A. Hessel, II, Roger E. Moe, Hitoshi Mohri, Hubert M. Radke

Instructors

Robert W. Barnes, Cyril S. Ito, George E. Pierce, David S. Sumner

Research Instructors

Moses Namkung, Hsi-Lung Pan

In the Department of Surgery, instruction is carried on during all four years of the medical student's training and integrated with that of the other departments in the School of Medicine.

The purpose of the undergraduate instruction in surgery is to provide the student with a basic background of surgical principles and surgical diagnosis and a knowledge of surgical problems.

In addition to the basic undergraduate instruction, a fully certified surgical residency program is available in general and thoracic surgery.

Graduate Program

Graduate Program Adviser

David H. Dillard
BB447 University Hospital

The faculty in the Department of Surgery offer a program in the Graduate School leading to the degree of Master of Science.

Students participating in residency programs may apply for admission to the Graduate School to work toward a degree of Master of Science by meeting the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog. Performance of fundamental experimental research of high caliber is an additional requirement for this advanced degree.

More complete information concerning the Department of Surgery's programs is provided in the professional bulletin of the School of Medicine.

UROLOGY

Chairman

Julian S. Ansell
D416 Health Sciences Building

Professor

Julian S. Ansell

Associate Professors

Glover W. Barnes, Warren H. Chapman

Assistant Professors

J. William McRoberts, Norman R. Zinner

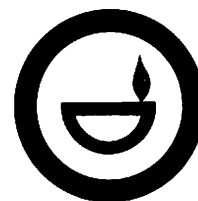
Instructors

Roy W. Skoglund, Jr., Arthur M. Sterling

Urology is the surgical discipline concerned with diseases of the male genitourinary organs and the female urinary tract. Training for medical students starts in the second year and continues through the third and fourth years.

Training is also provided for interns, nurses, and physical medicine technologists and allied specialists.

A urology residency program that is fully approved and certified is available.



NURSING

Dean

Madeleine M. Leininger
C309 Health Sciences Building

Associate Dean

Katherine J. Hoffman

Assistant Deans

Dorothy Crowley, Florence Gray

Professors

Elizabeth C. Giblin, Laurie Gunter, Katherine J. Hoffman, Kathleen M. Leahy (emeritus), Dolores Little, Louise Mansfield, Elizabeth S. Soule (emeritus), Mary S. Tschudin (emeritus)

Associate Professors

Marjorie V. Batey, Edna M. Brandt, A. Evelyn Burke, Doris Carnevali, Marguerite Cobb, Dorothy M. Crowley, Mildred Disbrow, Richard M. Emerson, Doris Geitgey, Florence I. Gray, Stella Hay, M. Edith Heine-mann, Margaret Hill, Virginia Olcott (emeritus), Oliver Osborne, Patricia Rose, Harriet H. Smith (emeritus), Jacqueline Vandeman

Assistant Professors

John R. Atkins, Mary Boozer, George Brengelmann, Pauline Bruno, Nada Estes, Elaine Gowell, Carrie Hall, Dorothy Hicks, Mary Jones, Margaret Linn Larson, Edith Metz, Helen Nakagawa, Geraldine Norris, Betty Pesznecker, Rosemary Pittman, M. Jean Saxon, Benita Sharp, Margaret Spaulding, Margo Stephens, Mary Thomas, Tomine Tjelta, Alma Ware, Barbara Williams, Vivian Wolf.

Instructors

Darlene Aanderud, Margaret Auld, Patricia Bentz, Linda Birum, Flora Breckenridge, Diana Brinton, Bernice Collar, Ruth I. Craven, Patricia A. FitzGerald, Susanna Garner, Janet George, Carol Gohrke, Helen Graves, Elizabeth Griffith, Virginia Haferkorn, Shirley J. Harlow, Emily Hitchens, Dorothy Hoshaw, Sheila Huang, Barbara Innes, Margaret John, Carla King, Joleen Kocke, Eileen McFadden, Aline Midthun, Barbara Minchin, Constance Nakao, Sharon Ogden, Patricia Patterson, June Penner, Marcene Powell, Joan Pontlana, Janet S. Reinbrecht, Jean Scheideman, Mary Louise Sebrey, Florence Smith, Margaret Smith, Susan Spangler, Muriel V. Standeven, Janet Treat, Esther Wallace, Judith West, Rosemary Witt, Elizabeth Worthy, Donna Zimmerman

Research Instructor

Helen Palisan

Associate

Carmela Campbell

Nursing has a unique role in assisting individuals, family units, and community groups to resolve health problems in the physical, emotional, and social environments. Individuals in our society are in continuous interaction with the changing environment as they strive to meet their basic human needs. Pressures from that interaction have an impact on the physical, emotional, social, cultural, and economic well-being of the individual, family, and community. Persons and social units

vary in their ability to deal effectively with stress and its results. Nursing encompasses the promotion of health; the conservation of health; and the care, treatment, and rehabilitation of the physically and emotionally ill of all ages in health centers, home, and community.

The University of Washington School of Nursing aims to prepare nurses who with experience and continued learning are expected to become increasingly proficient in meeting the nursing needs of people. The nurse collaborates with the physician as well as members of other disciplines in the achievement of therapeutic goals through devising and carrying out nursing care plans. Nurses use creative thinking in recognizing need for change, initiating change, and exercising judgment based on a sound foundation of scientific principles in relation to varying circumstances and technological advances. The professional nurse assumes the responsibility for directing those with less preparation to maintain the quality of patient care.

The School of Nursing offers undergraduate and graduate programs within the framework of the overall philosophy of the University of Washington. The faculty assumes the responsibility for the quality of its educational programs and for promoting effective nursing for the public through teaching, research, and service. The programs are designed to prepare professional nursing practitioners and to aid in the development of those who will serve in leadership roles in the transmission and advancement of nursing knowledge. The curriculums permit the student to develop increasing responsibility for her own learning; for developing a scientific attitude that promotes the critical investigation of ideas, independence of thought, and objectivity of observation; and for increasing the student's skill in organizing and synthesizing knowledge from many fields. The student brings this knowledge to bear upon the solution of typical nursing care problems of patients, families, and the community in meeting health needs.

The qualified student brings to the professional school a background from which she begins to make her individual contribution to nursing. The educational program promotes her professional and personal development. Opportunity for increasing self-direction in learning and in the management of her own life is essential. Breadth of academic background in the humanities and in the natural and social sciences contributes to fulfillment of professional responsibilities and personal interests.

General education and professional preparation compose the undergraduate curriculum leading to the de-

gree of Bachelor of Science in Nursing. They are designed to provide the basis for continuing personal and professional growth in the practice of nursing throughout the student's life. Successful completion of the program with the appropriate level of academic achievement enables the student to move directly into graduate study. The registered nurse who is a graduate of either a diploma or associate degree program follows the registered-nurse baccalaureate curricular pattern and the high school graduate follows the basic pattern in the undergraduate curriculum. The baccalaureate program includes approved preparation for community health nursing.

The School also offers programs leading to the degrees of Master of Arts and Master of Nursing. Students matriculated in another discipline for study toward a doctoral degree may elect a minor in nursing. Post-master's programs in advanced clinical study, planned on an individual basis, also are available.

THE GRADUATE PROGRAM

The graduate program in the School of Nursing is consistent with the philosophy of the Graduate School of the University of Washington. It is assumed that the student enters with basic knowledge and nursing ability as a professional practitioner and that her undergraduate education has provided her with a foundation in the liberal arts. Graduate offerings provide opportunity for the student to increase her clinical skills and develop teaching and research skills.

The faculty recognizes that each student comes with individual goals, and that the attainment of these goals will be achieved in various ways. Graduate study is characterized particularly by the student's involvement in independent study and research. Research followed by the sharing of results for critical review of one's colleagues is a component of all graduate programs. The results of independent study for the master's degree are set forth in a thesis.

The faculty believes there are theories and concepts that underlie all nursing and have relevance for all students, regardless of the field of special interest, and that there are some theories and concepts that may be more applicable to specialty areas. The use of theories from other fields, their reconceptualization for nursing, and the identification of theories peculiar to nursing are germane to graduate study. It is believed that there is a scientific rationale underlying the nursing process.

As part of a graduate program, each student will have an opportunity to test nursing theory, to observe and to analyze phenomena in the patient-care situation in a specific clinical area, to identify researchable problems,



and to specialize in one area of knowledge. The curriculum includes theory basic to teaching and/or administration and supervision in nursing. Opportunity for the application of these theories will be provided throughout the clinical field experience. The student thus is given a base for continuing the refinement of these competencies after graduation.

The School offers supplementary work in community-health nursing preparation. All programs are fully approved by the National League for Nursing.

Majors in nursing are held responsible for knowing and adhering to the rules and regulations of the University of Washington and the School of Nursing. Because the School has a responsibility to the public and to the profession of nursing, it must require of its graduates not only adequate knowledge of nursing theory and practice, but also the qualifications which are important to a professional nurse. Maintenance of good relationships with patients and co-workers, good physical and mental health, and a sincere interest in people are important for a successful nursing career.

The School of Nursing reserves the privilege of retaining only those students who, in the judgment of the faculty, satisfy the requirements of scholarship, health, and personal suitability to practice nursing.

Nursing education at the University began in 1917, under the leadership of Mrs. Elizabeth S. Soule, with a pre-nursing program consisting of a few public health nursing courses for graduates of hospital schools of nursing. These offerings were extended until both undergraduate and graduate programs were developed. In 1931, the integrated baccalaureate program was initiated in the Department of Nursing Education in the College of Arts and Sciences, and in 1945 the School of Nursing became an independently organized professional school in the Division of Health Sciences.

School Facilities and Services

The School of Nursing is part of the Division of Health Sciences, which is composed of the Schools of Dentistry, Medicine, Nursing, and Social Work, and the College of Pharmacy.

The Health Sciences Building, located at the south end of the campus near the Portage Bay Yacht Basin, houses the administrative units of the Schools of Nursing, Dentistry, and Medicine, a variety of classrooms, research and laboratory facilities, a library, and an auditorium. The University Hospital, adjacent to the Health Sciences Building, which was opened in May 1959, has a 320-bed capacity. It provides extensive inpatient and outpatient departments and is an

excellent teaching and research facility for students in nursing and other health sciences fields.

In conducting the undergraduate and graduate clinical teaching programs, the School of Nursing utilizes the facilities of the University Hospital with a bed capacity of 320; Harborview Medical Center, with a bed capacity of 398; Swedish Hospital Medical Center, with a bed capacity of 453; Virginia Mason Hospital, with a bed capacity of 280; The Doctors Hospital, with a bed capacity of 239; the United States Veterans Administration Hospital, with a bed capacity of 328; and St. Frances Xavier Cabrini Hospital, with a bed capacity of 246. Hospitals offering health care for selected individuals or specific illnesses include the Children's Orthopedic Hospital and Medical Center, with a bed capacity of 224; Firland Sanatorium, with a bed capacity of 239; the Seattle Mental Health Institute, with a bed capacity of 26; and Western State Hospital, with a bed capacity of 1800. Experience in community health nursing is arranged through the public health departments of Seattle-King County, Tacoma-Pierce County, Snohomish County, Bremerton-Kitsap County, Benton-Franklin County, Clark-Skamania County, and Bellingham-Whatcom County. Other community facilities are used, as necessary, to provide selected learning experiences for students.

Associated Nursing Students

All students registered in the basic program of the School of Nursing are eligible for membership in the Associated Nursing Students organization. By belonging to ANS, students are eligible to belong to SWANS (State of Washington Association of Nursing Students), which is made up of students from all the schools of nursing in the state. As a member of SWANS, a student is automatically a member of the National Student Nurse Association.

Among the functions of ANS are those that provide for unity and fellowship among classes, the promotion of interest in nursing, and the promotion of the interests and welfare of the nursing student.

Students may qualify for membership in Sigma Theta Tau, the national honorary society in nursing, by maintaining a cumulative grade-point average of 3.30 and evidence of leadership qualities.

Alpha Tau Delta, a national honor society for college women in nursing, has a chapter at the University of Washington. Students are eligible for membership upon completion of the first year of the basic program or current enrollment as a registered nurse in the baccalaureate program and a cumulative grade-point average of 2.75 or better.

Admission

Freshman Admission

To prepare for normal progress in the School of Nursing, the student requesting admission as a freshman is expected to meet the scholastic criteria that all students meet for entrance to the University. In addition, students are advised to select chemistry as their first laboratory science. A course in physics and a third year of mathematics are strongly recommended, and a fourth unit in English will be found helpful.

Progression to the Clinical Program

Clinical facilities in the anatomy-physiology laboratories are limited, necessitating an enrollment quota that will apply for the second year (sophomore) of the program. Admission into the second year, either by progression of freshman students currently enrolled or by students wishing to transfer from other institutions, is selective and limited in number. The enrollment quota for the second year will be filled with preference given to those applicants judged by the School to be best qualified to undertake the program. Equal consideration will be given to applications from students already enrolled in the School or seeking transfer to it from elsewhere on the University campus or from another institution. Prospective nursing transfers should write to the Undergraduate Advisory Office of the School of Nursing before the end of the Autumn Quarter prior to the year they wish to enter the second year of the Nursing program. Selection of the class for the second year will be made prior to the beginning of the Summer Quarter preceding the Autumn Quarter of the second year. Selection of students for the second year will be based on: (1) the applicant's scholastic standing in high school and college; (2) available test scores; (3) evidence that 45 credits and (4) the prerequisite courses (including organic and inorganic chemistry) will be completed before entrance into the Autumn Quarter of the second year.

Admission With Advanced Standing

Available clinical facilities place certain limitations on the number of transfer students who may be accepted into the third and fourth years of the nursing program. Not all students who apply and meet minimum standards of the University can be placed in the School of Nursing. Students will be selected to the extent that facilities are available and according to the qualifications they present.

Applicants who are registered nurses must be graduates of an approved community college or hospital school of nursing whose curriculum included psychiatric nursing.

Registered nurse applicants for admission to advanced undergraduate standing should request their school of

nursing to send two copies of their record to the University of Washington Office of Admissions as part of the admission procedure. The planned sequence of nursing courses begins Autumn and Spring Quarters.

Unclassified-5 Students

Students holding a baccalaureate degree in nursing with a deficiency in basic community-health nursing and/or psychiatric nursing may be admitted with an unclassified-5 status. A student admitted to the unclassified-5 status is not in the Graduate School.

Admission to Graduate Standing

Admission to the graduate programs of the School of Nursing requires acceptance by the Graduate School as well as admission to the School of Nursing. (See *Graduate Study* section of this catalog.) Applicants must be graduates of a baccalaureate program with an upper-division major in nursing, not necessarily accredited by National League for Nursing, but comparable to that of the University of Washington. Professional experience is not required prior to admission to the graduate program. Graduate Record Examination (Aptitude Test) and successful completion of a basic course in statistics are required prior to admission.

Extra Fees and Expenses

In addition to usual tuition and fees, students should be prepared to pay the cost of transportation between the University campus and the teaching units. This amount will vary from quarter to quarter. Basic degree students should plan approximately \$85.00 for the purchase of uniforms in the sophomore year and approximately \$5.00 for special achievement tests throughout the program. Graduate students who are matriculated for advanced degree programs should plan to have available approximately \$150 for costs connected with the preparation of their master's thesis.

Community health nursing field instruction during the senior year may be in one of several agencies either in or outside of Seattle. The student must be prepared to have a car for use during the field instruction quarter, have a current driver's license, and meet state requirements for insurance protection.

Licensure

Nurses who are graduates of approved nursing programs may be admitted to the School of Nursing prior to completion of the State Board Examination, but continuation in either the undergraduate or graduate program requires that students be currently licensed to practice nursing in some state or country. Nurses who expect to be employed in nursing while attending the University must be licensed to practice in the state of Washington and may apply to the State Board of Pro-



Professional Nurse Registration, Department of Licenses, Olympia, Washington.

Health Care

All students in the School of Nursing are required to take a special health examination, chest X rays, and inoculation for smallpox, tetanus, poliomyelitis, and diphtheria before beginning clinical laboratory courses. Physical defects must be corrected at the student's own expense. Students are expected to assume initiative in following the health program. Basic undergraduate students should see details of health care requirements listed in the *Handbook for Nursing Students*, available from the University Book Store.

Financial Assistance

A number of scholarships, awards, and loans are available to qualified entering or currently enrolled students and are administered by the University of Washington Office of Financial Aid, 3939 University Way N.E., Seattle, Washington 98105. Information, application forms, and the University of Washington Handbook of Financial Assistance, listing various forms of financial assistance available, can be obtained by contacting the Financial Aid Office. Information is also available in the undergraduate advisory office of the School of Nursing. All students are encouraged to investigate resources in their communities for possible scholarships or other financial aids.

Undergraduate Scholarships, Awards, and Loans for Nursing Students

Currently enrolled students are expected to anticipate their financial needs and apply to the Office of Financial Aid within the published dates. This is usually in February preceding the next academic year. In an emergency, however, students with a satisfactory grade-point average may make a request for assistance directly to the Scholarship, Award, and Loan Committee through the undergraduate advisory office of the School of Nursing.

General University scholarships are awarded on a competitive basis according to (1) scholarship achievement above the 3.00 (B) grade-point average, (2) financial need, and (3) participation in the extracurricular activities of the campus and community. Students who are preparing to enter the field of community health nursing may apply, upon recommendation of their program adviser, for a Goldsbury Memorial Scholarship.

The Swedish Hospital Medical Center Award is given by the Board of Directors to the outstanding basic student at the end of the junior year. Candidates are selected on the basis of scholarship and contribution to the community, the University, and the School of Nursing.

Application for federally funded grants, loans, and scholarships may be made through the Nursing Scholarship Program in the Office of Financial Aid. Qualified registered nurse students may apply for federal grants and traineeships for the final four quarters of the curriculum. Basic and registered nurse students who anticipate continuing with graduate study in psychiatric nursing, and who meet requirements, may be considered for the National Institute of Mental Health Traineeship during the junior and senior years of the nursing program. Application for federal grants and traineeships may be made to the Dean of the School of Nursing, and information may be obtained through faculty advisers.

Educational Programs Offered by the Military Services

The Army Student Nurse Program provides two years of educational opportunity on enlisted reserve status during the junior and senior years of the curriculum. Six months prior to graduation those under this program are commissioned as second lieutenants of the Army Nurse Corps. Upon completion of the basic nursing program and licensure as a registered nurse, participants serve on active duty for either two or three years, the duration determined by time spent in the student nurse program.

The Navy Nurse Corps Candidate Program offers a similar opportunity for qualified students during the junior and senior years. Upon graduation and licensure as registered nurses, appointees under this program will be obligated to accept appointment as ensigns in the Nurse Corps of the Naval Reserve and to serve on active duty for a period determined by the time spent in the student nurse program.

Undergraduate registered nurse students in the baccalaureate program may apply for appointment in the Army or Navy Student Nurse Programs discussed above.

Students in the baccalaureate programs may also apply to the Officer Student Training and Extern Program offered by the U.S. Department of Health, Education, and Welfare.

Postbaccalaureate and Graduate Traineeships, Assistantships, and Fellowships

The University of Washington participates in the Professional Nurse Traineeship Program as administered by the Division of Nursing of the U.S. Public Health Service. This program offers a limited number of traineeships for qualified applicants who are preparing for administration, teaching, supervision or clinical specialization in nursing, including community health nursing. Under the program of the National Institute of Mental Health a limited number of traineeships are

available for nurses eligible for advanced study in psychiatric nursing, and for psychiatric nurses who are seeking doctoral level study in other disciplines.

Graduate students are eligible to apply to the Office of Financial Aids for a National Defense Loan under the Nurse Training Act of 1964.

Under a grant from the Public Health Service, traineeships are available for a limited number of students enrolled in the Nurse-Scientist Graduate Program leading to the Doctor of Philosophy degree.

A limited number of traineeships for post-master's study in mental retardation are available under a program supported by the Children's Bureau, Department of Health, Education, and Welfare.

A post-master's program in rehabilitation nursing offers a limited number of traineeships under a grant from the Rehabilitation Services Administration, Department of Health, Education, and Welfare.

Applications for the above traineeships should be made directly to the Graduate Program Adviser of the School of Nursing.

The Graduate School provides for the employment of teaching and research assistants. (See *Graduate Study* section.) Foreign students on an educational visa are eligible to apply for such assistantships. Requests for assistantship application forms should be sent to the Graduate Program Adviser, School of Nursing.

Predoctoral students with a major in another discipline and a minor in nursing may be eligible for financial assistance through one of the following fellowship programs. Applications should be made directly to the agency administering the fellowship. *The United States Public Health Service Fellowship*: Chief, Research Grants Branch, Division of Nursing, Public Health Service, DHEW, 506C Tower Building, 800 North Quincy Street, Arlington, Virginia 22203. *The Nurses Educational Fund Incorporated*: 10 Columbus Circle, New York, N.Y. 10019. *The American Nurses Foundation*: 10 Columbus Circle, New York, N.Y. 10019.

Army Nurse Corps Candidate Program

A graduate student in nursing participating in this program is commissioned in the Army Nurse Corps, U.S. Army Reserve, as second or first lieutenant. Under this program the nurse agrees to remain as a commissioned officer with the Army Nurse Corps for either two or three years, excluding time spent in school.

Navy Nurse Corps Candidate Program

Graduate students who are accepted incur the same service obligations as do undergraduate candidates. Upon completion, they are commissioned as ensigns,

lieutenants junior grade, or lieutenants, depending upon their professional nursing experience.

Nursing Education Award

The Nursing Education Award is granted annually to the outstanding graduate of each of the programs of the School of Nursing. Candidates are selected on the basis of their scholarship, their contribution to the community, the University, and the School of Nursing, and their potential contribution to the profession of nursing.

UNDERGRADUATE PROGRAMS

Assistant Dean and Director of Undergraduate Programs

Florence Gray

D325 Health Sciences Building

Advisers

Doris Carnevali, Stella Hay, Esther Wallace

D325 Health Sciences Building

Bachelor of Science in Nursing

The curriculum leading to the Bachelor of Science in Nursing degree is designed for two types of students; one is the student with no previous preparation in nursing; the other, the student who is a graduate of a hospital or community college school of nursing. For the student with no previous preparation in nursing the curriculum is planned for four academic years and one summer session at the end of the sophomore year. For the student who is a registered nurse, the length of the program will vary depending on her previous education and the course load carried while at the University. There is a close interrelationship between the general and professional aspects of the program. The distribution of required courses provides a balance between general and professional education. An academic adviser will assist the student in the selection of the appropriate courses and will make suggestions for electives in the humanities and social sciences which will contribute to the individual's intellectual and personal development. One of the ways in which the student may take advantage of a wider selection of course offerings is through the pass/fail option. Since Autumn Quarter 1968, students registered in the undergraduate program of the School of Nursing have been privileged to utilize the pass/fail option in any course except those normally required of all students. Credit from courses using the pass/fail option is accepted as meeting degree requirements of the School of Nursing within the framework of a maximum of 25 credits, with no more than 5 credits allowed in any one quarter, after satisfactory completion of 45 credits at the University of Washington.



Mathematics Proficiency

Because an elementary proficiency in mathematics or logic is becoming more and more necessary in the study of the natural and social sciences that make up a large portion of the nursing curriculum, and because it is an expected accomplishment of the educated person, each student who enters the School of Nursing as a freshman or as a beginning or transfer student in the registered nurse program is expected to meet a proficiency requirement in mathematics or logic. This requirement may be satisfied by one of the following:

(1) Presenting a score of 55 or better in the mathematics achievement test included in the Washington Pre-College Testing Program, or by presenting grades of B or better in each of three years of college preparatory mathematics in high school

(2) Completing Mathematics 101, Intermediate Algebra

(3) Completing Philosophy 120, Introduction to Logic

Clinical Instruction

Clinical instruction is provided in all of the major fields of nursing: medical-surgical, maternal-child health, psychiatric, mental-health and community health nursing. This instruction is carried on in a variety of hospitals and other community facilities.

Community health nursing field instruction during the senior year may be in one of several agencies either in or outside of Seattle. The student must be prepared to have a car for use during the field instruction quarter, have a current driver's license, and meet state requirements for insurance protection.

Distribution of required courses:

Area	Credits
Nursing	88
Related Medical Sciences	9
Physical and Biological Sciences	32
Humanities	24
Social Sciences	14
Electives (Humanities/Social Sciences)	13
Total	180

Plus 3 credits in physical education

Students With No Previous Preparation in Nursing

Study in the arts and sciences is distributed over the first three years. Professional nursing study is dispersed throughout the curriculum, but greater concentration is provided during the junior and senior years.

Graduates of the program are prepared to enter nursing practice in all clinical fields of nursing. They are eligible to take the state licensing examination to become registered nurses.

Requirements are:

Area	Credits
Nursing (227, 228, 229, 260, 298, 299, 301, 367, 368, 369, 370, 371, 372, 373, 374, 409, 412, 413, 414, 415, 416, 421, 422, 429)	88
Related Medical Sciences (Preventive Medicine 323, 410, and Pharmacy 352)	9
Physical and Biological Sciences (Chemistry 101, 102, Mathematics 101, Microbiology 301, Conjoint 316, 317-318)	32
Humanities (English 101 and 102 or 103 required and other electives are desired)	24
Social Sciences (Psychology 100, Sociology 110, Home Economics 319)	14
Electives in Humanities/Social Sciences	13
Total	180

Plus 3 credits in physical education

CURRICULUM

First Year

AUTUMN QUARTER	CREDITS
CHEM 101 GENERAL	5
ENGL 101 INTRODUCTORY	3
HUM ELECTIVE	5
ELECTIVE (HUM. OR SOCIAL SCI.)	2
P E ACTIVITY ELECTIVE	1
	16

WINTER QUARTER	CREDITS
CHEM 102 GENERAL AND ORGANIC	5
ENGL 102 OR 103 INTRODUCTORY ENGLISH	3
HUM ELECTIVE	5
ELECTIVE (HUM. OR SOCIAL SCI.)	2
*P E 184 BASIC ACTIVITY APPLIED	1
	16

SPRING QUARTER	CREDITS
ELECTIVE (HUM. OR SOCIAL SCI.)	2
HUM ELECTIVES	8
PSYCH 100 GENERAL	5
P E ACTIVITY ELECTIVE	1
	16

Sociology 110 or Psychology 100 may be taken in either the freshman or sophomore year.

* Physical Education 184 recommended but not required.

Courses in the freshman year may be taken in any accredited college, or university. The remainder of the program is to be completed at the University of Washington. Students who wish to transfer to this School from another university school of nursing may be admitted to the basic professional program if they qualify for admission to the University and there are facilities available in the class they wish to enter. (See Admission With Advanced Standing.)

Registered Nurse Pattern

The registered nurse pattern differs in sequence and learning experiences from the basic pattern for students with no preparation in nursing, but is designed to attain the same goals.

Students with less than 45 transfer credits who have not taken the Washington Pre-College Test and who are younger than twenty-three years of age must take the test before their first registration. The 45 transfer credits are exclusive of physical education and military training. Students entering without acceptable transfer credits in English 101 (Introductory English) and Mathematics 101 (Intermediate Algebra) or Philosophy 120 (Introduction to Logic) must take the English and mathematics sections of the Washington Pre-College Test.

A registered nurse student may be allowed a limited number of credits in nursing on the basis of the results of a Comprehensive Nursing Placement Examination on selected nursing courses administered at the University of Washington. An appointment to take these examinations may be requested of the Bureau of Testing at the University, at any time, but must be completed at least five working days prior to registration. Credits earned in biological and physical sciences and family nutrition ten years prior to entering the program are not acceptable.

The registered nurse pattern of approach to the baccalaureate degree varies from that listed for the basic pattern in the requirement for Social Work 401, a two credit course, and in the required nursing courses at the 300 level that build on the competencies the student brings to the program. These are Nursing 351, 353, 354, 356, and 358. Nursing courses taken with the students in the basic pattern are as follows: Nursing 298, 299, 301, 412, 415, 416, 421, 422, and 429. Otherwise, the requirements listed for the areas of Related Medical Sciences, Humanities, Social Sciences, and Elective in Humanities or Social Sciences are essentially the same.

Registered nurse students are urged to carry professional liability insurance.

Other Programs

Supplementary Community Health Nursing Program

Supplementary study to prepare the registered nurse holding a baccalaureate in nursing or higher degree for community health nursing is available. The program extends over two quarters and includes a minimum of 20 credits in required and elective courses. At least half the course credits must be in nursing. The program must include community health nursing field practice and at least 5 credits in preventive medicine. Satisfactory completion of the program will be noted on the student's transcript.

School Nurse Certification

Supplementary study to prepare the registered nurse holding a baccalaureate degree in nursing that includes an accredited component in community health nursing for school nurse certification is jointly planned and administered by the College of Education and the School of Nursing. The College of Education and the School of Nursing review credentials and make recommendations for either provisional or standard certification: the College of Education on completion of the professional education requirements, the School of Nursing on completion of the nursing requirements.

Affiliate Program

Community health nursing theory and field courses and upper-division psychiatric nursing theory and field courses are open to students enrolled in certain university schools of nursing.

Affiliating students enroll in the University and the School of Nursing for the quarter that they are taking the designated courses. They are required to meet the admission requirements prescribed by the University and must pay the usual tuition and fees. University credit is granted upon successful completion of the courses.

GRADUATE PROGRAMS

Director of Graduate Programs

Katherine J. Hoffman

Graduate Program Adviser

Edith Metz

D311 Health Sciences Building

The School of Nursing offers graduate curriculums leading to degrees of Master of Arts and Master of Nursing. Post-master's programs planned on an individual basis are also available, including a doctoral minor for students matriculated in another discipline.



Master's Programs

Majors are offered in these nursing areas: maternal-child, medical-surgical, psychiatric-mental health, community health, and administration of nursing services. The major area includes advanced clinical study with opportunity for functional preparation in teaching, supervision, or administration.

Most programs are four quarters in length, but the individual program may vary with the particular major field and the number of credits carried each quarter. At least half of the total credits taken must be at the 500 level or above. Each student in the master's degree program carries out independent study in nursing and presents a written thesis. Within the first quarter of graduate study, the student should, with the help of her major adviser, plan her entire program in order to ensure a satisfactory sequence of courses.

Master of Nursing: Emphasis is on advanced preparation in an area of specialization in nursing. Supporting courses from at least two fields outside of nursing are required. A foreign language is not required for this degree.

<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	19
Related Fields: courses in at least two other disciplines	12
Research: courses in research and thesis	14
	—
	45

Master of Arts: This program includes a major in nursing and a minor in another discipline. Students are encouraged to select a minor that will serve as a basis for further post-master study. Students are expected to meet the undergraduate prerequisites of the minor department. The required course work and exact number of credits for the minor are determined by the minor department. A student seeking this degree must demonstrate a reading knowledge of one foreign language.

<i>Area of Study</i>	<i>Credits</i>
Major: advanced nursing courses	19
Minor: courses in another discipline (min.)	12
Research: courses in research and thesis	14
	—
	(min.) 45

Post-Master's Programs

Students who hold the master's degree may enroll for an additional period of study at the post-master level for the purpose of gaining additional depth in an area of study, added breadth of preparation, and increased

knowledge and skill in nursing research. Post-master study is offered in the areas of maternal-child nursing, medical-surgical nursing, mental retardation, administration of schools of nursing, rehabilitation nursing, faculty preparation for associate degree nursing programs, and research in nursing. Individual programs of study may be planned in keeping with the student's scholarly interests and long-range professional goals.

Interdisciplinary Graduate Programs

The professional nurse who wishes to extend her formal study and to increase her scholarly and research competence may apply for admission to the predoctoral program in other disciplines. Suggested fields are business administration, education, genetics, history, or any other of the sciences basic to nursing. Individual special research fellowships are available in limited numbers.

Under a grant from the Public Health Service, the University of Washington offers a graduate program that is designed for the preparation of the nurse-scientist and leads to the Doctor of Philosophy degree. The student in this program may elect to major in one of several fields: anthropology, microbiology, physiology, or sociology. The minor field is nursing.

The School of Nursing offers a minor on the doctoral level for those students who are matriculated in other disciplines. The minor in nursing should total 35 graduate credits, of which at least half must be at the 500 level. The recommended sequence of courses for each student is determined in the light of her previous work and future goals.



PHARMACY

Dean

Jack E. Orr
102 Bagley Hall

Associate Dean

Louis Fischer

Professors

Lynn R. Brady, Louis Fischer, Forest J. Goodrich (emeritus), Nathan A. Hall, E. Roy Hammarlund, Alain C. Huitric, Edward Krupski, Walter C. McCarthy, Jack E. Orr, Elmer M. Plein, L. Wait Rising

Assistant Professors

Jerry L. McLaughlin, Wendel L. Nelson, Larry A. Spitznagle, Frank F. Vincenzi

Lecturer

Joy B. Plein

Research Associate Professor

Robert G. Benedict

Washington statutes define "practice of pharmacy" as "... the practice of that profession concerned with the art and science of preparing, compounding, and dispensing of drugs and devices, whether dispensed on the prescription of a medical practitioner or legally dispensed or sold directly to the ultimate consumer, and shall include the proper and safe storage and distribution of drugs, the maintenance of proper records therefor, and the responsibility of relating information as required concerning such drugs and medicine and their therapeutic values and uses in the treatment and prevention of disease."

The College of Pharmacy bears a responsibility to the public and to the profession to prepare qualified men and women for professional service in one or more of the fields of pharmaceutical practice and for responsible citizenship. A primary objective of the College is, therefore, the provision of an instructional program assuring academic and technical proficiency in the basic sciences and their pharmaceutical applications combined with education in the liberal arts. An equally important objective is the cultivation of high regard for professional ethics and the concept of service.

A third major objective of the College is the advancement of the level of professional practice and service through research. This search for new knowledge is indispensable in helping achieve the major goals of the health professions, the maintenance of public health and relief of human ills. The graduate program is designed to prepare advanced students for teaching and research careers in the specialized pharmaceutical sciences.

The College considers a program of continuing education essential in maintaining a high level of professional practice, and meets this objective through an extension program of seminars, institutes, short courses, lectures, and other services.

An almost unlimited number of opportunities exist for pharmacists as members of the professional team providing health care to the public. Holders of the Bachelor of Science in Pharmacy degree may be found in a



variety of settings wherever pharmaceutical services are rendered. The majority of graduates engage in the community practice of pharmacy and many are owners or part-owners of pharmacies. Still others become pharmacists in hospital and clinic pharmacies; medical representatives of pharmaceutical manufacturers; production, control, or research pharmacists in the manufacture of medicinal and other pharmaceutical products; personnel in wholesale drug distribution; food and drug control chemists, or inspectors for governmental health agencies; or pharmaceutical journalists.

Founded in 1894, the University of Washington College of Pharmacy adopted the present five-year curriculum in 1957. Since 1925 the College has accepted prospective candidates for the degree of Doctor of Philosophy with specialization in pharmaceutical and medicinal chemistry, pharmacognosy, and pharmacy.

The College of Pharmacy is within the Division of Health Sciences, and is a member of the American Association of Colleges of Pharmacy. It is accredited by the American Council on Pharmaceutical Education.

College Facilities and Services

Instruction in pharmacy is centered, along with instruction in chemistry, in Bagley Hall. This building was completed in 1937 and was named for one of the founders of the University, Reverend Daniel Bagley.

Among the College of Pharmacy facilities in Bagley Hall are laboratories for pharmacy, prescription practice, manufacturing pharmacy, pharmaceutical and medicinal chemistry, pharmacognosy, drug assaying, and research; a drug service department; and a stockroom.

The University Hospital Pharmacy and the Student Health Center Pharmacy serve as clinical training facilities for the College. Senior students are assigned on a regular schedule to these pharmacies where they gain practical experience in compounding and dispensing prescriptions under the direction of staff pharmacists. The University Hospital Pharmacy and 16 other hospital pharmacies in Seattle serve as laboratories for the undergraduate and graduate programs in hospital pharmacy. The programs are directed by the Coordinator of Pharmaceutical Services, and laboratory instruction is given by the hospitals' chief pharmacists, each of whom holds the University rank of clinical instructor in pharmacy.

The Drug Plant Gardens of the College comprise approximately three acres of garden area, including a laboratory building that contains five greenhouses; three research laboratories; drug drying, milling, and extraction equipment; a darkroom, and a preparation room. Several hundred species of pharmaceutically important

plants are maintained in the gardens and greenhouses. One greenhouse is devoted to plants of tropical habitat; others are used for student instruction in methods of drug plant culture and for research in plant-growth regulators and the biosynthesis of plant constituents. An extensive seed exchange program is conducted with medicinal plant gardens throughout the entire world.

The drug service facility manufactures specialized pharmaceutical preparations for the Schools of Medicine and of Dentistry, the Student Health Service (Hall Health Center), the University Hospital, and other sections of the University. Much of the work done by this facility is in formulation and product development of drugs and dosage forms to be used in clinical and experimental research.

The College maintains a laboratory for the analysis of food products submitted by the Office of the Director of the State Department of Agriculture, drugs submitted by the State Pharmacy Board, and alcoholic products for the State Liquor Control Board. The Dean of the College is the State Chemist.

Various pharmaceutical manufacturing companies encourage pharmacy students to visit their plants and to become acquainted with their facilities. To help students take advantage of these tours, the companies provide hotel facilities and meals during the visits. Every other year a group of students from the College of Pharmacy, with a faculty adviser, makes a trip of about ten days, spending a day or two with each company. These tours enable students to observe pharmaceutical manufacturing in some of the world's largest and most modern plants.

The American Pharmaceutical Association, established in 1852, maintains student chapters so that students in the various colleges of pharmacy may join the national organization. The campus branch meets monthly during the academic year and sponsors lectures, social functions, and field trips. All students in the College are eligible for membership.

Upon graduation, affiliation with the organization may be continued on a full-membership basis. There are many active chapters, located in various parts of the country, in which the member may continue his association. One of these, the Puget Sound Chapter of the American Pharmaceutical Association, has its headquarters in Seattle.

Honorary and Fraternal Societies

Election to membership in *Rho Chi*, the pharmaceutical honor society, is on the basis of high scholarship and professional promise. *Rho* Chapter, at the University of Washington, one of 68 collegiate chapters, was established in 1932. Students who have completed 60 per

cent of the credits required for graduation in pharmacy with a grade-point average of at least 3.00 are eligible for membership. The purpose of *Rho Chi* is to promote the scientific advancement of pharmacy and to encourage high academic attainments.

Kappa Psi is a national professional pharmaceutical fraternity dedicated to the promotion of industry, mutual fellowship, high ideals, and high scholarship among its members, and to fostering pharmaceutical research. The University of Washington chapter, *Beta Omicron*, is one of 58 collegiate chapters and sends delegates to the Grand Council, which meets biennially. The campus chapter meets twice a month in alternate business and social meetings.

Lambda Kappa Sigma, the oldest and largest pharmaceutical sorority in the world, promotes the profession of pharmacy among women. There are now 37 collegiate and 19 alumnae chapters. *Chi* Chapter, at the University of Washington, participates in many activities. New members are selected during the first professional year on the basis of character, scholarship, and personality.

Employment

A list of positions open in retail and hospital pharmacies is maintained by the College of Pharmacy.

UNDERGRADUATE PROGRAMS

Adviser

Louis Fischer
300 Bagley Hall

Graduation Requirements

The pharmacy program is a five-year course of study which leads to a Bachelor of Science in Pharmacy degree. Students working towards the bachelor's degree in Pharmacy must meet certain general requirements of the University and the following College requirements: completion of the prescribed Pharmacy curriculum, with a minimum of 225 academic credits, plus 3 credits in physical education activity; completion of 8 credits in approved business administration courses and 29 credits in approved humanities and social sciences courses. The student must have a cumulative grade-point average of 2.00 (C) in the professional courses and an over-all cumulative average of 2.00 (C). No more than 18 credits in advanced ROTC courses and no more than 6 credits in professional courses numbered 499 may be applied toward graduation.

Licensure

In order to be admitted to the practice of pharmacy as a registered pharmacist in the state of Washington, the candidate must graduate from an accredited college of

pharmacy, complete the internship requirements as prescribed, and pass the licensing examination.

After enrollment in the College of Pharmacy, the student should file with the State Board of Pharmacy an application for registration as a pharmacy intern (fee \$1.00). The Board requires 1,800 hours of internship experience, of which 600 hours must be served after graduation from an accredited college of pharmacy. This experience must be obtained in a licensed pharmacy meeting the requirements promulgated by the Board. Experience gained before registration as a pharmacy intern, or during the school term, may not be counted toward the licensure requirement.

The examination for licensure may be taken only after completion of the internship requirement.

Further information about licensure requirements may be obtained from the State Board of Pharmacy, Washington Education Association Building, 319 7th Ave., Olympia, Washington 98501.

Curriculum

First Year

AUTUMN QUARTER		CREDITS
*CHEM 100	CHEMICAL SCIENCE	5
CHEM 140	GENERAL	3
ENGL 101	INTRODUCTORY ENGL	3
MATH 105	COLLEGE ALGEBRA	5
APPROVED ELECTIVE		4
†PHYSICAL EDUCATION ACTIVITY		15

WINTER QUARTER

CHEM 150	GENERAL	3
CHEM 151	GENERAL LAB	2
MATH 124	CALC. WITH ANALYT. GEOM.	5
OR		
MATH 157	ELEMENTS OF CALC.	4
†PHYS 114 AND 117 GENERAL AND LAB		5
†PHYSICAL EDUCATION ACTIVITY		14-15

SPRING QUARTER

CHEM 160	GENERAL	3
CHEM 170	QUAL. ANALYSIS	3
ENGL 102 OR 103	INTRODUCTORY ENGL	3
PHYS 115 AND 118	GENERAL AND LAB	5
APPROVED ELECTIVE		2
†PHYSICAL EDUCATION ACTIVITY		16

Second Year

AUTUMN QUARTER

PH CH 237	ORGANIC	3
BIOL 210	INTRODUCTORY BIOL.	5
PHYS 116 AND 119	GENERAL AND LAB	5
ENGL OR SPEECH		2 or 3
		15-16

WINTER QUARTER

PH CH 238	ORGANIC	3
PH CH 248	ORGANIC LAB	3
BIOL 211	INTRODUCTORY BIOL.	5
APPROVED ELECTIVES		4
		15

SPRING QUARTER

PH CH 239	ORGANIC	3
PH CH 249	ORGANIC LAB	3
BIOL 212	INTRODUCTORY BIOL.	5
APPROVED ELECTIVES		3
		14



Third Year

AUTUMN QUARTER		CREDITS
PH CH 325	QUANT. PHARM. ANAL.	5
PHARM 328-	PHARM. CALC.	0-
PHARM 331	GENERAL AND PHYS. PRINC.	4
P BIO 360	GENERAL HUM. PHYSIOL.	5
		14

WINTER QUARTER

PHCOL 301-	GENERAL PHARMACOLOGY	4-
PHARM -329	PHARM. CALC.	0-
PHARM 332	GENERAL AND PHYS. PRINC.	4
BIOC 405	INTRO. TO BIOCHEMISTRY I	3
MICRO 445	INTRO. MED. MICRO	5
		16

SPRING QUARTER

PHCOL -302	GENERAL PHARMACOLOGY	-5
PHARM -330	PHARM. CALC.	-1
BIOC 406	INTRO. TO BIOCHEMISTRY II	3
APPROVED ELECTIVE		5
		14

Fourth Year

AUTUMN QUARTER

PH CH 440	MEDICINAL CHEM.	3
PHCOG 412	GENERAL PHARMACOGNOSY	4
APPROVED ELECTIVES		8
		15

WINTER QUARTER

PH CH 441	MEDICINAL CHEM.	3
PHCOG 413	GENERAL PHARMACOGNOSY	3
APPROVED ELECTIVES		6
P MED 323	PUBLIC HEALTH PRIN. AND PRACT.	3
		15

SPRING QUARTER

PH CH 442	MEDICINAL CHEM.	3
PHCOG 414	GENERAL PHARMACOGNOSY	2
APPROVED ELECTIVES		10
		15

Fifth Year

AUTUMN QUARTER

PHARM 407	DISPENSING	4
PHARM 450	PHARM LAWS	3
APPROVED ELECTIVES		8
		15

WINTER QUARTER

PH CH 497	TOXICOLOGY	2
PHARM 408	DISPENSING	3
APPROVED ELECTIVES		10
		15

SPRING QUARTER

PHARM 409	DISPENSING	3
PHARM 452	CONTEMPORARY PROBLEMS	1
APPROVED ELECTIVES		11
		15

GRADUATE PROGRAMS

Graduate Program Adviser

Jack E. Orr

102 Bagley Hall

Admission

Students who intend to work toward a Master of Science or Doctor of Philosophy degree must apply for admission to the Graduate School and meet the requirements outlined in the *Graduate Study* section. Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded. Graduate study requires approval of both the College of Pharmacy and the Graduate School.

Students with undergraduate degrees in pharmacy or in the biological or physical sciences are accepted for graduate study in the pharmaceutical sciences. Students without undergraduate degrees in pharmacy will be required to complete courses basic to their chosen field of study during their graduate careers.

Undergraduates who plan to pursue graduate study may expedite their programs by selection of pertinent electives. Although the choice of electives will vary with the identity of the student's selected field in the pharmaceutical sciences it should be emphasized that graduate studies in the College of Pharmacy require adequate preparation in the physical and biological sciences, in mathematics, and in foreign language. Mathematics through calculus and courses in physical chemistry, qualitative organic chemistry, and biochemistry should be taken prior to admission to graduate study. However, students who have not completed certain desired courses during their undergraduate work may be permitted to do so during their graduate programs.

Specialization is offered in pharmaceutical and medicinal chemistry, pharmacognosy, pharmacy, and hospital pharmacy. Graduate study toward an advanced degree in pharmacology is directed by the Department of Pharmacology of the School of Medicine. The hospital pharmacy program may include a hospital pharmacy internship or residency if desired by the student.

Graduate programs of study vary with the specialization selected. Although the programs are flexible, certain general recommendations may be made. In addition to studies in their chosen field, students with specializations in pharmaceutical chemistry and pharmacy are required to follow programs of course work usually selected from advanced courses in organic chemistry, physical chemistry, biochemistry, or radiochemistry. A course in statistical methods or a course in computer programming is basic to all programs.

For specialization in hospital pharmacy, courses in the basic medical sciences are necessary in addition to the specialized courses in hospital pharmacy and manufacturing pharmacy.

For specialization in pharmacognosy, courses in organic chemistry, biochemistry, and plant physiology are basic to most programs. These are generally best supplemented by courses in plant anatomy, taxonomy, micro-

*Chemistry 100 (5 credits) required of students with no high school chemistry.

†See *College of Arts and Sciences* section for physical education activity requirement.

‡Working knowledge of trigonometry required. Students who have completed a unit of high school physics may be excused from physics laboratory (3 credits).

biology, mycology, specialized courses in organic chemistry, analytical chemistry, and physical chemistry.

All graduate students are encouraged to pursue additional courses in the pharmaceutical sciences other than their fields of specialization. Specific recommendations based upon individual interests, and information concerning courses may be obtained from the chairman of the department concerned or from the Graduate Program Adviser.

Master of Science

A student in this program must present at least 27 credits of course work, exclusive of thesis and nonthesis research. He must complete a research project, prepare an acceptable thesis, and pass a Final Examination. The student must present a certificate of proficiency in one foreign language.

Doctor of Philosophy

A student in this program must present a minimum total of 45 credits of course work, exclusive of dissertation and nonthesis research. The credits earned for the master's degree may be applied toward the doctor's degree. The student must pass a General Examination for admission to candidacy for the doctor's degree, complete a research project, prepare an acceptable dissertation, and pass a Final Examination. The research for the doctor's degree must be done at the University of Washington. The doctoral student must present a certificate of proficiency in one foreign language prior to the General Examination.

PHARMACEUTICAL SCIENCES

PHARMACEUTICAL CHEMISTRY

Chairman

Louis Fischer
300 Bagley Hall

The Department of Pharmaceutical Chemistry offers, for undergraduate students, courses which deal with the application of chemistry to the study of substances used in pharmacy and medicine. Advanced courses covering specialized techniques in pharmaceutical chemistry and medicinal chemistry are presented at the graduate level.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should contact the chairman of the Department before registration.

PHARMACOGNOSY

Chairman

Lynn R. Brady
303 Bagley Hall

Pharmacognosy deals with the biologic and chemical study of natural drug products employed as pharmaceuticals and medicinals. The Department of Pharmacognosy offers courses in the general aspects of plant and animal drug principles, including their sources, isolation, biosynthesis, identification, and uses. Other courses of advanced nature include the subjects of hormones, alkaloid biosynthesis, problems in drug plant cultivation, and pertinent current topics.

These courses are also available to qualified students from related science areas. The Department directs the activities of the Drug Plant Gardens and Laboratory. An extensive collection of living plants is maintained for experimental use.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should communicate with the chairman of the Department before registration.

PHARMACY AND PHARMACY ADMINISTRATION

Chairman

Nathan A. Hall
304 Bagley Hall

The Department of Pharmacy and Pharmacy Administration presents courses in pharmaceuticals dealing with the design of drug dosage form and the effect of pharmaceutical form on drug activity, as well as courses directly concerned with pharmacy practice and its management.

Building from a base of general education and applied sciences, individual courses offer studies of practice in different environments, such as the general commercial pharmacy, the patient care areas of medical institutions, and the hospital pharmacy. Postgraduate work is made available in continuing education, pharmaceuticals, hospital and clinical pharmacy. Several service courses are offered to nonmajors from other divisions of the University.

Students who have been admitted for work toward a Master of Science or Doctor of Philosophy degree should communicate with the chairman of the Department before registration.



SOCIAL WORK

Dean

Charles B. Brink
204 Eagleson Hall

Associate Dean

Calvin Y. Takagi
205 Eagleson Hall

Assistant Dean

Jerry L. Kelley
207 Eagleson Hall

Professors

Arthur C. Abrahamson, Charles B. Brink, Arthur S. Farber, David H. Gronewold, Marguerite Hunt, Thomas Fred Lewin, Henry W. Maier, Lawrence K. Northwood, Jack R. Parsons, Grace D. Reiss, Edmund A. Smith, Calvin Y. Takagi, Edna L. Wasser

Associate Professors

James Anderson, William C. Berleman, Ronald B. Dear, Moya M. Duplica, James Goodman, M. John Griswold, Carl Frederick Hanneman, James E. Herick, Benson Jaffee, Jerry L. Kelley, James W. Leigh, Catherine J. Macdonald, Robert W. Macdonald, Sidney Miller, LeNora B. Mundt, Alice Overton, Rino J. Patti, Gerald W. Pepper, Herman Resnick, Julianna Schmidt, Florence Ray Stier

Assistant Professors

Allethia L. Allen, Elwin Barrett, Janice M. DeLange, Jack A. Ellis, James G. Hoffman, Doris Jones, Robert Mears, Jerome R. Miller, Eugene Mochizuki, Robert Nelson, James R. Seaberg, Edward C. Teather, Bruce C. Weller

Lecturers

Annette L. Allen, Jack A. Bartleson, William A. Bell, Vernon E. Bryant, Cameron R. Dightman, Agnes E. Dixon, Donald K. Holmes, J. Frank Johnson, Anna K. Miller, Ross M. Peterson, Robert W. Reed

Social work is the professional service that helps mankind, individually and collectively, seek and find solutions to the problems of social welfare. In our increasingly scientific and industrialized society, the tasks of providing for man's economic, social, and emotional needs have become more immense and more complex, and are faced by all people. No longer can social problems be viewed as restricted to the poor, the felons, the mentally ill, and the handicapped.

Social work is rooted in public and private humanitarianism and in the principles of the great organized religions. Social workers now perpetuate these traditions in many capacities: from adoptive services for infants to residential care of the aged; from private practice in helping troubled people to industrial consultation; and from local agency services to national welfare planning. Career opportunities in social work are virtually boundless for those who share the basic belief in the dignity and worth of the individual human being regardless of station, color, or creed.

Consistent with the aims of the University, the program of the School of Social Work has three major dimensions: (1) the transmission of existing knowledge through the professional curriculum and participation in

instructional offerings of other units of the University; (2) the acquisition of new knowledge through research and scholarship by the faculty and students; and (3) service to the community through collaborative training programs, sponsorship of professional institutes, and consultation.

Primarily, the School is dedicated to excellence in the preparation of future social work practitioners through the two-year postgraduate curriculum. This dedication is shared by the administrative and instructional personnel in the community agencies that provide extensive field training for the students. The School also offers undergraduate courses, some of which are part of the social welfare major within the General Studies program of the College of Arts and Sciences.

Admission

Admission to the graduate professional program of the School of Social Work requires formal admission to the Graduate School as well as to the School of Social Work; hence, separate application forms should be submitted.

Foreign students are advised to allow three years for completion of the degree program. One year of previous employed experience involving use of English is highly desirable.

College Facilities and Services

All students enrolled in the professional curriculum in social work are eligible for membership in the Organization of Student Social Workers (OSSW). Through participation in the OSSW program and committee work, students have an opportunity to enlarge and enrich their professional educations. As an example, the OSSW and School of Social Work annually plan an event, such as a conference or retreat, at which students, faculty, and eminent guests present, usually in the form of prepared papers, significant trends and issues in social welfare and social work practice. Those in attendance pursue these trends and issues in small group discussions. In addition to this and other formal events, the OSSW sponsors a number of informal social events throughout the school year.

GRADUATE PROGRAM

Graduate Program Adviser
Catherine J. Macdonald
207 Eagleson Hall

Master of Social Work

Professional social work education prepares students for professional practice in social work. It is a two-year program of study leading to the Master of Social Work

degree. The areas of practice in which students are prepared to accept positions are many: poverty programs, public and private health and welfare agencies, and community planning bodies require the skills of professional social workers. These skills are usually rendered through a disciplined method, casework, group work, or community organization experience, which the student has acquired during his graduate education. Consistent with its responsibility to the profession of social work, the School exercises professional judgment concerning the suitability of students for admission to, or continuation in, the degree curriculum.

The curriculum is composed of courses concerned with the philosophy, organization, and administration of social service programs; the understanding of human growth and behavior; the understanding and use of social work methods; and the understanding and use of research methods. An integrated combination of class and field instruction is offered. Through this blending, theory is applied and practice is conceptualized while competence is being developed.

The following are the credits required in the class instruction segments of the curriculum:

SOCIAL WELFARE ORGANIZATION

Social Work 502, 503, 504, plus 2 additional credits (8 credits) to be elected from the 520 seminar series, 587, or from approved courses in other graduate departments.

HUMAN GROWTH AND BEHAVIOR

Social Work 550, 551, 552, (6 credits). Additional credits may be elected from approved courses.

SOCIAL WORK METHODS

Students must satisfactorily complete six quarters of methods courses, usually in one method. (Social Casework, Social Group Work, or Social Community Organization); Social Work 510, 511, 512, 530, 531, 532 (Social Casework), 521, 522, 523, 524, 525, 526 (Social Group Work), or 592, 509 (2 quarters), 573, 574, 575 (Social Community Organization).

In addition, students must also take the beginning courses in other methods, 510 or 521, plus 572. Additional credits may be elected from the 533 and 534 seminar courses, and 570.

Students must also satisfactorily complete 24 credits of field instruction 515 and 535. They spend an average of two days each week testing their developing knowledge and skills in one of a variety of settings where the professional methods of social casework, social group work, and social community organization are practiced. This laboratory experience is under the supervision and instruction of carefully selected, profes-



sionally prepared social workers. It provides students with an opportunity to develop skills in working with individuals and groups, to integrate classroom theoretical material with an actual work experience, and to develop professional attitudes and efficient methods of professional work. In addition to tuition costs and general fees, each student must plan for the costs of transportation to and from the field instruction agencies (approximately \$15.00 per month).

RESEARCH

Social Work 590 (Social Work Research), 2 credits plus 4-6 credits from either 591 (group research project) or 700 (individual thesis).

Requirements for the degree include completion of the prescribed curriculum, including Social Work 508 (Integrative Seminar), a minimum of three quarters in residence at this School, the equivalent of field instruction in six quarters, and completion of either an individual thesis or a group research project. Each student must present a total of 72 quarter credits of passing work and maintain a B average in all courses numbered 300 and above. In addition, the student must present a minimum of 65 quarter credits of B work or better. The degree is awarded on the basis of the student's competence in theory and practice, as evidenced through satisfactory completion of class and field courses, and advisory committee assessment.

Program Options

The School of Social Work offers its Master of Social Work degree program through two options. Under one, students complete their programs on the Seattle campus. Under the second, they complete half of their educations in the Spokane, Washington, area.

The course requirements of the two programs are equivalent, with the provision of some accelerated sections of courses for the Spokane students. Under the first plan, the students begin in the Autumn Quarter of the first year with concurrent classroom courses and field instruction that continues in Seattle throughout the six quarters. The normal study program is 12 credits each quarter. Under this plan the students complete their work in two regular three-quarter academic years with an intervening summer vacation between the two years.

Under the Spokane plan, students complete the requirements for the Master of Social Work in six consecutive quarters without a summer break. They also begin their professional educations in the Autumn Quarter in Seattle. They remain in Seattle for Autumn and Winter Quarters, enrolled only in classroom courses designed to ground them in basic knowledge and theory

relevant to social work practice. At the end of Winter Quarter the students transfer to Spokane where they remain for the following Spring, Summer, and Autumn Quarters. During these three quarters they complete all of the field instruction requirements in a single agency in the Spokane area under the direction of field instructors provided by the agencies. Thirty-two hours each week are spent in the agency and, in addition, the students take classroom courses in methods and human growth and behavior. These courses are taught by a faculty member of the University of Washington School of Social Work, who is the director of the Spokane program. The students in Spokane also do the initial part of their work on the research project. The normal class load, as in the Seattle program, is 12 credits.

A week's holiday is scheduled between each quarter, including the Summer and Autumn Quarters. The Autumn Quarter begins and ends several weeks before the regular Autumn Quarter. Hence, the students have a five-week break before returning to Seattle for the start of the Winter Quarter.

The sixth, or final, quarter on the Seattle campus is again devoted to classroom work and the completion of the research project begun in Spokane.

Special Program in Social Work Research

A special program of courses is available to students enrolled in the regular professional curriculum who desire additional training in Social Work Research (24 credits). Students electing this program must register for a field research practicum during the Summer Quarter between the first and second years. During the two-year period, students will be enrolled in Social Work 592 (Organization and Administration of Applied Research), 593 (Field Research Practicum), 594-595 (Advanced Social Work Research), and 700 (Thesis).

Courses for Non-Social Work Majors

Class enrollment permitting, and with permission, a number of courses are available to students enrolled in other graduate and professional departments of the University. These are: Social Work 502, 503, 504, 509, 510, 521, 550, 551, 552, 572, and 587.

Financial Aids

For information concerning scholarship awards, fellowships, stipends, and loans, consult the Office of Financial Aids, 3939 University Way, and the Chairman, Scholarship Committee, School of Social Work. A substantial number of awards, in amounts up to \$2,500 per year, are available to graduate students.

Employment

For information concerning part- and full-time work off campus see *Undergraduate Education* section in this catalog. Listings of part-time work in social agencies in the community are included in placement files within the School of Social Work.

Placement After Graduation

Because of the critical shortage of professionally prepared social workers, employment opportunities for graduates are numerous. Position vacancies in agencies and organizations in the immediate geographical region are maintained in a placement file within the library of the School of Social Work. All agencies and organizations in the region are encouraged to list their vacancies with the School of Social Work. A file of announcements of the position vacancies, nationwide and in foreign countries, is maintained. Representatives of major agencies visit the campus each year to recruit graduating students. Students are encouraged to interview agency representatives.

Typical Programs of Graduate Study

First Year

	CREDITS
AUTUMN QUARTER	
502 SOCIAL WELFARE ORGANIZATION	2
510 SOCIAL CASEWORK	2
515 FIELD INSTRUCTION	4-8
521 SOCIAL GROUP WORK	2
550 HUMAN GROWTH AND BEHAVIOR	2
WINTER QUARTER	
503 SOCIAL WELFARE ORGANIZATION	2
511 SOCIAL CASEWORK OR	
522 SOCIAL GROUP WORK	2
515 FIELD INSTRUCTION	4-8
551 HUMAN GROWTH AND BEHAVIOR	2
572 SOCIAL COMMUNITY ORGANIZATION	2
SPRING QUARTER	
504 SOCIAL WELFARE ORGANIZATION	2
512 SOCIAL CASEWORK OR	
523 SOCIAL GROUP WORK	2
515 FIELD INSTRUCTION	4-8
552 HUMAN GROWTH AND BEHAVIOR	2
590 SOCIAL WORK RESEARCH	2

Second Year

AUTUMN QUARTER	
520 SEMINAR	2
530 ADVANCED SOCIAL CASEWORK OR	
524 ADVANCED SCHOOL GROUP WORK OR 573	
ADVANCED SOCIAL COMMUNITY ORGANIZATION	2
535 ADVANCED FIELD INSTRUCTION	4-8
591 GROUP RESEARCH PROJECT (2) OR	
700 THESIS	2
PSYC 553 PSYCHODYNAMICS AND PSYCHOPATHOLOGY	
OR ELECTIVE	2
WINTER QUARTER	
ELECTIVE OR 508 INTEGRATIVE SEMINAR	2
520 SEMINAR OR ELECTIVE	2
531 ADVANCED SOCIAL CASEWORK OR	
525 ADVANCED SOCIAL GROUP WORK OR 574	
ADVANCED SOCIAL COMMUNITY ORGANIZATION	2
535 ADVANCED FIELD INSTRUCTION	4-8
591 GROUP RESEARCH PROJECT (2) OR	
700 THESIS	2

SPRING QUARTER	CREDITS
ELECTIVE OR 508 INTEGRATIVE SEMINAR	2
532 ADVANCED SOCIAL CASEWORK OR	
526 ADVANCED SOCIAL GROUP WORK OR 575	
ADVANCED SOCIAL COMMUNITY ORGANIZATION	2
535 ADVANCED FIELD INSTRUCTION	4-8
ELECTIVE IN HUMAN GROWTH AND BEHAVIOR	2
591 GROUP RESEARCH PROJECT (2) OR	
700 THESIS	2

UNDERGRADUATE PROGRAMS

Adviser

William C. Berleman

207 Eagleson Hall

Admission

The School of Social Work participates in a program leading to an undergraduate major in social welfare in collaboration with the General Studies program of the College of Arts and Sciences. Students preparing for admission to a professional school of social work, students who are interested in securing social welfare positions that do not require professional education, and students who wish a liberal arts background with concentration in the social sciences and social welfare may satisfy their interests by enrollment in this major.

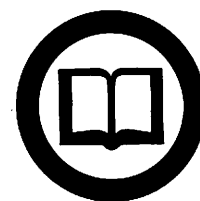
The social welfare program is designed to achieve a broader and deeper understanding of man and society through a pattern of study in the social sciences, including advanced requirements in psychology and sociology.

In addition, members of the faculty of the School of Social Work teach specific courses pertaining to social welfare and social work. These courses combine classroom study, an extended agency observation, and an individual thesis, in providing both scope and depth in the examination of social welfare institutions and services.

The agency observation course (Social Work 391) is available in two forms. It is offered for 5 credits as part of the social welfare major and, occasionally, for 6 credits Summer Quarter as a part of the Work-Study Program in Mental Health sponsored by the Western Interstate Commission on Higher Education.

Social Work 400 and 401 are also available as service courses to students in other University departments.

Educational advising for this curriculum is provided by the Director of General Studies, and for the social welfare courses by the coordinator of the undergraduate curriculum in the School of Social Work. Members of the faculty of the School of Social Work are available to advise students on their career interests and career planning in professional social work.



LAW

Dean

Luvern V. Rieke (acting)
207 Condon Hall

Associate Deans

William R. Andersen
203 Condon Hall

John C. Huston
216 Condon Hall

Professors

William R. Andersen, William T. Burke, Charles E. Corker, Richard Cosway, Harry M. Cross, Robert L. Fletcher, Marian G. Gallagher, Alfred Harsch (emeritus), Dan F. Henderson, Roland L. Hjorth, Robert S. Hunt, John C. Huston, Ralph W. Johnson, John M. Junker, Richard O. Kummert, Robert Meisenholder, Arval Morris, Rudolph H. Nottelmann (emeritus), Cornelius J. Peck, Luvern V. Rieke, Richard S. L. Roddis, Warren L. Shattuck, Robert L. Taylor (emeritus), Philip A. Trautman, Lehan K. Tunks

Associate Professors

John R. Price, Roy L. Prosterman, William H. Rodgers, Jr., Marjorie Dick Rombauer, William B. Stoebeck

Assistant Professors

Donald S. Chisum, Geoffrey L. Crooks, Yasuhiro Fujita, Virginia B. Lyness, Michael Murray Martin, Francis W. Smith, Jr.

Research Associate Professors

Zentaro Kitagawa

The School of Law

Established at the University in 1899, the School of Law is housed in Condon Hall, named for John T. Condon, organizer and first Dean of the School. A member of the Association of American Law Schools, the School is approved by the Council of the Section of Legal Education and Admissions to the Bar of the American Bar Association.

The programs of the School of Law are designed to help students develop an understanding of law, the processes by which it operates, and the social, economic, and political context in which it functions. Without in any way ignoring technical legal knowledge, the School of Law recognizes that legal education must be broadly based for its recipients to contribute effectively to shaping society's goals and developing the means of achieving these goals.

Graduates of the School of Law are prepared to practice law anywhere in the United States and other common-law countries. The curriculum and methods of instruction are designed to develop the student's highest potential, both in school and thereafter. Persons with a legal education, by virtue of their developed abilities to analyze and comprehend, are able to succeed in many careers not directly connected with representation of private clients.

The School follows a selective admissions policy and stresses small classes and opportunities for individual

research. Students are encouraged to rely on their own initiative and to develop their own powers of perception. Classroom discussion in which students participate fully is one means used to assist in the development of such powers. In the first year, each student will study one of his basic subjects in a small section of about twenty students. Independent research projects, either in the context of a seminar or under the supervision of an individual faculty member, are emphasized for the same purpose.

The law is not, and cannot be, static, and the man who is "learned in the law" is the man who has developed the ability to find sound solutions to new problems by adapting and using, rather than merely echoing, the teachings of the past.

School Facilities and Services

Postgraduate Degrees in Asian Law

Under the direction of Prof. Dan Fenno Henderson, the School conducts a program in Asian Law, with initial emphasis on the law of China and Japan. The program has produced material for courses and seminars in the fields of Japanese and Chinese law, and has accumulated the necessary library for bilingual postgraduate research in Japanese law. In addition, basic research has been done to produce bibliographies, style manuals, research guides, texts, dictionaries, and translations of statutes and decisions necessary for postgraduate work in United States-Japanese transactions. Similar work is underway in Chinese law.

In the autumn of 1967, the Board of Regents of the University authorized the faculty in law to offer graduate programs leading to the degrees Master of Laws (LL.M.), Master of Comparative Law (M.C.L.), and Doctor of Philosophy (Ph.D.).

Law Librarianship Program

The Law School provides facilities and instruction for lawyer candidates for the Master of Law Librarianship degree, or for other students of the Graduate School of Librarianship who elect specialized training in law librarianship. This program is described in the Announcement of the School of Librarianship.

Law Library

The Law School Library contains more than 195,000 volumes; included are decisions of all English and American courts of last resort, and the reported decisions of all lower courts in the United States. Extensive collections of English, American, and colonial statutes are available, as well as copies of all legal periodicals published in English.

In addition, the Library has one of the finest collections of Japanese law materials in the United States, other substantial Asian collections, a growing collection of

Russian materials, and most of the titles indexed in the *Index to Foreign Legal Periodicals*.

Undergraduate Education

The School of Law does not prescribe a definite undergraduate curriculum for its applicants. The wide range of lawyers' tasks and the difference in offerings from school to school preclude such an approach. With the assistance of his college or university adviser, a student should follow his own intellectual interests in developing his undergraduate program. However, there are certain goals which every student thinking of law school should keep before him in planning his college program. He should strive to acquire the ability to read, write, and speak the English language well; to gain a critical understanding of values and human institutions, political, economic, and social; and to understand and develop in himself creative power in thinking. Not only memory, but also accomplishment in understanding; not just knowing, but knowing why and how, should be the objectives. A more complete statement of goals is available from the School of Law on request.

College advisers will help students decide how best to accomplish these ends. The School of Law faculty will be glad to assist in program planning.

Student Activities

The *Student Bar Association* was organized to promote useful activities among the students in the School of Law; to foster a professional outlook on the part of such students; to promote and bring about contacts and cooperation between members of the association and members of the Bar; to foster a close relationship between members of the Association and members of the School of Law faculty; and to carry on and promote activities for the best interest of its members, the faculty, and the School. Throughout the year, it sponsors various social functions, engages speakers to appear before the law student body, engages in intramural recreational activities, publishes a newspaper, conducts the School's moot court competition, and aids in the operation of the Legal Aid program.

Every student enrolled in the School of Law is a member of this association. The elective officers—president, vice president, secretary, and treasurer, together with two elected representatives from each class—make up the executive board.

The Student Bar Association is affiliated with the Law Student Division of the American Bar Association.

Through the *Legal Aid Program*, the School of Law, in cooperation with the Legal Services Center in Seattle and under the supervision of a faculty adviser, offers the opportunity of assignment to regular weekly office hours



to students in the second- and third-year classes. The services of the Center are available to persons who are unable to afford the services of an attorney. Students are given the fullest responsibility consistent with their experience and ability. They interview clients to determine the nature of their problem. After consulting with the Center director or the faculty adviser, they may dispose of those cases that require only advice; they may conduct negotiations for settlements with opposing parties or their attorneys; and they may prepare cases for litigation under the supervision of one of the Center attorneys, with whom they may appear in court. The experience thus acquired is of considerable assistance to the young attorney embarking on his professional career.

Participation in the *Voluntary Defender Program* is limited to students in the second and third years who have completed the course in Criminal Law and Procedure. The function of the participants is to assist attorneys who have been appointed by the Superior Court of the State of Washington to defend persons charged with crimes who are unable to afford legal representation. The students assist the attorneys by investigating, doing research, and performing any other services required to prepare the case for trial. Participation in this program not only gives the student invaluable experience, but also gives the attorney additional assistance to ensure that every defendant in a criminal proceeding gets a fair trial and is adequately represented by counsel.

An extensive *moot court competition* is conducted by the Student Bar Association with the assistance and cooperation of the faculty. Competing students research assigned problems, prepare appropriate briefs, and present oral arguments before courts composed of judges, lawyers, and faculty members.

Each student is required to compete in one round during his first year in conjunction with the course in Legal Research and Analysis. During the second year, the Student Bar Association conducts a voluntary competition. Successive rounds determine the moot court finalists who present their arguments before judges of the Supreme Court of the State of Washington. Those who prevail represent the School in the National Competition, during their third year. Prizes donated by lawbook publishers are awarded to the four finalists.

A team from the School of Law also participates annually in the unique International Moot Court Competition with a team from the Faculty of Law of the University of British Columbia. Questions of transnational law are presented.

The *Order of the Coif* is a national honorary legal society with a chapter at the University. The order encourages scholarship and the advancement of the ethical standards of the legal profession. Membership is restricted to students who are within the upper 10 per cent of the graduating class.

The *University of Washington Law Review* is the School's legal periodical. It is published by a student editorial board consisting of approximately thirty select second- and third-year students under the direction of six student officers and with assistance from the law faculty. The *Review* serves as a medium of expression for legal scholars and is devoted particularly to the interpretation, advancement, and harmonious development of the law. It contains scholarly articles by judges, lawyers, teachers, and authorities in related business and professional fields. Surveys and discussions, based on thorough research by student members of the board, of important court decisions and topics of concern and interest to members of the profession are included.

The possibility of gaining admission to the *Law Review* staff provides students with an additional incentive to strive for high standards of performance during their first year in law school, for, in most cases, admission to the staff is based upon first-year performance. Only a very limited number of students are admitted on the basis of high scholastic performance during the second year.

A place on the student editorial board is an invaluable experience for professional life and should be one of the goals of every law student. It provides opportunities to develop skill in research and expression beyond those available in normal classwork activity. As a member of the *Law Review* staff, the student will gain his first experience in solving both administrative and peculiarly legal problems through organized cooperative effort. *Law Review* membership affords a means by which the student can make a real contribution to the legal profession during his student years.

The University of Washington *International Law Society* is a campus-wide organization open to students and faculty members from all disciplines. Its purpose is to provide both information about current trends in international law and a forum for investigation, research, and discussion. The *University of Washington Journal of International Law* provides the means for publishing papers dealing with problems of international law.

Law Student Civil Rights Research: The Council is a local chapter of an organization with a national membership of more than 2,000 law students. The Council undertakes a variety of projects in the general field of

civil rights and civil liberties. It is open to all interested students.

Three law fraternities are represented in the School of Law: Story Senate of *Delta Theta Phi*, Dunbar Chapter of *Phi Alpha Delta*, and Ballinger Inn of *Phi Delta Phi International*. Composed of and governed by law students, these fraternities serve to promote and develop comradeship, loyalty to the School and to the law, and an understanding of, and devotion to, the finest traditions of the legal profession.

Financial Aid

Financial aid awards are made possible by the generosity of many people, and the recipients' way in law school is made easier by the grants they receive. Some students would be unable to attend the School of Law were it not for scholarship and loan assistance; others, despite the fact that law study is a full-time occupation, would be forced to divert their attention from such study in order to earn money to put themselves through school.

Financial aid awards are usually made on a part-grant, part-loan basis. Awards are made principally on the basis of financial need, with scholarship, *Law Review* participation, and other factors sometimes being considered.

Whereas for scholarships, and even some loans, there is no legal obligation to do so, it is expected and urged that recipients of such funds, after graduation and when financially able to do so, will restore the funds to the School of Law so that an increasing number of other students may enjoy the same advantage.

Beginning Students

General: Students whose prior academic performance and economic need justify it may receive scholarship or combination scholarship-loan assistance. Application forms may be obtained from the School of Law and should be submitted by March 15 of the year in which the student intends to enter.

Asian Law Program: Special stipends are available to assist degree candidates who are qualified by reason of language competence to undertake studies in the Asian Law Program described below. Holders of such stipends are, of course, required to maintain acceptable academic standing in all their work.

Students in Residence

Applications for most financial aid awards are considered by the Committee on Scholarships in July, at which time the Committee can inform itself of the applicant's academic performance during the preceding academic year. Potential applicants may obtain necessary forms

at the Dean's Office and should inquire there at an early date concerning presently available funds, possible additional funds, or changes in deadline dates.

Loan funds are also available for which applications should similarly be made.

Additional loan funds are provided by National Defense Student Loans administered by the University. Applications should be directed to the University of Washington Director of Financial Aids, Schmitz Hall, Seattle, Washington 98105, as soon after April 1 of the appropriate year as possible.

In addition, numerous substantial prizes and awards are available for superior academic achievement in the School of Law.

Graduate Placement

The School maintains a placement service to assist students in finding legal positions upon graduation, and provides assistance to alumni who are seeking new associations. It also aids students in finding legal positions for the summer months. While the securing of employment remains the ultimate responsibility of the individual, the experience of the recent past indicates that all graduates can be suitably placed.

ADMISSION

When Students May Enter

Beginning students may enter the School of Law only in the Autumn Quarter, and are required to be present, as stated in their letter of acceptance, a few days earlier than the time set for upper-class students.

Requirements for Admission to First-Year Class

Applicants for admission must present a baccalaureate degree from an approved college or university.

Normally, students in the School of Law attend full time and complete their studies in nine quarters.

Law School Admission Test: Each applicant for admission to the first-year class must take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey. A \$13.50 fee is charged by the Testing Service. The test is given annually in February, April, July, and November in numerous locations in the United States and throughout the world. For detailed information, the applicant should write directly to Law School Admission Test, Educational Testing Service, Box 944, Princeton, New Jersey 08540. It is recommended that the test be taken during the academic year preceding the one for which admission is sought, preferably in February or before, and not later than April.



Other Elements: In recent years, the number of applications for admission to the first-year class has by far exceeded the number of places available. In determining which applications to accept, the score received on the Law School Admission Test is but one of many elements considered by the Admissions Council. All other aspects of the applicant's background are taken into account, with great emphasis being placed on the undergraduate record presented. A letter of admission constitutes a judgment by the Admissions Council that the applicant has the capacity and motivation to pursue the study of law successfully. In most instances, the Council's judgment has proved sound.

Procedure to Be Followed

The applicant must complete the following three steps:

(1) Request a formal application blank from the University of Washington School of Law, Seattle, Washington 98105, and file said application early in the final year of undergraduate study and under no circumstances later than March 15 of the year for which admission is sought.

(2) Request the registrar of each college he has attended to send *two* official transcripts *directly* to the School of Law; however, students applying for admission who last attended, or are attending, the University of Washington need have only one official transcript forwarded directly to the School of Law. All records become a part of the official file. They will not be returned or duplicated.

A student expecting a baccalaureate degree in June may have his application considered prior to receiving his degree. Such a student should submit transcripts of his college work through the first seven semesters or ten quarters. After completing his college work, the student must complete his application by sending the required number of transcripts of *all* of his college work.

(3) Request the Educational Testing Service, preferably on his test application, to send his Law School Admission test score to the School of Law.

Upon receiving a letter of acceptance, the applicant must submit two permanent passport-size facial photographs (approximately 2" x 2"). The photographs should be submitted prior to registration.

Applicants for admission whose collegiate educations have been received in countries where English is not the usual spoken language may be required to submit evidence of competence in English. On occasion, the Test of English as a Foreign Language administered by TOEFL, 1755 Massachusetts Avenue, Washington, D.C. 20036, will be employed. Such candidates should

make their own arrangements with TOEFL, preferably advising the School of Law of their action by sending carbons of the correspondence.

Admission With Advanced Standing

A transfer student may be eligible for admission if he has completed work at a school approved by the Association of American Law Schools, if he is in good standing at the time of his withdrawal (evidenced by a letter from the Dean of the school from which he is transferring), and if he meets the current admission requirements for beginning students at this School. At the discretion of the Dean, credit may be granted for course work taken at another law school. No credit will be granted, however, for courses in which grades are below the average required for graduation at the school from which the student wishes to transfer.

Transfer applications normally will be accepted only if the applicant's record demonstrates that he is capable of doing substantially above average law school work. Where an applicant has completed more than one year of law study, advanced standing will be permitted only in exceptional cases.

The applicant for admission as a transfer student should comply with the procedure required for admission to the first-year class and, in addition, forward a letter stating why he desires to transfer to this School.

Readmission After Withdrawal

First-year students: A first-year student who withdraws during the academic year is not eligible as a matter of right to return to the School. Such a student must compete for a place in the class with other applicants in the year he wishes to return. In passing upon an application for readmission, the reason for the withdrawal and the quality of work done prior to withdrawal will be considered.

Second- and third-year students: If a second- or third-year student not subject to dismissal withdraws from school, he is eligible as a matter of right to return, if he does so within twenty-four months of his withdrawal. His readmission thereafter is at the discretion of the Admissions Council.

All students: Any student in good standing required to withdraw because of a military obligation is entitled to return upon the completion of his first tour of military service.

PROGRAMS OF STUDY

The Juris Doctor (J.D.) Degree

The Juris Doctor (J.D.) degree is conferred upon a student who has met the residence requirements and has earned at least 135 quarter credits satisfactory to the

School of Law, including all required courses and seminars.

A student who started his work at the School of Law prior to September, 1964, and has earned at least 90 quarter credits in the School of Law by the end of the Summer Quarter, 1965, is eligible for a Juris Doctor degree if he has met the residence requirements, has earned at least 132 quarter credits satisfactory to the School of Law, and has met the current seminar requirement.

A student enrolled in the School may earn up to 10 quarter credits toward his Juris Doctor degree with course work taken in other units of the University. Approval will be granted at the discretion of the Dean's office upon a showing that such course work will contribute significantly to the student's legal education. School of Law credit will be granted only for courses in which the student receives a grade of C (2.00) or better. Normally, only graduate-level courses will be approved for such credit. Grades received in courses taken elsewhere will not be used in computing a student's grade-point average at the School except that if a failing grade is received, the student will be given a 44-E and the grade will be used in computing his School of Law average. On occasion, some of this work may be available on a pass/fail basis.

Residence requirements: To be eligible for the Juris Doctor degree, a student must complete at least nine quarters of study in residence. A quarter of residence credit is given for each Autumn, Winter, or Spring Quarter during which a student successfully completes at least 12 credits of work. (Although Summer Quarter courses offer regular academic credit, residence credit is awarded for Summer Quarter work only with special permission of the Dean.) In unusual cases, two quarters, in each of which a student earns less than 12 but more than 7 credits, may be combined to produce a quarter of residence credit.

A law student is making normal progress toward his J.D. degree so long as his work in each academic year, plus Summer Quarter, is equal to at least one-third of the total credits required for graduation. A full-time student in the School of Law is one who is registered for a minimum of 12 credits per quarter. To complete his work in nine quarters, however, a student must average 15 credits per quarter. No student may register for less than 12 nor more than 16 credits per quarter without the approval of the Dean's office. Such permission is rarely granted, and only to students whose records demonstrate the capacity to assume such a program of studies successfully.

Additional information concerning scholastic and other regulations is available at the Dean's office.

Honor Code

An Honor Code to which all students are subject is administered by the Student Bar Association. A statement concerning it is available at the Association office in Condon Hall and is distributed to law students at registration.

Time Demands of Law Study

School of Law studies demand all of a student's time and energy. Students should not plan to engage in outside work during the academic year. Those with financial need should explore fully the School's financial aid program. In addition to scholarship and grant funds, considerable loan funds are available. Use of loan funds is equivalent to making a "capital investment" in one's professional development.

Joint Programs

Individual programs can be developed for students interested in following a dual program leading to a J.D. and a graduate degree in some other discipline.

Asian Law Emphasis

The School's postgraduate Asian Law program, described more fully below, comprehends course, seminar, and research opportunities for students working toward their first professional degree as well as for postgraduate students in law. Candidates for the first degree may take courses and seminars in Japanese law taught in English that, together with additional supervised research, permit an emphasis on Japanese law. While foreign language fluency is not required for these courses, special financial aid available for this program is granted only to students who speak Chinese or Japanese. Language-qualified students who do well as first-degree candidates are eligible to apply for the postgraduate program in United States-Japanese transactions.

Postgraduate Degrees in Asian Law

Admission and General Requirements

Applicants for admission to the postgraduate* programs in law must meet the requirements of the faculty in law as well as the requirements of the University Graduate School, and each student should familiarize himself with the general policies, procedures, and regulations of the Graduate School. Statements about admission, scholarship, residence, continuous enrollment, general master's and doctor's degree requirements, and other pertinent

* Postgraduates in Law are graduate students in the University of Washington Graduate School.



information may be found in the *Graduate Study* section of this catalog or in the Graduate School bulletin entitled *Graduate Study and Research*.

Admission applications may be obtained by writing to the University of Washington Director of Admissions, Schmitz Hall, Seattle, Washington 98105.

LL.M. Program

Admission to the LL.M. degree program is limited to applicants who have received the first professional degree (LL.B. or J.D.) in the United States or in another common-law country, who are members of the Bar, who are bilingual in English and Japanese, and who have a record of superior academic achievement. The program contemplates one year in residence, to include at least 36 credits, including an acceptable major research undertaking.

M.C.L. Program

Bilingual lawyers who are graduates of law schools in non-common-law countries and who present superior academic records may apply for admission to the M.C.L. program. This program also involves one year in residence, to include at least 36 hours of work for credit, including an acceptable major research enterprise.

Ph.D. Program

Admission to the Ph.D. program is limited to exceptional scholar-lawyers, fluent in written Japanese or Chinese, who wish to pursue a major creative research project using Japanese or Chinese language sources. At least two and usually three years' residence is required to do the work necessary to pass the General Examinations admitting the student to candidacy for the doctoral degree. An acceptable dissertation must thereafter be submitted to complete requirements for the degree. In most cases, the Candidate will spend a year abroad while working on the dissertation.

Financial Aid

Financial aid is available for students admitted to any of the postgraduate degree programs, with stipends up to \$5,000 annually. For further information, applicants should write to University of Washington School of Law, Asian Law Program, Seattle, Washington 98105.

Summer Quarter

The School of Law offers a limited number of courses during Summer Quarter for those of its students who desire to take additional subject-matter, and for students from other law schools who have completed at least one year of study and who wish to do additional work for credit in their respective schools.

The Summer Quarter courses also afford opportunity for further study by practicing lawyers who desire systematic instruction in specialized areas of expanding significance.

Students with advanced standing who wish to transfer to the University of Washington School of Law as degree candidates and who desire to begin their study in the Summer Quarter must comply with admission procedures.

CURRICULUM

First-Year Program

First-year classes in law schools throughout the country traditionally have tended to be large. At several schools classes with from seventy to a hundred and seventy students have not been uncommon. Since World War II, an effort has been made to reverse this trend, and many law schools, including the University of Washington's, have attempted to accomplish this reversal by introducing first-year courses in the techniques of analysis, writing, and research.

While this program at the University of Washington School of Law has shown its value and is to be intensified, the faculty of the School of Law has decided that more should be done to individualize first-year instruction. To this end, three basic first-year courses—Contracts, Property I, and Torts—have been divided into three sections. In each course, one section will be large and two will have from 23 to 25 students. Each first-year student will be assigned to one of the small sections in one of these subjects. In this way, the School of Law hopes to combine the very real resource advantage of a fairly large school with the equally real advantage offered by small classes. The large sections will be handled in traditional fashion. The small sections provide opportunities for more individual expression by the student, for a closer teacher-student relationship, for additional testing of students, and for more written material to be presented by them.

First-year courses are designed to introduce students to basic legal skills, foundational subject matters, and the variety of public and private processes with which the profession is concerned. Entering students are introduced to the judicial dispute-settlement process through the Foundations of Law Study Course. It is offered during three days preceding the beginning of instruction in the other required courses. First-year course and seminar descriptions will be found in *Description of Courses* section of this catalog.

First Year**AUTUMN QUARTER****CREDITS**

—	FOUNDATIONS OF LAW STUDY	—
400	CONTRACTS	3
410	CIVIL PROCEDURE	2
416	LEGAL RESEARCH AND ANALYSIS	2
420	CRIMINAL LAW	3
430	PROPERTY I	3
440	TORTS	3

WINTER QUARTER

400	CONTRACTS	3
410	CIVIL PROCEDURE	3
416	LEGAL RESEARCH AND ANALYSIS	2
420	CRIMINAL LAW	3
430	PROPERTY I	3
440	TORTS	3

SPRING QUARTER

400	CONTRACTS	2
416	LEGAL RESEARCH AND ANALYSIS	1
430	PROPERTY I	2
440	TORTS	2
441	LAND USE PLANNING	3
504	POVERTY AND THE LEGAL PROCESS	3

Second- and Third-Year Elective Program

The elective system in the second and third years makes it possible for a student to choose a program design that best suits his interests and meets his needs. To make this choice meaningful, a considerable range of alternatives is available, crossing the full spectrum of taught law. Additional diversity is made possible by offering several courses in multiple sections, some for different credits and at different times of the year. In addition, independent study or research (Law 600) is available to interested students, as is the possibility of supplementing the Law School program with selected course offerings from other graduate disciplines.

To assist students in planning programs that meet their own interests and at the same time expose them to a representative range of subject matters, counseling is freely available at the School. The entire curriculum can be seen in the following table, which lists upper-class courses and seminars by subject-matter groups. The groups are not mutually exclusive and some offerings appear in more than one group. (Course and seminar descriptions will be found in the *Description of Courses* section of this catalog.)

University of Washington School of Law Upper-Class Elective Curriculum, 1969-70**Ordering the Legal Process:****Judicial, Administrative, Legislative, Private**

500, 501	ADMINISTRATIVE LAW IV, III
509	FEDERAL COURTS AND THE FEDERAL SYSTEM
520	CONSTITUTIONAL LAW VIII
525, 526	EQUITABLE REMEDIES IV, III
553	CONFLICT OF LAWS VI
555	CREDITOR-DEBTOR LAW
556	CRIMINAL PROCEDURE
561	EVIDENCE

569	PROFESSIONAL RESPONSIBILITY
570	LEGISLATION
571	LOCAL GOVERNMENT LAW
580	TRIAL AND APPELLATE PRACTICE
585	PROBLEMS IN EVIDENCE
588	WORKSHOP IN LAND-USE PLANNING LAW
614	CRIMINAL PROCEDURE SEMINAR
616	FEDERAL COURT SEMINAR
617	FEDERAL TAX POLICY SEMINAR
626	REGULATED INDUSTRIES SEMINAR
628	URBAN PLANNING LAW SEMINAR

Ordering Personal and Family Relationships

559	DOMESTIC RELATIONS
615	INDIAN LEGAL PROBLEMS SEMINAR
625	POLITICAL AND CIVIL RIGHTS IN THE UNITED STATES SEMINAR

Ordering Property Ownership, Use and Distribution

527	INTELLECTUAL PROPERTY
535	PROPERTY II
538	PERSONAL PROPERTY SECURITY
539	REAL PROPERTY SECURITY
551	COMMUNITY PROPERTY
558	DEATH AND GIFT TAXATION
560	ESTATE PLANNING WORKSHOP
574	NATURAL RESOURCES
581	ESTATE AND TRUST ADMINISTRATION
588	WORKSHOP IN LAND-USE PLANNING LAW
623	NATURAL RESOURCES SEMINAR
624	OCEAN RESOURCES SEMINAR
627	SELECTED PROBLEMS OF ENVIRONMENTAL PROTECTION SEMINAR
628	URBAN PLANNING LAW SEMINAR
629	PRIVATE LAND DEVELOPMENT SEMINAR

Control and Correction of Socially Deviant Behavior

556	CRIMINAL PROCEDURE
614	CRIMINAL PROCEDURE SEMINAR

Ordering Economic Activity: Public and Private

503	ASSOCIATIONS I
505, 506	CORPORATIONS V, IV
507	BUSINESS PLANNING
508	SECURITIES REGULATION
516	COMMERCIAL TRANSACTIONS V
521	LEGAL ACCOUNTING
530	FEDERAL INCOME TAXATION V
531	FEDERAL INCOME TAXATION III
538	PERSONAL PROPERTY SECURITY
539	REAL PROPERTY SECURITY
555	CREDITOR-DEBTOR LAW
563	GOVERNMENT REGULATION OF BUSINESS
564	INSURANCE
565	INTERNATIONAL TRANSACTIONS
567	LABOR LAW
568	LABOR RELATIONS
577	STATE AND LOCAL TAXES
579	SURETYSHIP
590	CORPORATE INCOME TAX
593	SOCIAL LEGISLATION
595	INTRODUCTION TO JAPANESE LAW
613	CORPORATE PLANNING SEMINAR
617	FEDERAL TAX POLICY SEMINAR
619	INSURANCE SEMINAR
622	CONSUMER PROTECTION SEMINAR
626	REGULATED INDUSTRIES SEMINAR
629	PRIVATE LAND DEVELOPMENT SEMINAR



Perspective Offerings: Comparative, International, Philosophical

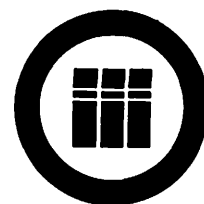
522	NONLEGAL DECISION THEORY
548	U.S.-JAPANESE TAX PROBLEMS
549	U.S.-JAPANESE ADMINISTRATIVE LAW PROBLEMS
552	COMPARATIVE LAW
557	ECONOMIC ANALYSIS FOR LAWYERS
565	INTERNATIONAL TRANSACTIONS
566	JURISPRUDENCE AND LEGAL PHILOSOPHY
586	INTERNATIONAL LEGAL ORDER
595	INTRODUCTION TO JAPANESE LAW
596	JUSTICIABILITY IN U.S.-JAPANESE TRANSACTIONS
597	U.S.-JAPANESE CONTRACTING PROCESS
598	U.S.-JAPANESE CORPORATE RELATIONS
620	TUTORIAL IN JAPANESE LAW

Seminar Program

The School's seminar program is built upon the belief that an opportunity for sustained research, analysis, and writing at an advanced level is an important part of one's preparation for the contemporary legal profession. Such an opportunity makes possible development of student skills in marshalling relevant authorities, critical evaluation of authorities, fitting analyses into existing doctrinal patterns, drawing on relevant knowledge from other disciplines, relating doctrinal analyses to what in fact happens in society, generating insight into how existing problems ought to be resolved, and conveying the results of investigation and research in a meaningful and concise manner.

Each student is required to complete 6 quarter credits of seminar work before graduation. The typical seminar carries 6 credits, spans the student's entire third year, and carries an enrollment of from four to eight students.

Seminars	CREDITS
611 BUSINESS PLANNING	6
612 CONFLICT OF LAWS	4
613 CORPORATE PLANNING AND COUNSELING	6
614 CRIMINAL PROCEDURE	6
615 INDIAN LEGAL PROBLEMS	6
616 FEDERAL COURT	6
617 FEDERAL TAX POLICY	6
619 INSURANCE	6
622 CONSUMER PROTECTION	6
623 NATURAL RESOURCES	6
624 OCEAN RESOURCES	6
625 POLITICAL AND CIVIL RIGHTS IN THE UNITED STATES	6
626 REGULATED INDUSTRIES	6
627 SELECTED PROBLEMS ON ENVIRONMENTAL PROTECTION	6
628 URBAN PLANNING LAW	6
629 PRIVATE LAND DEVELOPMENT	6



LIBRARIANSHIP

Director

Irving Lieberman
133 Library

Associate Director

L. Dorothy Bevis
133 Library

Graduate Program Adviser

Irving Lieberman
133 Library

Professors

Harry C. Bauer (emeritus), L. Dorothy Bevis, Marian G. Gallagher (Professor of Law; Law Librarian), Irving Lieberman, Marion A. Milczewski

Associate Professors

Eleanor E. Ahlers, William V. Nash, Marion E. Peterson, Mabel A. Turner (emeritus)

Assistant Professors

Mae M. Benne, Irene Heninger (acting), Benjamin F. Page, Grant T. Skelley, Jonathan Stanfield

Associates in Librarianship

Patricia A. Vessie, Aileen Wright

A library is a storehouse for the collective mind of man—a legacy of his ideas, thoughts, and knowledge. But it is much more than merely a collection of books. Because it is organized, classified, and cataloged it is the great instrument of inquiry, a source of learning tapped by both the student and his teacher. The program in librarianship is intended to prepare students for professional careers in library work.

One of forty-eight schools accredited by the American Library Association, the School prepares students for professional positions in all types of libraries. Programs offered lead to the degrees of Master of Librarianship and Master of Law Librarianship. The School of Librarianship is a member of the Association of American Library Schools.

The basic professional curriculum, including the prerequisite courses, is organized around a group of studies designed to provide a sound foundation in principles and methods, and is required of all students pursuing graduate degrees in librarianship. In addition, students elect courses which will prepare them for special fields of library service, such as those designed for children and young people's work, school library work, health sciences librarianship, information science, archival management, and law librarianship. Other programs may be designed in accordance with individual student needs which might include his choice of type of library and his undergraduate subject major—art, economics, music, political science, sociology, the natural and physical sciences.

Librarianship is a nonthesis program, but a thesis is not precluded if a student wishes to engage in special investigation or research in a cognate field.

Admission

The approval of both the Graduate School and the School of Librarianship is necessary for admission to the graduate program. In order to facilitate entrance



procedures, students may apply for and be accepted by the Graduate School and the School of Librarianship even though they are deficient in modern foreign language or the four prerequisites mentioned below. These deficiencies *must be removed* before the student will be allowed to register for 500-level courses. The deadline for submission of applications and complete credentials for Autumn Quarter is July 15, and for Summer Quarter, April 29. However, students are advised to apply early, since enrollment quotas may be filled prior to deadlines.

Students from countries where English is a foreign language require at least two years to complete the program as full-time students and may enter only in the Autumn Quarter. The deadline for submission of applications and complete credentials for foreign students is February 1.

Four prerequisite courses are required of all students before beginning graduate-level work in Librarianship. These are: Librarianship 440 (Libraries and Society), 441 (Basic Library Materials), 442 (Book Selection), and 443 (Organization of Library Materials: Theory and Practice). The four prerequisite courses carry 3 quarter credits each, or a total of 12 credits. The courses are designed to form a basic foundation for graduate work to follow and also to serve as terminal library courses for students not seeking the graduate library degree. *These 12 quarter credits are in addition to the required 45 quarter credits for the Master of Librarianship degree.*

Librarianship courses offered by other colleges and universities accredited by the Northwest Association of Secondary and Higher Schools will be articulated with the graduate program of the School of Librarianship. A student admitted from another accredited institution will be granted up to 12 quarter credits for courses completed, *without a reduction in the required 45 quarter credits for the Master of Librarianship degree.* Transcripts of individual students will be evaluated at the time of admission, and prior to the date of registration and enrollment.

The curriculum of the School of Librarianship includes not only the prerequisites but also new arrangements and content in the areas of reference and technical services. Additional courses will be offered in the ensuing years giving emphasis in the areas of services and materials for children and youth, newer instructional materials and media, information science, archival management, and advanced subject bibliography such as medicine, science, engineering, etc. Many of these new courses will be available to librarians as in-service education.

The entrance requirement of a modern foreign language (foreign students may not use their national language or English) may be met either by submitting *one academic year*, at the college level, of a modern foreign language *or* by passing the Graduate School Foreign Language Examination.

In the degree work following the prerequisites, the required courses which each candidate must complete are Librarianship 502, 509, 515, 516, 535, and 599, though not in that order. For some specializations, others are required.

Librarianship 702, for 3 credits, is an administrative convenience and may not be included in computing the 45 quarter credits required for the master's degree. It is designed so that a degree candidate may be enrolled for the quarter in which he expects to earn the degree, without registering for a specific class or classes.

Summer Program

The full program for the Master of Librarianship degree is available to Summer Quarter students. The prerequisite courses, as well as both required and elective courses in the graduate program, are offered every summer. Course offerings vary from year to year, but are planned to enable students to complete requirements for the degree by attendance during summers only.

Law Librarianship

Applicants for entrance to the Law Librarianship program must hold a Bachelor of Laws or a Juris Doctor degree from an accredited American law school, and applications must be approved by the Dean of the University of Washington School of Law. Since specialized Law Librarianship courses are not offered in the Summer Quarter, the Master of Law Librarianship degree must be completed in the consecutive quarters of the regular academic year. Prerequisite courses are, however, offered in the Summer Quarter.

Library Facilities

The School of Librarianship is in the south wing of the Henry Suzzallo Library. The professional materials of librarianship, including an outstanding collection of children's books and a high school library collection, are a part of the Henry Suzzallo Library. These materials are supplemented by the Library's central and departmental research libraries containing more than a million and a half volumes. In addition, the School of Librarianship has the William E. Henry collection of rare books. Students have access to the facilities of the Pacific Northwest Bibliographic Center and the University's Audio-Visual Services. The Seattle Public Library and the King County library system are also available for student use.



PUBLIC AFFAIRS

Dean

Brewster C. Denny
266 Smith Hall

Graduate Program Advisory Office
266 Smith Hall

Faculty (Including Cooperating Faculty)

Abraham B. Bergman, Robert L. Bish, Gardner Brown, Richard A. Cooley, James A. Crutchfield, Jr., Brewster C. Denny, Barney Dowdle, Mary L. Eysenbach, Ralph Johnson, Herbert M. Kagi, Morton Kroll, Fremont Lyden, Marion E. Marts, Kenneth M. McCaffree, Ernest G. Miller, Robert H. Pealy, George A. Shipman, Robert Warren, Edward Wenk, Jr., Dael M. Wolfe

The Graduate School of Public Affairs is a graduate professional school providing education and research for the public service. The School offers a program of studies leading to the degree of Master of Public Administration, designed to prepare the student for service as a professional administrator in the public service at all levels—local, state, national, and international.

Graduates serve in such varied positions as foreign service officers, city managers, and budget analysts. The School draws upon those disciplines of the University which contribute to professional education and research in the field, and thus the faculty includes participating members from these disciplines. The School also cooperates with a number of University departments in doctoral programs having a significant public policy or public administration content.

Master of Public Administration

The School offers a program leading to the degree of Master of Public Administration. Admission to this program requires formal admission to the Graduate School as well as acceptance by the Graduate School of Public Affairs. There is no formal requirement for specific undergraduate courses or majors. The School invites applications from students of such varied backgrounds as political science, economics, business administration, history, social work, engineering, public health, and other fields in the social and physical sciences to undertake a program leading to professional public service. The student will ordinarily need a background in the social sciences, in the nature and historical background of American institutions, basic preparation in general economics, and a mature capacity to digest reading and to express himself in clear and lucid English. The student who lacks sufficient background in these areas may be required to make up these deficiencies by taking or auditing appropriate courses in addition to the course requirements for the degree. Ordinarily, the degree of Master of Public Administration is awarded upon the successful completion of two years of course work, a summer internship, a degree project and a comprehensive examination. This is a nonthesis program. There is no formal language requirement.

Students may select their field of emphasis from two general concentrations: Public Administration, for students primarily interested in general administrative or



managerial positions in the public service, and Public Policy, for students preparing for government positions which require professional preparation in one or more particular areas of public policy such as foreign affairs, science and public policy, health policy, natural resources, urban affairs, and the like. The student, with the approval of the Graduate Program Adviser, selects courses from among those offered by the School and by other departments of the University.

In addition to the basic course work and the summer internship, the student has the opportunity to participate in the General Seminar at which distinguished public servants appear, in workshops and conferences sponsored by the Graduate School of Public Affairs, and in the activities of the Institute for Administrative Research. An important feature of the program of the School is the sponsorship of the Public Policy Seminars. These are faculty seminars in which professors from several colleges, schools, and departments of the University and distinguished experts from off-campus discuss a particular problem area of public policy. Students participate as auditors at the invitation of faculty members. Interdisciplinary seminars in natural resources, urban and regional public policy, and health care are already regular features of the program. Others are in the planning stages for future years.

Mid-Career Education

A substantial number of students in the School are public servants with several years of public service who, on a part-time or full-time basis, take graduate work at mid-career to prepare themselves for new and broader policy and administrative responsibilities. The University is one of eight universities participating in the Career Education Awards program sponsored by the U.S. Civil Service Commission. Under this program approximately ten federal and state officials enroll each year in the Graduate School of Public Affairs for a special mid-career educational program with emphasis on the administration of public policy.

Institute of Governmental Research

The Institute of Governmental Research, as a major research unit of the University, performs a variety of

roles concerned with problems of public policy and administration in the state of Washington and the Pacific Northwest region. In the performance of these roles, a primary mission of the Institute is to work with other organizations of the University in bringing the highest standards and criteria of various disciplines to the solution of public problems.

Institute policies are developed through advisory committees composed of representatives of University schools and departments that wish to participate in efforts to formulate solutions to public policy issues. Further, the Institute receives policy advice from committees composed of public officials and civic leaders. Thus, the Institute is University-wide in its activities and interests, and is an important link between the University and the world of public affairs.

The rapid urbanization of the state of Washington has created new problems and intensified old ones for the state government and its local governments, as well as for federal and regional agencies. Consequently, in the activities of the Institute staff and its relationships within the University, with public officials, and with citizen organizations, major program emphasis is on problems of *urban* public policy and administration. The Institute develops and administers programs to increase opportunities for cooperative interdisciplinary research by faculty and graduate students on pressing problems of urban society that have lasting research significance and that contribute to the solution of those problems.

The Institute is administered on behalf of the University by the Dean of the Graduate School of Public Affairs as executive agent. The Institute, with a substantial broadening in mission and an expansion of University research and service in urban affairs, is the successor organization to the Bureau of Governmental Research and Services.

Further Information

For further information and a detailed publication on this program, write to the University of Washington, Dean of the Graduate School of Public Affairs, 266 Smith Hall, Seattle, Washington 98105.

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INTERDISCIPLINARY GRADUATE DEGREE PROGRAMS

ART HISTORY

Chairman of Art History Group and Graduate Program Adviser
Millard B. Rogers
131 Art Building

Professors

Constantine G. Christofides (Romance Languages),
Friedrich G. Grossmann (Art)

Associate Professors

Colin N. Edmonson (Classics), Paul Pascal (Classics),
Millard B. Rogers (Art), Roger B. Stein (English)

Assistant Professors

Martha Kingsbury (Art), Glenn T. Webb (Art)

Cooperating Faculty

René Bravmann (Art), B. Holm (Art), Hal N. Opperman (Art), T. Gervais Reed (Art), Myra Rosenfeld (Art)

The graduate program in Art History leading to the Doctor of Philosophy degree is administered by an interdisciplinary Art History Group of the Graduate School. The Master of Arts degree in Art History is administered by the Art History Division of the School of Art.

Admission

In addition to admission into the Graduate School, students must be accepted into the program by the

faculty of the Graduate Group on Art History. Those students whose backgrounds are judged insufficient by the Graduate Group on Art History may be required to satisfy deficiencies before being allowed to undertake a full-scale graduate program.

Requirements for the Degree

A minimum of 72 credits, exclusive of the dissertation, after admission to Graduate School, is required. At least 36 of these must be in courses numbered 500 and above. Every student is expected to take some work outside his major field, this work to be approved by his Supervisory Committee. Of the 36 credits above 500, a maximum of 15 may be taken outside the field of Art History.

Language

A reading knowledge of French and German, as tested by the standard language examinations (Educational Testing Service) used by the University of Washington, is also a requirement. Candidates in certain fields may be asked to demonstrate to their advisory committees that they have a working knowledge of more than these two languages. The ETS examinations may be written and passed by undergraduates who are urged to establish their foreign language competence before they enter the Graduate School.



Residency and Registration

Students must present a minimum of three academic years of resident study, two of them at the University of Washington, with at least one year in continuous full-time residence. (The continuous year may be satisfied with three out of four consecutive full-time quarters.)

Admission to Candidacy and General Examination

At the end of two years of course work and after a successful demonstration of proficiency in French and German, students will be permitted to take the General Examinations. These examinations will cover three fields of Art History chosen from the following general areas: (1) South Asia and Southeast Asia, (2) Eastern Asia, (3) Ancient, (4) Medieval, (5) Renaissance, (6) Baroque, (7) Modern.

No more than two fields may be selected from the same area. Topics will be defined in writing to each graduate student in accordance with the student's specific interest and the University's resources. For example, in the ancient area a student might elect Greek and Roman art as two of his specific fields; the third would have to be selected from another area. Or, a student might select nineteenth-century European art and contemporary American art as two fields within the modern area, but his third field would have to be selected from some area other than modern.

Dissertation

Each student must prepare and have accepted by the Art History Group, a dissertation that is an original and significant contribution to knowledge. Credit for the dissertation ordinarily should be at least one-third of the total credit for the degree. Since original works of art constitute primary sources in art historical investigation, the student will be expected to have a first-hand knowledge of the relevant monuments with which his dissertation is concerned. This may necessitate registration *in absentia* for one or more quarters.

Final Examination

The final examination will be oral, and will cover the subject of the dissertation and the student's research.

Financial Assistance

The graduate Art History Program offers the Samuel H. Kress Foundation Fellowship of \$3,000 each year to a student who is pursuing a program in the history of art. Limited funds are available for the assistance of graduate students in the history of art, and there are certain teaching assistantships for which students may apply.

ASIAN STUDIES

Chairman of Asian Studies Group

Donald C. Hellmann
414 Thomson Hall

Graduate Program Adviser

Jack L. Dull
405 Thomson Hall

Professors

R. J. C. Butow (History), D. F. Henderson (Law), L. N. Hurvitz (Asian Languages and Literature), R. N. McKinnon (Asian Languages and Literature), M. D. Morris (Economics), P. Serruys (Asian Languages and Literature), V. Y. C. Shih (Asian Languages and Literature), G. E. Taylor (Far Eastern), H. Wilhelm (Asian Languages and Literature), T. V. Wylie (Asian Languages and Literature)

Associate Professors

P. R. Brass (Political Science), K. Chang (Geography), J. R. Cooke (Asian Languages and Literature), R. A. Garfias (Music and Anthropology), E. Gerow (Asian Languages and Literature), E. B. Harper (Anthropology), D. C. Hellmann (Political Science), G. H. Kakiuchi (Geography), C. F. Keyes (Anthropology), F. Lukoff (Asian Languages and Literature), F. Mah (Economics), T. Niwa (Asian Languages and Literature), K. B. Pyle (History), M. R. Rogers (Art), J. R. Townsend (Political Science), I. Yen (Asian Languages and Literature)

Assistant Professors

J. Brim (Anthropology), F. F. Conlon (History), J. L. Dull (History), J. B. Palais (History), H. Schiffman, T. Takaya (Asian Languages and Literature), G. T. Webb (Art)

The Asian Studies Group, an interdisciplinary Group of the Graduate School, offers programs leading to the Master of Arts degree. The Group, comprising faculty members from a number of disciplines cooperating within the Far Eastern and Russian Institute, offers several Asian regional specializations leading to the degree, and these are described later in this section.

The regional programs include basic discipline courses and a combination of courses in several other disciplines on a particular region. For complete course listings and further details refer to the Far Eastern and Russian Institute, the Department of Slavic Languages and Literature, the Department of Asian Languages and Literature, and the other cooperating departments.

Outlined below are regional graduate programs currently offered by the Group.

Chinese Regional Studies

This course of study is designed chiefly to meet the needs of students who plan to work for the degree of

Ph.D. in a discipline such as history but at this stage can profit most from concentration in the area rather than concentration in a discipline. It also serves students who regard the Master of Arts degree as terminal. Students may draw upon courses in history, political science, economics, anthropology, geography, philosophy, and literature. A combination of strong training in one discipline and studies of China in at least two other disciplines will be arranged to meet the needs of each student. Those planning to work for the doctoral degree are particularly advised to be certain they have solid grounding in a discipline before electing the Chinese studies program. Students may also pursue programs leading to the M.A. degree in any one of several discipline departments and concentrate much of their work on China.

Admission Requirements. The applicant must meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog. An undergraduate grade-point average of 3.00 in the junior and senior years is normally a prerequisite for admission. The student should have had some formal training in the Chinese language, although this is not always required.

Course Requirements. Students must satisfactorily pass courses totaling a minimum of 45 credits. In addition, they will register for at least 9 credits of thesis research. Of the 45 course credits, at least 25 must be in courses numbered 500 and above. Credit will be given for courses numbered 300-499 on the following conditions only: (1) The instructor and the student's adviser agree that the course is essential to the student's program of study, and (2) the total of such course credits does not exceed 20.

Candidates for Master of Arts degrees with specialization in Chinese regional studies may take more than 20 credits in courses numbered 300-499 if they are deemed necessary to his training, but no more than 20 credits will be counted toward degree requirements. Students working toward this degree may receive credit for Chinese language courses, but should normally take no more than 5 credits per quarter and have no more than one-third of their total credits in Chinese language courses.

Far East seminar courses 521, 522, 523 are designed to introduce students to the major disciplines in which Chinese studies are pursued at this University. They also give students an opportunity to combine in their own research the methods of history and at least one other discipline. It is recommended that this seminar be taken by all candidates for the M.A. degree.

Other Requirements. To qualify for the Master of Arts degree with specialization in Chinese Regional Studies,

students are expected to pass a departmental language examination demonstrating their ability to use Chinese materials in research. Students will also write a thesis which makes use of Chinese materials. The thesis will usually build upon work done in seminars. The degree will be awarded after a final oral examination covering course work and the thesis has been passed.

Japanese Regional Studies

Admission requirements. This program may be undertaken either to obtain a terminal degree or to prepare for the Ph.D. degree in a discipline. Students also may pursue programs leading to the M.A. degree in other departments and concentrate much of their work on Japan. Discipline concentration is in the social sciences, but students may choose from courses in a variety of supporting fields. Those planning to work for the Ph.D. degree are particularly advised to be certain they have solid grounding in one discipline before electing the Japanese studies program.

Course requirements. This program requires a minimum of 45 credits in course work. In addition to seminars and 500-level course work, the student must take at least one additional seminar-level course in a supporting field. Students are required to include designated courses in their program unless there is evidence of equivalent previous training: Asian History (HSTAS) 422, History of Tokugawa Japan (offered jointly with the Far Eastern and Russian Institute as Far Eastern 453); Asian History (HSTAS) 423, Modern Japan (offered jointly with the Far Eastern and Russian Institute as Far Eastern 454); Asian History (HSTAS) 443, Japanese-American Relations (offered jointly with the Far Eastern and Russian Institute as Far Eastern 456); Political Science 429, International Relations in the Far East; Political Science 432, American Foreign Policy in the Far East (offered jointly with the Far Eastern and Russian Institute as Far Eastern 432); Political Science 435, Japanese Government and Politics (offered jointly with the Far Eastern and Russian Institute as Far Eastern 439).

Other requirements. Each candidate is expected to pass a Japanese language examination to demonstrate both a basic knowledge of the structure of the language and an ability to use Japanese materials in his field of concentration.

The student must prepare a thesis based upon original research making use of Japanese materials. In some cases, students may be allowed to submit two seminar papers in place of the thesis. A final oral examination will be based on the thesis but will cover course work as well.



Korean Regional Studies

This program may either lead to a terminal degree or serve as preparation for a Ph.D. degree in a discipline. Concentration is in the social sciences, but students may choose from courses in a variety of supporting fields. Students may also pursue programs leading to the M.A. in other departments and concentrate much of their work on Korea.

The prospective student who intends to proceed to Ph.D. work at the University of Washington should keep in mind that there is no Ph.D. offered in regional studies. He must concentrate in a discipline and make formal application to the department concerned. Even if the student does so, and is accepted for admittance, there is no guarantee that he will be accepted as a Ph.D. candidate until he has fulfilled the M.A. requirements for that department. It would thus be of advantage to the student to take courses within his chosen discipline while still a prospective candidate for the M.A. with specialization in Korean Regional Studies.

Admission Requirements. The applicant must meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog. An undergraduate grade-point average of 3.00 in the junior and senior years is normally a prerequisite for admission.

Course Requirements. This program requires a minimum of 36 credits in course work and 9 of thesis credits. At least 18 of these credits should be in seminars and 500-level course work.

Students are required to include the following courses in their programs: Far East 469, History of Korea to 1800; Far East 470, History of Korea from 1800 to the present; Far East 566, Problems in Korean History. If the student is able to do original research in Korean, Japanese, or Chinese materials, he may also enroll in the research seminar in Korean history, Far East 567-568 (HSTAS 572, 573).

Language requirements will vary with the student's level of proficiency at admission. For those students with no prior language training in Korean, two full years of course work will be required. Students with previous Korean language training will be required to take formal course work until such time as they can demonstrate an ability to use Korean materials in their field of concentration. For a terminal M.A., Korean will be the only departmental language requirement. For those planning to continue toward the Ph.D., course work in either Japanese or Classical Chinese (or both) might be essential if the student expects to be able to handle primary and secondary materials.

Other Requirements. The student must prepare a thesis based upon original research, ordinarily making use of

Korean materials. In some cases, students may be allowed to submit, in place of a thesis, two seminar papers. A final oral examination will be based on the thesis but will cover course work as well.

South Asian Regional Studies

A regional studies program on South Asia at both the B.A. and M.A. levels is now in the process of elaboration, but has not yet received the sanction of the necessary authorities. For information on these programs and their status please write Prof. Edwin Gerow, 423 Thomson Hall. It is expected that these programs will be available no later than Autumn 1970.

Pending such decision, it is possible to acquire a significant concentration on South Asia within established degree programs of several departments, notably Anthropology, History, Economics, and Political Science. At present, information regarding these possibilities should be directed to the departments concerned.

Language instruction is presently offered through the third-year level in Sanskrit, Tamil, and Hindi-Urdu, but no language and literature degree programs now exist.

Students may also refer to the General Studies section of this catalog where it is often possible to work out individual programs of study at the B.A. level, focusing on South Asia under the auspices of that program.

BIOLOGY TEACHING

**Chairman of Biology Teaching Group and
Graduate Program Adviser**

Ingrith Deyrup-Olsen
221 Johnson Hall

Associate Chairman of Biology Teaching Group

Donald S. Farner
142 Johnson Hall

Professors

Ingrith Deyrup-Olsen (Zoology), H. C. Douglas (Microbiology), Donald S. Farner (Zoology), A. J. Kohn (Zoology), B. J. D. Meeuse (Botany), G. J. Paulik (Fisheries)

Associate Professors

H. W. Blaser (Botany), E. W. Nester (Microbiology), Roger G. Olstad (Education), R. F. Stettler (Forest Resources)

The University of Washington offers an interdisciplinary program leading to the degree of Master of Arts for Teachers in the field of Biology. This program is designed for biology teachers in secondary schools and community colleges. Emphasis is on broadening the student's understanding of the various fields of biologi-

cal science, and on providing opportunities for independent study, with improvement of the student's effectiveness as a teacher as the primary goal.

The program offers training in the major areas of biology and in advanced courses and seminars in science teaching methods and curriculum design. Each student is asked to perform a study, in depth, of a biological problem in the context of its relevance to the teaching of biological science. Guidance in this work will be provided by a sponsoring professor and advisory committee drawn from the range of departments and colleges concerned with biological science and with education throughout the University of Washington.

Admission to the program may be granted to teachers with provisional or permanent certification, who meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this catalog.

Specific requirements for the M.A.T. degree in the field of biology include a minimum of 36 credits in course work distributed as follows: 27-30 credits in courses in biological science and science education, including at least one course in each of the fields of biochemistry, botany, genetics, microbiology, and zoology. A minimum of 9 to 12 of these credits must be at or above the 500 level. In project work, 6-9 credits are required which may take the form of a laboratory, field, library, or classroom study.

Award of the degree will be recommended on successful completion of a written report on the project work and on passage of a general examination in the fields of the candidate's specific interests and course work.

Further information about the program may be obtained from the Graduate Program Advisers.

BIOMATHEMATICS

Chairman of Biomathematics Group and Graduate Program Adviser
Edward B. Perrin
F361 Health Sciences

Professors

Z. William Birnbaum (Mathematics), Douglas G. Chapman (Fisheries, Forest Resources, and Mathematics), Gerald J. Paulik (Fisheries), Edward B. Perrin (Preventive Medicine), Ronald Pyke (Mathematics), Donovan J. Thompson (Preventive Medicine), Allan C. Young (Physiology and Biophysics)

Associate Professors

Blair M. Bennett (Preventive Medicine), Arthur C. Brown (Physiology and Biophysics), Robert T. Paine

(Zoology), Brian J. Rothschild (Center for Quantitative Science), Kenneth J. Turnbull (Forest Resources)

Assistant Professors

Norman Breslow (Preventive Medicine), Joseph Felsenstein (Genetics), Lloyd D. Fisher (Mathematics), James C. Kelley (Oceanography), Richard A. Kronmal (Preventive Medicine)

Biology and medicine are currently undergoing revolutionary advances in their development as quantitative sciences. New technological advances find expression in new research tools. New theoretical concepts are being employed in the analysis of quantitative data. The techniques and viewpoints of mathematics and statistics, traditionally peripheral to biology and medicine, are being woven into the fabric of the life sciences. The recent emergence and rapid growth of interest in mathematical biology provide exciting new opportunities in research and teaching.

The University of Washington, through the Biomathematics Group of the Graduate School, has established a program leading to degrees of Master of Science and Doctor of Philosophy. In this program, students develop competence in mathematical statistics and in applying mathematics and statistics to a biological field of their choice.

Admission

Students may enter the program from undergraduate majors in mathematics or statistics or any biological field. In particular, students should have 30 quarter credits in mathematics and statistics (beyond college algebra) and 15 quarter credits in basic biology or 30 quarter credits in a biological field and 15 quarter credits in calculus.

PROGRAMS OF STUDY

Although the primary program, with prescribed course requirements listed below, is in biostatistics, students who wish to develop other mathematical tools, e.g., from differential and integral equations, numerical analysis, etc., to apply to biological problems are welcome to the program. For such students individual programs can be arranged as indicated below.

I. Biostatistics

(a) Master of Science

COURSE REQUIREMENT OPTIONS	CREDITS
MATHEMATICS 394, 395 (PROBABILITY) (3,3)	
MATHEMATICS 482, 483 (STATISTICAL INFERENCE) (3,3)	
MATHEMATICS 484 (DISTRIBUTION-FREE INFERENCE) (3)	
MATHEMATICS 485 (ANALYSIS OF VARIANCE) (3)	
PREVENTIVE MEDICINE 530, 531, 532 (MEDICAL BIOMETRY) (3,3,3)	

Approved electives: 6-10 credits depending on the student's background.



(b) Doctor of Philosophy

COURSE REQUIREMENT OPTIONS	CREDITS
MATHEMATICS 394, 395, 482, 483, 484, AND 485 (AS LISTED ABOVE)	18
MATHEMATICS 424, 425, 426 (FUNDAMENTAL CONCEPTS)	9
MATHEMATICS 581, 582, 583 (ADVANCED THEORY OF STATISTICAL INFERENCE)	9
PREVENTIVE MEDICINE 591, 592, 593 (ADVANCED BIOSTATISTICS)	9

Approved electives: At least 15 credits, the selection depending on the student's background in biology and mathematics. In any case, one sequence should be in a biological area.

All students are required to register for the Biostatistics Seminar (Mathematics 590 or Preventive Medicine 590) for 1 credit per quarter for at least 9 credits.

II. Other Degree Programs in Biomathematics

Individual programs in biomathematics can be worked out leading to the M.S. or Ph.D. degrees. Such programs, for example, may be set up to establish strength in numerical analysis and/or model building and to apply this in biophysics and physiology or in quantitative ecology.

In place of the courses in mathematical statistics and biostatistics, students interested in this option for a Ph.D. degree should take Mathematics 424, 425, 426 and select 30 credits from the following options.

MATHEMATICS 394, 395, 396 (PROBABILITY)	(3,3,3)
MATHEMATICS 407, 408 (MATHEMATICAL OPTIMIZATION THEORY)	(3,3)
MATHEMATICS 427, 428, 429 (TOPICS IN APPLIED ANALYSIS)	(3,3,3)
MATHEMATICS 464, 465, 466 (NUMERICAL ANALYSIS)	(3,3,3)
MATHEMATICS 491, 492 (STOCHASTIC PROCESSES)	(3,3)
MATHEMATICS 591, 592, 593 (ADVANCED PROBABILITY)	(3,3,3)
MATHEMATICS 541, 542, 543 (SPECIAL TOPICS IN APPLIED MATHEMATICS)	(3,3,3)
MATHEMATICS 591, 592, 593 (SPECIAL TOPICS IN PROBABILITY AND STATISTICS)	(3,3,3)

At least one of the sequences in mathematics should be at the 500 level. In addition, students would select approved electives for at least 21 credits in biophysics-physiology or from the courses Fisheries 556, 557, 558; Biology 472; and Zoology 572, 574, 578.

Some courses in simulation or operations research in the Graduate School of Business Administration could be substituted for the undergraduate mathematics courses.

Further Requirements

Demonstration of proficiency in one foreign language and a thesis are required for the Master of Science and Doctor of Philosophy degrees.

If the M.S. is taken and a language proficiency examination (usually in French, German, Russian, or Spanish) is completed as part of the requirements for that degree, no further language examination is necessary. It is not necessary, however, to take an M.S. before going on to the Ph.D.

At the completion of about two years of course work, the student working for a Ph.D. will take General Examinations (written and oral). For those in the biostatistics option there will be written examinations in theoretical statistics and biostatistics and an examination in a biological field to test the student's ability to integrate mathematical methods with his field of application. At the successful completion of these examinations, the student is advanced to candidacy.

While most of the Candidate's time, after completion of the Ph.D. General Examination, is devoted to his dissertation research program, he is expected to devote part of his time to consultation to gain greater facility in using mathematical and statistical tools in interdisciplinary problems. Formal credit can be given for this through courses numbered 600 (Independent Study or Research) in the appropriate department. Such consultation is an essential part of the training of a biostatistics student.

COMPARATIVE LITERATURE

Chairman of Comparative Literature Group

Frank J. Warnke

B436 Padelford Hall

Associate Chairman

Ernst Behler

D338 Denny Hall

Graduate Program Adviser

Frank W. Jones

B521 Padelford Hall

Professors

Sverre Arestad (Scandinavian), Ernst H. Behler (Germanics), Constantine G. Christofides (Romance Languages), Robert B. Heilman (English), Karl-Ivar Hildeman (Scandinavian), Antonin Hruby (Germanics), Walter Johnson (Scandinavian), Edith Kern (Romance Languages), Wolfgang Leiner (Romance Languages), John B. McDiarmid (Classics), Richard McKinnon (Asian Languages), Lew R. Mickelsen (Slavic Languages), William H. Rey (Germanics), Frank J. Warnke (English), Hellmut Wilhelm (Asian Languages), Turrell V. Wylie (Asian Languages)

Associate Professors

Gerhard Baumgaertel (Germanics), Robert Ellrich (Romance Languages), Edwin M. Gerow (Asian Languages), William C. Grummel (Classics), Frank W. Jones (English), Pierre Mackay (Classics), Otto Reinert (English), Roman S. Struc (Germanics)

Assistant Professors

Elizabeth D. Dipple (English), Frank J. Kearful (English), Willis A. Konick (Slavic Languages), Michael Loraine (Classics)

The graduate program in Comparative Literature leading to the Master of Arts and Doctor of Philosophy degrees, is administered by an interdisciplinary Comparative Literature Group of the Graduate School.

The comparative study of literature concerns itself with literature in its essential nature, not as restricted to one specific national culture or language. Typical areas of inquiry for the comparative literature scholar include literary traditions prevailing for long periods of time in large cultural areas, major genres and forms as they are manifested in different linguistic and cultural environments, patterns of influence and reception of literary works among various national cultures, and the general principles of literary theory and criticism.

On receiving the Master of Arts or the Doctor of Philosophy degree, the graduates are qualified for teaching and research in comparative and world literature and the history of literary genres, as well as the language and literature of their specialization.

Graduate study in Comparative Literature involves intensive work in two or more national literatures, read in their original tongues. To qualify for study toward the M.A., the student must demonstrate, at the beginning of his study, advanced competence in one foreign language; within a year of his beginning residence, he must show a basic reading knowledge of a second foreign language. For Ph.D. work, the student must be equipped with advanced competence in two foreign languages and a basic reading knowledge of a third. In some cases a program involving the study of relations between literature and some related field, e.g., philosophy, psychology, is approved by the Comparative Literature faculty.

During their period of study, students working for advanced degrees in Comparative Literature are eligible for teaching assistantships in the language of their major literature; namely, Asian, Classics, English, Germanic, Romance, Scandinavian, or Slavic.

All requests for information regarding the Comparative Literature program should be addressed to the Graduate Program Adviser, Comparative Literature, Room B434, Padelford Hall.

COMPARATIVE PHYSIOLOGY

Chairman of Comparative Physiology Group
Kjell Johansen
303 Old Oceanography Building

Graduate Program Adviser
Arthur W. Martin
140 Johnson Hall

Professors

Donald S. Farner (Zoology), Aubrey Gorbman (Zoology), Arthur W. Martin (Zoology), Ingrith Olsen (Zoology), Harry D. Patton (Physiology and Biophysics), A. M. Sher (Physiology and Biophysics), Arnold L. Towe (Physiology and Biophysics), J. Walter Woodbury (Physiology and Biophysics), A. C. Young (Physiology and Biophysics)

Associate Professors

A. C. Brown (Physiology and Biophysics), J. T. Conrad (Physiology and Biophysics), John Edwards (Zoology), T. F. Hornbein (Medicine and Physiology and Biophysics), Kjell Johansen (Zoology), C. J. Lenfant (Medicine and Physiology and Biophysics), C. F. Stevens (Physiology and Biophysics), Robert L. VanCitters (Physiology and Biophysics), C. A. Wiederhielm (Physiology and Biophysics)

Assistant Professors

C. G. Gale (Physiology and Biophysics), A. M. Gordon (Physiology and Biophysics), John Palka (Zoology), C. E. Stirling (Physiology and Biophysics), Dennis A. O. Willows (Zoology)

The University of Washington offers an interdisciplinary program leading to the Master of Science and Doctor of Philosophy degrees in the field of Comparative Physiology. The program is offered by the Comparative Physiology Group of the Graduate School; its faculty comprises certain members of the departments of Physiology and Biophysics and of Zoology. These departments contribute space and resources to the program, which is largely supported by training grants from the National Institutes of Health.

The program aims at combining a broad training in animal morphology (from gross anatomy to ultrastructure) with advanced training in biophysics and, where necessary, biochemistry and physical chemistry in order to encourage the utilization of the whole spectrum of organisms, from protozoans to man, in advanced physiological research and teaching. In this way the program attempts to join the resources available in mammalian physiology with those in invertebrate physiology. The program is designed to accommodate graduate students of various backgrounds, including graduates in biology, zoology, physics, mathematics, chemistry, or biochemistry.

A limited number of students will be supported from funds available through training grants. Additional support is available in the form of teaching and research assistantships.

Students who wish to enter the program in Comparative Physiology must meet the requirements of the Graduate



School as outlined in the *Graduate Study* section of this catalog.

Minimum prerequisites for entering the program are 10 credits in general zoology or general biology, or any combination of introductory courses in zoology, botany, and genetics; 12 credits in general physics; 15 credits in chemistry (including general chemistry and organic chemistry), and a minimum of 15 credits in mathematics (including calculus).

Requests for further information should be addressed to the Graduate Program Adviser or the Group Chairman.

COMPUTER SCIENCE

Chairman of Computer Science Group

Jerre D. Noe

228 Roberts Hall

Graduate Program Adviser

David B. Dekker

226 Roberts Hall

Professors

Hellmut Golde (Electrical Engineering), Allan A. Goldstein (Mathematics), Earl B. Hunt (Psychology), David L. Johnson, (Electrical Engineering), Laurel J. Lewis (Electrical Engineering), Jerre D. Noe (Computer Sciences), Ronald Pyke (Mathematics)

Associate Professors

John G. Cramer (Physics), David B. Dekker (Mathematics), Theodore H. Kehl (Physiology and Biophysics), Robert W. Ritchie (Mathematics), Ralph T. Rockafellar (Mathematics)

Assistant Professors

Jean L. Baer (Electrical Engineering), Alistair D. C. Holden (Electrical Engineering), Jonathan Stanfield (Librarianship)

Lecturer

Robert Gillespie (Computer Center)

The field of computer science recently has emerged as a separate discipline, evolving from such disciplines as mathematics and engineering, which gave computer science much of its early impetus. The use and utility of electronic digital computers is well established and well known; no further elaboration is necessary. Nevertheless, computer science is much more than the design and programming of computers for their use in certain tasks: it involves the general concept of information and studies the transformation of information in much the same sense as physics studies the transformation of energy.

Computer science is devoted to the representation, storage, manipulation, and presentation of information in an environment permitting automatic information sys-

tems. The computer scientist is interested in discovering the means by which information can be transformed in order to model and to analyze the information transformations in the real world. This interest leads to inquiry into both the theory and the application of (1) effective ways to represent information of all forms, (2) effective algorithms to transform information, (3) effective languages with which to express algorithms, (4) effective means to monitor the process and display the transformed information, and (5) economic ways to accomplish (1) and (4).

Both mathematics and engineering have contributed greatly to the development of electronic computing and information transformation devices, the former principally through the development of computational algorithms (largely in numerical analysis) and the theories of computability, recursive functions, and automata, and the latter primarily through the design of computing devices and the development of the theory of digital circuits. In recent years many other disciplines have taken a very active interest in computer science and have contributed greatly to the development of this discipline. Linguistics plays an increasing role in the development of computer languages and the problem of machine translation of natural languages; librarianship, or library science, is vitally interested in the efficient storage and retrieval of information; business administration has a stake in the processing and the modeling and simulation of complex systems and in the display of business information; psychology is contributing greatly to the development of learning or self-improving automata; biology and medicine provide a substantial amount of background for the modeling of human and animal information processing. This brief list mentions only the principal contributors to the field of computer science; the use of computing machines has, of course, invaded practically all fields.

Computer Science includes research in many areas, including: theory and design of digital computers, theory and development of computer languages and their processors, automata theory, artificial intelligence, numerical analysis, information display systems, systems simulation and operations research, command and control systems, and real time and on-line information processing.

The Computer Science Laboratory equipped with a Xerox Data Systems Sigma 5 computer is operated by the Computer Science Group for research and teaching in Computer Science.

The Computer Science Group offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

Admission

To be admitted to the graduate program in computer science, a student must satisfy the admissions criteria outlined in the *Graduate Study* section of this catalog. In addition, the student must make an application to the Computer Science Group, showing that his background includes:

- (1) Basic knowledge of programming with a procedure-oriented language, e.g., FORTRAN, ALGOL, COBOL, including the development of programming algorithms.
- (2) Basic knowledge of computer organization and arithmetic and assembly language programming, e.g., FAP, MAP, Autocoder.
- (3) Mathematics through differential and integral calculus, elementary differential equations, algebra of matrices, introductory modern algebra, and fundamentals of mathematical logic. Knowledge of numerical analysis is desirable but not required.

A student with subject area deficiencies may occasionally be admitted. Courses taken to remove such deficiencies will not be counted toward any degree requirement.

Admission to the computer science program may be restricted because of limited facilities. Applications for admission to the program should be submitted by these deadlines (earlier than the University-published dates):

Application for Autumn Quarter, February 1; application for Winter Quarter, October 1; application for Spring Quarter, January 1. Applications by foreign students may be made only for Autumn Quarter and must be submitted by January 1.

Applicants requesting financial aid in the form of scholarships or assistantships will be considered only for Autumn Quarter admission, and applications for financial aid must be filed by February 1.

Computer science and financial-aid application forms may be obtained directly from the Computer Science Group, University of Washington, Seattle, Washington 98105.

Master of Science

Two options leading to the Master of Science degree are offered. Individual programs should be designed to provide considerable breadth of knowledge as well as depth in some area of specialization. In addition to the degree requirements outlined in the *Graduate Study* section of this catalog, the student must satisfy several requirements:

Nonthesis option

1. Completion of 40 credits of course work. At least one-half of the credits must be in courses numbered 500 or above.

2. At least 30 credits must be in courses chosen from the Computer Science course list.

3. The remaining course work should be in one or more supporting fields, e.g., engineering, mathematics, natural sciences, business administration, linguistics, philosophy, psychology, or medicine.

4. Demonstration of proficiency in a foreign language (usually French, German, or Russian).

5. Passing satisfactorily an oral examination in one area of specialization.

Thesis option

1. Completion of 31 credits of course work. At least one-half of the credits must be in courses numbered 500 or above.

2. At least 24 credits of course work must be in courses chosen from the Computer Science course list.

3. See item 3 under nonthesis option.

4. See item 4 under nonthesis option.

5. Preparation of a thesis acceptable to a Computer Science supervisory committee. Students must register for at least 9 credits of Computer Science 700, in addition to the 31 credits of course work.

6. Pass an oral examination on his thesis work.

Examples of programs providing appropriate depth are:

1. A program in programming languages and systems: Computer Science 478, 510, 531; Electrical Engineering 501, 502; Mathematics 405, 519.

2. A program in design of computers: Computer Science 478, 531; Electrical Engineering 501, 576, 588, 589; Mathematics 405.

3. A program in abstract theory for students with a strong algebra background: Computer Science 478, 531; Electrical Engineering 501; Mathematics 405, 504, 505, 506.

4. A program in numerical analysis: Computer Science 478; Electrical Engineering 501; Mathematics 464, 465, 466, and/or 557, 558, 559.

Doctor of Philosophy

Individual Ph.D. programs must be approved by the Supervisory Committee, appointed by the Dean of the Graduate School. Requirements that supplement those outlined in the *Graduate Study* section of this catalog are as follows:

1. Passing a Ph.D. qualifying examination administered by the Computer Science Group. The examination normally is taken after completion of one year of graduate study and covers breadth of knowledge in Computer Science, which can be obtained from the basic Com-



puter Science courses. A detailed prospectus will be issued well in advance of the examination.

2. Demonstrating proficiency in a foreign language, (usually French, German, or Russian).

3. Passing the General Examination specified in the *Graduate Study* section of this catalog. In this examination the student must demonstrate depth of knowledge in the area of programming languages and in one of a number of special areas acceptable to his Ph.D. Supervisory Committee. Examples of such areas are numerical analysis; computer design; and theoretical foundations of computer science (includes automata theory, mathematical logic, and modern algebra).

4. Completing approximately 60 credits of course work, at least 40 of which are to be in courses numbered 500 or above, and approximately 45 credits should be in courses chosen from the Computer Science course list.

Course work taken for the M.S. degree will be applicable to the Ph.D.

5. Preparation of a dissertation acceptable to the Supervisory Committee. Students must register for at least 27 credits of Computer Science 700, Thesis.

Course List

Courses listed below are acceptable for application to requirements for computer science degrees. Courses may be added to or deleted from this list from time to time. Electives may be chosen from other courses in this catalog with the approval of the student's adviser.

COMPUTER SCIENCE 470	DESIGN OF DIGITAL DATA SYSTEMS
COMPUTER SCIENCE 478	COMPUTER ORGANIZATION AND MACHINE LANGUAGE PROGRAMMING
COMPUTER SCIENCE 501	COMPUTER LANGUAGES
COMPUTER SCIENCE 502	PROGRAMMING SYSTEMS
COMPUTER SCIENCE 510	LIST PROCESSING AND STRING MANIPULATION
COMPUTER SCIENCE 519	MATHEMATICAL LINGUISTICS
COMPUTER SCIENCE 531, 532	AUTOMATA THEORY
COMPUTER SCIENCE 541	COMPUTER MEASUREMENTS AND EVALUATION TECHNIQUES
COMPUTER SCIENCE 551	OPERATING SYSTEMS
COMPUTER SCIENCE 552	SYSTEMS PROGRAMMING PRACTICUM
COMPUTER SCIENCE 573, 574	INTRODUCTION TO ARTIFICIAL INTELLIGENCE
COMPUTER SCIENCE 590	SPECIAL TOPICS IN COMPUTER SCIENCE
COMPUTER SCIENCE 600	INDEPENDENT STUDY OR RESEARCH
COMPUTER SCIENCE 700	THESIS
ELECTRICAL ENGINEERING 576, 577	INFORMATION THEORY AND CODING I, II
ELECTRICAL ENGINEERING 588, 589	LOGICAL DESIGN OF DIGITAL COMPUTERS I, II
ELECTRICAL ENGINEERING 590	ADVANCED TOPICS IN DIGITAL COMPUTERS
MATHEMATICS 403, 404	INTRODUCTION TO MODERN ALGEBRA
MATHEMATICS 405	INTRODUCTION TO METAMATHEMATICS
MATHEMATICS 407, 408	MATHEMATICAL OPTIMIZATION THEORY
MATHEMATICS 464, 465, 466	NUMERICAL ANALYSIS I, II, III
MATHEMATICS 501, 502, 503	MATHEMATICAL LOGIC
MATHEMATICS 504, 505, 506	MODERN ALGEBRA
MATHEMATICS 557, 558, 559	SPECIAL TOPICS IN NUMERICAL ANALYSIS

DRAMA ARTS

Chairman of Drama Arts Group and
Graduate Program Adviser

Gregory A. Falls

113 Drama-TV Building

Professors

Sverre Arestad (Scandinavian), Gregory A. Falls (Drama), Walter Johnson (Scandinavian), Bertram L. Joseph (Drama), Gerald R. Kechley (Music), Edith Kern (Romance Languages), Robert B. Loper (Drama), John B. McDiarmid (Classics), David R. Wagoner (English), Frank J. Warnke (Comparative Literature)

Associate Professors

Frank W. Jones (English), Richard N. McKinnon (Asian Languages), Charles W. Smith (Art)

Assistant Professors

Norman Stokle (Romance Languages), John R. Wolcott (Drama)

The University of Washington, through the interdisciplinary Drama Arts Group of the Graduate School, comprised of faculty members from Drama, Art, Asian Languages and Literature, Classics, English, Music, Scandinavian Languages and Literature, Slavic Languages and Literature, and other disciplines, offers a program leading to the Doctor of Philosophy degree for students who can demonstrate artistry in one of the theatre arts.

A student may choose to concentrate in theatre history, dramatic literature, or criticism. Study is not limited to the English language theatre and drama; it is ultimately a study of world theatre and drama. The University provides extensive offerings in dramatic literature and criticism (English as well as other languages) and students in the Drama Arts program may choose widely among the courses in a number of departments and schools.

Students must meet all the general degree requirements for the Ph.D. at the University of Washington.

NEAR EASTERN STUDIES

Chairman of Near Eastern Studies Group and
Graduate Program Adviser

Farhat J. Ziadeh

225 Denny Hall

Professors

Harold L. Amoss (Urban Planning), John B. McDiarmid (Classics), Sol Saporta (Linguistics), Peter F. Sugar (History), Farhat J. Ziadeh (Classics)

Associate Professors

Ilse D. Cirtautas (Asian Languages and Literature), Nicholas L. Heer (Classics), Pierre A. MacKay (Classics)

Assistant Professors

Jere L. Bacharach (History), Michael B. Loraine (Classics), John H. Mikhail (Political Science)

Cooperating Faculty

Assistant Professors: Walter G. Andrews (Classics), John W. Clear (Classics), Tom Drury (Romance Languages and Literature), Allen H. Podet (Classics)

Through the interdisciplinary Near Eastern Studies Group of the Graduate School, the University offers a graduate program leading to the Master of Arts degree in Near Eastern Studies.

Students who intend to work toward the master's degree must meet the requirements of the Graduate School as outlined in the *Graduate Study* section of this Catalog.

General requirements for the Master of Arts program are 36 credits in approved courses and seminars plus an additional 9 credits for a thesis, and a reading knowledge of French or German (although in some cases Russian, Spanish, or a second Near Eastern language may be acceptable).

Students may concentrate in Arabic, Hebrew, Persian, or Turkish. Knowledge of a Near Eastern language is not a prerequisite for admission to the program, but the degree requires the equivalent of three years of language study. In addition to language and literature, students in this program are expected to take work in either comparative literature or in linguistics and may include supporting courses in Near Eastern anthropology, history, political science, and other related subjects.

PHYSIOLOGY PSYCHOLOGY

Chairman of Physiology Psychology Group and Graduate Program Adviser

Moncrieff H. Smith, Jr.
419G Denny Hall

Professors

Arthur A. Lumsdaine (Psychology), Harry D. Patton (Physiology and Biophysics), Moncrieff H. Smith, Jr. (Psychology), Orville A. Smith, Jr. (Physiology and Biophysics), Arnold L. Towe (Physiology and Biophysics)

Associate Professors

Walter Makous (Psychology), Charles F. Stevens (Physiology and Biophysics)

Assistant Professors

E. S. Luschei (Physiology and Biophysics), D. Y. Teller (Psychology)

This interdisciplinary program administered by the Physiology Psychology Group of the Graduate School has been designed to meet an evident need for intensive training in the overlapping area of the behavioral and physiological sciences. Currently, physiology and other departments of medical schools are appointing psychologists to carry on certain types of physiological research and to teach medical students. Psychology departments have long felt the need for individuals more highly conversant with physiological techniques and concepts than is usual for Ph.D.'s in psychology. Further, because physiological psychology is a fruitful research field, numerous research institutes are seeking men trained in both disciplines.

Individuals could take a Ph.D. in each subject. In practice this is rarely feasible, with the result that individuals in physiological psychology and in behavioral neurophysiology are usually less than adequately trained in one or the other of the parent disciplines. Therefore, it is the aim of the faculty in Psychology and the faculty in Physiology to work jointly to afford graduate students intensive training in the large area of overlap between the disciplines.

The program of each student will be supervised by a committee of four faculty members. Each student will be expected to do laboratory work in both areas in order to familiarize himself with current research techniques in the respective departments. Although no formal master's degree program is provided, each student will be expected to do independent research in one discipline or the other prior to undertaking a doctoral research program.

Each student will spend approximately one year in basic course work in each discipline. At the conclusion of these two years of study, his training will consist of advanced seminars in either area, and doctoral research.

Because physiological psychology and neurophysiology are strongly developed at the University of Washington, the graduate student will find the latest in instrumentation and research techniques in both fields.

In addition to the facilities of both the Physiology and Psychology Departments, students will have the opportunity of working with laboratory primates at the Regional Primate Center. At the Center there are facilities for a wide variety of behavioral and physiological studies of a number of primate species. Since primates offer unique advantages both for the behavioral and physiological work, the Center is a valuable adjunct to the resources of the training program.



RADIOLOGICAL SCIENCES

Chairman of Radiological Sciences Group, and
Graduate Program Adviser

Kenneth L. Jackson

D218 Health Sciences Building

Professors

Ellsworth C. Alvord, Jr. (Pathology), Albert L. Babb (Nuclear Engineering), David Bodansky (Physics), Lauren R. Donaldson (Fisheries), Arthur W. Fairhall (Chemistry and Physics), Melvin M. Figley (Radiology), Stanley P. Gessel (Forest Resources), Aubrey Gorbman (Zoology), Milton P. Gordon (Biochemistry), Ralph W. Moulton (Chemical Engineering), Erling J. Ordal (Microbiology), Herschel L. Roman (Genetics), Allyn H. Seymour (Fisheries), Richard B. Walker (Botany)

Associate Professors

Gerald M. Christensen (Radiology), Kenneth L. Jackson (Radiology), Wil B. Nelp (Radiology), Peter Wootton (Radiology)

The program leading to the degree of Master of Science in Radiological Sciences is offered by the Radiological Sciences Group of the Graduate School. Study for this degree is open to students with bachelor's degrees in a physical or biological science or in engineering.

Two options for a program of study leading to the master's degree are offered in order to satisfy the somewhat different requirements and interests of biological scientists and physical scientists or engineers. The Physical Science Option is designed to give the student advanced training in radiation physics and nuclear engineering, together with a broad background in biology, biophysics, radiochemistry, and other areas of radiological sciences. The Biological Science Option is designed to give the student advanced training in radiation biology and in related biological and health sciences, together with instruction in radiation physics, physical chemistry, radiochemistry, and other areas of radiological sciences.

Specific course recommendations for each of the two options are given below. The curricula include radiological sciences seminars, which are conducted by local and visiting scientists who are active in radiation research. Thesis topics are generally chosen in some area of radiation research, and include studies in radiation biology, radioecology, nuclear medicine, radiochemistry, radiation physics, or nuclear engineering. Thesis research may be carried out in various University laboratories of the School of Medicine, College of Arts and Sciences, College of Engineering, College of Fisheries, or the Laboratory of Radiation Ecology. Opportunity for research in the Hanford Laboratories of the U.S. Atomic Energy Commission may also be provided

through special arrangement. There is no foreign language requirement. The general requirements of the Graduate School for the master's degree apply, however, including the completion of 18 credits in courses numbered 500 or above. For specific requirements, see the *Graduate Study* section of this catalog.

A student who has completed any of the recommended courses of his program at a prior time may substitute elective courses with the approval of the Graduate Program Adviser. Electives may be chosen in the fields of biology, medicine, public health, chemistry, physics, mathematics, and engineering.

A student with a deficiency in one area of the prerequisites may be accepted for the program, provided he removes the deficiency during the first year of graduate study. Credit toward the degree is not ordinarily granted for a course used to remove a deficiency.

Physical Science Option

Prerequisites include a bachelor's degree in a physical science or in engineering, and Physics 327 (Introduction to Nuclear Physics) or the equivalent, Mathematics 238 (Elements of Differential Equations) or the equivalent, and a year of general biology at the college level.

RECOMMENDED COURSES*		CREDITS
PHYS 431, 433	MODERN PHYSICS LABORATORY	3,3
NUC E 484	INTRODUCTION TO NUCLEAR ENGINEERING	4
NUC RADGY 487J	RADIOACTIVE TRACER TECHNIQUES	2
CHEM 410	RADIOCHEMICAL TECHNIQUES AND RADIOACTIVITY MEASUREMENTS	
NUC E 485	NUCLEAR INSTRUMENTS	3
FISH 473	RADIONUCLIDES IN THE AQUATIC ENVIRONMENTS	3
RADGY 501-502	BIOLOGICAL EFFECTS OF IONIZING RADIATION	2-2
RADGY 503-504	LABORATORY IN RADIATION BIOLOGY	1-1
RADGY 507	RADIATION HAZARDS ANALYSIS AND CONTROL	1
RADGY 517	RADIATION DOSIMETRY	4
RAD S 520	RADIOLOGICAL SCIENCE SEMINAR	2
RAD S 700	THESIS	9

Biological Science Option

Prerequisites include a bachelor's degree in a biological science, and courses in mathematics through differential and integral calculus, chemistry through quantitative analysis, and organic chemistry.

RECOMMENDED COURSES		CREDITS
500-LEVEL COURSE IN A BIOLOGICAL SCIENCE		3
RADGY 501-502	BIOLOGICAL EFFECTS OF IONIZING RADIATION	2-2
RADGY 503-504	LABORATORY IN RADIATION BIOLOGY	1-1
RADGY 505	RADIOLOGICAL PHYSICS	2
RADGY 507	RADIATION HAZARDS ANALYSIS AND CONTROL	1
FISH 473	RADIONUCLIDES IN THE AQUATIC ENVIRONMENTS	3
CHEM 350,351	ELEMENTARY PHYSICAL CHEMISTRY	3,3
CHEM 410	RADIOCHEMICAL TECHNIQUES AND RADIOACTIVITY MEASUREMENTS	3
PHYS 320	INTRODUCTION TO MODERN PHYSICS	3
PHYS 327	INTRODUCTION TO NUCLEAR PHYSICS	3
RAD S 520	RADIOLOGICAL SCIENCE SEMINAR	2
RAD S 700	THESIS	9

*Modification of these requirements may be made in special cases at the discretion of the Graduate Program Adviser. More detailed information concerning course content may be obtained by referring to *Description of Courses* section in this catalog.

RUSSIAN AND EAST EUROPEAN STUDIES

Chairman of Russian and East European Studies Group
W. A. Douglas Jackson
501 Thomson Hall

Graduate Program Adviser
E. Harold Swayze
220 Thomson Hall

Professors

Herbert Ellison (History), W. A. Douglas Jackson (Geography), Lyman H. Legters (Russian and East European Studies), Lew R. Micklesen (Slavic Languages and Literature), John Reshetar (Political Science), Peter Sugar (History), Marc M. Szeftel (History), Donald W. Treadgold (History)

Associate Professors

Imre Boba (History), Judith G. Leber (Economics), E. Harold Swayze (Slavic Languages and Literature), Joseph Velikonja (Geography)

Assistant Professors

James Augerot (Slavic Languages and Literature), Paul Gribanovsky (Slavic Languages and Literature), Roger Hagglund (Slavic Languages and Literature), Willis Konick (Slavic Languages and Literature)

The Russian and East European Program administered by an interdisciplinary group of the Graduate School offers courses leading to the Master of Arts degree. The program faculty, consisting of specialists drawn from a number of cooperating departments and from the Far Eastern and Russian Institute, offers specializations in Russian regional studies and in East European regional studies. Inquiries concerning these programs and requests for applications for admission should be addressed to the Graduate Program Adviser.

For complete course listings and further details, refer to the catalog offering of the Far Eastern and Russian Institute, or the Departments of Economics, Geography, History, Political Science, and Slavic Languages and Literature.

Russian Regional Studies

Admission requirements: Applicants must have the equivalent of six quarters (two years) of instruction in Russian at this University. Undergraduate training should have included substantial work in history, political science, economics, geography, or Slavic languages and literature. Students who wish to concentrate in a discipline for which their preparation is inadequate must make up deficiencies in addition to fulfilling the course requirements described below.

Course requirements: A concentration in one discipline (a minimum of four quarters of course work) and at least one course in each of three other disciplines. A minimum of 47 credits, including 9 thesis credits, must be earned.

Other requirements: A thesis and a final oral examination based on the thesis but also covering the student's major discipline and the field in general. Students must pass the Educational Testing Service Examination in Russian.

East European Regional Studies

Admission requirements: Applicants who lack a knowledge of the language of the area will be required to make up the deficiency. However, they must have a reading knowledge of French, German, or Russian before entering the program. An undergraduate major in history, political science, economics, geography, or Slavic Languages and Literature is desirable, but students with undergraduate training in other fields may be accepted. Students who wish to concentrate in a discipline for which their preparation is inadequate must make up deficiencies in addition to fulfilling the course requirements described below.

Course requirements: A concentration in one discipline (a minimum of four quarters of course work) and at least one course in each of three other disciplines. A minimum of 54 credits, including 9 thesis credits, must be earned.



DESCRIPTION OF COURSES

Colleges and schools are listed in alphabetical order in this section. Courses are arranged alphabetically by department under the heading of the college or school in which they are offered.

Courses numbered from 100 through 299 are lower-division courses for freshmen and sophomores; those numbered from 300 through 499 are upper-division courses for juniors, seniors, and fifth-year students.

Courses numbered 500 and above are intended for and restricted to graduate students. Some courses numbered in the 300's and 400's are open both to graduates and to upper-division undergraduates. Such courses, when acceptable to the major department and the Graduate School, may be part of the graduate program. The Graduate School accepts credit in approved 300-level courses for the minor or supporting fields only; approved 400-level courses are accepted as part of the major.

Undergraduate students of senior standing who wish to register for a 500-level course must obtain permis-

sion from both the instructor of the class and the Dean of the Graduate School.

The number in parentheses following the course title indicates the amount of credit each course carries. In most lecture courses, a credit is given for each weekly class hour during a quarter; laboratory courses generally carry less credit than the work time required. An asterisk in place of a credit number means that the amount of credit is variable.

The letters A, W, Sp, and S, following the number of credits, refers to the quarter or quarters in which the course is offered. A refers to Autumn Quarter, W to Winter, Sp to Spring, and S to Summer.

Specific areas in the departments of Anthropology, Art, Civil Engineering, Education, History, and Speech are designated by area letters. These letters *must* precede course numbers on the Official Program.

Not all of these courses are offered every quarter. Final confirmation of courses to be offered, as well as a list of times and places of class meetings, is given in the *Time Schedule*.

The four courses numbered 600, 700, 702, and 800 are restricted to graduate students in the Graduate School. They appear by number and title only where applicable under the departmental course listings in this catalog. Descriptions for these courses are uniform throughout the University and, therefore, are listed below in order to eliminate the necessity of repeating them each time they appear. The asterisk (*) following the course title indicates the amount of credit is variable.

600 Independent Study or Research (*)

Individual readings or study, including independent study in preparation for doctoral examinations, research, etc. Prerequisite, permission of Supervisory Committee Chairman or Graduate Program Adviser. Name of faculty member responsible for supervising the student should be indicated on Program of Studies.

700 Master's Thesis (*)

Research for the master's thesis, including research preparatory or related thereto. Limited to pre-master graduate students, i.e., those who have not yet completed the master's degree in their major field at the University of Washington. Prerequisite, permission of Supervisory Committee Chairman or Graduate Program Adviser. Name of faculty member responsible for supervising the student should be indicated on Program of Studies.

702 Degree Final (3)

Limited to graduate students completing a nonthesis master's degree program.

800 Doctoral Dissertation (*)

Research for the doctoral dissertation and research preparatory or related thereto. Limited to Intermediate graduate students, i.e., those who have completed the master's degree or the equivalent, or Candidate-level graduate students. Pre-master students initiating doctoral dissertation research should register for 600. Prerequisite, permission of Supervisory Committee Chairman or Graduate Program Adviser. Name of faculty member responsible for supervising the student should be indicated on the Program of Studies.

COLLEGE OF ARCHITECTURE AND URBAN PLANNING

ARCHITECTURE

Courses for Undergraduates

150, 151 Architectural Appreciation (2,2)

ASp, WS

PUNDT

Survey of architectural design from an historical viewpoint. Prerequisite, 150 recommended for 151. (Formerly 100, 101.) For nonmajors.

152 Environmental Design Professions (3) Sp

BONSTEEL

Survey of professional role in shaping physical environment. For nonmajors.

300, 301, 302 Introduction to Design — Laboratory (4, 4, 4) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

305, 306, 307 Introduction to Design (1, 1, 1) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

310, 311, 312 Introduction to Design

Graphics (1, 1, 1) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

320 Introduction to Structural Theory I (3)

AW

Vectors, equilibrium of forces, graphic and analytical study of force systems, load tracing in buildings. Prerequisite, Mathematics 125. (Formerly 276.)

321 Introduction to Structural Theory II (3) WSp

The nature of structural materials; their reactions to forces and force systems; their strengths and elastic properties. Methods of designing and joining structural members. Prerequisite, 320. (Formerly 277.)

322 Introduction to Structural Theory III (3) Sp

Simple building structural elements and systems. Beams and posts. Trusses. Introduction to lateral force and vertical force-resisting systems. Prerequisite, 321. (Formerly 278.)

330 Introduction to Building Methods, Materials, and Assemblies I (2) A

JORGENSEN, SMALL

Introduction to the requirements for the development of the built environment; a survey of the built environment's response to human physiological needs, natural and unnatural physical phenomena.

331 Introduction to Building Methods, Materials, and Assemblies II (2) W

JORGENSEN, SMALL

Introduction to the life systems of the built environment; a survey of man's fundamental concepts and methods for the control and modification of the natural physical environment. Prerequisite, 330.

332 Introduction to Building Methods, Materials, and Assemblies III (2) Sp

JORGENSEN, SMALL

Introduction to the physical structuring of the built environment; a survey of man's funda-

mental concepts and methods for building, the conversion of raw material into building components, the assembly process, the maintenance of the built environment. Prerequisite, 331.

340 Environmental Awareness: Ecosystems (3) A

HASENSTAB

Introduction to general concepts of systems and an interdisciplinary development of concepts and problems of human and physical ecology. (Formerly 110.)

341 Environmental Awareness: Appreciation (3) W

BONSTEEL

Survey of the sensory and intellectual qualities of the environment. Prerequisite, 340.

342 Environmental Awareness: Prognostics (3) Sp

HASENSTAB

The future of the environment—forces and problems, techniques and tools; the environmental design professions and emerging alternative environments.

350 Survey of Environmental Arts I (3) A

HILDEBRAND

A survey of city form, landscape architecture, and architecture from earliest times to circa 1150.

351 Survey of Environmental Arts II (3) W

HILDEBRAND

A survey of the city form, landscape architecture, and architecture from circa 1150 to 1750.

352 Survey of Environmental Arts III (3) Sp

JOHNSTON

Survey of city form, landscape architecture, and architecture from circa 1750 to the present.

400, 401, 402 Introduction to Architectural Design Laboratory (4,4,4) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

405, 406, 407 Introduction to Architectural Design (1,1,1) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

410, 411, 412 Architectural Graphics (1, 1, 1) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

420 Structural Design I (4) AW

Design of complete building frames in timber, laminated wood, and steel, considering earthquake resistance, building response, continuity, and the structural design process. Prerequisite, 322. (Formerly 376.)

421 Structural Design II (4) WSp

Development of basic reinforced and prestressed concrete design process, and design of continuous structures in reinforced concrete, employing beams, girders, and slabs. Prerequisite, 420. (Formerly 377.)

422 Structural Design III (4) SpS

Design of concrete structures: including flat slabs and plates, columns, footings, shear walls, and retaining walls. Prerequisite, 421. (Formerly 378.)

430 Environmental Control Systems I (3) A

HARLAN, JANSEN

Investigation and evaluation of methods of analysis, established theories for environmen-

tal control; climate control systems, illumination and daylighting systems, sound control systems, mechanized and unmechanized circulation systems, safety systems, communication systems, waste removal and discharge systems. Prerequisite, 332.

431 Integrated Building Systems I (3) W

HARLAN, JANSEN

Investigation and evaluation of the integrated building process; components, subassemblies, structural systems, environmental control systems, integrated structural environmental control systems. Investigation and evaluation of material for building. Prerequisite, 430.

432 Integrated Building Systems II (2) Sp

HARLAN, JANSEN

Investigation and evaluation of the integrated building process; production, fabrication, assembly, post-assembly evaluation. Investigation and evaluation of materials for building. Prerequisite, 431.

434 Mechanical Equipment of Buildings—Plumbing and Sanitation (2) A

435 Mechanical Equipment of Buildings—Electrical (2) W

436 Mechanical Equipment of Buildings—Heating and Ventilation (2) Sp

440 Human Needs Analysis (3) A

The development of programming methods for the study of human needs in relation to architectural design. Prerequisites, junior or senior standing and permission.

441 Laboratory in Human Needs Analysis (3) W

The application of human needs programming methods in architectural settings. Prerequisite, 440.

442 Social Implications of Architecture (3) Sp

A consideration of the ways man both shapes and is shaped by his physical environment. Prerequisites, junior or senior standing, Sociology 110 or Psychology 100, and permission.

450 Survey of Environmental Arts (5) S

HILDEBRAND

The environmental arts of architecture, landscape architecture, and urban planning. An historical evolution with special emphasis on factors shaping these arts in the Western world and the twentieth century.

451 History of Modern Architecture (3) A

PUNDT

Analysis of architectural developments since the Baroque. Prerequisite, 352 or permission. (Formerly 303.)

452 Characteristics of Puget Sound Architecture and Towns (3) Sp

STEINBRUECK

Form, detail, and construction as determining and identifying qualities of buildings. Esthetic and historical values as seen in the visual qualities of the urban form of the Puget Sound town. (Formerly 333.)

453 Architecture of the Ancient World (3) A

Architecture of the ancient and classical cultures from earliest times through the time of Constantine. Prerequisite, 350 or permission. (Formerly 200.)

454 Romanesque and Gothic Architecture (3) W

HILDEBRAND

Architecture of Western Europe from the decline of the Roman Empire through the fifteenth century. Prerequisite, 351 or permission. (Formerly 201.)

455 Renaissance and Baroque Architecture (3) Sp PUNDT

Architecture of Western Europe from circa 1350 to 1750. Prerequisite, 351 or permission. (Formerly 202.)

456 History of Chicago School Architecture (3) W PUNDT

Study and critical investigation of the contribution of major architects in Chicago, the mid-west and west coast at the opening of the twentieth century. Prerequisite, 451 or permission.

457 Neoclassicism and Romanticism in Europe and America (3) Sp PUNDT

Study and critical investigation of European and American architecture and urban design from 1750 to 1850. Prerequisite, 451 or permission.

460 Design Theory and Analysis (3) W,Sp SELIGMANN

Design theory, analysis of planning, and building types. Prerequisite, 352 or permission.

470 Production Management I (2) Sp SMALL

Investigation and evaluation of office production management methods; production development, production drawings, contract documents, construction administration, construction cost control, post construction evaluation. Prerequisite, concurrent registration in 432.

480, 481, 482 Contract Drawings (3,3,3) A,W,Sp CARROLL

Lectures and drafting-room practice.

499 Undergraduate Research (*, max. 6) AWSpS Prerequisite, permission.

Courses for Graduates Only

500, 501 Architectural Design Laboratory (6,6) AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

502 Architectural Studies Options (6) AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

503, 504, 505 Architectural Studies Options (6,6,6) AWSpS, AWSpS, AWSpS

Detailed descriptions of work in all sections are available quarterly from the Department of Architecture. Prerequisite, permission.

506 Advanced Visual Design (2) A THIEL

Principals of visual organization applied to problem-solving in multidimensional media. Prerequisite, 302 or permission. (Formerly 414.)

507 Graphic Representation and Simulation (2) W THIEL

Representation of objects and space employing traditional, figurative, and abstract idioms. Prerequisite, 302 or permission. (Formerly 415.)

508 Light and Color (2) Sp THIEL

Experimental studies in light and color directed toward their creative manipulation in

art and architecture. Prerequisite, 302 or permission. (Formerly 416.)

510 Design Graphics I (3) A ROHRER, SPOULE

Laboratory work in observation and monochromatic freehand drawing of geometric and non-geometric form in direct media. Prerequisite, permission.

511 Design Graphics II (3) W ROHRER, SPOULE

Laboratory work in monochromatic drawing of geometric and non-geometric form in varied media. Prerequisite, 510.

512 Design Graphics III (3) S ROHRER, SPOULE

Laboratory work in freehand polychromatic representational drawing of geometric and non-geometric form in transparent and opaque color. Prerequisite, 511.

513 Design Communication I (3) A ROHRER, SPOULE

Historical survey of design illustration and work in application to current design solution explanation. Prerequisite, permission.

514, 515 Design Communication II, III (3,3) W,Sp ROHRER, SPOULE

Survey of contemporary professional practice in design and solution presentation; field trips to current design presentation events. Individual research projects in graphic drawing, photography scale models, advanced photography, mechanical and electronic aids towards a synthesis of design solution communication. Prerequisites, 513 for 514; 514 for 515.

520 Advanced Structural Design (3) A ALBRECHT

Identification and study of the basic mechanisms of resistance to forces of all structural types; building case studies emphasizing the fundamental design approach. Prerequisite, 422. (Formerly 476.)

521 Structural Design Through Model Studies (3) W ALBRECHT

Theory of models, dimensional analysis, direct model analysis; studies employing specific materials, techniques of testing and measurement. Offered jointly with Civil Engineering as CEST 477. Prerequisite, 422 or permission.

522 Skin-Resistant Structures (3) Sp ALBRECHT

Resistance mechanisms, structural systems employing plates, folded plates, shells, and membranes, with applications to the structural design process. Prerequisite, 422. (Formerly 478.)

523 Industrialized Building Systems (3) A ROSNER

Consideration of the evolution of prefabrication, building products, components, construction methods, and building systems through the nineteenth and twentieth centuries. Prerequisite, permission.

530 Environmental Control Systems II (3) A

Detailed studies in building equipment systems. Simulation of comparative conditions, experiment and investigation of contemporary practices and standards, extrapolations, heating, ventilating, and air conditioning systems, water and energy supply systems, waste removal and discharge systems. Prerequisite, 430.

531 Environmental Control Systems III (3) W

Detailed studies in building equipment systems. Simulation of comparative conditions,

experiment and investigation of contemporary practices and standards, extrapolations, illumination systems, sun control systems, acoustical control systems, communication system-mechanical circulation systems. Prerequisite 430.

532 Integrated Building Systems III (3) S

Detailed studies in integrated building systems. Simulation of comparative conditions, experiment and investigation of contemporary practices and standards, extrapolations; integrated structural or environmental control systems, and materials for building. Prerequisites, 432, 470. To be taken concurrently with 570.

535 Illumination Seminar (2) AWSp

Principles of illumination as applied to buildings. Prerequisite, senior in architecture. (Formerly 338.)

536 Acoustics Seminar (2) AWSp TOWNE

Principles of acoustical designing as applied to buildings. Prerequisite, senior in architecture. (Formerly 339.)

550, 551 Graduate Seminar: Environmental Design Issues (1-3,1-3) A,W

Seminars concerning a wide variety of issues in the area of environmental design. Each seminar focuses on a different specific topic and is directed by a seminar leader who is an authority in his field. Prerequisite, graduate standing or permission.

570 Production Management II (3) S

Investigation and development of advanced office production management methods; schematic development, design development, construction documents, construction administration, post construction evaluation. Prerequisites, 402, 432, 470; to be taken concurrently with 532.

571 Building Economics (3) S MITHUN

Social, political, and economic factors affecting the location, construction, financing, and marketing of buildings. Prerequisite, 470. (Formerly 370.)

572 Specifications and Contracts (3) W MITHUN

Construction documents—detailed organization and composition of contracts, specifications, and related contract documents. Prerequisite, 470. (Formerly 369.)

573 Professional Practice (3) A MITHUN

Introduction to the architectural office, business operation, and professional practice. Prerequisite, 470. (Formerly 468.)

575 Graduate Seminar, Research and Analysis I (3) A

A survey of concepts and methods used in research and analysis needed to provide an adequate basis for design decisions. Concepts are drawn primarily from the social sciences, but applications are made to architectural and planning situations. Prerequisite, Mathematics 105. (Formerly 531.)

576 Graduate Seminar, Research and Analysis II (3) W

An introduction to quantitative methods for design research and analysis. Descriptive statistics, probability theory, tests of hypotheses, statistical decision theory, correlation and regression, and time series are considered. Prerequisite, 575. (Formerly 532.)

577 Graduate Seminar, Research and Analysis III (3) Sp

Advanced quantitative methods for design research and analysis. Matrix algebra, special topics in correlation, multiple regression, mathematical programming, queuing models, simulation, and gaming. Prerequisite, 576. (Formerly 533.)

578 Computer Applications in Architecture (3) A

BONSTEEL

Seminar format with feasibility studies and/or applications in use of data processing system. Prerequisite, previous or concurrent programming experience.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSpS

BUILDING CONSTRUCTION

Courses for Undergraduates

301,302 Building Industry (3,3) A,W

EBERHARDER

Organization and functioning of the building industry, legal, ethical, business, and management aspects. (Formerly Building Technology and Administration 301, 302.)

310 History of Building (3) Sp

VAREY

A historical survey of building techniques and materials as conditioned by environmental, technical, and social influences. (Formerly Building Technology and Administration 310.)

401,402 Building Estimating (4,4) A,W

HUTCHINSON

The principles of building costs, estimating, and construction cost control. Prerequisite, Architecture 332. (Formerly Building Technology and Administration 401, 402.)

410 Senior Study (4) AWSp

Independent study of a specific building industry problem with assigned proctor. Prerequisite, senior standing. (Formerly Building Technology and Administration 410.)

420 Building Financing (3) Sp

FLAHERTY

The financing of building construction, financial institutions, regulations, government participation, and financing principles. Prerequisites, 302 and Urban Development 310. (Formerly Building Technology and Administration 420.)

499 Undergraduate Research (*, max. 6) AWSpS

Individual or small group studies in which students may select topics with approval of faculty sponsor and department. Prerequisite, permission.

LANDSCAPE ARCHITECTURE

Courses for Undergraduates

330 Theory and Perception of Landscape Architecture (3) W

HAAG

General survey, orientation, and introduction to basic theory of landscape architecture. Prerequisite, Architecture 300, 301, and 302 or permission. (Formerly Landscape Architecture 230.)

331 History of Landscape Architecture (3) A

JOHNSTON

A critical and historical analysis of man's

progress in designing land and outdoor space. (Formerly Landscape Architecture 231.)

334, 335, 336 Construction (4,4,4) A,W,Sp

SAKUMA

A study of the problems of earth grading, drainage, highway design and alignment, retaining walls, irrigation and utility systems. Prerequisite, Architecture 400, 401, and 402.

350, 351, 352 Landscape Design, Grade III (6,6,6) AWSp, AWSp, AWSp

HAAG, SAKUMA

Intensive study in the analysis, approach, solution, and presentation of basic landscape architectural problems. Prerequisite, Architecture 400, 401, and 402.

410, 411, 412 Landscape Architecture Graphics I, II, III (1,1,1) AWSp

HAAG, SAKUMA

Field and laboratory observation and in mixed media. Freehand drawing from nature and construction.

460, 461, 462 Landscape Design, Grade IV (6,6,6) AWSp, AWSp, AWSp

HAAG, SAKUMA

Advanced study in the analysis, approach solution and presentation of complex landscape architectural problems. Prerequisite, 352.

465 Planting Design (4) Sp

HAAG

Studio exercises and lectures in the use of plant materials in landscape architectural design. Prerequisite, fifth-year landscape architecture major.

470 Office Procedure (3) W

HAAG

A study of the professional practice and ethics of the landscape architect. Prerequisite, fifth-year student in landscape architecture.

499 Undergraduate Research (1-6) AWSp

Independent study pertaining to special problems associated with landscape architecture.

URBAN PLANNING

Courses for Undergraduates

210 Contemporary Urban Problems (2) W

HANCOCK

Study of major trends and problems in urban America that have grown out of our past or that are developing today. A new topic and new materials will be presented each quarter. Topics are selected for their contemporary importance, environmental (biocultural) impact and planning implications. History is used as our chief record of their past, not as a blueprint of the present and future.

201 Urban Planning Projects I (2) AWSp

Laboratory for discussion and analysis of selected economic, social, political, and design aspects as applied to contemporary urban planning problems. Prerequisite, sophomore standing.

300 Social and Institutional Determinants for Physical Planning (3) W

Analysis of population, locational, and other factors for application in the preparation of physical plans. Prerequisite, junior standing.

400 Introduction to Urban Planning (3) AWSpS

GAYDEN, HANCOCK, HRUZA, ROBERTSON, SHINN, WOLFE

History, principles, theories of city growth and planning. Emphasis on city structure as a

physical monument to contemporary culture. Present urban problems and remedial action.

425 Introduction to Urban Transportation (3) Sp

HORWOOD

Identification of the framework, central concepts, constraints, and issues of the urban transportation planning problem. Offered jointly with Civil Engineering as CETC 425.

430 Quantitative Methods in Urban Planning (3) W

BELL

Methods of statistical analysis applied to urban planning; measurement and inference. Central tendency, correlation, trends, probability, surveys.

446 Field Study (2-4) AW

AMOS

Explicit task assignment in a community development organization under professional and academic supervision. Placement arranged by the Bureau of Community Development. Participation ordinarily limited to seniors. Prerequisite, permission of the instructor.

451 Regional Planning and Development (3 or 5) Sp

MORRILL, THOMAS

Emphasis placed primarily on the process of implementing regional development policies in economically advanced and lesser developed countries. Resultant changes which occur in the distribution and structure of economic activities and settlement patterns are also studied and evaluated. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with Geography as Geography 451.

460 Metropolitan Area Government (5) W

WARREN

Conceptual problems in metropolitan analysis; urban governmental systems; regional political decision-making structures; metropolitan, state, and federal relations; value implications of formal organization. Offered jointly with Political Science as Political Science 480.

475 Directed Social Change (3) A

AMOS

General course for both undergraduate and graduate students on the theories and practice of directed social change and citizen involvement in the planning process.

479 The Urban Form (3) A

WOLFE

Examination of the physical patterns of urban areas related to the forces producing them. Observation, identification, and methods of recording aspects of the urban scene. Prerequisite, 400.

480 The Urban Planning Process (4) W

HIGHTOWER, WOLFE

The urban plan and plan making. Emphasis on comprehensive, coordinative urban planning. Various planning surveys and methodology and techniques discussed. Prerequisite, 400.

482 Urban Community Facilities (3) W

NORTON; SCHNEIDER, R.

Relationships of goal structure and physical requirements of public facilities. Criteria pertinent to schools, parks, utilities, etc., and their effect on the comprehensive plan. Prerequisite, urban planning or architecture major, or permission.

485 Housing (3) ASp GREY

Survey of housing and redevelopment problems, theories, standards, and practice. Development of public policies, finance, technological considerations, social factors, and priorities. Prerequisite, 400.

489 History of City Development (3) W JOHNSTON

Analysis of city forms and designs emphasizing their relation to the culture of each period.

490 Urban Planning Policies and Programs (3) W NORTON

Goals, processes of policy formulation, methods of planning, effectuation, and related problems. Community, regional, state, and national programs. Prerequisite, 480 or permission.

498 Special Topics (2-4) AWSpS

Systematic study of specialized subject matter. Topic for each quarter varies, depending upon current interest and needs, and is announced in the preceding quarter. Prerequisite, permission.

499 Special Projects in Urban Planning (5) AWSp JAMMAL

Preprofessional workshop. Emphasizes acquiring facility in the integration of analytical, programmatic, and communications techniques developed in other courses by means of several assigned problems. Prerequisite, senior standing.

Courses for Graduates Only

500 Survey of Urban Planning (3) A NORTON

Concepts and logic of planning as a professional activity. Evolution of guiding ideas in relation to changing social, economic, and environmental conditions within the American political framework. Major procedures used by planners. Critical appraisal. Not open to students who have taken 400.

501 Resources for Urban Planning (2) A SHINN

Introduction to areas of specialized study in environmental planning and policy programming. Organization for planning in the Seattle region; range of activities and emphases, established and changing roles. Required of new graduate students; not open to others.

505 Urban Renewal (3) Sp SEYFRIED

Analysis of urban renewal needs and practices. Particular emphasis on problems encountered and on potential new directions of development.

512 Fiscal Resources and Economic Activity (2) W GREY

Economic analysis as related to planning objectives. Analysis of the mechanics of the urban economy, especially as related to growth and the problems of local public finance. Topical economic problems in relation to planning. Prerequisite, permission.

521 Comprehensive Planning Analysis (2) Sp HIGHTOWER, SHINN

The information basis for planning. Methods of data interpretation pertaining to population, economic base, spatial requirements, location, and other operational problems en-

countered in city plan preparation. Prerequisite, 580 or permission.

522 Metropolitan Planning Analysis (2) A SCHNEIDER, J.

Investigative and analytical techniques appropriate to plan preparation at metropolitan or regional scales, including consideration and evaluation of methodologies and organizing concepts derived from other disciplines. Prerequisite, 521 or permission.

523 Urban Design Analysis (2) A JAMMAL

The study of concepts, methods, and processes basic to planning, design, and effectuation. Prerequisite, permission.

524 Seminar in Urban Design (2) W COPELAND

Studies of the various arrangements of urban forms that affect perceptual experiences. Urban design considerations of the location of structures, open space, movement channels, and methods of implementing public policy decisions affecting urban design. Prerequisite, 479.

525 Transportation and Land-Use Planning Models (3) A SCHNEIDER, J.

Theory underlying land-use and transportation-planning models. Past attempts to model urban development. Modelling of alternatives. Forecasting technological innovations, assessing their land-use implications. Prerequisite, permission.

527 Information Systems for Planning and Research (3) A CLARK, DIAL, HORWOOD

Computer programming technology and data systems design for large scale data inputs. Machine editing, data manipulation, and information retrieval. Laboratory problems adapted to specialized interests of students. No previous computer programming experience required. Offered jointly with Geography as Geography 527 and Civil Engineering as CETC 527.

528 Automated Mapping and Graphing (3) W HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with Geography as Geography 528 and Civil Engineering as CETC 528. Prerequisites, basic statistics and 527, or permission.

529 Computer Applications to Urban and Regional Analysis (3) Sp HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with Geography as Geography 529 and Civil Engineering as CETC 529. Prerequisite, 528 or permission.

530 Research Seminar: Geography and Development (3, max. 6) A THOMAS

Offered jointly with Geography as Geography 530.

535 Airport Systems Planning (3) W SHINN

Investigation of physical, socio-political, and economic features of air transportation system planning. Emerging technologies, inter-

modal relationships, the decision-making environment. Scenarios of anticipated conflict and resolution and problems. Offered jointly with Civil Engineering as CETC 535.

540 Laboratory in Urban Planning Methods and Techniques (5) Sp COPELAND, JAMMAL

Methods of schematic conceptualization. Presentation and manipulation of physical patterns in a case study area to develop optimal relationships. Prerequisite, 580 or permission.

541 Laboratory in Comprehensive Planning (5) A GAYDEN, HIGHTOWER, SHINN

The application of urban planning skills and techniques to the problem of formulating alternative comprehensive plans for a specific city. Prerequisite, 521 or permission.

542 Laboratory in Metropolitan Planning (5) W SCHNEIDER, J.

Formulation of plans and developmental programs interrelating such region-wide concerns as natural resource base, transportation, industrial activity and location, environmental contamination, recreation, political constraints. Prerequisite, 522 or permission.

543 Laboratory in Urban Design (5) W JAMMAL

The development of urban designs within the context of the total planning process. Specifically, the following areas will be emphasized: investigation, development, and application of survey techniques, analyses, programming, concepts and methods of implementation relative to urban design. Prerequisite, 523 or permission.

544 Urban Planning Problems (5) Sp

Advanced laboratory problems. Intensive consideration of planning problems of topical significance. Prerequisite, permission.

546 Practicum (3-5) AWSp AMOSS

Field work assignments to participate in some phase of a community problem-solving activity utilizing planning skills. Placement is ordinarily arranged by the Bureau of Community Development. Enrollment for credit is limited to one quarter. Prerequisite, permission of the instructor.

550 Research Seminar (2) W

Development and presentation of advanced topics of individual investigation.

551 Regional Planning Seminar (3) W THOMAS

Regional planning and development theories and methodologies. Critical evaluation of regional planning in selected "economically advanced" and "lesser developed countries." Offered jointly with Geography as Geography 551. Prerequisites, 451 and graduate standing.

575 Seminar in Citizen Participation (3) W AMOSS

Seminar on modes of citizen participation in public decision making, advocacy planning, participant democracy, and community development are considered in terms of contemporary problems.

579 Comparative Urbanism (3) Sp WOLFE

Characteristics and problems of urbanization in the world; comparisons of origins and development; physical form, land utilization, and planning. Selected major cities. Prerequisite, permission.

580 Theories and Methodology of Planning I (4) W

HIGHTOWER, WOLFE

A survey of the philosophy, methods, and analytical techniques used in planning public actions and policies, with emphasis on the logic and assumptions on which these are based. Various planning surveys and methods discussed. Prerequisite, permission.

581 Theories and Methodology of Planning II (4) Sp

HIGHTOWER, WOLFE

Factors relating to the timing, phasing, and programming of urban development. The bearing of amenity, density, etc., on the actual development process. Prerequisite, 480 or 580.

591-592-593 Doctoral Seminar I, II, III (2-2-2) A,W,Sp

HIGHTOWER, HANCOCK, HORWOOD, SCHNEIDER, J.

Researchable issues and research methodology. Discussion and critique of selected pieces of recent research work. Presentation and critique of research proposed by members of the seminar. Credits given on satisfactory completion of the three-quarter sequence. Prerequisite, master's degree or the equivalent in a planning discipline.

598 Special Topics (1-4) AWSp

Systematic study of specialized subject matter. Topic varies for each quarter, depending upon current interest and needs, and is announced in the preceding quarter. Prerequisites, permission.

600 Independent Study or Research (*) AWSp**700 Thesis (*) AWSpS****800 Doctoral Dissertation (*)**

COLLEGE OF ARTS AND SCIENCES

ADVERTISING—See *Communications*

ANTHROPOLOGY

Specific areas in Anthropology are designated by area letters. These letters must precede course numbers on the student's Official Program. Designation letters and their definitions are:

ANTH—Anthropology (General and Sociocultural Anthropology)

ARCHY—Archaeology

PHY A—Physical Anthropology

Courses for Undergraduates**GENERAL****ANTH****100 Introduction to the Study of Man (5)**

Introduction to the anthropological subfields of archaeology, physical anthropology, and sociocultural anthropology through the examination of selected problems in human physical, cultural, and social evolution. (Not open to students who have had or are currently taking other courses in anthropology.)

SOCIOCULTURAL ANTHROPOLOGY**ANTH****111 Afro-American Culture (3)**

The historical development and nature of Afro-American culture in the United States,

including discussion of the Atlantic slave trade, slavery as a social institution, the evolution of black folk culture, and contemporary Afro-American urban culture.

ANTH**202 Principles of Social Anthropology (5)**

Introduction to analytical and comparative methods for the analysis of social and cultural systems. Training in fundamentals for more advanced courses in social anthropology.

ANTH**212 Perspectives on Afro-American Culture (3)**

Focus is on several analyses of Afro-American personality and culture, including exploration of contemporary attitudes and issues which emerge from racial awareness, Black identity, and hostility and aggression. Emphasis is placed upon the conflict between adaptive and assimilative patterns.

ANTH**213 Africa (3)**

An introduction to the cultures and societies of Africa with emphasis on sub-Saharan Africa.

ANTH**216 Oceania (3)**

Contemporary and traditional life in the Pacific Basin.

ANTH**225 Community Development and Action (3)**

The use of concepts and examples of directed culture change to analyze community action and community development. Lectures will be supplemented by case studies, films, and discussions with those who are actually working with directed culture change.

ANTH**301 Human Nature and Culture (3)**

The sources of variations in the customs, values, and beliefs of human groups. Appraisal of the anthropological notion of "cultural relativism." Not open to students who have had or are currently taking other anthropology courses. Prerequisite, sophomore standing.

ANTH**311 Indian Cultures of the Pacific Northwest (3)**

Comparative analysis of material culture and social, religious, and political institutions. Prerequisite, sophomore standing.

ANTH**316 South Asia (3)**

Major cultural features of the Indian and Pakistan subcontinent. Prerequisite, sophomore standing.

ANTH**317 Southeast Asia (3)**

Survey of the culture, history and contemporary ethnology of the peoples of southeast Asian countries: Burma, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, and the Philippines. Prerequisite, sophomore standing or permission.

ANTH**319 Peoples and Cultures of the Iranian Plateau (3)**

A survey of the cultural features of the Iranian plateau with particular attention to modern problems of cultural change. Prerequisite, sophomore standing or permission.

ANTH**322 Peoples of South America (3)**

Contemporary societies of South America: economic, political, ethnic, and cultural characteristics; historical background. Prerequisite, sophomore standing or permission.

ANTH**333 Art of the Northwest Coast Indian (3)**

Emphasis on the structure and style of two-dimensional art of the northern tribes. Offered jointly with the School of Art as Art History 333. (Formerly Anthropology 343.)

ANTH**334 Art of the Northwest Coast Indian (3)**

Three-dimensional art of the Northwest coast cultural art with emphasis on aesthetic principles, techniques, and cultural functions. Offered jointly with the School of Art as Art History 334. (Formerly Anthropology 344.)

ANTH**335 Art of the Northwest Coast Indian (3)**

Northwest coast Indian art as related to drama and dance with special attention to the Kwakiutl Indians. Offered jointly with the School of Art as Art History 335. (Formerly Anthropology 345.)

ANTH**350 The Civilized and the Primitive (3)**

The development of urban modes of life in the light of the common and distinctive social and cultural characteristics of cities, peasantries, and tribal groups or bands. The process of urbanization, the disappearance of truly primitive peoples, and the emergence of the peasant. Selected case studies from the past and the present. Prerequisite, sophomore standing.

ANTH**401 West African Societies (3)**

Detailed analysis of social and cultural features, including the western Sudan area. Prerequisite, 202 or permission.

ANTH**402 Societies of Eastern and Southern Africa (3)**

The historical background and contemporary life of cultural groups in eastern and southern Africa with special study of selected cases of political and economic organization and cultural change. Prerequisite, 202 or permission.

ANTH**404 Mainland Southeast Asian Societies (5)**

Intensive treatment of the kinship systems, religious institutions, ecology, and sociopolitical systems of the peoples of mainland southeast Asia. Prerequisite, 202 or permission.

ANTH**405 Comparative Social Anthropology of Malay Peoples (4)**

Comparison of the social institutions and ethnohistory of Malay peoples in western Austronesia. Prerequisite, 202 or permission.

ANTH**408 New Guinea Societies (5)**

The indigenous peoples of coastal and interior New Guinea and adjacent islands; their aboriginal cultures and modern development in spatial and temporal perspective. The studies will deal intensively with selected general problems of ethnographic method and ethnological and sociological interpretation. Prerequisite, 202 or permission.

ANTH

409 Western Austonesian Societies (3)
Comparative social anthropology of the social systems of Micronesia, Polynesia, and the eastern islands of Melanesia with special attention to the small communities inhabiting low coral atolls. Prerequisite, 202 or permission.

ANTH

412 South Asian Social Structure (5)
Caste dynamics, political control, economic organization, and religion in Hindu-village India. Prerequisite, 202 or permission.

ANTH

416 North American Indians (3)
A descriptive and historical treatment of the native Indian cultures of the United States and Canada. Prerequisite, 202 or permission.

ANTH

418 Meso-American Society and Culture (3)
Analysis of the social and cultural features of Meso-America. Prerequisite, 202 or permission.

ANTH

425 Applied Anthropology (3)
Planned and directed social and cultural change. Prerequisite, 202 or permission.

ANTH

426 Peasant Culture and Society (5)
Survey of current methodological and theoretical approaches to the study of peasant society and culture. Comparative analysis of selected cases illustrating the relationship of peasant societies to other types of social systems. Prerequisite, 202 or permission.

ANTH

429 Expressive Culture (5)
An anthropological view of the expressive aspects of culture: plastic-graphic arts, myth and folktale, music, dance, humor and tragedy, play and games. Prerequisite, 202 or permission.

ANTH

430 Music: An Anthropological View (3)
Consideration of music in its social context; change and continuity in music traditions, and basic structure in music, with some consideration of problems of field work in ethnomusicology. Prerequisite, 202 or permission.

ANTH

431 Primitive Literature (3)
Mythology and folktales of nonliterate peoples. Theories of interpretation or oral literature as they apply to theories of culture growth and diffusion. Prerequisite, 202 or permission.

ANTH

432 Visual Anthropology (3)
The place of photography and films in ethnography; their use in the documentation and interpretation of cultural and social systems. Prerequisite, 202 or permission.

ANTH

434 Comparative Morals and Value Systems (3)
The sociological functions of morality in simple societies. Prerequisite, 202 or permission.

ANTH

435 Primitive and Peasant Economic Systems (5)
The chief features of nonmonetary and simple monetary economies. The impact of monetary economy and industrial technology on pre-

industrial systems and those of limited monetary circulation. Prerequisite, 202 or permission.

ANTH

436 Social Anthropology of Religion (5)
A comparative social anthropological study of religious systems. Deals with the major theoretical approaches derived from the cultural evolutionists and from Marx, Freud, Durkheim, and Weber. Substantive discussions and interpretations of various aspects of comparative religion: ritual, myth, rites of passage, magic, witchcraft and sorcery, mana and taboo, sacrifice, religious specialists, etc. Problems of definition, method, and theory. Prerequisite, 202 or permission.

ANTH

437 Political Anthropology (5)
Survey of the major approaches and theories. Prerequisite, 202 or permission.

ANTH

438 The Analysis of Kinship Systems (5)
Kinship groups in evolutionary perspective; functional analyses of kin roles; structural analyses of kin statuses; the analysis of sets of kinship terminology; the culture of kinship. Prerequisite, 202 or permission.

ANTH

439 Primitive Law and Social Control (5)
Juridical activities in preliterate societies. Relation of law to religion, politics, and social structure. Prerequisite, 202 or permission.

ANTH

441 Introduction to Culture and Personality (5)
Systematic survey of the field of culture and personality as a subdiscipline of social anthropology. Explication of basic concepts—culture, personality and social structure—and their interrelationships. The relevance of psychological variables for the study of social systems and culture. Prerequisites, 202 and any introductory course in general psychology or personality theory, or permission.

ANTH

450 Introduction to Language (5)
The science of language surveyed with the emphases and orientations of anthropological linguistics. Prerequisite, 202 or permission.

ANTH

451, 452, 453 Phonology (3,3,3)
Detailed study of speech sounds, mechanism of their production, and structuring of sounds in languages; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Linguistics as Linguistics 451, 452, 453.

ANTH

454 Methods in Comparative Linguistics (3)
Methods and theory of comparative linguistics in relation to anthropological research. Prerequisite, Linguistics 400 or permission. Offered jointly with the Department of Linguistics as Linguistics 454.

ANTH

455 Areal Linguistics (3, max. 6)
Linguistics analyses of the languages of a selected area. Offered jointly with the Department of Linguistics as Linguistics 455.

ANTH

456, 457, 458 Basic Swahili (5,5,5)
An introduction to the structure of spoken and written Swahili. Concentration on the acquisition of elemental conversational skill

and an introduction to written texts of graded difficulty. (Formerly Anthropology 466, 467, 468.)

ANTH

459 Types and Techniques of Transcription (3)
Analysis of aims and problems in the written symbolization of structured data. Emphasis on field transcription of human movement, music, and language. Prerequisite, 202 or permission.

ANTH

460 History of Anthropology (5)
History of developments in the several fields of general anthropology. Prerequisites, 202 and 15 additional credits in anthropology.

ANTH

461, 462, 463 Syntax (3,3,3)
Study of the structuring of meaningful elements in language; practical experience with a wide variety of languages; taxonomic and generative views of grammar. Prerequisite, Linguistics 400 or permission. Offered jointly with the Department of Linguistics as Linguistics 461, 462, 463.

ANTH

464 Bantu Linguistics (2)
A general survey of the development of Bantu linguistics with special emphasis on comparative Bantu phonology, morphology, and syntax. Prerequisite, permission of instructor.

ANTH

466, 467, 468 Intermediate Swahili (3,3,3)
Reading of relatively complicated material from prose to traditional poetry. Emphasis on acquiring an ability to manipulate ideas in Swahili orally and written. Review of structure. Prerequisites, 456, 457, 458 (formerly Anthropology 466, 467, 468) or equivalent for 466; 466 for 467; 467 for 468.

ANTH

469 Special Studies in Anthropology (3)
The delineation and analysis of a specific problem or related problems in anthropology. To be offered occasionally by visitors or resident faculty. May be repeated for credit by permission. Prerequisite, 202 or permission.

ANTH

490 Problems in Social Structure (3)
Selected current problems in the study of social structure. Prerequisites, 202, 20 additional credits in anthropology, and permission.

ANTH

491 Museology (3, max. 6)
Tutorial involvement with some of the technical competencies required in the acquisition, preservation, preparation, and exhibition of anthropological materials in a museum. Prerequisites, 25 credits in anthropology and permission.

ANTH

492 Data Analysis in Social Anthropology (3)
An introduction to elementary manual and semiautomated techniques for the processing, organization, and analysis of typical anthropological data. Lectures, demonstrations, class projects. Prerequisites, 202 and 20 additional credits in anthropology or permission.

ANTH

493 Advanced Topics in Expressive Culture (3)
Analysis and testing of special domains of aesthetic expression, such as graphic arts,

oral literature, dance, and humor among non-Western peoples. Prerequisites, 202, 429, 450 (or 453), and permission.

ANTH

494 Problems in the Social Anthropology of Religion (3)

Selected current problems. Prerequisites, 202, 436, 15 additional credits in anthropology, and permission.

ANTH

495 Advanced Problems in Ethnology (3)

One or more current problems in ethnology. Seminar format. Prerequisites, 25 credits in anthropology and permission.

ANTH

496 Problems in Psychological Anthropology (3)

Problem areas and new approaches to the study of culture and personality. Prerequisites, 441, 20 additional credits in anthropology, and permission.

ANTH

499, 499H Undergraduate Research (*, max. 12; max. 18 for honors students only)

Prerequisite, permission.

ARCHAEOLOGY

ARCHY

205 Principles of Archaeology (5)

Introduction to the aims of archaeology and methods of reconstructing prehistory. Significance of various methods of food collection and food production, of domestication of plants and animals, and of agricultural systems. Techniques of dating archaeological remains. (Formerly Anthropology 205.)

ARCHY

270 Field Course in Archaeology (12)

Methods and techniques of field excavation as demonstrated through field experience. (Offered Summer Quarter only.) Prerequisite, permission. (Formerly Anthropology 270.)

ARCHY

303 Prehistoric Cultures of the Old World (3)

The beginnings of culture in the Old World to the Early Iron Age in Western Europe. Prerequisite, sophomore standing. (Formerly Anthropology 303.)

ARCHY

304 Prehistoric Cultures of the New World (3)

The beginnings of culture of the New World from Pleistocene times until European exploration and conquest. Prerequisite, sophomore standing. (Formerly Anthropology 304.)

ARCHY

370 Methods and Problems of Archaeology (5)

Field experience in the Pacific Northwest. Prerequisite, permission. (Formerly Anthropology 370.)

ARCHY

371 Analysis of Archaeological Data (3)

Designed for students who have had field experience in archaeology. Prerequisite, permission. (Formerly Anthropology 371.)

ARCHY

471 Trans-Pacific Contacts in Pre-Columbian Times (3)

Investigation of numerous parallels in agricultural techniques, architecture, religious symbolism, astronomical and calendric systems, and various implements of specific form be-

tween Asia, Oceania, Middle America, and South America beginning with the third or fourth millennium before Christ. Prerequisite, 205 or permission. (Formerly Anthropology 471.)

ARCHY

472 Prehistoric Cultures of North America (3)

Archaeological history of the various regions of North America north of Mexico. Prerequisite, 205 or permission. (Formerly Anthropology 472.)

ARCHY

473 Archaeology of Mexico (3)

Pre-Hispanic culture history of Middle American civilizations in central and southern Mexico and the desert dwellers in northern Mexico. Prerequisite, 205 or permission. (Formerly Anthropology 473.)

ARCHY

474 Prehistoric Cultures of South America (3)

Archaeological history of the Andean region from the beginnings of agriculture to the culmination of Incan civilization and related civilizations in Colombia, Ecuador, Peru, Bolivia, Chile, and Argentina. Archaeological history of some tropical and subtropical regions of South America. Prerequisite, 205 or permission. (Formerly Anthropology 474.)

ARCHY

475 Archaeology of the Mayan Civilization (3)

Pre-Hispanic culture history of the Mayan peoples of Guatemala, the Yucatan peninsula, Honduras, and Chiapas (Mexico). Prerequisite, 205 or permission. (Formerly Anthropology 475.)

ARCHY

497 Theory and Method in Archaeology (3)

Examination of theoretical constructs in the analysis of archaeological data. Terminology, typologies, and interregional comparisons. Prerequisites, 205, 20 additional credits in anthropology, and permission. (Formerly Anthropology 497.)

PHYSICAL ANTHROPOLOGY

PHY A

201 Principles of Physical Anthropology (5)

The evidence for primate evolution from the fossil record and from the morphological, genetic, and behavioral variability of living forms. Relationship of human genetics to the evolution of modern populations. (Formerly Anthropology 201.)

PHY A

281 African Origins: Social Biology of Sub-Saharan Africa (3)

Origin and biological nature of the peoples of Africa south of the Sahara with emphasis upon the influences of ecology, disease, and nutrition. Race mixtures, growth and development, physique, heat stress physiology, and genetics. Prerequisite, sophomore standing. (Formerly Anthropology 282.)

PHY A

282 Afro-Americans: Social Biology of Blacks in the New World (3)

African source areas, distribution, and biology of Negroes in the Americas with special emphasis on the United States. Race mixture, racial laws, and Negro reactions. Racial composition, growth patterns, body build, climatic stresses, and disease susceptibilities. Prerequisite, sophomore standing. (Formerly Anthropology 281.)

PHY A

480-481 Primate Anatomy: Structure and Function (5-5)

The anatomy of various primates is studied in detail with special reference to structural and functional relationships. The evolution and present ecology of primates are examined as they relate to the total anatomical picture. The laboratory consists of dissection of a specified primate and a study of the dentition and osteology. Prerequisites, 201 and/or Zoology 111-112 and/or Biology 210, 211, 212, or permission. (Formerly Anthropology 480-481.)

PHY A

482 Physical Anthropology: Population Genetics (5)

The population as a unit of study will be defined, and methods of analyzing the forces of evolution operative in human populations will be presented. Prerequisites, 201 and/or Zoology 111-112 and/or Biology 210, 211, 212; Genetics 351 or 451; Sociology 431; statistics, or permission. (Formerly Anthropology 482.)

PHY A

483 Primate and Human Variations (5)

Discussion of the morphological, physiological, and genetic variability of living primate and human populations with special reference to adaptation. Stressed are adaptive responses to selective pressures engendered by the total environment. Laboratory. Prerequisites, 201 and/or Zoology 111-112 and/or Biology 210, 211, 212; Genetics 351 or 451; statistics; or permission. (Formerly Anthropology 484.)

PHY A

484 Primate and Human Growth (3)

Genetics of growth and growth and maturation in experimental primates and man. Emphasized is the effect of the total environment upon growth processes with special reference to non-Western human societies. Prerequisites, 201 and/or Zoology 111-112 and/or Biology 210, 211, 212; Genetics 351 or 451; Zoology 456 or Biological Structure 404; statistics; or permission. (Formerly Anthropology 483.)

PHY A

485 Primate and Human Growth Laboratory (2)

Laboratory dealing with current methods used to assess growth and development. Must be accompanied by 484. Prerequisites, 201 and/or Zoology 111-112 and/or Biology 210, 211, 212; Genetics 351 or 451; Zoology 456 or Biological Structure 404; statistics; or permission. (Formerly Anthropology 483L.)

PHY A

486 Primate and Human Evolution (5)

Discussion of living forms and the fossil record with reference to the nature of primate evolution. Morphological, genetic, and behavioral data are used to appraise taxonomy of living primates and their phylogenetic implications. Special emphasis is placed on the evolution of the hominids and their cultures. Laboratory. Prerequisites, 201 and/or Zoology 111-112 or Biology 210, 211, 212; Geology 437 or concurrent registration; statistics; or permission. (Formerly Anthropology 485.)

PHY A

487 Human and Comparative Osteology (3)

Introduction to the vertebrate skeleton. The skeleton is described in detail and various methods of determining age and sex are presented, as well as osteometry and modern statistical methods for handling such data. Prerequisite, permission of instructor.

PHY A

498 Advanced Topics in Physical Anthropology (3, max. 9)

A series of seminars on different aspects of physical anthropology. Prerequisite, permission of instructor. (Formerly Anthropology 498).

Courses for Graduates Only

GENERAL

ANTH

600 Independent Study or Research (*) AWSp

ANTH

700 Thesis (*)

ANTH

702 Degree Final (3)

ANTH

800 Doctoral Dissertation (*)

SOCIOCULTURAL ANTHROPOLOGY

Courses for Graduates Only

ANTH

500 Preceptorial Reading (6)

A course for beginning graduate students who have not had adequate training in the problems, principles, and methods involved in the analysis and comparison of social and cultural systems.

ANTH

505 Field Techniques in Ethnography (3)
The techniques of collecting, recording, ordering, and utilizing ethnographic data in the field. Problems of rapport, sample, interview, observation, and interpretation.

ANTH

510 Seminar on North American Indians (3)
An advanced comparative treatment of selected aspects of the Indian cultures and societies of North America.

ANTH

512 Seminar on Oceania (3)
An advanced comparative treatment of selected aspects of the cultures and societies of Oceania.

ANTH

513 Seminar on Africa (3)
An advanced comparative treatment of selected aspects of the cultures and societies of Africa.

ANTH

515 Seminar on South America (3)
An advanced comparative treatment of selected aspects of the cultures and societies of South America.

ANTH

516 Seminar on Southeast Asia (3)
An advanced comparative treatment of selected aspects of the cultures and societies of Southeast Asia.

ANTH

517 Seminar on South Asia (3)
An advanced analysis of selected problems in South Asian ethnology and social structure. Prerequisite, 412.

ANTH

518 Seminar on Middle America (3)
An advanced comparative treatment of selected aspects of the cultures and societies of Middle America.

ANTH

525 Seminar in Culture Processes (3, max. 6)
The concept of process and its application to the study of culture.

ANTH

527 Acculturation (3)

Systematic analysis of psychological, social, and cultural implications of the contact of peoples.

ANTH

530 Structures and Functions of Oral Literature (3)

Of interest to students of language and literature.

ANTH

531 Analysis of Oral Literature (3, max. 6)
Various approaches to the study of folklore and myth. Of interest to students of language and literature.

ANTH

532 Content Analysis of Oral Literatures (3)
Analysis of oral literature for main themes, relationships, personalities, tragedy, humor, values, world view, and their sociocultural connections. Of interest to students of language and literature. Prerequisite, permission.

ANTH

537 Non-Western Political Systems (3)
Ethnic manifestations, methodological problems, and theoretical implications of polity in a wide range of cultures.

ANTH

540 Anthropology and Health (3)
Seminar on the history, development, and future of anthropological contributions to problems of health and illness. Prerequisite, permission.

ANTH

541 Seminar in Psychological Aspects of Culture (3)
Selected problems in the relation of culture and personality types. Prerequisite, 441 or permission.

ANTH

550 Field Text Recording (3)
Training in verbatim recording in non-Western connected speech such as myth and biographical dictations; especially designed for sociocultural anthropologists, rather than linguists, who are shortly leaving for a long session of field research.

ANTH

553 Analysis of Linguistic Structures (3, max. 6)
Offered jointly with the Department of Linguistics as Linguistics 553. Prerequisite, permission.

ANTH

559 Seminar in Language and Culture (3)
Theoretical and methodological problems in language and culture.

ANTH

561 Seminar in Methods and Theories (3, max. 9)

ANTH

562 Implications of Concepts From Anthropology for Nursing (3)
An examination of selected core concepts from anthropology and an assessment of the implications of these concepts for nursing research. Offered jointly with the School of Nursing as Nursing 562.

ANTH

563 Structural-Functional Analysis (3, max. 9)

ANTH

564 Formal Methods of Analysis for Social Anthropology (3)

A seminar on selected nonstatistical mathematical methods and models of relevance to various problems in social anthropology.

ANTH

565, 566, 567 History of Anthropological Sciences (3,3,3)

A series of core courses for the beginning graduate student in which the growth and development of anthropological science is analyzed.

ANTH

569 Social and Cultural Change: Africa (3)
Urbanization, stratification, technology, education, social and religious movements, and cultural pluralism in contemporary Africa. Offered jointly with the Department of Sociology as Sociology 569. Prerequisite, graduate standing in a social science department.

ANTH

591 Seminar in Museology (3)
Research into problems of museology. Prerequisite, permission.

ARCHAEOLOGY

ARCHY

501 Preceptorial Reading (6)

A course for beginning graduate students who have not had adequate training in the problems, principles, and methods involved in the reconstruction of prehistory. (Formerly Anthropology 501.)

ARCHY

570 Seminar in Theory and Method in Archaeology (3)
(Formerly Anthropology 570.)

ARCHY

571 Field Course in Archaeology (5)
Study of prehistoric cultures through archaeological excavation and analysis. Work will be largely in the state of Washington, but other areas may be included. Offered Summer Quarter only. (Formerly Anthropology 571.)

ARCHY

572 Seminar in North American Archaeology (3, max. 6)
Selected problems in the archaeology of America north of Mexico. Prerequisite, Archaeology 472 or permission. (Formerly Anthropology 572.)

ARCHY

573 Seminar in Middle American Archaeology (3, max. 6)
Selected problems in the archaeology of Middle America. Prerequisite, Archaeology 473 or 475 or permission. (Formerly Anthropology 573.)

ARCHY

574 Seminar in South American Archaeology (3, max. 6)
Selected problems in the archaeology of South America and southern Central America. Prerequisite, Archaeology 474 or permission. (Formerly Anthropology 574.)

ARCHY

575 Strategy of Archaeology (3)
A systematic examination of the methodology and elementary techniques of archaeology for the objective of prehistory, acquainting the student as well with sources of material and techniques of wide applicability in the field situation. (Formerly Anthropology 575.)

ARCHY

579 Seminar in Underwater Archaeology (3)
Problems and practices of archaeology underwater. Includes world survey of types of sites, problems of working in underwater environment, methods, principles, accomplishments to date and possible projects in northwest America. Prerequisite, Archaeology 571 or permission. (Formerly Anthropology 579.)

PHYSICAL ANTHROPOLOGY**PHY A**

502 Preceptorial Reading (6)
A course for beginning graduate students who have not had adequate training in the problems, principles, and methods involved in the study of primate evolution, human genetics, and the evolution of modern populations. (Formerly Anthropology 502.)

PHY A

581 Dental Anthropology (5)
An intensive survey of the dentitions of primates from tree shrews to man. Emphasis will be placed on the range of metric and morphologic variability existing in the teeth of these animals, both in fossil and living groups. Environmental and genetic factors will be considered within this ontogenetic and phylogenetic framework. (Formerly Anthropology 581.)

PHY A

582 Seminar in Race and Genetics (3, max. 9)

Examination of various problems dealing with the forces of evolution operative on human populations. Prerequisite, 482 or permission. (Formerly Anthropology 582.)

PHY A

583 Topics in Growth and Development (3, max. 9)

Seminar dealing with various topics of child growth and development. Topics to change from quarter to quarter. Prerequisite, Physical Anthropology 484 or permission. (Formerly Anthropology 583.)

PHY A

586 Topics in Primate and Human Evolution (3, max. 9)

A consideration of one or more major topics relevant to the evolution of man and the primates. Prerequisite, permission of instructor.

ARABIC—See Classics

ART

Specific areas in Art are designated by area letters. These letters must precede course numbers on the student's Official Program. Designation letters and their definitions are:

ART—Art

ARTH—Art History

Courses for Undergraduates**Humanities 102 The Arts (5)**

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

Humanities 103 The Arts of Africa, the Caribbean, and Black America (5)

Creative achievements by the Blacks of Africa, the Caribbean, and America in visual arts, music, dance, literature, and theatre. Guest lecturers and performing artists.

ART

100 Introduction to Art (3) AWSp
A course for majors in elementary education.

ART

101 Special Studies in Art for Nonmajors (3, max. 9)

Individual and group instruction in art with special projects, readings, and papers in art serving as a focus for studio work. Prerequisite, permission.

ART

105, 106, 107 Drawing (3,3,3)
AWSpS, AWSpS, AWSpS

Perspective, light and shade, composition. Prerequisites, Art 105 for 106; 106 for 107.

ART

109, 110 Design (3,3) AWSpS, AWSpS

Art structure as the basis for creative work. Organization of line, space, and color. Lectures, discussion, and supplementary reading. Prerequisite, Art 109 for 110.

ART

129 Appreciation of Design (2) AWSp

Lectures on design fundamentals, illustrated with slides and paintings, pottery, textiles, etc. Reading and reference work.

ART

201, 202, 203 Ceramic Art (3,3,3)
AWSpS, AWSp, AWSp

Pottery: hand-building processes, wheel throwing, glazing, kiln firing. Prerequisites, Art 107, 110, 129 for 201; 201 for 202; 202 for 203.

ART

205 Graphic Design—Introduction (3) AWSp
Survey and introduction. (Design and use of letter forms.) Prerequisites, ART 107, 110, 129.

ART

250 Design and Materials: Textiles—Printing and Dyeing (3) AWSp

Printing and dyeing of textiles. Techniques include block printing, batik, tie and dye, discharging. Prerequisites, ART 107, 110, 129.

ART

251 Design and Materials: Glass (3)

Fusing, forming, laminating, and surface treatments of glass. (Glass-blowing excluded.) Prerequisites, ART 107, 110, 129.

ART

252 Design and Materials: Plastics (3)

Forming, joining, and casting of plastics. Prerequisites, ART 107, 110, 129.

ART

253 Design and Materials: Wood (3) AWSp

Shaping and forming of wood. Lamination and fabricating techniques. Usage of hand and power tools. Prerequisites, ART 107, 110, 129.

ART

254 Design and Materials: Metal (3) AWSp

Basic techniques in manipulation and construction of metals. Visual, tactile, and aesthetic aspects. Prerequisites, ART 107, 110, 129.

ART

255 Design and Materials: Textile Construction (3) AWSp

Knotting, hooking, stitching, and other nonwoven constructional techniques with a variety of textile fibers. Prerequisites, ART 107, 110, 129.

ART

256, 257, 258 Painting (3,3,3) AWSpS, AWSpS, AWSpS

Beginning oil painting. Prerequisites, Art 107, 110, 129 for 256; 256 for 257; 257 for 258.

ART

259 Water-Soluble Media (3)

Prerequisites, Art 107, 110, 129.

ART

261 Elements of Interior Design (3) AWSp
Study of basic residential spaces and furnishings. Scale drawings, materials, and color.

ART

262 Essentials of Interior Design (2) Sp

Illustrated lectures on color, texture, and form in residential space.

ART

265, 266, 267 Advanced Drawing (3,3,3)
AWSp, AWSp, AWSp

Prerequisites, Art 107, 110, 129 for 265; 265 for 266; 266 for 267.

ART

268 Anatomical Drawing (3) ASp

Study of the figure's internal structure and its relationship to surface appearance. Drawing from the model and anatomical material. Prerequisites, Art 107, 110, 129.

ART

272, 273, 274 Beginning Sculpture Composition (3,3,3)
AWSpS, AWSpS, AWSpS

Fundamentals of composition in the round and in relief. Prerequisites, Art 107, 110, 129 for 272; 272 for 273; 273 for 274.

ART

280, 281, 282 Furniture Design (5,5,5) A,W,Sp

Design and full-scale construction of furniture in the shop, includes working drawings, scale models, and layout. Prerequisites, Art 107, 110, 129, Architecture 300, 301, 302, 305, 306, 307, 310, 311, 312 for 280; 280 for 281; 281 for 282.

ART

300 Art Education: Crafts (3)

Design in leather. Exploration of techniques and processes leading to creative work. Prerequisite, junior standing in art.

ART

302 Art Education: Crafts (3) AWSpS

Bookbinding. The design and construction of books including decorative paper techniques. Prerequisite, junior standing in art.

ART

303 Art Education: Crafts (3) AWSpS

Paper techniques and processes. Prerequisite, junior standing in art.

ART

304 Art Education: Crafts (3) AWSpS

Textile techniques and processes. Prerequisite, junior standing in art.

ART

305 Art Education: Crafts (3) AWSpS

General techniques and processes involved with various materials. Prerequisite, junior standing in art.

ART

307, 308 Intermediate Painting (3,3)

Prerequisites, ART 258 for 307; 307 for 308.

ART

309 Portrait Painting (3) S

Prerequisite, ART 308.

ARTS AND SCIENCES

ART

310, 311, 312 Interior Design (5,5,5) A,W,Sp
Analysis of interior spaces and furnishings in relation to human needs. Includes study of materials, scale drawings, models, and presentation. Prerequisites, ART 262, 282, ARTH 283; Home Economics 125 for 310; 310 for 311; 311 for 312.

ART

313, 314 Fundamentals of Photography (3,3) WSp
RIECKS

Basic theory and techniques of photographic reproduction. Lighting, exposure, camera technique, and processing. Application of photographic techniques to the solution of problems in visual presentation. Prerequisite, junior standing in Graphic or Industrial Design for 313; 313 for 314.

ART

316, 317, 318 Design for Industry (5,5,5) A,W,Sp

Product design, working drawings, models, presentation drawings, product analysis, display, marketing. Prerequisites, junior standing in Industrial Design for 316; 316 for 317; 317 for 318.

ART

322, 323, 324 Life Sculpture (3,3,3) AWSp, AWSp, AWSp
DU PEN

Work in clay from the posed model. Figure composition, discussions, reading, and sketchbook. Prerequisites, Art 274 for 322; 322 for 323; 323 for 324.

ART

328 The Film as Art (3)

The historical development of film as an aesthetic medium with an emphasis on pivotal film makers and their unique contribution to the art of film.

ART

332, 333, 334 Intermediate Sculpture Composition (3,3,3) AWSpS, AWSpS, AWSpS
DU PEN

Advanced work in various media and techniques. Prerequisites, Art 324 for 332; 332 for 333; 333 for 334.

ART

335, 336 Metal Casting (3,3) AWSp, AWSp
Introduction to foundry techniques as applied to fine arts casting of nonferrous material. Prerequisites, Art 274 for 335; 335 for 336.

ART

337, 338 Welding (3,3) AWSp, AWSp
The study and application of welding methods as a sculpture technique making use of oxyacetylene, electric arc, and heliarc. Prerequisites, Art 274 for 337; 337 for 338.

ART

339 Film Making (5, max. 15)
Fundamentals of camera techniques: lens, lighting, meter reading, filming speeds, film types, cinematic movement, camera movement. Fundamentals of film editing, splicing and timing, sound recording, and synchronizing. Prerequisites, junior standing in art and permission.

ART

340 Design for Printed Fabrics (3) W
PENINGTON

Hand-block and silk-screen printing; mass-production design. Prerequisite, Art 250 or permission.

ART

350 Introduction to Printmaking (3) AWSpS
Studio problems. Prerequisites, Art 107, 110, 129.

ART

351 Printmaking (3) AWSpS
Continuation of 350. Prerequisite, Art 350.

ART

352 Printmaking (3) AWSpS
Prerequisite, Art 351.

ART

353, 354, 355 Advanced Ceramic Art (5,5,5) AWSp, AWSp, AWSp
Pottery—advanced work in forming, decorating, and glazing. Prerequisites, ART 203 and permission for 353; 353 for 354; 354 for 355.

ART

356 Glass Blowing (3, max. 9)
Techniques of blowing molten glass through use of the blow pipe. Glass-furnace construction and lectures on glass technology. Prerequisite, permission of instructor.

ART

357 Metal Design (3) ASp
PENINGTON
Construction includes processes of raising, soldering, forging in copper, pewter, silver. Lectures and research on historic and contemporary examples. Prerequisite, junior standing in art.

ART

358 Jewelry Design (3) AWSp
PENINGTON, SOLBERG
Jewelry design and construction, including stone setting and forging in silver and gold. Lectures and research on historic and contemporary examples. Prerequisite, junior standing in art.

ART

359 Enameling (3) AWSp
PENINGTON
Enamel design for metal work or jewelry, champlevé, Plique-à-jour, Limoges, Cloisonné on copper, silver, or gold. Prerequisite, Art 357 or 358.

ART

360, 361, 362 Life (3,3,3) AWSpS, AWSpS, AWSpS
Drawing and painting from the model. Prerequisites, Art 258 and 267 for 360; 360 for 361; 361 for 362.

ART

366, 367, 368 Graphic Design—Fundamentals (3,3,3) A,W,Sp
CARRAHER, DAHN
Emphasis on the development of visual ideas in graphic design. Prerequisites, Art 205 for 366; 366 for 367; 367 for 368.

ART

369, 370 Costume Design (2,2) ASp
Design of clothing with emphasis on line, color, materials, use. For Home Economics majors only.

ART

410 Graphic Design—Book and Magazine Illustration (5) A
RAND
Prerequisite, ART 368.

ART

436, 437, 438 Sculpture Composition (5,5,5) AWSpS, AWSpS, AWSpS
DU PEN
Individual compositions in various media in

large scale. Prerequisites, ART 334 for 436; 436 for 437; 437 for 438.

ART

445, 446, 447 Advanced Industrial Design (5,5,5) A, W, Sp
DEL GIUDICE
Market analysis and selected professional problems in industrial design. Prerequisites, ART 318 for 445; 445 for 446; 446 for 447.

ART

450, 451, 452 Advanced Printmaking (5,5,5) AWSpS, AWSpS, AWSpS
ALPS
Prerequisites, ART 352 for 450; 450 for 451; 451 for 452.

ART

457 Advanced Metal Design (3) AWSp
PENINGTON
Individual problems in metal design and construction. Prerequisite, ART 357.

ART

458 Advanced Jewelry Design (3) AWSp
PENINGTON
Individual problems in jewelry design and construction. Prerequisite, ART 358.

ART

459 Advanced Enameling (3) AWSp
PENINGTON
Individual problems in enameling. Prerequisite, ART 359.

ART

463, 464, 465 Advanced Painting (3,3,3) AWSpS, AWSpS, AWSpS
Prerequisites, Art 308 and 362 for 463; 463 for 464; 464 for 465.

ART

466, 467, 468 Graphic Design—Advertising Art (5,5,5) A,W,Sp
CAPLAN
Expression of ideas in terms of design. Variety of media and reproduction processes. Prerequisites, Art 368 for 466; 466 for 467; 467 for 468.

ART

472, 473, 474 Advanced Interior Design (5,5,5) A,W,Sp
Comprehensive problems related to contemporary needs, both public areas and residences, usually offered in conjunction with off-campus designers. Prerequisites, Art 312 for 472; 472 for 473; 473 for 474.

ART

475, 476, 477 Advanced Painting (3,3,3) AWSpS, AWSpS, AWSpS
Prerequisites, Art 465 for 475; 475 for 476; 476 for 477.

ART

479, 480 Graphic Design—Fashion Illustration (3,3) W,Sp
RAND
Prerequisites, Art 410 for 479; 479 for 480.

ART

485, 486, 487 Advanced Ceramic Art (5,5,5) AWSp, AWSp, AWSp
Pottery design and construction; stone ware; clay bodies; glazes. Prerequisites, Art 355 for 485; 485 for 486; 486 for 487.

ART

490 Art Education in the Schools (3) S
For school administrators and teachers requiring help in problems relating to the teaching of art. Workshop experiences, lectures, and

discussions. No previous art experience necessary. Prerequisite, teaching experience

ART

491 Readings in Art Education (3)
Basic readings in art education. A survey of leaders and movements that have contributed to the development of art education, with special attention to social and philosophical factors that have influenced art programs in American schools. Prerequisite, senior standing.

ART

492 Field Study in Art Education (3, max. 9)
Individual study of a selected problem in art education within a school setting under the direction of a faculty member. Prerequisites, approved plan of study and permission of the instructor.

ART

493 Problems in Art Education (3, max. 9)
A course designed to consider significant and critical problems in the field of art education. Topic to be announced. Prerequisite, permission of the instructor.

ART

494 Instructional Materials in Art Education (3, max. 9)
The preparation of teaching materials in selected media appropriate to the learner and with concern for subject matter. Prerequisite, senior standing.

ART

495 Graphic Design—Advanced (5, max. 15) AWSp
Theory and psychology of advertising and visual communication. Independent and group work. Prerequisites, Art 468, 480.

ART

497 Study Abroad—Studio Individual Projects (3-10, max. 20)
Prerequisite, permission.

ART

498 Individual Projects—Painting/Sculpture (3 or 5, max. 15) AWSpS
Prerequisite, permission.

ART

499 Individual Projects Design (3 or 5, max. 15) AWSpS
Prerequisite, permission.

Courses for Graduates Only**ART**

500, 501, 502 Seminar in Art Education (3 or 5 each) AS, WS, SpS
JOHNSON, RAVEN
Special problems related to the teaching of art.

ART

509 Portrait Painting (3) AWSpS

ART

512 Seminar in Painting (3, max. 9) AWSp

ART

522, 523, 524 Sculpture (3 or 5 each) AWSpS, AWSpS, AWSpS

ART

530, 531, 532 Design (3 or 5 each) AWSpS, AWSpS, AWSpS

ART

550, 551, 552 Printmaking (3 or 5 each) AWSpS, AWSpS, AWSpS
ALPS

ART

553, 554, 555 Ceramic Art (3 or 5 each) AWSp, AWSp, AWSp

ART

560, 561, 562 Life Painting (3 or 5 each) AWSpS, AWSpS, AWSpS

ART

563, 564, 565 Advanced Painting (3 or 5 each) AWSpS, AWSpS, AWSpS
Prerequisites, Art 465 and 477 for 563; 563 for 564; 564 for 565.

ART

600 Independent Study or Research (*) AWSp

ART

700 Thesis (*) AWSp

ART

702 Degree Final (3)

ART HISTORY**ARTH**

201, 202, 203 History of Western Art (3,3,3)
An introduction to major achievements in the principle media from prehistoric times to the present. Illustrated lectures. 201: Ancient and Early Medieval; 202: Late Medieval and Renaissance; 203: Baroque and Modern. Prerequisites, sophomore standing for 201; 201 for 202; 202 for 203.

ARTH

283 History of Furniture and Interior Architecture (3)

Illustrated lectures on the evolution of furniture and interior architecture. (Formerly Art 283.)

ARTH

301 Survey of Asian Art (5)
The origins and interplay of the major movements of Asian art. (Formerly Art 215.)

ARTH

307 Baroque and Rococo Art (5)
OPPERMAN

The arts and architecture of Europe from the end of the sixteenth century to the latter half of the eighteenth century. Prerequisite, sophomore standing or permission. (Formerly Art 319.)

ARTH

308 Survey of Modern Art (5)
The art of Europe and America from the late eighteenth century to the present, with emphasis on stylistic and thematic changes in painting.

ARTH

331 Tribal Art (5)
BRAVMANN

A survey of the arts of Sub-Saharan Africa, Pre-Columbian America (North and South), and the Pacific Islands, including Australia and New Zealand, from pre-historic times to the ethnographic present.

ARTH

333 Art of the Northwest-Coast Indian (3)
HOLM

Northwest-Coast Indian art, with emphasis on the structure and style of two-dimensional art of the northern tribes. Offered jointly with the Department of Anthropology as Anthropology 333. (Formerly Art 343.)

ARTH

334 Art of the Northwest-Coast Indian (3)
HOLM

Three-dimensional art of the Northwest-Coast culture area, with emphasis on aesthetic principles, techniques, cultural functions. Of-

ferred jointly with the Department of Anthropology as Anthropology 334. (Formerly Art 344.)

ARTH

335 Art of the Northwest-Coast Indian (3)
HOLM

Northwest-Coast Indian art as related to drama and dance, with special attention to the Southern Kwakiutl. Offered jointly with the Department of Anthropology as Anthropology 335. (Formerly Art 345.)

ARTH

341 Greek Archaeology and Art (3)
EDMONSON

A survey of major art forms from the Mycenaean to the Hellenistic periods, with special attention to modern archaeological methods and excavations; illustrated by slides. Offered jointly with the Department of Classics as Classical Archaeology 341. (Formerly Art 341.)

ARTH

342 Roman Archaeology and Art (3)
PASCAL

A survey of major art forms, with special attention to modern archaeological methods and excavations; illustrated by slides. Offered jointly with the Department of Classics as Classical Archaeology 342. (Formerly Art 342.)

ARTH

381 History of Painting Since the Renaissance (2)
MOSELEY

Illustrated lectures. Prerequisites, Art History 201, 202, 203. (Formerly Art 326.)

ARTH

382 History of Modern Sculpture (2)
Sculpture from the Renaissance to the present; lectures and slides. Prerequisites, Art History 201, 202, 203. (Formerly Art 320.)

ARTH

391 History of Pottery (3)
KOTTLER

Survey of stylistic and technical history of world pottery. Prerequisite, permission. (Formerly Art 325.)

ARTH

392 History of Printmaking (2)
ALPS

A selective survey of major artists and media in the field of printmaking. Prerequisite, junior standing in art. (Formerly Art 327.)

ARTH

401 Oriental Ceramic Art (2)
ROGERS

A survey illustrated by specimens in the collection of the Seattle Art Museum. Prerequisites, Art History 301 or major in ceramic art. (Formerly Art 401.)

ARTH

406 Study Abroad: Art in Provence (5, max. 15)

Monuments in and around Avignon. Emphasis upon Roman and Romanesque architecture and sculpture, later medieval French painting, great works of all periods and countries in regional museums, and the Provencal landscape of Cézanne, Van Gogh, and Gauguin. Prerequisite, permission. (Formerly Art 483.)

ARTH

411 Early Chinese Painting: T'ang to Yüan (3)
WEBB

A study of the changing styles and attitudes

accompanying the development of painting (particularly landscape painting) in China from earliest times. Prerequisite, upper-division standing. (Formerly Art 429.)

ARTH

412 Later Chinese Painting: Yüan through Ch'ing (3)

WEBB

Chinese painting from the time that the study of individual masters becomes the main task at hand. Prerequisite, upper-division standing. (Formerly Art 430.)

ARTH

415 Early Japanese Painting: Twelfth to Sixteenth Century (3)

WEBB

Yamato-e and the art of the illustrated handscroll of Heian and Kamakura times, and the ink landscape tradition associated with Shubun and Sesshu. Prerequisite, upper-division standing. (Formerly Art 431.)

ARTH

416 Later Japanese Painting: Sixteenth to Nineteenth Century (3)

WEBB

A survey of later Japanese painting with emphasis on the art of the Kano, Sotatsu/Korin, Shijo/Maruyama, and Nanga schools. Prerequisite, upper-division standing. (Formerly Art 432.)

ARTH

417 Buddhist Painting of China and Japan (3)

WEBB

A survey of Buddhist painting in China and Japan from the fifth century until circa 1300. Prerequisite, upper-division standing. (Formerly Art 433.)

ARTH

418 Buddhist Sculpture of China and Japan (3)

WEBB

A survey of Buddhist sculpture in China and Japan from the fifth century until circa 1300. Prerequisite, upper-division standing. (Formerly Art 434.)

ARTH

419 Chinese and Japanese Architecture (3)

WEBB

Religious and secular architecture of China and Japan, with emphasis on Japanese temples and shrines. Prerequisite, upper-division standing. (Formerly Art 435.)

ARTH

420 Study Abroad: Art and Architecture of the Kansai (8)

WEBB

A study, conducted in the field and in lecture/discussion sessions, of all the important monuments of Japanese art in the temples, shrines, and museums of Kyoto, Otsu, Nara, Osaka, and their vicinities.

ARTH

421 Art of India (3)

ROGERS

Stylistic and iconographic study of the art of India. Prerequisite, Art History 301 or permission. (Formerly Art 482.)

ARTH

431 Primitive Art I (3)

BRAYMANN

The arts of Mesamerica, South America, and Oceania. (Formerly Art 440.)

ARTH

432 Primitive Art II (3)

BRAYMANN

The arts of New Guinea, Australia, and Africa. Prerequisite, Art History 431. (Formerly Art 441.)

ARTH

436 Arts of Sub-Saharan Africa I (3)

BRAYMANN

The tribal arts of the Western Sudan and the Western Guinea coast with their archaeological antecedents. (Formerly Art 442.)

ARTH

437 Arts of Sub-Saharan Africa II (3)

BRAYMANN

The tribal arts of the Central Guinea Coast, Nigeria, the Cameroons, and Gabon. (Formerly Art 443.)

ARTH

438 Arts of Sub-Saharan Africa III (3)

BRAYMANN

The tribal arts of the Congo, Southern Savannah, and clusters of artistic traditions outside of generally defined artistic maps of Africa. Prerequisite, Art History 436 or 437. (Formerly Art 444.)

ARTH

442 Greek and Roman Pottery (3)

EDMONSON

Shapes, fabrics, and decorations from the Neolithic period to the sixth century A.D. Offered jointly with the Department of Classics as Classical Archaeology 442. (Formerly Art 402.)

ARTH

444 Greek and Roman Sculpture (3)

EDMONSON

History and development of Greek sculpture and sculptors, their Roman copyists, and Roman portraits and sarcophagi. Emphasis will be on Greek sculpture of the fifth century B.C. Offered jointly with the Department of Classics as Classical Archaeology 444. (Formerly Art 404.)

ARTH

453 Romanesque Art I (3)

CHRISTOFIDES

The history of early medieval art (architecture, sculpture, painting, decorative arts), from Carolingian times through the twelfth century. Prerequisite, upper-division standing. (Formerly Art 488.)

ARTH

454 Romanesque Art II (3)

CHRISTOFIDES

Intensive study of the high Romanesque style, including the art and architecture, with related monuments, of the pilgrimage roads to Compostela. Prerequisite, upper-division standing. (Formerly Art 489.)

ARTH

461 Early Renaissance Painting (3)

ROSENFELD

The painting of the fourteenth and fifteenth centuries in Florence and Siena. Prerequisite, familiarity with vocabulary of art or with related history. (Formerly Art 491.)

ARTH

462 High and Late Renaissance Painting (3)

ROSENFELD

The painting of the sixteenth century in Florence and Rome. Prerequisite, familiarity with vocabulary of art or with related history. (Formerly Art 493.)

ARTH

463 Early Renaissance Sculpture (3)

ROSENFELD

The sculpture of the late thirteenth, fourteenth, and fifteenth centuries in the Florentine tradition. Prerequisites, Art History 201, 202, or equivalent background. (Formerly Art 469.)

ARTH

469 Problems in Northern European Art (3, max. 12)

GROSSMANN

The evolution of Northern European art during the fifteenth through seventeenth centuries will be treated in such a manner as to direct the attention of students to the many points of iconography, style, and attribution that need clarification. The major artistic traditions of this area will be covered during four academic quarters. Prerequisite, upper-division standing.

ARTH

471 Masters and Monuments of Counter-Reformation Rome (3)

OPPERMAN

The works and impact of the major architects, sculptors, and painters active in Rome from the death of Michelangelo to the death of Bernini (1564-1680). Concentration upon Caravaggio, Bernini, Pietro da Cortona, Poussin, and Borromini. Prerequisite, Art History 307 or permission of instructor. (Formerly Art 418.)

ARTH

472 Art in France: Henry IV-Louis XVI (3)

OPPERMAN

Architecture, painting, sculpture, decoration. The classic ideal: formation, zenith, extinction around 1700, and rebirth in the later eighteenth century. Main points: Versailles, Watteau, the decorators of the rococo, and tendencies of the period. Prerequisite, Art History 307 or permission of instructor. (Formerly Art 416.)

ARTH

473 Dutch Painting of the Golden Age (3)

OPPERMAN

The genesis, development, and decline of painting in the United Provinces from their independence in 1581 to the end of the seventeenth century. Emphasis upon the anti-mannerist reaction in Utrecht, Frans Hals, Rembrandt, and upon the origins of Dutch genre traditions. Prerequisite, Art History 307 or permission of instructor. (Formerly Art 417.)

ARTH

481 Origins of Modern Art (3)

KINGSBURY

Stylistic and iconographic study of European painting and sculpture from 1750 to 1848. Prerequisites, Art History 201, 202, 203. (Formerly Art 426.)

ARTH

482 Impressionism and Post-Impressionism (3)

KINGSBURY

Stylistic and iconographic study of European painting and sculpture from 1848 to 1900. Prerequisites, Art History 201, 202, 203. (Formerly Art 427.)

ARTH

483 Art of the Twentieth Century (3)

KINGSBURY

Painting and sculpture in Europe and America from 1900 to the present. Prerequisites, Art History 201, 202, 203. (Formerly Art 428.)

ARTH**486 History of American Art—Colonial Period (3)**

REED

A survey of architecture, town design, painting, sculpture, and the decorative arts in the United States from original European settlement to the Revolutionary War. Prerequisite, junior standing. (Formerly Art 405.)

ARTH**487 History of American Art to 1913 (3)**

STEIN

Survey of American art, especially painting, to the Armory Show, with attention to major figures, the American culture context, and parallel European trends. Prerequisite, familiarity with vocabulary of art or with related history or literature. (Formerly Art 406.)

ARTH**491, 492, 493 Art History and Criticism (3,3,3)**

(Formerly Art 423, 424, 425.)

ARTH**496 Study Abroad—Art History Individual Projects (3-10, max. 20)**

(Formerly Art 496.)

ARTH**498 Individual Projects—Art History (3 or 5, max. 15)**

Prerequisite, permission. (Formerly Art 498.)

Courses for Graduates Only**ARTH****501, 502, 503 Seminar in the General Field of Art (3 or 5 each)**

(Formerly Art 503, 504, 505.)

ARTH**511 Seminar in Chinese Art (3, max. 9)**

WEBB

A critical appraisal of the principle research methods, theories, and types of literature dealing with the art of China. Prerequisite, permission of instructor. (Formerly Art 583.)

ARTH**515 Seminar in Japanese Art (3, max. 9)**

WEBB

A critical appraisal of the principle research methods, theories, and types of literature dealing with the art of Japan. Prerequisite, permission of instructor. (Formerly Art 584.)

ARTH**521 Seminar in Indian Art (3, max. 9)**

ROGERS

A critical appraisal of the principle research methods, theories, and types of literature dealing with the art of India. Prerequisite, Art History 421. (Formerly Art 582.)

ARTH**566 Seminar in North-European Art (3)**

GROSSMANN

The seminar will deal with problems of style and iconography of the northern European masters of the fourteenth through fifteenth centuries. Prerequisite, permission of instructor. (Formerly Art 578.)

ARTH**577 Seminar in Baroque Art (3, max. 9)**

OPPERMAN

Iconographic and stylistic problems of the art of the baroque period, with emphasis on the principle research methods, theories, and types of literature dealing with the art of the seventeenth and eighteenth centuries in Europe. (Formerly Art 594.)

ARTH**581 Problems in Modern Art (3, max. 9)**

KINGSBURY

Art-historical problems of the nineteenth and twentieth centuries. Prerequisites, graduate standing and Art History 308, or equivalent, or permission of instructor.

ARTH**590 Seminar in Criticism of Contemporary Art (3, max. 9)**

Seminar on contemporary art and appropriate critical methodology. Prerequisites, Art History 587, 588, 589. (Formerly Art 574)

ARTH**600 Independent Study or Research (*)****ARTH****700 Thesis (*)****800 Doctoral Dissertation (*)****ARTS AND SCIENCES**

Numbers under this heading are reserved by the College of Arts and Sciences for curriculum innovations.

101, 102, 103, 104, 105, 106 Perspectives and Issues (3-5 each)

Courses intended for lower-division students and offered by faculty from various departments of the University on topics not otherwise offered in the courses of the various departments. Topics may include issues or concepts transcending the province of a single discipline and will vary from one quarter to another.

401, 402, 403, 404, 405, 406 Perspectives and Issues (3-5 each)

Courses intended for upper-division and graduate students and offered by faculty from various departments of the University on topics not otherwise offered in the courses of the various departments. Topics may include issues or concepts transcending the province of a single discipline and will vary from one quarter to another. Prerequisite, upper-division standing.

ASIAN LANGUAGES AND LITERATURE**Courses for Undergraduates****CHINESE****121 Accelerated Chinese (10)A**

Introduction to sounds and structure of modern Chinese (Mandarin) by the inductive method. After acquiring a certain familiarity with the language, students are introduced to the written language. (Formerly 101.)

134 Intensive Chinese (15) S

Introduction to sounds and structure of modern Chinese (Mandarin) by the inductive method. After acquiring a certain familiarity with the language, students are introduced to the written language. This course is especially recommended for students (particularly graduates) who plan to devote more time to other subjects during the regular academic year. (Formerly 150.)

211 Nonaccelerated Chinese (5) A

Continuation of 134. Prerequisite, 134 or permission. (Formerly 200.)

212 Nonaccelerated Chinese (5) W

Continuation of 211. Prerequisite, 211 or permission. (Formerly 250.)

213 Nonaccelerated Chinese (5) Sp

Continuation of 212. Prerequisite, 212 or permission. (Formerly 300.)

222 Accelerated Chinese (10) W

Continuation of 121. Prerequisite, 121 or equivalent. (Formerly 201.)

223 Accelerated Chinese (10) Sp

Continuation of 222. Rapid learning of Chinese characters and reading of texts. Students should learn about 1,500 characters by the end of the year. Prerequisite, 211 or 222. (Formerly 301.)

300 Advanced Chinese Conversation (1-3, max. 9) AWSp

YEN

Participation in the program of the Chinese House or attendance at a noon-hour session supervised by a language informant. Prerequisite, 213 or 223, or equivalent. (Formerly 315.)

311, 312, 313 Intermediate Modern Chinese (5,5,5) A,W,Sp

YEN

Selected readings in modern Chinese literature, philosophy, history, and political science (including newspaper materials.) Prerequisite, 213 or 223, or equivalent. (Formerly 302, 303, 304.)

334 Chinese, Intensive (15) S

Prerequisite, 213 or 223, or equivalent. (Formerly 350.)

400 Tutorial Chinese (5) W

YEN

A refresher course designed for students of Chinese who have completed courses in the language but cannot be properly placed in regularly scheduled courses. Students work at individual maximum speed with a tutor. Placement level will be determined by examination. Prerequisites, permission and advanced standing. (Formerly 488.)

401, 402, 403 Chinese Dialects (5,5,5) A,W,Sp

YEN

Introduction to the sound and structure of one of the following Chinese dialects: (A) Cantonese, (B) Foochow, (C) Amoy, and (D) Shanghai. Prerequisite, 304.

407 Chinese Reference Works and Bibliography (3) Sp

WILHELM

Introduction to the methodology of Sinology. Prerequisite, 300 or 301, or equivalent. (Formerly 408.)

411, 412, 413 Advanced Contemporary Chinese (5,5,5) A,W,Sp

YEN

Selections from Communist publications where a large amount of new terminology is introduced and a great number of abbreviated characters used. Prerequisite, 313. (Formerly 461, 462, 463.)

441, 442, 443 Structure of Chinese (3,3,3) A,W,Sp

YEN

Practical phonetics with special application to the problem of articulation improvement. Morphology with application to vocabulary building, use of particles and syntax. Prerequisite, 313. (Formerly 451, 452, 453.)

444 Intensive Classical Chinese (15) S

An introduction to classical Chinese using the methodologies of philology, comparative se-

mantics, descriptive linguistics, phonology, and literary analysis. Prerequisites, 213, 223, or equivalent. (Formerly 400.)

451, 452, 453 Classical Chinese (5,5,5) A,W,Sp SERRUYS

Syntactical analysis, translation from literary Chinese into English and vice versa. To be taken in sequence only. Prerequisite, 213 or 223, or equivalent. (Formerly 405, 406, 407.)

461, 462, 463 Chinese Literature (5,5,5) A,W,Sp WILHELM

461: lectures on Chinese literature from earliest times to the end of Han. 462: lectures on Chinese literature from the end of Han to the end of T'ang. 463: lectures on Chinese literature since T'ang times. Prerequisite, 213 or 223, or equivalent. (Formerly 455, 456, 457.)

481 Modern Chinese Fiction (5) A SHIH

Studies of representative works of major Chinese fiction writers from 1918 to 1949. Prerequisite, 313 or permission. (Formerly 458.)

492 Readings in Chinese Philosophical Texts (5) W SHIH

Prerequisite, permission.

499 Undergraduate Research (3-5, max. 15) AWSp

For Chinese language and literature majors. Prerequisite, permission.

HINDI-URDU

101-102, 103 Elementary Hindi-Urdu (5-5, 5) A,W,Sp

Introduction to the spoken language. Oral drills emphasizing pronunciation and elementary conversation. Grammatical and syntactical exercises. Introduction to the two writing systems in 103.

201, 202, 203 Intermediate Hindi (5,5,5) A,W,Sp

Systematic expansion of vocabulary and grammatical forms and structures. Oral and writing practice based on Hindi prose readings. Prerequisite, 103 or equivalent.

301, 302, 303 Advanced Hindi (5,5,5) A,W,Sp

Prerequisite, 203 or equivalent.

468 Seminar on Modern Hindi Literature (3) Genre and contextual analysis of literary forms of a rapidly developing language.

JAPANESE

111, 112, 113 First-Year Japanese (5,5,5) A,W,Sp NIWA

Introduction to spoken Japanese, pronunciation, oral composition, and grammar; reading of romanized Japanese; conversation, composition, and grammar; introduction to modern written Japanese in 113. (Formerly 101-102, 103.)

134 Intensive Japanese (15) S NIWA

A beginning course covering the same ground as Japanese 111, 112, 113. Introduction to spoken Japanese, pronunciation, oral composition, and grammar; reading of romanized Japanese; conversation, composition, and grammar; introduction to modern written Japanese. (Formerly 150.)

211, 212, 213 Second-Year Japanese (5,5,5) A,W,Sp NIWA

Reading and translation of modern Japanese. Also oral work in Japanese. Prerequisites, 111, 112, 113 or equivalent. (Formerly 201, 202, 203.)

311, 312, 313 Third-Year Japanese (5,5,5) A,W,Sp HIRAGA

Reading and translation of modern Japanese. Also oral work in Japanese. Prerequisite, 213 or equivalent. (Formerly 301, 302, 303.)

331, 332, 333 Intensive Japanese (15,15,15) A,W,Sp NIWA

331: oral-aural approach to modern Japanese. Requires full-time commitment by the student. Attendance at language laboratory hours required in addition to regular five-hour day. 332: first-year reading Japanese. Reading and translation of modern Japanese. Classes conducted principally in Japanese. Prerequisite, 331 or permission. (Same material covered as in 211, 212, 213.) 333: second-year reading Japanese. Reading and translation of modern Japanese. Classes conducted principally in Japanese. Prerequisite, 332 or permission. (Same material covered as in 311, 312, 313.) (Formerly 311, 312, 313.)

411, 412, 413 Fourth-Year Japanese (5,5,5) A,W,Sp HIRAGA

Reading of newspapers and other modern materials. Discussions in Japanese in class. Prerequisites, 313 or permission. (Formerly 401, 402, 403.)

461, 462, 463 Readings in Modern Japanese Literature (3-5,3-5,3-5) A,W,Sp TAKAYA

Close reading and discussion of representative works of twentieth century poetry, fiction, and drama in the original text. Prerequisite, permission. (Formerly 460.)

499 Undergraduate Research (3-5, max. 15) A,W,Sp

For Japanese language and literature majors. Prerequisite, permission.

KOREAN

211-212, 213 Elementary Korean (5-5,5) A,W,Sp LUKOFF

Introduction to the modern standard Korean spoken and written language.

311, 312, 313 Intermediate Korean (5,5,5) A,W,Sp LUKOFF

Systematic expansion of vocabulary and grammatical forms of standard Korean; introduction of Chinese characters in mixed script. Prerequisite, 213 or equivalent.

411, 412, 413 Readings in Contemporary Korean (5,5,5) A,W,Sp LUKOFF

Reading in a variety of modern standard styles, with oral and written practice. Prerequisite, 313 or equivalent.

465, 466, 467 Readings in Korean Documents (5,5,5) A,W,Sp

465: Korean bibliography and references. Prerequisite, 413 or permission. 466, 467: Primarily for students in the social sciences majoring in the Korean field. Prerequisite, 465 or permission.

499 Undergraduate Research (3-5, max. 15) For Korean language and literature majors. Prerequisite, permission.

MONGOLIAN

302 Introduction to Mongolian (5) A OKADA, YIDEMJAB

Beginner's grammar, easy texts.

303 Modern Mongolian Literary Language (5) W OKADA, YIDEMJAB

Grammar, syntax, and styles of modern Mongolian based on colloquial and Cyrillic alphabet. Prerequisite, 302.

304 Colloquial Mongolian (5) Sp OKADA, YIDEMJAB

Grammar of the spoken language in Outer and Inner Mongolia. Reading of colloquial texts, translation into English, conversation in Mongolian. Prerequisite, 303.

305 Classical Mongolian (5) Sp OKADA

Grammar, syntax, styles of the Mongolian written language of the seventeenth to twentieth centuries. Prerequisite, 304.

306 Manchu Grammar for Beginners (3) W OKADA

Students are first introduced to the Manchu alphabet; study phonology, morphology, a brief survey of the history of the language, and then proceed to some simpler reading materials.

307 Advanced Manchu Reading (3) Sp OKADA

Students read historical documents originally written in Manchu, with or without parallel texts in Chinese or Mongolian; also read translations from classical and secular Chinese literature such as songs, romances, and novels. Prerequisite, 306.

402, 403, 404 Intermediate Mongolian (5,5,5) OKADA, YIDEMJAB

Selected readings in modern Mongolian literature, history, political science, and newspaper materials. Prerequisites, 304 and 305, or equivalent.

499 Undergraduate Research (3-5, max. 15) WSp OKADA

For Mongolian language and literature majors. Prerequisite, permission.

SANSKRIT

301, 302, 303 Introduction to Sanskrit (5,5,5) A,W,Sp GEROW

Intensive study of the basic grammatical structure of the classical language; reading of elementary texts from the epic and classical periods.

401, 402 Intermediate Sanskrit (5,5) A,W GEROW

Advanced classical grammar; rapid reading of a kāvya text or texts, ordinarily a drama or major prose work. Prerequisite, 303.

403 Introduction to Vedic Study (5) Sp GEROW

Reading of selected Vedic hymns, with extensive linguistic and historical analysis; problems of comparative grammar in relation to Sanskrit. Prerequisite, 402.

TAMIL

301-302, 303 Introduction to Tamil (5-5,5) A,W,Sp SCHIFFMAN

An intensive introduction to the modern

spoken language. Transformation drills will be emphasized. The writing system and literary dialect will be introduced at a suitable stage.

401-402, 403 Intermediate Tamil (5,5,5) A,W,Sp

SCHIFFMAN

Intensified use of the modern spoken language, beginning with moderately difficult conversation and drills, and working up to more advanced materials, including radio, plays, continuation of work with written language. Prerequisite, 303.

411, 412, 413 Advanced Tamil (5,5,5) A,W,Sp

SCHIFFMAN

Readings in modern literary Tamil. The modern novel and short story as seen in the writings of such writers as Jeyakanthan, Putumaippittan, Vayyavan, Janakiraman, Sundara Ramaswamy, and Ramamirthan. Laboratory sessions will continue practice in the colloquial dialect. Prerequisite, 403.

455 Structure of Dravidian (3)

SCHIFFMAN

Comparative description of the phonological and syntactic system with emphasis on areal features and shared rules of Tamil, Telugu, Kannada, or Malayalam. As appropriate, contrasting examples will be taken from the lesser Dravidian languages, particularly those of the northern Dekkan. Dravidian group as a source of a major set of borrowings of linguistic features by the North Indian (Indic) language group.

THAI

150 Intensive First-Year Thai (15) S

COOKE

A beginning course covering the same ground as 301, 302, 303. Introduction to spoken Thai: pronunciation, grammar, conversation. Introduction to the written language: reading and writing.

301, 302, 303 Basic Thai (5,5,5) A,W,Sp

COOKE

Introduction to the structure of modern spoken and written Thai. One hour lecture and five hours intensive oral practice (in Thai) per week. Prerequisites, none for 301; 301 for 302; 302 for 303.

401, 402, 403 Intermediate Thai (5,5,5) A,W,Sp

COOKE

Reading of more complicated material in preparation for classes conducted in Thai where material is discussed. Review of structure. Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403.

411, 412, 413 Readings in Thai (5,5,5) A,W,Sp

COOKE

Readings in a variety of modern styles with oral and written practice. Prerequisite, 403 or equivalent.

TIBETAN

401, 402, 403 Colloquial Tibetan (5,5,5) A,W,Sp

NORNANG

Introduction to phonology, morphology, and syntax of spoken Tibetan (Lhasa dialect) by the inductive method.

404, 405, 406 Literary Tibetan (3,3,3) A,W,Sp

WYLIE

Introduction to the phonology, grammar, and syntax of written Tibetan. Materials selected for rapid development of reading knowledge.

414 Readings in Modern Tibetan

(3, max. 9) A,W,Sp

NORNANG, WYLIE

Selections from various Tibetan materials including newspapers and magazines. Prerequisite, 406 or equivalent.

421, 422, 423 Advanced Colloquial Tibetan (5,5,5) A,W,Sp

NORNANG

Instruction and drill in advanced colloquial sentence patterns and syntactical constructions.

499 Undergraduate Research (3-5, max. 15) A,W,Sp

NORNANG, WYLIE

For Asian languages and literature majors. Prerequisite, permission.

TURKIC

301, 302, 303 Introduction to Uzbek (3,3,3) A,W,Sp

CIRTAUTAS

Introduction to the modern Uzbek written and spoken language. Conversation in Uzbek.

404 Survey of Turkic Languages (3) A

CIRTAUTAS

Linguistic outlines of modern Turkic languages. Brief phonetical, morphological, and syntactical analysis of selected materials. Of interest to students of Turkic, anthropology, and linguistics.

VIETNAMESE

150 Intensive Vietnamese (15) S

Introduction to the structure of modern spoken and written North Vietnamese with additional exposure to southern Vietnamese dialects. Recommended for students wishing to acquire familiarity with the language in a short time. Prerequisite, permission.

301, 302, 303 Basic Vietnamese (5,5,5) A,W,Sp

Introduction to the structure of modern spoken and written Vietnamese. One hour lecture and five hours intensive oral practice (in Vietnamese) per week. Prerequisites, 301 for 302; 302 for 303.

401, 402, 403 Intermediate Vietnamese (5,5,5) A,W,Sp

Reading of more complicated material in preparation for classes conducted in Vietnamese where material is discussed. Review of structure. Prerequisites, 303 or equivalent for 401; 401 for 402; 402 for 403.

461, 462, 463 Modern Vietnamese Literature (5,5,5) A,W,Sp

Survey of directions in modern Vietnamese literature. Analysis and discussion of typical text. (Alternates with 471, 472, 473.) Prerequisite, 403 or equivalent.

471, 472, 473 Sino-Vietnamese (5,5,5)

Introduction to Sino-Vietnamese literature. Reading and discussion of typical texts. (Alternates with 461, 462, 463.)

LITERATURE COURSES IN ENGLISH

Chinese 361 Genres in Chinese Literature (5)

ROBERTSON, SHIH

Depth study of works from the major Chinese literary genres and analysis of their characteristic features. Examination of the relationship between similar genres in Chinese and Western literary traditions. Works will be read in translation. Chinese 362 recommended but not required. (Formerly 311.)

Chinese 362 Chinese Literature in English (5) W

ROBERTSON, SHIH

A general survey with special attention to historical, philosophical, and cultural background; emphasis upon modern literary movements stimulated by China's contact with the West. No knowledge of the Chinese language is required. (Formerly 320.)

Chinese 473 Conventions in Chinese Poetry (5) A

ROBERTSON

A survey of important conventions in the genres of traditional Chinese poetry, from earliest times to the end of the Sung dynasty. Where possible, comparisons will be drawn with reference to Western poetic usage. Open to majors and nonmajors. Knowledge of Chinese language not required. (Formerly 412.)

Indian 321 Modern Indian Literature in English (3) W

A general survey of the contemporary Indian literature with special attention to the fusion of modernistic trends with tradition. No knowledge of an Indian language is required.

Indic 320 Indic Literature in English (5) W

GEROW

A general survey with special attention to historical, philosophical, and cultural background. No knowledge of the Sanskrit language is required.

Japanese 421 Japanese Literary Tradition (5) A

TAKAYA

A broad inquiry into the literary heritage of Japan through reading and discussion of representative works available in English in prose, poetry, and drama from early beginnings to mid-nineteenth century. (Formerly 420.)

Japanese 422 Tokugawa Literary Tradition (5) W

TAKAYA

A survey courses in Japanese literature covering the period between 1600 and 1867 when the rise and development of popular literature and theater among the common people had reached the highest peak through men like Chikamatsu, Saikaku, and Basho. Readings and discussion of representative works in prose, poetry, and drama up to the beginning of Meiji period. (Formerly 424.)

Japanese 423 Modern Japanese Literature in English (5) Sp

TAKAYA

Discussion and analysis of representative works, especially of fiction, from the late nineteenth and twentieth centuries. (Formerly 421.)

Japanese 441 Studies in Japanese Poetry in English (5) Sp

MC KINNON

Traditions and techniques; systematic investigation of the major poetic forms, focusing on representative poets and their works. (Formerly 422.)

Japanese 443 Studies in Japanese Drama in English (5) Sp

MC KINNON, TAKAYA

Principal forms, techniques, and theory of No, Kyogen, Joruri, and Kabuki; also the contemporary theater. Aspects of the stage, costume, masks, and other accoutrements of the theater will be discussed along with its principal playwrights and performers. (Formerly 423.)

Korean 320 Korean Literature in English (5) Sp
 Historical development of Korean literature. Special consideration to the relationship with Chinese and Japanese literature.

Mongolian 320 Mongolian Literature in English (5) Sp
 OKADA

Turkic 320 Eastern Turkish Literature in English (3) A
 CIRTAUTAS

Covers both the historical (Chaghatai XV-XIX Centuries) and the modern (mainly Uzbek) periods of Eastern Turkish literature. History, types of literary works, and characteristic elements of prose and poetry will be presented by using selected material translated into English.

Courses for Graduates Only

CHINESE

511, 512, 513 Modern Chinese Readings (5,5,5) A,W,Sp

Selections from learned journals and scholarly books in intermingled styles (colloquial and literary Chinese). Prerequisite, 313. (Formerly 561, 562, 563.)

540 Seminar on Chinese Linguistics (3, max. 9) WSp

Advanced phonology, problems of archaic Chinese, dialectology; descriptive and historical treatment of Sinitic languages. For advanced students of Chinese or of linguistics. Prerequisite, permission. (Formerly 555.)

541 Chinese Phonology (3) A
 (Formerly 529.)

542, 543 Introduction to Texts in Ancient Script (3,3) W,Sp
 SERRUYS

Structure of Chinese characters. Development of Chinese script and related problems. Selected texts of inscriptions. 542: Shuo Wen. 543: Bronzes I. Prerequisite, permission. (Offered alternate years; offered 1971-72.) (Formerly 534.)

545, 546 Introduction to Texts in Ancient Script (3,3) W,Sp
 SERRUYS

Structure of Chinese characters. Development of Chinese script and related problems. Selected texts of inscriptions. 545: Bronzes II and Bone Inscriptions I. 546: Bone Inscriptions II. Prerequisites, completion of 543 and permission. (Offered alternate years; offered 1970-71.) (Formerly 534.)

551, 552, 553 Readings in Classical Chinese (5,5,5) A,W,Sp
 ROBERTSON, SERRUYS
 (Formerly 522, 523, 524.)

560 Seminar on Chinese Literature (4, max 8) Sp
 SHIH
 (Formerly 550.)

561, 562, 563 Studies in Chinese Literature (5,5,5) A,W,Sp
 SHIH

561: literature of the Chou and Han periods. 562: literature from Wei to T'ang times. 563: literature since the end of T'ang. (Formerly 526, 527, 528.)

572 Studies in Chinese Poetry (5) W
 SHIH
 (Formerly 531.)

581 Studies in Chinese Prose (5) A
 WILHELM
 (Formerly 530.)

585 Studies in Chinese Drama and Novel (5) Sp
 SHIH
 (Formerly 532.)

591, 592, 593 Readings in Chinese Political Thought and Institutions (5,5,5) A,W,Sp
 For students wishing to develop proficiency in using Chinese source material. Different texts each quarter, selected primarily on basis of students' needs. Prerequisite, permission. (Formerly 536, 537, 538.)

595 Seminar on the Book of Changes (3) A
 WILHELM
 An examination of the textual problems of the Book of Changes and of its place in the history of Chinese thought. Prerequisite, 553 or equivalent or permission. (Formerly 551.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

JAPANESE

501 Readings in Bibliographical Materials (5) W
 HIRAGA

Intensive reading and discussion of materials from principal bibliographical sources in the social sciences and the humanities pertaining to Asia. Reports on selected topics and problems. Prerequisite, 413 or permission. (Formerly 500.)

505, 506, 507 Readings in Documentary Japanese (5,5,5) A,W,Sp
 HIRAGA

505: Introduction to Rambun. 506: Readings in documents of ancient and medieval periods. 507: Readings in documents since the beginning of the Tokugawa period. Prerequisite, permission. (Formerly 522, 523, 524.)

551, 552, 553 Readings in Classical Japanese Literature (3-5, 3-5, 3-5) A,W,Sp
 MCKINNON

Readings in prose, poetry, and drama, antiquity to nineteenth century. Prerequisite, permission. (Formerly 550.)

560 Seminar in Japanese Theater (3-5, max. 15) A,W,Sp
 MC KINNON, TAKAYA

Designed to deal with the major Japanese theatrical traditions through the examination of primary and secondary sources for developing a deeper appreciation and understanding of the theater as a vital element in Japanese culture. Prerequisite, Japanese theater courses in English or advanced courses in Japanese or permission.

561, 562, 563 Advanced Japanese for China Specialists (5,5,5) A,W,Sp
 HURVITZ

Enables China specialists to read the voluminous Japanese secondary literature on China. The method employed is to point out at every stage the features common to the two written languages, as well as the ones that distinguish them. Prerequisite, reading knowledge of Chinese or permission.

580 Colloquium in Japanese Literature (3-5, max. 15) A
 MC NINNON, TAKAYA

Advanced course in Japanese literature where the students may have the opportunity of

studying under scholars and specialists from Japan who will be affiliated with the Department on a temporary basis. Prerequisite, permission.

590 Seminar in Japanese Literature (3-5, max. 15) A,W,Sp
 MC KINNON, TAKAYA

Close examination of selected periods, writers, or genres, including problems of literary criticism in Japanese literature. Prerequisite, 15 credits in 462 or 553. (Formerly 570.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

KOREAN

501, 502, 503 Seminar in Korean (3-5, 3-5, 3-5) A,W,Sp
 LUKOFF

521, 522, 523 Modern Korean Literature (5,5,5) A,W,Sp

Readings in important works in Korean literature of the twentieth century. Prerequisite, 413 or permission. (Offered alternate years; offered 1971-72.)

531, 532, 533 Classical Korean Literature (5,5,5) A,W,Sp

Selected works, primarily in *Hangul* up to the twentieth century, including representative authors in prose, poetry, and drama. Prerequisite, permission.

541, 542, 543 Readings in Hanmun Texts (5,5,5) A,W,Sp

Readings from representative authors from the fifteenth to the late nineteenth century. Prerequisites, Korean 413, Chinese 451 or Japanese 413, or permission. (Offered alternate years; offered 1971-72.)

550, 551, 552 Seminar in Korean Literature (3-5, 3-5, 3-5) A,W,Sp

Close examination of selected periods, writers, or genres, including literary criticism, in Korean literature. Prerequisite, 543 or 523, or permission. (Offered alternate years; offered 1970-71.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

MONGOLIAN

521 Ancient Mongol: hPhagspa Script (3) A
 OKADA

Script and grammar of hPhagspa texts; reading and translation. Prerequisite, 305.

522 Mongol: Ancient Texts (3) W
 OKADA

Grammar and reading of Mongol texts of the fourteenth to seventeenth centuries. Historical texts are emphasized. (Offered alternate years; offered 1971-72.)

579 Comparative Altaic Linguistics (3)
 OKADA

Comparative phonology and morphology of Mongol and Turkic and other related languages. Offered jointly with Linguistics 579. Prerequisite, permission.

600 Independent Study or Research (*) AWSp

SANSKRIT

550 Seminar on Indic Literature (3, max. 9) AWSp
 GEROW

Close examination of selected authors, periods

or traditions, within the context of Indian literary history. Prerequisite, Sanskrit 402. (Offered alternate years; offered 1971-72.)

555 Seminar on Indian Grammar
(3, max. 6) WSp
GEROW

Selected problems relating to the history of the Sanskrit language; reading and critical examination of the methodology of Pāṇini's grammar. Prerequisite, 403 or permission; 550 recommended. (Offered alternate years; offered 1971-72.)

600 Independent Study or Research (*) AWSp
GEROW

TIBETAN

500 Advanced Literary Tibetan (3, max. 9)
AWSp
NORNANG, WYLIE

Reading of manuscripts and xylographs with emphasis on biographical, historical, and geographical material. Prerequisite, 406 or equivalent.

502, 503, 504 Comparative Study of Chinese, Mongolian, Tibetan, and Sanskrit Texts (5,5,5) A,W,Sp
HURVITZ, LABRANG, NORNANG, OKADA, WYLIE

Prerequisite, permission.

534 Buddhist Tibetan (2, max. 6) AWSp
NORNANG

Reading of Buddhist literature in translation and original Tibetan compositions. Prerequisite, 406 or equivalent.

544 Ancient Tibetan Documents (2, max. 6)
AWSp
WYLIE

Reading of selections from ancient documents, inscriptions, and annals. Prerequisite, 406 or equivalent.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

TURKIC

542, 543 Comparative and Historical Grammar of Turkic Languages
(3,3) W,Sp
CIRTAUTAS

Classification of the Turkic languages; alphabets used; phonology, morphology, and syntax; lexical composition; structure changing developments. Prerequisites, Turkic 303 or 404, or Turkish 103. (Offered every third year; offered 1970.)

546 Old Turkic (3) W
CIRTAUTAS

Introduction to Runic script; phonology, morphology, and syntax of the oldest form of Turkic; reading and translation of seventh and eighth century inscriptions, of importance for the history of the Turks during this period. Prerequisite, permission. (Offered every third year; offered 1970.)

547 Old Uighur (3) Sp
CIRTAUTAS

Introduction to script systems; phonology, morphology, and syntax. Reading and translation of mainly Buddhist texts in Uighur script, eighth through the eleventh centuries. Prerequisite, permission or background in Old Turkic or a Modern Turkic language. (Offered every third year; offered 1970.)

600 Independent Study or Research (*) AWSp
CIRTAUTAS

VIETNAMESE

521, 522, 523 Survey of Vietnamese

Literature (3,3,3) A,W,Sp

History of literary activities in Viet Nam. Analysis and discussion of typical texts. Prerequisite, 403 or equivalent.

531, 532, 533 Seminar in Vietnamese

Literature (3,3,3) A,W,Sp

Intensive study of key topics in Vietnamese literature. Analysis and discussion of texts. (Alternates with 521, 522, 523; offered 1970-71.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

ASTRONOMY

Courses for Undergraduates

101 Astronomy (5) AWSp

BÖHM, HODGE

The solar system, stars, galaxies, and cosmology.

102 Introduction to Astronomy (5) Sp

HODGE, JACOBSEN, WALLERSTEIN

Survey of the solar system, stars, galaxies, and cosmology. Prerequisite, one year of high school physics or Physics 101-102 or 110, 111, 112.

301 Astronomy for Scientists and Engineers (3)

Introduction to astronomy for students in the physical sciences. Prerequisite, Physics 123.

321, 322, 323 Basic Astronomy (3,3,3) A,W,Sp

HODGE, JACOBSEN, WALLERSTEIN

Intended for physical scientists, this course gives a mathematically-oriented treatment of the planets and interplanetary medium, the sun and other stars, star clusters, the Galactic system, galaxies, and cosmology. Prerequisites, Physics 123 and calculus.

411 Spherical and Practical Astronomy (3) A
JACOBSEN

Spherical triangles, precession, aberration. Prerequisites, 101 or equivalent, calculus, permission.

421 Solar System and Dynamical Astronomy (3) W
JACOBSEN

Planetary motion, special subjects. Prerequisites, 101 or equivalent, calculus, permission.

422 Astronomical Orbits (3) Sp

JACOBSEN

Methods of calculating orbits of planets and comets, as well as visual, spectroscopic, and eclipsing binary stars. Stellar masses.

431, 432, 433 Stellar and Interstellar Astrophysics (3,3,3) A,W,Sp

Stellar spectra, luminosity, radii, and temperatures. Stellar structure, energy sources and compositions. Interstellar gas and dust, its temperature, density, distribution in the Galaxy and interaction with stars. Prerequisite, Physics 322 or 325.

499 Undergraduate Research (*, max. 15)
AWSp

Current or special astronomical problems. Prerequisite, permission.

Courses for Graduates Only

501 Solar System Astrophysics (3)

HODGE

Atmospheres, surfaces, and interiors of planets. Natural satellites, asteroids, comets,

meteors, meteorites. Meteorite craters, micro-meteorites, and meteoritic dust. Interplanetary medium. Prerequisite, modern physics.

502 Seminar in Solar System Problems (2)

HODGE

Origin of the solar system, as inferred from its dynamical, astrophysical, and chemical properties. Emphasis on current research. Prerequisite, modern physics.

503 Seminar on Planetary Atmospheres (2)

507 Physical Foundations of Astrophysics I
(3)

Survey of thermodynamics from an astronomer's point of view: black body radiation, basic radiative transfer, equation of state, degenerate gases, crystallization of high density, introduction to hydrodynamics and gas dynamics for astronomers: turbulence, convection, shock waves, radiation gas dynamics.

508 Physical Foundations of Astrophysics II
(3)

Introduction to magnetohydrodynamics, basic theorems and application to stellar and interstellar magnetic fields; introduction to plasma physics, waves in a plasma, kinetic theory and transport phenomena in astrophysics. Prerequisite, Physics 513 or equivalent.

511 Galactic Structure (3)

HODGE

Kinematics, dynamics, and contents of the galaxy. Spiral structure. Structure of other galaxies. Evolution of galaxies. Prerequisite, modern physics.

512 Extragalactic Astronomy (3)

HODGE

Types of galaxies. Integrated properties, content, and dynamics. Extragalactic distance scale, groups and clusters. Radio sources. Observational cosmology. Prerequisite, modern physics.

513 Cosmology (3)

BARDEEN

Homogeneous isotropic models. Microwave and X-ray background radiation, radio galaxies, quasars. Nucleosynthesis, galaxy formation.

521, 522 Stellar Atmospheres (3,3)

BOHM

Theory of continuous radiation and spectral line formation. Applications to the sun and stars. Prerequisite, Physics 421 or equivalent. (Offered 1971-72.)

531 Stellar Interiors (3)

BOHM

The physical laws governing the temperature, pressure, and mass distribution in stars. Equation of state, opacity, nuclear energy generation. Models of main sequence stars. Prerequisite, Physics 421 or equivalent. (Offered 1970-71.)

532 Stellar Evolution (3)

BOHM

Theoretical and observational approaches to stellar evolution. Prerequisite, 531. (Offered 1970-71.)

541 Interstellar Matter (3)

Physical conditions and motions of neutral and ionized gas in interstellar space. Interstellar dust, magnetic fields, formation of grains, clouds, and stars. Prerequisite, modern physics or permission.

551 Stellar Dynamics (3)

BARDEEN

Kinematics and dynamics of stars in clusters and galaxies. Prerequisites, classical mechanics and differential equations.

561 High Energy Astrophysics (3)

BARDEEN

Observed properties of Supernovae, X-ray stars, radio sources, quasars. Theories explaining such objects. Origin of cosmic rays.

597 Topics in Observational Astrophysics (1-5)

598 Topics in Theoretical Astrophysics (1-5)

600 Independent Study or Research (*)AWSp

700 Thesis (*)

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

ATMOSPHERIC SCIENCES

Courses for Undergraduates

101 Survey of the Atmosphere (5) AWSp
Composition and structure of earth's atmosphere; relation of earth to sun and consequent geographical temperature distribution; processes within the atmosphere which produce rain, snow, and other condensation phenomena; tropical and extratropical storms, thunderstorms, chinooks, and cold waves.

201 Introduction to the Atmosphere (3) W
A survey of the most important topics in meteorology designed for beginning premajors or majors in physical science, engineering, and other technical fields. Composition and structure, radiative processes, water substance and processes, air motions. Prerequisites, one year of high school physics and Mathematics 124.

301 Introduction to Atmospheric Sciences (5) W
REED

Composition and structure of the atmosphere. Solar and terrestrial radiation. Water substance and processes. Thermodynamic processes. Air motions. Physical properties and processes of the upper atmosphere. Prerequisites, Mathematics 124 and Physics 123, or equivalent.

321 Physical Climatology (5) A
CHURCH

Analysis of effects of latitude, altitude, mountains, ocean currents, wind systems, and various surfaces on the distribution of air temperatures, precipitation, and other climatic elements. Statistical reduction and interpretation of climatic data. Prerequisite, 101.

322 Regional Climatology (5) W
CHURCH

Principles of several climatic classifications. Description of elements of climatic types of continents, emphasizing North America, and adjacent ocean areas based on the Koeppen and Thornthwaite classification systems. Prerequisite, 101.

329 Microclimatology (3) Sp
FRITSCHEN

Climatic characteristics in the lower layers of the atmosphere. Soil temperatures and their relation to temperatures of overlying air. Vertical temperature, moisture, wind speed, and wind direction gradients. Effects of plane, concave, and convex surfaces, and vegetal covering on temperature and wind distribution. Prerequisite, 101 or 201 or permission.

340 Introduction to Atmospheric Physics (5) Sp

BUSINGER, HOBBS

Earth's field of gravity. Atmospheric thermodynamics; properties and distribution of atmos-

pheric gases. Introduction to cloud physics. Prerequisite, Mathematics 125 or permission.

351 Atmospheric Observations and Analysis (5) A

BADGLEY, WALLACE

Methods of using common meteorological instruments for measuring precipitation, temperature, pressure, humidity, winds, including upper-air observations. Thermodynamic diagrams. Analysis of surface and upper-level charts and vertical cross sections. Prerequisites, one year of calculus and general physics.

390H Tutorial in Atmospheric Sciences (*, max. 6) Sp

Review and discussion of selected problems in atmospheric sciences. Introduction to research methods. Presentation of a research paper. Prerequisites, Mathematics 224, Physics 123.

403 Introduction to Geophysics: The Atmosphere (5) W

BUSINGER, FLEAGLE

The atmosphere in its relation to the environment, gravity, geomagnetism, composition, transfer processes, motions, clouds, signal phenomena. Offered jointly with Geophysics as Geophysics 403. Prerequisites, Mathematics 325, Physics 222, or equivalent.

431 Atmospheric Physics (5) A
BUSINGER

Properties of cloud particles, solar and terrestrial radiation, transfer processes and applications. Prerequisites, 340 or Physics 222, and Mathematics 325.

432 Atmospheric Physics (3) W
Electromagnetic principles and application to the atmosphere, properties of waves, atmospheric probing, natural signal phenomena, radar effects of nuclear explosions. Prerequisites, 340 or Physics 222 or equivalent, and Mathematics 325.

435 Introduction to Cloud Processes (3) Sp
FRASER, HOBBS

Emphasis on the qualitative aspects of cloud formation and processes. Moist adiabatic processes; dew point equation. Condensation nuclei. Thermodynamics and dynamics of convection. Development of precipitation in warm clouds. Ice nuclei; growth of ice particles in clouds. Orographic clouds and precipitation. Artificial modification. Severe storms. Prerequisite, 340 or permission.

441, 442 Atmospheric Motions (5,5) A,W
HOLTON, REED, WALLACE

441: preliminary mathematics, vector operations, fundamental equations, simple manipulations of equations, circulation and vorticity, the role of friction. Prerequisites, Mathematics 325, Physics 371, or Atmospheric Sciences 340. 442: numerical weather prediction, barotropic and baroclinic wave theory, the general circulation. Both courses include laboratory exercises. Prerequisite, 441 for 442.

450 Atmospheric Data Analysis (5) W
REED

Statistical and other methods employed in atmospheric data analysis. Frequency distributions, sampling theory, linear correlation, elementary time-series analysis, objective map analysis. Prerequisites, 351, General Engineering 115, or equivalent.

452 Forecasting Laboratory (5) Sp

REED, WALLACE

Daily practice in map analysis and forecasting, using current weather data. Severe storm forecasting. Statistical methods. Prerequisites, 351 and 441.

462 Sea-Air Transfer Processes (6) S

BADGLEY, FLEAGLE

Classroom work and field observations relating to the physical processes occurring at ocean-atmosphere boundary. Transfer of energy, momentum, and moisture and their effects on small-scale and large-scale phenomena, including fog formation, convection, modification of air masses. Prerequisite, 442 or permission.

492 Readings in Meteorology or Climatology (*) AWSp

Prerequisite, permission.

493 Special Problems in Meteorology or Climatology (*) AWSp

Prerequisite, permission.

Courses for Graduates Only

510 Physics of Ice and Snow (3) A
HOBBS

Structure of the water molecule. Crystallographic structures of ice. Electrical, optical, thermal, and mechanical properties of ice. Growth of ice from the vapor and liquid phases. Physical properties of snow. Offered jointly with Geophysics as Geophysics 510. Prerequisite, permission.

511 Glaciology I: Formation of Snow and Ice Masses (3) W
UNTERSTEINER

Snow climatology. Transport of snow by wind. Transfer of radiative, sensible, and latent heat at the surface of snow and ice. Freezing of natural water bodies. Heat and mass budget of ice masses. Theories of ice ages. Offered jointly with Geophysics as Geophysics 511. Prerequisite, 510 or permission.

512 Glaciology II: Structural Glaciology (3) Sp
UNTERSTEINER

Heat and mass transfer in snow and ice. Metamorphism. Effects of heat conduction, vapor diffusion, radiation, solid impurities, brine inclusions. Petrography of snow and ice. Flow structures. Bulk physical properties of natural snow and ice. Offered jointly with Geophysics as Geophysics 512. Prerequisite, 511 or permission.

513 Glaciology III: Dynamic Glaciology (3) A
MEIER

Flow laws of ice, steady laminar flow. Sliding on bedrock. Kinematic waves, glacial surges. Snow and avalanche dynamics. Deformation and drift of sea ice. Relation of structures to deformation. Offered jointly with Geophysics as Geophysics 513. Prerequisite, 512 or permission.

514 Field Glaciology (6) Sp
LA CHAPELLE

Structure and metamorphism of snow cover. Energy exchange at melting snow and ice surfaces. Deformation and flow of glaciers. Climatology and mass budgets. Glacier features. Emphasis on instrumentation, field techniques, and data analysis. Offered jointly with Geophysics as Geophysics 514. Prerequisites, 511, 512, or permission.

522 Advanced Regional Climatology (3) W
CHURCH

Intensive study of the characteristics of climatic elements for a selected region or climatic type and a statistical analysis of the elements studied. Prerequisite, 322 or permission.

525 Seminar in Atmospheric Problems Associated with Air Pollution (2)

BADGLEY, CHARLSON

Seminar for both engineers and atmospheric scientists in the atmospheric problems related to air pollution. Offered jointly with the College of Engineering as CEWA 525.

528 Applied Meteorology and Bioclimatology (3) A

BUETTNER

Interrelationship of meteorology and bioclimatology to human health and heat balance, aviation and space medicine, air pollution, agriculture, forestry, transportation, etc. Prerequisites, 322 and 340, or permission.

531 The Upper Atmosphere (3) A

LEOVY

Structure, composition, and dominant physical and photochemical processes. Sound propagation, aurora, air glow, ionosphere, and Van Allen belts. Role of the sun, planetary atmospheres. Prerequisites, Mathematics 238 and Physics 320, or permission.

532 Atmospheric Electricity (3) W

BUETTNER

Formation and disappearance of atmospheric ions. Normal air electrical field. Lightning requisite, 531 or permission. (Offered alternate years; offered 1970-71.)

533 Atmospheric Radiation (3) Sp

BUETTNER

Solar spectrum. Atmospheric scattering, spectra of water vapor and other gases. Albedo of earth and atmosphere. Radiative heat balance. Prerequisites, Physics 320 and Mathematics 238. (Offered alternate years; offered 1971-72.)

534 Weather Sensing by Satellites (3) Sp

BUETTNER

Flight characteristics of spacecraft. Physical laws of remote sensing, using micro-, infrared, and visible waves. The importance of surface parameters (temperature, emissivity, sea state). The inversion principle of atmospheric sounding. Comparison of weather analysis from earthbound and from satellite data. Prerequisites, 431 and 531, or permission. (Offered alternate years; offered 1970-71.)

535 The Physics of Clouds (3) W

FRASER, HOBBS

Study of the microphysical processes leading to the formation of clouds and production of rain, snow, and thunderstorm electrification. Prerequisite, 340 or permission.

539 Structure and Dynamics of Upper Atmosphere (3) Sp

LEOVY

Properties of the ionosphere, electromagnetic wave propagation, the dynamics of the ionosphere. Offered jointly with the Department of Geological Sciences as Geophysics 539. Prerequisite, 542 or permission.

541, 542 Dynamic Meteorology (3,3) W,Sp

FLEAGLE, HOLTON

541: basic equations of dynamic meteorology, general theorems, scale analysis. Prerequisites, Mathematics 325, Aeronautics and Astronautics 567 or equivalent. 542: hydrostatic balance, geostrophic balance, anelastic balance. Prerequisite, 541.

543, 544 Planetary Fluid Dynamics (3,3) A,Sp

FLEAGLE, HOLTON

543: perturbation equations in Eulerian and Lagrangian form, simple wave motions in incompressible and compressible fluids, linear

baroclinic theory. Prerequisites, 541 or Oceanography 511, or equivalent. 544: theorems on baroclinic instability, the equations of motion in spectral form, nonlinear interactions, laboratory analysis, the general circulation. Prerequisite, 543.

545 The General Circulation of Atmosphere (3) W

WALLACE

Requirements of the global angular momentum heat, mass, and energy budgets upon atmospheric motions as deduced from observations. A study of the physical processes through which these budgets are satisfied. Prerequisite, 442 or permission.

546, 547, 548 Atmospheric Turbulence (3,3,3) A,W,Sp

BADGLEY, BUSINGER

546: laminar and turbulent flow; analogy between kinetic theory of gases and turbulence theory; Reynolds averaging; dissipation of energy; statistical descriptions of turbulent flow. Prerequisite, 442 or permission. 547: turbulent flux of heat, momentum, and moisture in the layer of the atmosphere next to the earth; Richardson's stability criterion; free convection. Prerequisite, 546. 548: diffusion of matter in the atmosphere; application of Fickian and statistical theories of diffusion; use of Lagrangian and Eulerian correlation functions. Prerequisite, 546.

551 Advanced Atmospheric Analysis

(3, max. 10) Sp

REED, WALLACE

Selected advanced nonroutine types of analysis. Exercises in objective map analysis and numerical weather prediction. Prerequisite, 442 or permission.

560 Theory of Meteorological Instruments (3) W

BADGLEY, BUSINGER

Physical theory of operation of meteorological instruments. New and specialized research instruments and more difficult problems involving standard instruments. Prerequisites, one year of calculus and permission.

593 Laboratory in Experimental Meteorology (3, max. 6) Sp

The role of controlled-model experiments in meteorology. Laboratory study of cloud formation and modification; convection cells, turbulent air motion; thermally induced air drainage; flow over obstacles; wave motion; surface of discontinuity; atmospheric circulation. Prerequisite, 542.

600 Independent Study or Research (*)**700 Thesis (*)****800 Doctoral Dissertation (*)****BIOLOGY**

The courses in biology listed below are administered by several departments. Other courses in biology are listed under such headings as *Biochemistry*, *Biological Structure*, *Botany*, *Genetics*, *Microbiology*, and *Zoology*.

Courses for Undergraduates**101-102 General Biology (5-5) A,W**

ILLG, KOHN, KRUCKEBERG, MEEUSE, ORIAN, PALKA

Principles of living systems as viewed at levels from the subcellular to the community. Emphasis on structural and functional analysis of

biological organization—its adaptedness, its genetic diversity, its energetics—leading to an evolutionary synthesis. The position of man in the biological world. For nonmajors and teaching majors in biology. (Credit will not be given for 101-102 if any two of the following courses, or their equivalents, have previously been taken: Zoology 111-112; Botany 111, 112.)

210, 211, 212 Introductory Biology (5,5,5)

AW,WSp,SpA

An introduction to the phenomena of life for students intending to go on to more advanced biology courses and into preprofessional programs. Emphasis is placed on features common to all living things: molecular and subcellular phenomena; cellular structure, metabolism and energetics; genetic regulation of development; the nature, functional properties, and evolution of plant and animal organisms and groups of organisms. Prerequisite, one year of college chemistry or permission. Organic chemistry should be taken concurrently.

401 Cell Biology (3) W

CUMMINS, WHITELEY

Structure and function of the cell. Prerequisites, Zoology 301, Genetics 451, or permission.

402 Cell Biology Laboratory (2) W

CUMMINS, WHITELEY

Prerequisites, 401 concurrently and permission. (Formerly 401L.)

454 Evolutionary Mechanisms (3)

KRUCKEBERG

Evolutionary change as determined by mutation, recombination, and selection. Effects of the genetic system, isolating mechanisms, hybridization, and polyploidy on speciation. Examples of micro- and megaevolutionary changes from plant and animal kingdoms. For advanced undergraduate and graduate students in the biological sciences. Prerequisite, Genetics 451 or equivalent. (Offered alternate years; offered 1970-71.)

472 Principles of Ecology (3) W

EDMONDSON, ORIAN, DEL MORAL

Population biology, interactions between organisms in biological communities, relationship of community to environment, principles of natural selection. Prerequisites, 15 credits in biological sciences and upper-division standing, or permission.

473 Limnology (3) A

EDMONDSON

Biological, physical, and chemical features of lakes and other inland waters. Prerequisites, 15 credits in biological sciences, 10 credits in college chemistry, and upper-division standing.

474 Ecology Laboratory (3) Sp

EDMONDSON

Prerequisites, 472 and permission. (Formerly 472L.)

475 Limnology Laboratory (2) A

EDMONDSON

Examination of biota of fresh waters, survey of limnological methods, and analysis of data. Prerequisites, 473 and permission. (Formerly 473L.)

Courses for Graduates Only**501 Advanced Cytology (5) Sp**

Detailed study of the structure and function of the cell. Prerequisite, permission.

508 Cellular Physiology (3) Sp

WHITELEY

The cell membrane and permeability, cytoplasmic physiology, intracellular energetics and biosynthesis, physiology of cell division, cell movement. (Biology 508 and 509 may be elected separately, or in either sequence.) Prerequisite, 401 or permission.

509 Cellular Physiology (3) Sp

WHITELEY

Chemistry and physiology of the interkinetic and dividing nucleus, nucleocytoplasmic interactions, physiology of differentiated cells. (Biology 508 and 509 may be elected separately, or in either sequence.) Prerequisite, permission.

510 Cellular Physiology Laboratory (2) Sp

WHITELEY

Prerequisites, concurrent registration in Biology 508 or 509, and permission. (Formerly 508L.)

573 Topics in Limnology (3) W

EDMONDSON

Readings in the literature of limnology, with detailed discussion of modern problems. Prerequisite, permission. May be repeated for credit.

586 Analysis of Development (3) A

An analysis of structural, physiological, and molecular levels of developmental processes including gametogenesis, fertilization, cell and tissue movements, induction, and cytodifferentiation. Prerequisites, Zoology 456 and Biochemistry 442, or permission.

587 Analysis of Development Laboratory (1-5, max. 5) AWSp

A series of intensive workshops in developmental biology, each extending over seven to ten days. Each will be based on problems under study in the laboratory of the instructors involved, using materials, methods, and approaches characteristic of that laboratory. Prerequisites, 586 and permission.

BOTANY

Courses for Undergraduates

111 Elementary Botany (5) ASp

Structure, physiology, and reproduction of plants, with emphasis on seed producing groups. Suitable for the nonscience major, since general biological principles are stressed.

112 The Plant Kingdom (5) WSp

BLASER, NORRIS, WAALAND

An introduction to the major groups of the plant kingdom. Structure and reproduction and the theories of evolutionary relationships of the phyla are considered. Prerequisite, 111, or Biology 101-102, or Zoology -112.

113 Elementary Plant Classification (5) Sp

HITCHCOCK

An introduction to plant classification; field study and laboratory identification of the common plant families and the conspicuous flora of western and central Washington. Two full-day field trips required of all students.

201, 202, 203 Plant Propagation (2,2,2)

A,W,Sp

MUHLICK

201: hardy bulbs; broadleaf and conifer cuttings; operation of a small greenhouse. 202: tender bulbs, orchids, grafting. 203: care and treatment of seeds and seedlings; division and

layering; care of the home grounds. Intended for students desiring knowledge of the principles involved in growing plants in the greenhouse and garden. Prerequisite for each course, 111, or Biology 101-102, or permission.

311 Lower Plants: Form and Function

(5) A

A study of structure and function of representative plants. Laboratory culture, growth studies, and experimental manipulations of plant materials. Intended for upper-division students with basic biological background. Prerequisites, Biology -102, 210.

313 Introductory Taxonomy (5) A

HITCHCOCK

Principles of classification; rules of nomenclature; botanical exploration (western North America). Field and laboratory study of Washington flora, concentrating on largest and most important groups, especially grasses, and the sunflower family. Not open to students who have taken Botany 113. Prerequisites, 10 credits in biological science or junior standing, and permission. (Offered alternate years; offered 1970-71.)

331 Ornamental Plants (3) Sp

HITCHCOCK, KRUCKEBERG

Identification, recognition, and use of cultivated trees and shrubs. Emphasis on laboratory and field study of woody species used in Northwest landscapes; plant exploration and origins of ornamentals. Prerequisite, 113 or 10 credits in biological science. For nonmajors, teaching majors in biology, and students in forestry and landscape design.

350 Introduction to Plant Geography (3) W

DEL MORAL, KRUCKEBERG, TSUKADA

Patterns of world vegetation distributions; the relationships between vegetation and climate; introduction to general theories of plant distribution. An emphasis will be upon the affinities between vegetation in different parts of the world.

360 General Mycology (5) W

STUNTZ, WHISLER

General survey of the fungi with emphasis on life cycles, structure, physiology, economic importance. Prerequisite, 10 credits in biological science or permission.

371 Elementary Plant Physiology (5) Sp

HALPERIN, WALKER

Study of nutrition, assimilation, transport, growth, photosynthesis and cellular respiration in plants, with the aid of simple physical and chemical principles. For nonmajors. Not open to those who have had 216. Prerequisites, 111 or Biology -102, and Chemistry 102, or permission.

421 Bryology (3)

Taxonomy of the mosses, with emphasis on the moss flora of the Pacific Northwest. Intensive practice in identification of mosses in laboratory. Field study for collections, recognition, and natural history of mosses. For undergraduate and graduate majors in botany and related fields. (Offered irregularly.)

431, 432 Taxonomy (5,5) W,Sp

HITCHCOCK

Morphology and phylogeny of families of seed plants; flora of western North America. Prerequisite, 113 or equivalent. (Offered alternate years; not offered 1970-71.)

441 Morphology of Vascular Plants (5) Sp

BLASER

Comparative study of vascular plants. Emphasis on the primitive groups, their fossil ancestry. The origin of the seed habit, introduction to problems of angiosperm morphology. Prerequisite, 112 or 312, or permission. (Offered alternate years; offered 1970-71.)

443 Freshwater Algae (5)

NORRIS

Morphology, life-histories, systematics, and ecology of freshwater algae, with emphasis on the local flora. Opportunities provided for students to learn basic cytological, morphological, and physiological characteristics of the freshwater algae. Studies will be made on algae collected in the field and on specimens grown in laboratory culture. Students will be given the opportunity to isolate and grow laboratory cultures of certain local algae. Prerequisite, 112 or 311, or permission.

444 Plant Anatomy (5) A

BLASER

Study of the origin and differentiation of tissue systems; practice in interpretation of histology of plant materials. Prerequisite, 111 or Biology -102.

446 Algology (5) Sp

NORRIS, WAALAND

Examination of algal phyla from the viewpoint of morphological and physiological characteristics important to their systematics. Points emphasized are: phylogeny of various lines of evolution in algae, relationships between algae and other parts of plant and animal kingdoms, algal geography and species of economic importance. Prerequisite, 112 or 311, or 20 credits in biology.

447 Phytoplankton Morphology and Taxonomy (4) A

NORRIS

Advanced discussion of phytoplankton morphology with emphasis on characteristics important to their taxonomy. Emphasis placed on cytology of the organisms, their life histories, adaptive morphological characteristics, and isolation and culture of phytoplankton organisms. Prerequisite, 445 or 446, or permission. (Offered alternate years; offered 1970-71.)

448 Marine Algal Ecology (4)

WAALAND

The marine environment in relation to the distribution of marine algae, zonation of benthic algae, interactions of algae and animals and the biological basis for phycogeography. Prerequisite, 445 or 446, or permission.

450 Terrestrial Plant Ecology (3) Sp

DEL MORAL

Relationships of populations to their environments; interactions between plants; theories of vegetation. Prerequisite, Biology 472 or permission.

451 Plant Ecology Laboratory (2) Sp

DEL MORAL

Laboratory, greenhouse, and field study; reports on original observations will be required. Prerequisite, concurrent registration in 450.

454 Palynology and Quaternary

Phytogeography (5) A

TSUKADA

A study of former vegetation and environments by relating the fossil pollen record to ecological principles; fundamentals and applications of pollen-spore morphology and pol-

len analysis through lectures and practical experiences in the laboratory and field. Two full-day (Friday and Saturday) field trips required of all students. Prerequisite, 113 or 313, Biology 472, or permission.

462 Basidiomycetes (5) A

STUNTZ

Structure and classification of the Basidiomycetes. Prerequisite, 360 or permission.

463 Phycocomycetes and Related Fungi (5) Sp

WHISLER

Life history, development, taxonomy, and physiology of slime molds and Phycocomycetes. Prerequisites, 360, Microbiology 400, or permission. (Offered alternate years; offered 1970-71.)

464 Ascomycetes (5) Sp

STUNTZ

Structure and classification of the Ascomycetes. Prerequisite, 360 or permission. (Offered alternate years; not offered 1970-71.)

466 Rusts, Smuts, and Fungi Imperfecti (5) Structure, classification, and biology of rusts, smuts, and imperfect fungi, with particular emphasis on the role of these fungi in plant pathology. Prerequisite, 360 or permission. (Offered irregularly.)

469 Development in Lower Plants (5) W

WHISLER

A comparative study of growth and differentiation in the higher protista, with emphasis on sporogenesis, sexuality, nutrition, and cell-wall development in the fungi and algae. Prerequisite, 112 or permission. (Offered alternate years; not offered 1970-71.)

472 Plant Physiology (5) A

CLELAND, MEEUSE

Covers the same field as Botany 371, but stresses biochemical approaches. Recommended for biology majors. Not open to those who have taken 371. Prerequisites, 111 or Biology -102, or Biology 212, and completion of, or concurrent registration in, Chemistry 232, or permission.

476 Mineral Nutrition (3) A

WALKER

Absorption, translocation, and utilization of essential mineral elements. The soil culture and solutions as nutrient media for the growth of plants considered in theory and practice. Prerequisite, 371 or 472, or equivalent. (Offered alternate years; offered 1970-71.)

478 Plant Morphogenesis (3) Sp

HALPERIN

Morphological and physiological data are integrated in an analysis of the factors controlling the inception and development of specialized cells and organs in plants. Prerequisites, 112 and 371 or equivalents, or 20 credits in biological sciences. (Offered alternate years; offered 1970-71.)

480 Plant Cytology (3) W

HASKINS

Analysis of structure and function of plant cells. Emphasis will be placed on the ultrastructure of plant cells and cell components. Prerequisites, 15 credits in biological science and permission.

481 Plant Cytology Laboratory (2) W

HASKINS

Bright-field and phase-contrast microscopy; cytochemical methods; demonstration of optical equipment; individual projects. Prerequisite, 480. (Formerly 480L.)

498 Special Problems in Botany (1-15)

AWSp

Students with suitable background in botany may enroll to do special study in algology, anatomy, bryology, cytology, morphology, physiology, or taxonomy. Prerequisite, permission of instructor.

Courses for Graduates Only

520 Seminar (1) AW

Prerequisite, permission.

521 Topics in Plant Physiology (2, max. 10) W

MEEUSE, WALKER, CLELAND

Modern trends and methods in plant physiology. Prerequisite, permission.

522 Seminar in Morphology and

Taxonomy (2, max. 10) A

HITCHCOCK, KRUCKEBERG, BLASER

Current research and trends in morphology and taxonomy of higher plants. Comparison of classical with modern approaches and concepts. Prerequisite, permission.

523 Selected Topics in Mycology

(2, max. 10) Sp

STUNTZ, WHISLER

Selected topics from all phases of mycology. Prerequisite, permission.

524 Topics in Algology (2, max. 10) W

NORRIS

Selected topics from all phases of algology. Prerequisite, permission.

525 Topics in Plant Ecology

(2, max. 10) W

DEL MORAL, KRUCKEBERG

Selected topics from various phases of plant ecology. Prerequisite, permission of instructors.

526 Topics in Palynology (2, max. 6) Sp

TSUKADA

Discussion and review of literature in pollen structure, deposition in sediments, and paleoecology. Prerequisite, permission.

545 Marine Algology (6) S

NORRIS, WAALAND

Morphology, life histories, systematics, and ecology of marine algae, with emphasis on the local flora. Opportunities provided for students to learn basic morphological and physiological characteristics of marine algal phyla and to apply this knowledge in studying in the field and laboratory cultures. (Consult "Announcement of the Friday Harbor Laboratories" for the year offered.) Prerequisite, 112 or 311, or permission. (Formerly 445.)

565 Marine Mycology (6) S

WHISLER

Taxonomy and morphology of aquatic fungi with emphasis on marine forms, collection, and culture methods. (Consult "Announcement of the Friday Harbor Laboratories" for the year offered.) Prerequisite, 112 or 311 or 360 or 20 credits in biology. (Formerly 465.)

570 Plant Metabolism (3) W

MEEUSE

Metabolism of organic compounds, with emphasis on photosynthesis and cellular respiration. (Offered alternate years; offered 1970-71.) Prerequisites, 472, and Chemistry 232 or equivalent, and permission. (Formerly 473.)

571 Plant Metabolism Laboratory (2) W

MEEUSE

Prerequisite, concurrent registration in 570. (Formerly 473L.)

572 Water Relations (3) W

WALKER

Permeability and water relationships, with special emphasis on influences affecting behavior of plants in the field. (Offered alternate years, not offered 1970-71.) (Formerly 474.)

573 Water Relations Laboratory (2)

WALKER

Prerequisite, concurrent registration in 572. (Offered alternate years; not offered 1970-71.) (Formerly 474L.)

575 Problems in Algal Physiology (6) S

Metabolic activity of the algae. (Consult "Announcement of the Friday Harbor Laboratories" for year offered.) Prerequisites, 472 or 371, Chemistry 232, and permission. (Formerly 475.)

577 Plant Growth and Development (3) Sp

CLELAND

Control of growth, development, and differentiation in higher plants. Prerequisite, 472 or permission. (Offered alternate years; offered 1970-71.) (Formerly 477.)

578 Plant Growth and Development

Laboratory (2) Sp

CLELAND

Experimental methods for studying plant growth and development. Must be accompanied by 577. (Formerly 477L.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3)

800 Doctoral Dissertation (*)

BULGARIAN—See Slavic Languages and Literature

CATALAN—See Romance Languages and Literature

CHEMISTRY

Courses for Undergraduates

100 Chemical Science (5) ASpS

Atoms, molecules, and chemical reactions. A survey of fundamental principles. Designed both as a terminal course for nonscience majors and as an introductory course for those who wish to continue with 101 or 140. (Note the Mathematics prerequisite for 140.) Chemistry 100 is given in two versions, with (A,S) laboratory, and without (A [evening], Sp) laboratory. The laboratory version is recommended for students who intend to continue with 101 or 140. No credit to those who have had one unit or more of high school chemistry.

101 General Chemistry (5) AW

For nonscience and nonengineering majors who plan to terminate their study of chemistry with 101 or 102. Molecular theory, quantitative relationships in chemical processes, solutions, ionic equilibria, acids, bases, and salts. Chemistry of common metals and nonmetals. Prerequisite, one unit of high school chemistry or physics or 100.

102 General and Organic Chemistry (5) WSp

Organic compounds; hydrocarbons, alcohols, aldehydes, ketones, ethers, acids, aromatics, fats and oils, proteins and carbohydrates. Students who plan to take 231 should not

take 102. Prerequisite, 101 or A or B grade in 100 at the University of Washington, or qualifying examination.

140 General Chemistry (3) AWSpS

For science, engineering, and other majors who plan to take a year or more of chemistry courses. Atomic structure, the chemical bond, stoichiometry, kinetic theory, gases, liquids, solids, solutions. Prerequisites, high school chemistry or Physics or Chemistry 100 and qualification for Mathematics 105.

145,145H General Chemistry (3) A

Parallels 140. Students with an A or B grade in high school chemistry and a strong aptitude for science (e.g. upper quartile in mathematics or Washington Pre-College Test) should register for 145 instead of 140. Final enrollment in 140 or 145 will be based on a qualifying examination given during registration period.

147H General Chemistry Honors Laboratory (3) A

Introduction to quantitative chemistry. Prerequisite, concurrent registration in 145, or permission.

150 General Chemistry (3) AWSpS

Chemical kinetics, equilibrium, electrochemistry, principles of thermodynamics. Prerequisite, 140 or 145.

151 General Chemistry Laboratory (2) AWSpS

Experiments illustrating quantitative relationships in chemistry. Prerequisites, 140 or permission, or concurrent registration in or prior completion of 145, 150, or 155.

155,155H General Chemistry (3) W

To follow 145. Parallels 150. Prerequisite, 145; 155 for 155H, A or B grade in 145H, or permission.

157H General Chemistry Honors Laboratory (4) W

Laboratory work in elementary physical and quantitative chemistry. Prerequisites, 145, 147H, and concurrent registration in 155 or permission.

160 General Chemistry (3) AWSpS

The chemistry of representative elements, metals and nonmetals. Introduction to organic and nuclear chemistry. Prerequisite, 150 or 155.

165,165H General Chemistry (3) Sp

To follow 155 and 155H, respectively. Parallels 160. Prerequisite, 155; 165 for 165H, A or B grade in 155H, or permission.

167H General Chemistry Honors Laboratory (3) Sp

Elementary physical, quantitative, and qualitative chemistry laboratory. Prerequisites, 155, 157H, and concurrent registration in 165, or permission.

170 Qualitative Analysis (3) AWSpS

Semi-microqualitative analysis for common cations and anions; separation and identification procedures. Prerequisites, 151 and 160 or 165 (170 may be taken concurrently with 160 or 165).

198,198H Tutorial Study (1, max. 3) AWSp

For chemistry majors only. Discussion in small groups of aspects of chemistry of current interest to undergraduates. Prerequisites, permission of chemistry adviser and grade-point average of 3.00 for freshmen, 2.50 for

sophomores. Not to be taken concurrently with 199.

199,199H Special Problems (1, max. 6) AWSp

Problems relating to experimental chemistry. For chemistry majors only. Prerequisites, permission of chemistry adviser and a chemistry grade-point average above 3.00.

221 Quantitative Analysis (5) AWSpS

Volumetric and gravimetric. Prerequisites, 160 or 165; and 170. Not for students who have completed 167H.

231 Organic Chemistry (3) AWSpS

For students planning only two quarters of organic chemistry. Structure, nomenclature, reactions, and synthesis of the main types of organic compounds. (Offered evenings only in Winter Quarter.) Prerequisite, 150 or 155.

232 Organic Chemistry (3) AWSpS

Continuation of 231. (Offered evenings only in Spring Quarter.) Prerequisite, 231.

241 Organic Chemistry Laboratory (2) AWSpS

Usually to accompany 231. Preparation of representative compounds. Prerequisites, 147H or 151; and 231, which may be taken concurrently.

242 Organic Chemistry Laboratory (2) AWSpS

Usually to accompany 232. Preparations and qualitative organic analysis. Prerequisites, 232 (which may be taken concurrently) and 241.

335 Organic Chemistry (3) AWS

For chemistry and chemical engineering majors and other qualified students planning three or more quarters of organic chemistry. Structure, nomenclature, reactions, and synthesis of organic compounds. Theory and mechanism of organic reactions. Prerequisites, 160 or 165 and 170 (which may be taken concurrently).

336 Organic Chemistry (3) WSp

Continuation of 335. Prerequisite, 335.

337 Organic Chemistry (3) SpS

Continuation of 336. Prerequisite, 336.

345,345H Organic Chemistry Laboratory (2) A

Usually to accompany 335. Organic syntheses. Prerequisite, 335, which may be taken concurrently.

346,346H Organic Chemistry Laboratory (1) W

Continuation of 345. Usually to accompany 336. Prerequisites, 336, which may be taken concurrently, and 345.

347,347H Organic and Qualitative Organic Laboratory (3) Sp

Continuation of 346. Usually to accompany 337. Prerequisites, 337, which may be taken concurrently, and 346.

350 Elementary Physical Chemistry (3) WS

Survey of some major topics in physical chemistry. Prerequisites, two quarters of chemistry, Physics 116, and Mathematics 124.

351 Elementary Physical Chemistry (3) SpS

Continuation of 350. Prerequisite, 350.

401 Principles of Chemistry (3, max. 6) S

Primarily for high school teachers. Principles of chemistry, atomic and molecular nature

of matter, periodic system, stoichiometry, chemical reactions, modern terminology and nomenclature.

402 Techniques of Chemistry (2 credits in a given quarter or 3 credits in a given quarter) S

Primarily for high school teachers. Discussion and demonstration of fundamental techniques, determination of composition and structure, analysis and synthesis, separation and purification processes, electrochemical processes, use of stable and radioactive isotopes.

410, 410H Radiochemical Techniques and Radioactivity Measurements (3) Sp

An introductory general-service course for students planning further work in nuclear or tracer applications. Safety procedures, detection and measurement of nuclear radiations, radiochemical and tracer techniques. Prerequisites, 160 or 165, Mathematics 124 and Physics 116, or permission.

412 Inorganic Chemistry Laboratory (3) W

Preparation and characterization of typical inorganic substances. Prerequisite, 457, which may be taken concurrently.

414 Systematic Inorganic Chemistry (3) A

The elements and their compounds in relation to the periodic system. Prerequisite, 351 or 457.

415 The Chemical Bond (3) A

The nature of the chemical bond; complex compounds. Prerequisite, 457.

416 Inorganic Chemistry (3) W

Chemistry of the main group elements. Prerequisite, 457.

418 Radiochemistry (3) W

Natural radioactivity, nuclear systematics and reactions, radioactive decay processes, decay laws, statistical considerations, applications of radioactivity. Prerequisites, 157H or 170, 455; or permission.

425 Quantitative Analysis (3) W

ROBINSON

Special analytical methods. Prerequisites, 221 or 167H, 455; or permission.

426 Instrumental Analysis (3) Sp

CRITTENDEN

Introduction to electrical and optical methods of analysis. Prerequisites, 221 or 167H, and 458.

427 Advanced Quantitative Theory (3) A

CRITTENDEN

Principles of analytical chemistry. Prerequisites, 221 or 167H, 232 or 337, 457, or permission.

428 Chemical Microscopy (3) Sp

ROBINSON

Theory of the polarizing microscope and its application to chemistry. Prerequisite, 457 or permission.

429 Microquantitative Analysis (3) Sp

ROBINSON

Principles and techniques. Prerequisite, 425 or permission.

436 Spectral Methods in Structural Chemistry (4) W

An introduction to the theory, instrumentation, and application of spectroscopic methods in organic and inorganic chemistry. Laboratory provides experience in actual instrumental operation. Prerequisites, 232 or 337, or permission.

446 Advanced Organic Synthesis Laboratory (3) A

Advanced techniques of isolation, identification, and characterization of organic compounds. Prerequisite, 347 or permission.

455, 455H Physical Chemistry (3) ASp

Introduction to quantum chemistry, statistical mechanics, kinetic theory of gases. Prerequisites, 160 or 165, Mathematics 126, and college physics.

456, 456H Physical Chemistry (4) AW

Thermodynamics, phase equilibria, colligative properties of solutions, electrolytes, and electrochemistry. Prerequisite, 455.

457, 457H Physical Chemistry (3) WSp

Chemical kinetics, transport properties, molecular structure, the solid state, surfaces, and macromolecules. Prerequisite, 456.

458 Physical Chemistry Laboratory (4) ASp

Prerequisites, 457, which may be taken concurrently, or 350, 351, and 455.

499, 499H Undergraduate Research

(*), max. 12) AWSpS

For qualified chemistry majors in the prescribed curriculum, especially those planning graduate work. Prerequisites, permission and a chemistry grade-point average above 3.00.

Courses for Graduates Only**508 Advanced Inorganic Chemistry (3) Sp**

ROSE

Synthesis, reactions, and structure of coordination compounds. Applications of NMR, isotope replacement phenomena, magnetic susceptibility, and the Mössbauer Effect. Prerequisites, 415 and 416.

510 Current Problems in Inorganic and Nuclear Chemistry (2, max. 12) Sp

CADY, MACKLIN, MEYER, RITTER, ROSE

For doctoral candidates in inorganic chemistry. Current topics, e.g., acid-base theory; halogens; hydrides; groups III and IV; interstitial, chelate, and high-temperature chemistry; inorganic free radicals.

513 Advanced Nuclear Chemistry (2, max. 6) A

FAIRHALL, VANDENBOSCH

Nuclear reactions, fission, complex radioactive decay, low-level techniques, geochemistry, cosmochemistry, chemistry of the synthetic elements. Prerequisite, 418 or permission.

520 Current Problems in Analytical Chemistry (2, max. 12) AWSp

CRITTENDEN, ROBINSON

For doctoral candidates in analytical chemistry. Current topics, e.g., electrochemistry, trace analysis, methods of data treatment, analytical instrumentation theory.

526 Advanced Instrumental Analysis (3) Sp

CRITTENDEN

Absorption and emission spectroscopy, polarography, potentiometry, and dielectric properties as applied to problems in analytical chemistry. Prerequisite, 426 or permission. (Offered alternate years; offered 1970-71.)

530 Advanced Organic Chemistry (3) A

POCKER

Electronic mechanisms in organic chemistry. An introduction to the theory of organic reactions. Prerequisite, 337 or equivalent.

531 Advanced Organic Chemistry (3) W

ANDERSON

Discussion of the principal reactions of synthetic organic chemistry, with emphasis on practical methods. Transformation of functional groups. Prerequisite, 530 or permission.

532 Advanced Organic Chemistry (3) Sp

POCKER, SCHUBERT

Kinetics and equilibria as related to the mechanisms of organic reactions. Absolute Rate Theory. Stereochemistry and the steric course of reactions. Prerequisite, 531 or permission.

540 Current Problems in Organic Chemistry (3, max. 18) AWSp

ANDERSEN, ANDERSON, CHILTON, POCKER, SCHUBERT, STOUT, WEINSTEIN, WOODMAN

For doctoral candidates in organic chemistry. Discussions of topics of current interest and importance, e.g., sesquiterpenes, acyclic and cyclic compounds (Andersen); nonclassical aromatic compounds; small ring heterocycles (Andersen); carbohydrates, amino acids, peptides (Chilton); catalytic action, enzyme and model-enzyme catalysis, molecular rearrangements, kinetic deuterium isotope effects (Pocker); acid-base catalysis, solvent and substituent effects (Schubert); natural products, biosynthesis, application of physical methods to structural problems (Stout); synthesis of proteins, natural product studies (Weinstein); heterocyclic compounds, peptide syntheses (Woodman). See the department for instructor and topic during any particular quarter.

550, 551 Introduction to Quantum Chemistry (3,3) A,W

Solutions of the Schrödinger equation for simple systems; approximate methods; angular momentum and spin; electronic structure of atoms; group theory; electronic, vibrational, and rotational levels in molecules; spectroscopic selection rules. Prerequisite, 455 or permission for 550 (Mathematics 324 recommended); 550 or permission for 551.

552, 553 Statistical Mechanics (3,3) W,Sp

General theorems of statistical mechanics; relation of the equilibrium theory to classical thermodynamics; quantum statistics; theory of imperfect gases; lattice statistics and simple cooperative phenomena; lattice dynamics and theory of solids; liquids, solutions, and polymers; time-dependent phenomena and mechanisms of interaction. Prerequisites, 455 and 456 (concurrent registration permitted) or equivalent for 552; 552 for 553.

559 Chemical Kinetics (3)

RABINOVITCH

Modern experimental methods and fundamental theories of reaction rates. Role of vibrational excitation in unimolecular and bimolecular reactions. Energy transfer. Nonequilibrium systems and microscopic rate parameters. Prerequisite, 457 or 552 or permission.

560 Current Problems in Physical Chemistry (3, max. 18) ASp

DAVIDSON, EGGERS, EICHINGER, GOUTERMAN, SLUTSKY, VINCOW

For doctoral candidates in physical chemistry. A discussion of topics selected from active research fields, e.g., electronic structure of molecules, electron correlation, density matrices, semi-empirical methods (Davidson, Gouterman); vibrational and rotational analysis of molecular spectra including applications of symmetry, normal coordinates,

force constants; interaction of rotation with vibration, anharmonic effects (Eggers); macromolecules, biopolymers (Eichinger); lattice dynamics, chemistry of the solid state (Slutsky); current problems in electron spin resonance spectroscopy (Vincow). See the department for instructor and topic during any particular quarter.

581 Topics in Inorganic Chemistry (3, max. 18) AWSp

Open only to students accepted for doctoral work in chemistry.

582 Topics in Analytical Chemistry (3, max. 18) AWSp

Open only to students accepted for doctoral work in chemistry.

583 Topics in Organic Chemistry (3, max. 18) AWSp

Open only to students accepted for doctoral work in chemistry.

585 Topics in Physical Chemistry (3, max. 18) AWSp

Open only to students accepted for doctoral work in chemistry.

590 Seminar in General Chemistry (1, max. 18) AWSpS**591 Seminar in Inorganic Chemistry (1, max. 18) AWSpS****592 Seminar in Analytical Chemistry (1, max. 18) AWSpS****593 Seminar in Organic Chemistry (1, max. 18) AWSpS****595 Seminar in Physical Chemistry (1, max. 18) AWSpS****600 Independent Study or Research (*) AWSpS****700 Thesis (*) AWSpS****702 Degree Final (3) AWSpS****800 Doctoral Dissertation (*)**

CLASSICAL ARCHAEOLOGY—See Classics

CLASSICAL LINGUISTICS—See Classics

CLASSICS**Courses for Undergraduates****GREEK****101-102, 103 Elementary Greek (5-5,5) A,W,Sp**

101-102: an intensive study of grammar, with reading and writing of simple Attic prose; 103: reading of selections from classical Greek literature.

201 Xenophon (3) A

Selections from Xenophon's *Anabasis* and other works. Prerequisite, 103.

202 Plato: Shorter Dialogues (3) W

Selections from the Socratic dialogues. Prerequisite, 201.

203 Homer (3) Sp

Selections from the *Iliad* or *Odyssey*. Prerequisite, 202.

207, 208 Grammar and Composition (2,2) A,W

Systematic review of grammatical principles; exercises in prose composition. To be taken concurrently with 201 and 202.

209 Survey of Greek Literature (2) Sp

A brief history of Greek literature, with an introduction to the materials and methods of classical scholarship. Prerequisite, 202.

300, 301 Greek Language, Accelerated (3,3) A,W

Intensive introduction to Homeric Greek. Not accepted as upper-division credit toward a major in Greek or Classics. Prerequisites, for 300, junior standing and permission; 300 for 301.

309 Advanced Grammar and Composition (1, max. 4) AWSp

Prerequisite, 208.

413 The Pre-Socratic Philosophers (3) A MCDIARMID

(Offered alternate years; offered 1970-71.)

414 Plato (3) W

MACKAY

(Offered alternate years; offered 1970-71.)

415 Aristotle (3) Sp

MACKAY

(Offered alternate years; offered 1970-71.)

422 Herodotus and the Persian Wars (3) A EDMONSON

(Offered alternate years; offered 1971-72.)

424 Thucydides and the Peloponnesian War (3) W EDMONSON

(Offered alternate years; offered 1971-72)

426 Attic Orators (3) Sp

MACKAY

(Offered alternate years; offered 1971-72.)

442, 443, 444 Greek Drama (3,3,3) A,W,Sp MCDIARMID

(Offered alternate years; offered 1971-72.)

449 Greek Epic (3) A

MACKAY

(Offered alternate years; offered 1970-71.)

451 Lyric Poetry (3) W

GRUMMEL

(Offered alternate years; offered 1970-71.)

453 Pindar: The Epinician Odes (3) Sp

MCDIARMID

(Offered alternate years; offered 1970-71.)

490, 490H Supervised Study (3-6, max. 18) AWSp

Special work in literary and philosophical texts for graduates and undergraduates.

499 Undergraduate Research (*, max. 15) AWSp

LATIN

101-102, 103 Elementary Latin (5-5,5) A,W,Sp

101-102: an intensive study of grammar, with reading and writing of simple Latin prose; 103: reading of selections from classical Latin literature.

201 Intermediate Latin: Introduction to Latin Literature (3) A

Readings in prose and poetry from various Latin authors. Prerequisite, two years of high school Latin or 103.

202 Intermediate Latin: Cicero and Ovid (3) W

Readings from the orations of Cicero and the elegiac verse of Ovid. Prerequisite, 201.

203 Intermediate Latin: Vergil (3) Sp

Selections from the first six books of the *Aeneid*. Prerequisite, 202.

206, 207, 208 Grammar and Composition (2,2,2) A,W,Sp

Systematic review of Latin vocabulary, forms, and grammatical principles; exercises in prose composition. To be taken concurrently with 201, 202, and 203. Prerequisites, two years of high school Latin or 103; 206 for 207; 207 for 208.

300, 301 Latin Language, Accelerated (3,3) A,W

Intensive introduction to classical Latin. Not accepted as upper-division credit toward a major in Latin or Classics. Prerequisites, for 300, junior standing and permission; 300 for 301.

305, 306, 307 Survey of Latin Literature (3,3,3) A,W,Sp

READ

Survey of Latin literature from its origins to the end of the second century A.D. 305, Republic; 306, Augustan Age; 307, Silver Age. Prerequisite, four years of high school Latin or 203.

309 Advanced Grammar and Composition (1, max. 4) AWSp

READ

Prerequisite, 208.

401 Medieval Latin (3) Sp

PASCAL

Prerequisite, permission.

412 Lucretius (3) A

GRUMMEL

(Offered alternate years; offered 1971-72.)

413 Cicero's Philosophical Works (3) W

GRUMMEL

(Offered alternate years; offered 1971-72.)

414 Seneca (3) Sp

GRUMMEL

(Offered alternate years; offered 1971-72.)

422 Livy (3) A

VIGNOLI

(Offered alternate years; offered 1970-71.)

423 Cicero and Sallust (3) W

HARMON

(Offered alternate years; offered 1970-71.)

424 Tacitus (3) Sp

EDMONSON

(Offered alternate years; offered 1970-71.)

447 Roman Lyric (3) A

VIGNOLI

(Offered alternate years; offered 1971-72.)

449 Roman Elegy (3) W

GRUMMEL

(Offered alternate years; offered 1971-72.)

451 Roman Satire (3) W

VIGNOLI

(Offered alternate years; offered 1971-72.)

457 Roman Drama (3) A

PASCAL

(Offered alternate years; offered 1970-71.)

458 Roman Epic (3) W

GRUMMEL

(Offered alternate years; offered 1970-71.)

459 Roman Pastoral (3) Sp

GRUMMEL

(Offered alternate years; offered 1970-71.)

475 Improvement of Teaching: Latin (3) S READ

Examination and evaluation of the various methods of teaching Latin; audio-visual aids; testing materials; textbooks; relation of Latin to other languages; Latin derivatives in English vocabulary. Offered jointly with the College of Education as Education Curriculum and Instruction 438.

476 Caesar for High School Teachers (3) S READ

Interpretation of Caesar's works in the light of their historical, political, literary, and geographical background, with special reference to the problems of high school teaching. Offered jointly with the College of Education as Education Curriculum and Instruction 439.

490, 490H Supervised Study (3-6, max. 18) AWSp

Special work in literary and philosophical texts for graduates and undergraduates.

499 Undergraduate Research (*, max. 15) AWSp

CLASSICS COURSES IN ENGLISH

101 Latin and Greek in Current Use (2) AWSp

Designed to improve and increase English vocabulary through a study of the Latin and Greek elements in English, with emphasis on words in current literary and scientific use. No knowledge of Latin or Greek required.

210 Greek and Roman Classics in English (5) AWSp

EDMONSON, GRUMMEL, HARMON, MACKAY, MCDIARMID, PASCAL, READ, VIGNOLI

An introduction to classical literature through a study of the major Greek and Latin authors in modern translation. Lectures will be given by various members of the staff.

422 Greek Historians and Philosophers in English (3)

The development of Greek writing from mythical and poetic formulations to logical argument and scientific classification; based on a study of Hesiod, Hippocrates, the Pre-Socratic philosophers, Herodotus, Thucydides, and Plato's *Republic*.

426 Greek and Roman Epic in English (3) A A study of the *Iliad*, the *Odyssey*, the *Aeneid*, and selections from other ancient epics.

427 Greek and Roman Tragedy in English (3) W

MCDIARMID

A study of the development of Greek and Roman tragedy, with extensive readings in representative plays of Aeschylus, Sophocles, Euripides, and Seneca.

428 Greek and Roman Comedy in English (3) Sp

PASCAL

Readings from the comedies of Aristophanes, Menander, Plautus, and Terence.

430 Greek and Roman Mythology (3) AWSp GRUMMEL, HARMON, PASCAL

The principal myths found in classical and later literature.

435 The Ancient Novel (3) Sp

A study of the origins, growth, and tradition of the romantic novel in Greek and Latin antiquity.

440 Greek and Roman Critics in English (3) Sp

GRUMMEL

Problems of literary criticism as considered by Plato, Aristotle, Longinus, and other major classical writers.

CLASSICAL ARCHAEOLOGY**341 Greek Archaeology and Art (3) A**

EDMONSON

A survey of the major art forms from the Mycenaean to the Hellenistic period, with special attention to modern archaeological methods and excavations, illustrated by slides. Offered jointly with the School of Art as Art History 341.

342 Roman Archaeology and Art (3) W

PASCAL

Roman architecture, painting, and sculpture, with emphasis on the innovations of the Romans in these areas, illustrated by slides. Offered jointly with the School of Art as Art History 342.

442 Greek and Roman Pottery (3) A

EDMONSON

Shapes, fabrics, and decorations from the Neolithic period to the sixth century A.D. Offered jointly with the School of Art as Art History 442. (Offered alternate years; offered 1970-71.) (Formerly 402.)

444 Greek and Roman Sculpture (3) W

EDMONSON

History and development of Greek sculpture and sculptors, their Roman copyists, and Roman portraits and sarcophagi. Emphasis on Greek sculpture of the fifth century B.C. Offered jointly with the School of Art as Art History 444. (Offered alternate years; offered 1970-71.) (Formerly 404.)

446 Greek Architecture (3) Sp

EDMONSON

A detailed study of Greek architecture from its beginnings, with special emphasis on the Periclean building program in fifth-century Athens. (Offered alternate years; offered 1970-71.) (Formerly 406.)

**NEAR EASTERN COURSES
IN ENGLISH****210 Introduction to Islamic Civilization and Culture (5) A**

ANDREWS, CLEAR, HEER, LORAINÉ, MACKAY, ZIADEH

Background and foundations of Islam; development of Islamic culture, with emphasis on the intellectual, literary, aesthetic, and associative aspects; the impact of the West and resulting modern problems.

220 Ancient Near Eastern Culture (5) W

CLEAR

Ancient Near Eastern civilizations, with emphasis on the culture and civilization of the Northwest Semites.

420 Islamic Religious Literature in English (3)

HEER

Readings in Islamic theology and mysticism.

422 Islamic Philosophical and Scientific Literature in English (3)

HEER

Readings in philosophy, the physical sciences, and medicine.

424 Islamic Society in Its Literature in English (3)

HEER

Aspects of life in the Islamic world as depicted by various Arab and Persian writers.

430 Classical Islamic Institutions in English (3)

ZIADEH

Readings concerning Islam's principal political, administrative, religious, and educational institutions.

432 Islamic Literature on Jurisprudence and Law in English (3)

ZIADEH

The origins of the *shari'ah*, its development throughout the Islamic period, and the modern reform of this law.

434 Arabic Literature in English (3)

ZIADEH

Literary genres; literary theory; principal literary authors and their works.

440 Persian Literature in English (3)

LORAINÉ

A survey of Islamic Persian literature from its origins to modern times, with representative readings.

442 Turkish Literature in English (3) W

ANDREWS

Survey of Turkish literature, both Ottoman and Modern, with emphasis on poetry.

450 The City of Cairo: History, Topography, and Monuments (3)

MACKAY

A survey of the physical development and the economic and social organization of an Islamic city, as exemplified in the history of Cairo from the first establishment at Fustat to the present day. Consideration of the major styles of Islamic architecture, as represented in existing monuments of Cairo.

490 Supervised Study (3-6, max. 18) AWSp

Special work in Near Eastern Studies for graduates and undergraduates.

499 Undergraduate Research (3-6, max. 18) AWSp**ARABIC****101-102, 103 Elementary Arabic (5-5,5)**

A,W,Sp

HEER

101-102: an intensive study of grammar, with oral and written drill, and reading of simple texts; 103: reading of selected texts in literary Arabic.

201, 202, 203 Intermediate Arabic (5,5,5)

A,W,Sp

ZIADEH

Reading of selected texts in literary Arabic, with continuing emphasis on grammar and syntax. Prerequisites, 103 for 201; 201 for 202; 202 for 203.

401, 402, 403 Advanced Arabic (5,5,5)

A,W,Sp

HEER

Reading of selected Arabic literary texts. Prerequisite, 203.

490 Supervised Study (3-6, max. 18) AWSp

HEER, ZIADEH

Special work in literary texts for graduates and undergraduates. Prerequisite, 403 or equivalent.

499 Undergraduate Research (3-6, max. 18) AWSp**HEBREW****101-102, 103 Elementary Hebrew (5-5,5)**

A,W,Sp

Introduction to classical Hebrew, emphasizing elements of grammar and reading of various styles found in the Hebrew Bible.

201, 202, 203 Intermediate Hebrew (5,5,5)

A,W,Sp

Selections from Biblical prose, Rabbinical texts, and medieval prose and poetry. Prerequisites, 103 for 201; 201 for 202; 202 for 203.

401, 402, 403 Advanced Classical Hebrew (5,5,5) A,W,Sp

CLEAR

Extensive readings in the Hebrew Bible and relevant materials, with special emphasis on the various genres and styles used, and analysis of problems of interpretation and translation. Prerequisites, 203 or equivalent for 401; 401 for 402; 402 for 403.

490 Supervised Study (3-6, max. 18) AWSp

Special work in literary texts for graduates and undergraduates. Prerequisite, 403 or equivalent.

499 Undergraduate Research (3-6, max. 18) AWSp**PERSIAN****101-102, 103 Elementary Persian (5-5,5)**

A,W,Sp

LORAINÉ

Beginning course in pronunciation, conversation, grammar, and graded reading.

201, 202, 203 Intermediate Persian (5,5,5)

A,W,Sp

LORAINÉ

Introduction to Persian literature, with continuing emphasis on grammar and syntax. Prerequisites, 103 for 201; 201 for 202; 202 for 203.

401, 402, 403 Advanced Persian (5,5,5)

A,W,Sp

LORAINÉ

Readings in selected Persian literary texts. Prerequisites, 203 or equivalent for 401; 401 for 402; 402 for 403.

490 Supervised Study (3-6, max. 18) AWSp

Special work in literary texts for graduates and undergraduates. Prerequisite, 203 or equivalent.

499 Undergraduate Research (3-6, max. 18) AWSp**TURKISH****101-102, 103 Elementary Turkish (5-5,5)**

A,W,Sp

ANDREWS

Introduction to modern Turkish. Pronunciation and conversation, grammar and composition, graded reading. Latin characters used throughout.

201, 202, 203 Intermediate Turkish (5,5,5)

A,W,Sp

ANDREWS

Introduction to modern Turkish literature. Prerequisites, 103 for 201; 201 for 202; 202 for 203.

401, 402, 403 Ottoman Turkish (5,5,5)

A,W,Sp

ANDREWS

Readings from the historians and poets of the Ottoman period. Texts written in Arabic characters will be used. Prerequisites, 203 for 401; 401 for 402; 402 for 403.

ARTS AND SCIENCES

490 Supervised Study (3-6, max. 18) AWSp
ANDREWS
Special work in literary texts for graduates and undergraduates. Prerequisite, 203 or equivalent.

499 Undergraduate Research (3-6, max. 18) AWSp

Courses for Graduates Only

CLASSICS

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

GREEK

520 Seminar (3, max. 27) AWSp

599 Graduate Reading (*, max. 18) AWSp
Supervised reading in selected fields.

600 Independent Study or Research (3-6, max. 15) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

LATIN

520 Seminar (3, max. 27) AWSp

599 Graduate Reading (*, max. 18) AWSp
Supervised reading in selected fields.

600 Independent Study or Research (3-6, max. 15) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

CLASSICAL ARCHAEOLOGY

511 Mycenaean Archaeology (3) A
EDMONSON

The art, architecture, and culture of Greece in the late Bronze Age, with emphasis on recent archaeological and linguistic discoveries. (Offered alternate years; offered 1971-72.)

513 Athenian Topography (3) W
EDMONSON

Detailed consideration of the topography and monuments of ancient Athens from the beginning through the Roman period. (Offered alternate years; offered 1971-72.)

515 Attic Epigraphy (3) Sp
EDMONSON

Study of Athenian inscriptions with emphasis on their historical value. The classification and editing of inscriptions, epigraphical techniques, and special problems are treated in detail. (Offered alternate years; offered 1971-72.)

CLASSICAL LINGUISTICS

501 Comparative Phonology of Greek and Latin (3) A

The phonological developments of Greek and Latin from Indo-European to the classical periods of both languages.

503 History of the Greek Language (3) W
The morphological and syntactical development of the Greek language from Homer through the New Testament; the development of prose and poetic style.

505 History of the Latin Language (3) Sp
The morphological and syntactical development of the Latin language; the development of Latin as a literary language.

506 Italic Dialects (3) A
The principal remains of the non-Latin languages and dialects of ancient Italy.

508 Greek Dialects (3) W
The non-Attic dialects of ancient Greek, based on a study of inscriptions and the literary remains.

510 Mycenaean Greek (3) Sp
A study of the Linear-B tablets found in Crete and on the Greek mainland.

ARABIC

600 Independent Study or Research (3-6, max. 18) AWSp

700 Thesis (*) AWSp

HEBREW

600 Independent Study or Research (3-6, max. 18) AWSp

700 Thesis (*) AWSp

NEAR EAST

520 Seminar in Near Eastern Civilization and Thought (3, max. 27)

530 Seminar in Near Eastern Literature (3, max. 27)
Prerequisite, reading knowledge of Arabic, Persian, or Turkish.

600 Independent Study or Research (3-6, max. 18) AWSp

700 Thesis (*) AWSp

PERSIAN

600 Independent Study or Research (3-6, max. 18) AWSp

700 Thesis (*) AWSp

TURKISH

600 Independent Study or Research (3-6, max. 18) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

CHINESE—See Asian Languages and Literature

COMMUNICATIONS

Courses for Undergraduates

COMMUNICATIONS

150 The Mass Media (5) AWSp
AMES, PEMBER, SAMUELSON

Organization, operation, and control of the mass media in America; social functions of mass communication; characteristics of media audiences. Open to nonmajors.

200 The Communication Process (5) AWSp
MATHIASON, PYSZKA, RUGGELS
An examination of the functions of communication and of the use of the concept in various social sciences. Open to nonmajors.

201 Communications Today (2) A
An elementary course in theory in the communications process and a survey of contributions of the various disciplines as applied to mass media, news, advertising, and editorial interpretations. A critical study of language use. Open only to nonmajors.

202 History of the Press in America (2) W
SMITH, TEETER
A study of the men and ideas which shaped the development of the press in America. Open only to nonmajors.

203 The Press in Contemporary America (2) Sp
AMES, SCHNEIDER
A study of responsibility of the mass media in relation to the political and economic spheres of society. Special emphasis on ethics of journalism. Open only to nonmajors.

220 Legal Aspects of Communications (5) AWSp
PEMBER
Regulations governing publication in the mass media. Open to nonmajors. (Formerly 320.)

226 Introduction to Advertising (3) ASp
ADAMS, PYSZKA
Economic and social aspects; organizational structure; comparison of major media; and the elements of creating and producing advertising. Open only to nonmajors.

250 Survey of Radio and Television (3) Sp
SHADEL
History of the media, organization and regulation of the industry, commercial aspects, educational use, programming. Open only to nonmajors. (Formerly Radio Television 250.)

291 Photography (3) AWSp
CONRAD
Elementary news photography, photo processing, and picture editing. Prerequisite 150. Open only to majors. (Formerly Journalism 291.)

314 The Role of the Magazine in America (3) W
SMITH
The significance of specialized periodicals as vehicles of popular expression. Open to nonmajors.

316 Contemporary Affairs (3) WS
YERXA
Background and significance of international, national, and local newsworthy events. Primarily a discussion course. Open to nonmajors.

321 News Writing (4) AWSp
JOHNSTON
Structure of news and feature stories. Prerequisites, 150, 200, 220, and reasonable proficiency in the use of the typewriter. Open to nonmajors by permission. (Formerly Journalism 300.)

322 Reporting Contemporary Affairs (4) AWSp
SHADEL, YERXA
Reporting of contemporary news scene with special emphasis on national affairs. Prerequisite, 321. Open only to majors. (Formerly Journalism 318.)

323 Reporting Urban Affairs (4) AWSp
SCHNEIDER
Advanced reporting of the urban area. Emphasis on social change, city government, and court procedures. Prerequisite, 321. Open only to majors. (Formerly Journalism 319.)

324 Critical Writing for the Mass Media (4) AWSp
JOHNSTON, KINKEL, YERXA
Interpretive, persuasive, and analytical writing for the mass media with emphasis on editorials; reviewing of books, films, the arts;

concepts of editorial responsibility; a study of outstanding critics. Prerequisite, 321. Open only to majors. (Formerly Journalism 413.)

325 Copy Editing (4) AWSp

SCHNEIDER, SMITH

Decision-making in the newsroom. An analysis of criteria for selection and display of news. Training in the making of editorial judgments, writing of headlines, editing of copy, handling of photos, and dummied pages. Prerequisite, 321. Open only to majors. (Formerly Journalism 301.)

326 Magazine Article Writing (3) A

Nonfiction writing for national magazines and specialized publications. Prerequisite, permission. Open to nonmajors. (Formerly Journalism 404.)

328 Reporting Minority Affairs (3) Sp

SCHNEIDER

Problems in advanced reporting designed to communicate minority views to the larger society. Prerequisite, permission. Open to nonmajors.

329 Reporting Minority Affairs Laboratory (2) Sp

SCHNEIDER

News writing laboratory in problems of advanced reporting designed to communicate minority views to the larger society. Must be taken with Communications 328. Prerequisite, 321.

PUBLIC RELATIONS

338 Public Relations (3) A

Principles and practice of public relations in business, industry, government, and social agencies; policy and conduct as fundamentals in good relationships. Open to nonmajors. (Formerly Communications 303.)

339 Problems in Public Relations (3) W

Group application of principles to the field problems of local business or agencies, with reports and recommendations. Prerequisite, 338. Open to nonmajors. (Formerly Communications 403.)

ADVERTISING

340 Introduction to Advertising (2) W

PYSZKA, RIS

Comparison of major media; the elements of creating and producing advertising. Prerequisites, 150, 200, and 220. Required of majors in the advertising sequence; open to others by permission of instructor. (Formerly Advertising 340.)

341 Advertising Copywriting (5) ASp

RIS

The purpose of this course is to develop an appreciation and understanding of the theory and methods of writing advertising copy for newspapers, radio, television, and direct mail. Attention is also given to copy formats required by various media as well as an understanding of the relationships between graphics and written words. Prerequisite, 340. Open only to majors.

343 Layout and Production (3) ASp

DENIS

Theory and problems in the design and production of advertisements for printed media. Prerequisite, 340. Open only to majors. (Formerly Advertising 333.)

345 Advertising Campaigns (5) WSp

PYSZKA, RIS

Advanced consideration of communication problems relevant to advertising efforts. Lim-

ited concern with practical exercises in planning and execution of national advertising campaigns: objectives, budgets, media selection, and evaluation. Prerequisites, 341 and 343. Open only to majors.

348 Advertising Research (3) W

PYSZKA

Consideration of research problems and methods of investigation relevant to advertisers; emphasis on conceptualization of advertising problems in the broader context of communication processes and effects; review of existing research sources, but special emphasis on original research. Prerequisite, 200 or permission. Open to nonmajors. (Formerly Advertising 448.)

RADIO-TELEVISION AND BROADCAST JOURNALISM

349 Radio and Television Advertising

(5) AW

CRANSTON

Principles of broadcast media as they apply to advertisers; planning a radio or television campaign; developing radio-television commercials. Prerequisite, 340 or 370 or Marketing 411. Open to nonmajors by permission of instructor. (Formerly Radio-Television 352.)

353 Radio and Television News Writing

(3) AWSp

KINKEL

Gathering, writing, editing, and programming news for the broadcast media, including visual treatment for television and film. Prerequisite, 321 or 370. Open to nonmajors by permission of instructor. (Formerly Radio-Television 376.)

354, 355 Television News Film Techniques

(2,2) A,W

HATCH, KINKEL

Development of skills in the use of the motion-picture camera; a study of the use of film in news and public affairs programming; emphasis on writing for film purposes and on developing editorial judgment. Prerequisite, 353 or permission of instructor. (Formerly Radio-Television 454, 455.)

356, 357, 358 News Broadcasting (2,2,2)

ASp,AW,WSp

KINKEL, SHADEL

Preparation and presentation of news broadcasts; progression from editing radio news program to use of visuals and performance in television newscasts. Prerequisite, 353. Open only to majors. (Formerly Radio-Television 456, 457, 458.)

360 Radio Production (5) AWSp

CRANSTON

Studio and microphone setups; timing, use of sound effects and incidental music; performance. Prerequisites, for majors, 150, 200; for nonmajors, permission of instructor. (Formerly Radio-Television 260.)

361 Television Production (3) AWSp

RYAN

The tools and crafts of production of television programs, culminating in closed-circuit presentations and recordings of student-created programs subject to critical evaluation. Prerequisites, for majors, 150, 200; for nonmajors, permission of instructor. (Formerly Radio-Television 461.)

365 Television Workshop Laboratory

(2-4, max. 8) AWSp

RYAN

Laboratory under on-air conditions at educational station, assignments and duties increas-

ing in complexity as student's growth indicates. Prerequisites, 361 and permission of instructor. (Formerly Radio-Television 465.)

370 Elements of Radio Writing (5) AWSp

RYAN

Principles of writing for listeners. Prerequisites, 150, 200, 220, and reasonable proficiency in the use of the typewriter. Open only to majors. (Formerly Radio-Television 270.)

371 Laboratory Work on KUOW (3) AWSp

WIRTZ

Supervised practice in the various departments of the University's FM radio station, KUOW. Prerequisites, 360, 370. Open only to majors. (Formerly Radio-Television 350.)

373 Television Writing (3) Sp

CRANSTON

Principles and techniques of writing material for television production. Practice in writing live and film presentations, with consideration of camera, direction, and production problems. Open to nonmajors. (Formerly Radio-Television 373.)

374 Advanced Television Writing (3) W

CRANSTON

Development of an original television script of professional production caliber. Prerequisite, 373. Open to nonmajors.

377 The Documentary (3) Sp

CRANSTON

Development of the documentary; background, aims and creative aspects; function of the documentary in mass media. Open to nonmajors. (Formerly Radio-Television 377.)

379 Seminar in Broadcast Problems (3) W

RYAN

The current problems of the broadcast industry, projected against basic legal, ethical, social, and economic principles of station operation. Open only to majors. (Formerly Radio-Television 477.)

Courses for Undergraduate and Graduate Students

400 Communication Theory (3) W

CARTER

Analysis of the factors affecting communication and its results, including research in psychology, sociology, linguistics, and anthropology, together with significant studies in mass communications. Prerequisite, 200 or permission. Open to nonmajors.

402 Government and Mass Communication

(3) W

PEMBER

The Anglo-American concept of freedom of communication; its evolution under United States federal and state constitutions; present tension areas; judicial decisions; statutes and administrative regulations affecting publishing, broadcasting, etc. Open to nonmajors.

406 Social Control and the Mass Media

(5) A

CLARKE

An analysis of relationships among the social structure, political power, and the mass media, and the influence of the media on popular culture. Prerequisite, 200 or permission. Open to nonmajors.

411 Mass Communications Research (5) Sp

EDELSTEIN

Recent developments in the study of mass communications content and audience, with

emphasis on the printed media. Prerequisite, 150 or permission. Open to nonmajors. (Formerly Communications 310.)

414 History and Communications (5) W SMITH

The growth and development of the press, with emphasis on journalism in the United States and its social, political, and ethical responsibilities. Prerequisite, 5 or more credits in American history or permission. Open to nonmajors.

443 The Social Functions of Advertising (2½) S PYSZKA

An analysis of the economic, cultural, and ethical aspects of advertising in modern society, both here and abroad, with special attention to its position in business enterprise and to its relationship to the media of mass communication. Open to nonmajors.

450 Broadcast Programming (3) Sp RYAN

A critical study of the nature, range, and structure of broadcast programming and of the forces that shape it. Open to nonmajors. (Formerly Radio-Television 450.)

459 Television in the Schools (3) S DILWORTH

Television programs to supplement classroom work; the development of the American system of broadcasting; the development and significance of educational television, and the contribution schools can make to broadcasting. Open to nonmajors; not open to graduate students in Communications. (Offered jointly with the College of Education as EDC&I 488.) (Formerly Radio-Television 459.)

463 Television Production Workshop for Teachers (2½) S RYAN

Working in University studios, under laboratory conditions involving production and on-camera methods, teachers learn to present instructional subject matter through television. Especially for those who expect to work with television as instructors or as supervisors of school-oriented television activities. Open to nonmajors; not open to graduate students in Communications or to students with credit for 361. (Offered jointly with the College of Education as EDC&I 489.) (Formerly Radio-Television 463.)

470 Theory and Criticism of Broadcasting (3) A SHADEL

The development of social, economic, and critical standards of broadcasting and the function of radio-television in the mass communication process. Prerequisite, 150 or 250, or permission of instructor. Open to nonmajors.

474 The Educational Role of the Mass Media (2½) S AMES

A critical study of the role the mass media have served in providing the individual with the information necessary for fulfillment of his major responsibilities as a citizen, as an economic unit, as a moral force, and as a cultural entity. Open only to nonmajors.

480 Public Opinion and Propaganda (5) AS EDELSTEIN

The analysis of public opinion and propaganda as a communication process. An integration of behavioral, historical, and political

concepts of public opinion, propaganda, and communication. Prerequisite, 200 or permission. Open to nonmajors.

485 Comparative Communication Systems (5) Sp MATHIASON

The structure and functions of communication systems. The role of communication in social change, e.g., politicization, modernization, and other forms of social and political development. Country and regional studies of the structure, control, content, audiences, and effects of communication. Prerequisite, 200 or permission. Open to nonmajors. (Formerly Communications 415.)

495, 496, 497 Honors Seminar in Communications (3,3,3) A,W,Sp AMES, CLARKE, PEMBER

Analysis of the contributions to communications of the behavioral sciences (first quarter) and the humanities (second quarter) in preparation for the writing of an honors thesis in Communications 497. Prerequisite, senior honors standing. Open to nonmajors.

498 Problems of Communications (1-5, max. 10) AWSpS

Research and individual study. Prerequisite, permission of Director and staff.

Courses for Graduates Only

500, 501 Theory of Communication (5,5) W,Sp CARTER

Seminars presenting major points of view—general semantics, persuasion and effects, and communication systems. Examination of communication concepts in the empirical literature. Prerequisites, 508 for 500; 400 for 501. Open to nonmajors.

502 Seminar in Government and Mass Communication (3) Sp PEMBER

Directed independent research into, and analysis of, legal problems in mass communications, institutional and media operations. Prerequisite, 402. Open to nonmajors.

505 Communication and Politics (3) W CLARKE

Study of the primary literature dealing with communication and American political behavior. Prerequisite, 406. Open to nonmajors.

506 Communication and Leisure (3) Sp CLARKE

Study of the mass media as popular entertainment, including analysis of content and audience gratification. Prerequisite, 406. Open to nonmajors.

507 Computer Applications in Communication Research (3) A RUGGELS

A course designed to acquaint the communication research student with both the potentialities and the use of the electronic digital computer in the behavioral sciences. Prerequisites, elementary programming and elementary statistics. Open to nonmajors.

508, 509 Communication Research (5,5) A,W CARTER, RUGGELS, SAMUELSON

Development of the rationale and methods of behavioral science in the context of communication research and theory. Prerequisite for 509, 508 and statistics through analysis of variance. Open to nonmajors.

511 Seminar in Communication Research (3, max. 15) WSp

CARTER, RUGGELS, SAMUELSON
Advanced individual projects in quantitative research. Prerequisites, 508 and statistics through analysis of variance. Open to nonmajors.

512, 513, 514 Seminar in History and Communications (3,3,3) A,W,Sp AMES, SMITH

The development of the historical approach to communications research. Study of historical method, bibliography, and criticism.

550-551 Advanced Communication Methods (2-4)-(2-4), max 6) A,W JOHNSTON, KINKEL, SHADEL, RYAN, YERXA

Directed individual projects in the design and organization of a complex mass communication, with a level of accomplishment suitable for professional quality print or broadcast media. Advanced techniques of research and production analyzed and applied. Prerequisite, bachelor's degree in a communications major or equivalent. Open only to majors.

570 Seminar in the Theory and Criticism of Broadcasting (3) W SHADEL

Evaluation and criticism of the function and operation of broadcasting in the mass communications process. Use of primary sources, including data gathering and analysis. Prerequisite, 470. Open to nonmajors.

580 Seminar in Public Opinion and Propaganda (3) W EDELSTEIN

Directed reading and research in the analysis of public opinion and propaganda. Prerequisite, 480. Open to nonmajors.

581 Seminar in International Communications (3) Sp EDELSTEIN

The analysis of international communications. Directed research in intercultural communication. Prerequisite, 580. Open to nonmajors.

583 Regional Communication Systems (5) A EDELSTEIN, MATHIASON

Analysis of communication problems of regional economic associations, and theory of political community, and examination of empirical research on regional communication. Special emphasis will be given Western Europe and the North Atlantic area. Prerequisites, 480, 485, or equivalent, or permission. (Offered alternate years with 585.) Open to nonmajors.

584 Research Seminar in Regional Communication Systems (3) W EDELSTEIN, MATHIASON

Directed research in communication factors in regional integration in a determined region of the world. Prerequisite, 583. (Offered alternate years with 586.) Open to nonmajors.

585, 586 Seminar in Comparative Communication Systems (3,3) A,W MATHIASON

The analysis and comparison of communication systems. Directed research in comparative systems and into the role of communications in national development. Prerequisite, 485. (Offered alternate years with 583, 584.)

597 Practicum in Communication Research (1-5, max. 10) AWSpS

Individual participation by a qualified graduate student in an on-going research project

under the direction of a faculty member. Prerequisites, 501, 509.

598 Selected Readings (1-5, max. 5) AWSpS
Prerequisite, permission of Director and staff.

600 Independent Study or Research (3-5, max. 9) AWSpS
Prerequisite, permission of Director and staff.

700 Thesis (*) AWSpS

702 Degree Final (3)

800 Doctoral Dissertation (*)

COMPARATIVE LITERATURE

Courses for Undergraduates

261, 262, 263 Modern African Literature (3,3,3) A,W,Sp

A survey course in African literature from the colonial period to the present with specific references to the themes of nostalgia, rebellion, and humanism. Readings, discussion of, and reports on, representative works in prose, poetry, and drama. Among authors studied: Achebe, Mphahlele, Oyono, Paton, Senghor, Soyinka, Tutuola. Prerequisite, sophomore, junior, or senior standing.

300 World Classics of Western Europe (5) A JONES

Great works of English, French, Italian, and Spanish poetry, drama and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in English and Romance literature. Prerequisite, junior standing.

301 World Classics of Germany, Russia, and Scandinavia (5) W STRUC

Great works of Danish, German, Icelandic, Norwegian, Russian, and Swedish poetry, drama and fiction, from the Middle Ages to the twentieth century, read in English and taught by specialists in English and Romance literature. Prerequisite, junior standing.

302 World Classics of the Orient (5) Sp MCKINNON

Great works of Chinese, Japanese, and Korean literature and thought, read in English and taught by specialists in Far Eastern literature. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 302. Prerequisite, junior standing.

400 Heroic Poetry (5) W JONES

Ancient, medieval, and Renaissance epic poems, read in English. The *Gilgamesh* epic, *Iliad*, *Odyssey*, *Metamorphoses*, *Aeneid*, *The Song of Roland*, and *Jerusalem Delivered*.

401 Modern European Drama (5) A REINERT

Selected plays, read in English, by Ibsen, Strindberg, Chekhov, Pirandello, Brecht, Camus, Durrenmatt, the absurdists, and others, representing naturalism, expressionism, theatricalism, and other movements that have shaped the modern European theater. Prerequisite, junior standing.

415 The Comic in Literature (5) ELLRICH

A study of masterpieces of comic literature emphasizing various modes and uses of the comic. Prerequisites, junior standing and at least 10 credits of literary study.

480 Modern European Poetry (5) Sp JONES

Selected work, read in English, by French, German, Italian, and Spanish poets from the Romantic period to the present. Prerequisite, junior standing.

496 Special Studies in Comparative Literature (5, max. 10)

To be offered occasionally by visitors or resident faculty. Consult department each quarter for specific information.

Courses for Graduates Only

Consult department for information on the quarter and year the courses below will be offered.

510 Theories and Methods of Comparative Literary History (5, max. 10)

JONES, STRUC, WARNKE
Lectures on comparative theory and practice from Vico to the present; seminar papers on comparative topics relevant to the student's fields of concentration.

511 The Art of Translation (5, max. 10) JONES

Lectures on principles of translating literary works into readable English. Students present and comment on translations made by them and give seminar papers on problems of translation in theory and practice.

513, 514 History of European Literary Theory and Criticism (3,3) BEHLER

A two-quarter seminar concerned with the analysis of the main concepts of literary theory and literary criticism in the western world as they have developed from the Middle Ages to the present. Emphasis will be placed on the philosophical background from which the literary ideas emerged.

515 Recent Trends in Literary Criticism (3) KERN

A study of some of the recent trends in literary criticism; in particular, structural and philosophical approaches. Prerequisites, advanced graduate standing and facility in reading French.

522, 523 Existentialism and Literature: Form and Content (3,3) KERN

A study of the effects of existential and phenomenological thought on literary themes and techniques. Prerequisite, graduate standing.

525 The Baroque in Criticism and Literature (3) KERN, LEINER, WARNKE

An investigation into the origins and history of the term as used in literary criticism, accompanied by a study of representative Baroque literature in various countries. Included are such works as *Don Quixote*, *Phedre*, and French, Spanish, Italian, and German poetry available in translation, but preferably to be read in the original.

530 Comparative Study of French and German Courtly Epic (3) HRUBY

Three major works of the German and French courtly epic, *Erec*, *Perceval*, and *Tristan*, will be systematically compared. Prerequisite, permission.

535 Poetic Forms (3-5, max. 15)

A seminar concerned with the evolution, dissemination, and function of metrical and stanzaic forms in various literatures. Course will change—consult department each quarter for specific information. Prerequisite, ordinarily, reading knowledge of one foreign language.

540 Eighteenth-Century European Aesthetics (3) BEHLER

An analysis of important works of eighteenth-century aestheticians in England, France, and Germany. Prerequisite, facility in reading either French or German.

545 Studies in Renaissance and Baroque Epic Poetry (3) WARNKE

A study of renaissance and baroque epic poetry, including works of Ariosto, Tasso, Spenser, Milton, and others. Prerequisite, reading knowledge of either French, Italian, Spanish, or Portuguese.

546 Studies in the Renaissance (3-5, max 10)

An examination of various aspects of Western European literature during the Renaissance. Course will change; consult department each quarter for specific information. Prerequisite, reading knowledge of at least one European language.

550 European Realism (3) STRUC

Seminar study of works of European Realism (Balzac, Flaubert, Turgenev, Dostoevski, Tolstoy, the representative Victorians, and the writers of "poetic realism") in connection with various aesthetic doctrines and subsequent critical appraisals. Prerequisite, graduate standing.

555 Studies in Irony (3) BEHLER

A seminar examining irony in literary, philosophical, and satirical masterpieces from the classical period to contemporary literature.

560 Classical Rhetoric and Literature (Seventeenth and Eighteenth Centuries) (3) LEINER

A seminar exploring the influence and the importance of classical rhetoric in European literary works of the seventeenth and eighteenth centuries. Texts and examples to be chosen in English, French, Italian, and German literatures. Prerequisite, reading knowledge of French, Italian, or German.

565 Studies in Nineteenth-Century Literature (3-5, max. 15)

Seminar examining various aspects of nineteenth-century European literature. Course will change—consult department each quarter for specific information. Prerequisite, ordinarily, reading knowledge of one foreign language.

570 Studies in the Novel (3-5, max. 15)

Two two-hour seminars comparing two or more novels of varying national literatures. Course will change—consult department each quarter for specific information. Prerequisite, reading knowledge of one foreign language.

571 Studies in the Lyric (3-5, max. 15)

An examination of central questions in the study of the lyric genre as approached from an international point of view. Course will change, so consult department each quarter

for specific information. Prerequisite, ordinarily, reading knowledge of one foreign language.

575 Intercultural Relationships in Literature (3-5, max. 15)

Seminar or seminars examining significant relationships among the literatures of various national cultures during various historical periods. Course will change—consult department each quarter for specifics. Prerequisite, reading knowledge of one foreign language.

576 Non-Western Literary Tradition (3-5, max. 15)

This course is intended to provide those with a background in Western literary criticism an awareness of features characterizing wholly separate, long, and strongly sustained critical traditions in other areas (China, for example). Normally translations will be assigned for nonreaders of the foreign language or languages concerned. Course will change. Consult department each quarter for specifics.

580 Literary Relations (3-5, max. 15)

A seminar that will examine relationships or parallels between two, or among more than two, important writers from different national literatures. Course will change—consult department each quarter for specific information. Prerequisite, ordinarily, reading knowledge of one foreign language.

585 Literature of Islam and Europe (3-5, max. 15)

A seminar examining the mutual influences between Islamic literature and culture (chiefly Arabic and Persian) and European. Course will change—consult department each quarter for specific information. Prerequisite, ordinarily, reading knowledge of one foreign language.

592, 593, 594 The European Romantic Movement (3,3,3) BEHLER

Analysis of the chief works of the Romantic movement in England, Germany, and France, and their repercussions in America.

596 Special Studies in Comparative Literature (3-5, max. 15)

To be offered occasionally by visitors or resident faculty. Consult department each quarter for specific information.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

CZECH—See *Slavic Languages and Literature*

DANCE

Other courses in dance are listed under *Physical and Health Education* in this section of the catalog.

251, 252, 253 Intermediate Contemporary Dance Technique (3,3,3) A,W,Sp JONSON

Amplification of basic foundation; examination of concepts; analysis of techniques; practice of established techniques. Prerequisites, Physical Education 153 for 251; 251 for 252; 252 for 253, or permission. (251 may be repeated once for credit.)

256, 257, 258 Intermediate Ballet Technique (3,3,3) A,W,Sp BORIS

Amplification of basic foundation; increased vocabulary, terminology refinements; *adage*, *allegro*, *pirouettes*, *tours*, *batté*, *tours de force*. Prerequisites, Physical Education 158 for 256; 256 for 257; 257 for 258, or permission. (256 may be repeated once for credit.)

280 Basic Movement for Theatre Disciplines (1, max. 3)

Basic body actions, unified through structure and improvisation; foundation for coordinated, articulate physical requirements in theatre disciplines; preliminary to period movement and manners studies. Prerequisite, permission.

290 Structure of Music in Relation to Dance (2-5, max. 5)

Study of structural parallels between organized sound and organized movement; emphasis on time-space relationships. Prerequisite, permission.

351, 352, 353 Advanced Ballet and Contemporary Dance Techniques (5,5,5) A,W,Sp

BORIS, JONSON

Introduction to unified technique; exploration of interaction between techniques. Prerequisites, 253 and 258 for 351; 351 for 352; 352 for 353, or permission. (351 may be repeated once for credit.)

490 Special Studies in Dance (1-3, max. 15)

Special studies in dance: specialized areas within the body of knowledge known collectively as the art of ballet. Prerequisite, permission.

DANISH—See *Scandinavian Languages and Literature*

DRAMA

Courses for Undergraduates

101 Introduction to the Theatre (5) AWSp WOLCOTT

An introduction to the theatre as an art form with emphasis on the play in production. The role of the various theatre artists: actors, directors, designers, and playwrights. Required attendance at one or more performances. Lecture and discussion groups. Open to nonmajors.

102, 103 Play Analysis (3,3) W,Sp

LOPER

Descriptive analysis of plays, both modern and historical, to provide tools for the student to read a text critically and creatively. (Formerly 102-103.)

121, 122, 123 Movement for the Actor (2,2,2)

BORIS, ZASLOVE

Movement for the actor based on Lecoq techniques. 121: improvisation for development of sensory-motor skills; 122: re-education of muscular efforts and coordination; 123: use of masks for characterization. Prerequisite, acceptance for the Bachelor of Fine Arts program.

141, 142, 143 Voice Training for the Actor (3,3,3) A,W,Sp

141: relaxation, limbering, and centering of the voice; 142: vocal dramatic styles (Ja-

cobean and medieval texts); 143: vocal dramatic styles (Jacobean medieval texts). Prerequisite, acceptance for the Bachelor of Fine Arts program.

146 Theatre Voice and Speech (3) AWSp

Stage vocal techniques and exercises in practical application. Open to nonmajors.

151, 152, 153 Acting (3,3,3) A,W,Sp

LOPER

Theory and practice of fundamentals. 151: development of fundamental aptitudes in acting (focus, recall, sense memory) through improvisation and basic scene work; 152: analysis and development of characterization; 153: advanced analysis, character rhythm, extended scene work. Prerequisites, 151 for 152; 152 for 153.

155, 156, 157 Acting (5,5,5) A,W,Sp

ROSS, ZASLOVE

Acting for the professionally-oriented student. 155: improvisation, the fundamentals of acting theory, practice; 156: acting styles, medieval; 157: acting styles, Tudor and Elizabethan. Prerequisite, acceptance for the Bachelor of Fine Arts program.

181, 182, 183 Play Analysis for the Actor (2,2,2) AWSp

ROSS

Play analysis from the point of view of the actor; 181: the principles of method and their imaginative integration for the actor; 182: application of analysis method to medieval plays; 183: application to Tudor plays. Prerequisite, acceptance for the Bachelor of Fine Arts program.

210, 211, 212 Theatre Technical Practice (2 or 4, 2 or 4, 2 or 4) W,A,Sp

CRIDER, DAVIS, LOUNSBURY

Intensive lecture, laboratory course in basic theories, techniques and equipment of stage scenery, lighting, costumes and scene painting. 210: scene construction and scene painting; 211: costumes; 212: lighting and technical stage procedures. Crew work required in addition to scheduled class hours.

221, 222, 223 Movement for the Actor (2,2,2) AWSp

ZASLOVE

221: advanced mask work, comedy characterization, animal improvisation; 222: Commedia Del Arte techniques; 223: advanced commedia. Prerequisite, completion of first year of the Bachelor of Fine Arts program.

230 Introduction to Children's Drama (2) W

HAAGA, VALENTINETTI

Survey of children's drama with an emphasis on philosophies and practices. Includes children's theatre, creative dramatics, and puppetry. Open to nonmajors.

241, 242, 243 Voice Training for the Actor (3,3,3) A,W,Sp

ROSS

241: Vocal dramatic styles, Elizabethan; 242: Vocal dramatic styles, Jacobean and Greek; 243: Vocal dramatic styles, Moliere and Restoration. Prerequisite, completion of first year of the Bachelor of Fine Arts program.

251, 252, 253 Acting (4,4,4) A,W,Sp

LOPER

Intensive course-sequence in acting with integrated laboratory work in movement and voice. Improvisation, mime, scene analysis, and emphasis on realistic acting with introduction to styles and genres. Majors only.

Prerequisites, audition for 251; 251 for 252; 252 for 253.

255, 256, 257 Acting (5,5,5) A,W,Sp
ROSS

255: Elizabethan and Jacobean styles; 256: Greek and Restoration styles; 257: Moliere and Commedia Del Arte. Prerequisite, completion of first year of the Bachelor of Fine Arts program.

271, 272, 273 Seminar in Theatre and Drama (2,2,2)

Prerequisite, completion of first year of the Bachelor of Fine Arts program.

275, 276, 277 History of Western Theatre and Drama (5,5,5) A,W,Sp
JOSEPH, WOLCOTT

275, Classic and Medieval; 276, Renaissance and Elizabethan; 277, Modern. Analysis of theatre forms and methods of production, with collateral analysis of dramatic literature and critical theories. Open to nonmajors. (Formerly Drama 471, 472, 473)

298, 498 Theatre Production (1; 1, max. 3) AWSp, AWSp

Laboratory courses for students participating in School of Drama productions. Prerequisite, being cast in a production.

316 Theatrical Make-Up (2) AWSp
DAVIS

Basic principles, with intensive practice in application of make-up for use on proscenium and arena stages. Open to nonmajors.

324 Children's Theatre (3) WSp

Theory and techniques, play selection and analysis, and rehearsal procedures. Emphasis on directing.

325, 326 Play Production (5,5) Sp,W
DAVIS, GRAY

325: fundamentals of scenery, lighting and costume design and construction; 326: fundamentals of directing, especially for high school, with some acting. Open to nonmajors.

331 Puppetry (3) AWSp
VALENTINETTI

Introduction to puppetry; construction and use of simple puppets as a visual aid in education, recreation, and therapy.

336 Drama in the Elementary School (3)
SIKS

Teaching drama as a discipline, emphasizing fundamentals of acting and employing movement, speech, improvisation, and relationship of objectives organically; correlation with language arts. Prerequisites, 151 and Educational Psychology EDPSY 304.

338 Creative Dramatics (3) AWSp
HAAGA, SIKS

Analysis of basic principles and techniques of the creative process in informal drama; observation of children and youth.

351, 352, 353 Advanced Acting (3,3,3) A, W, Sp
LOPER, CRIDER, JONSON

Theory and practice of period styles: 351, Shakespeare; 352, Moliere and Restoration; 353, classical and non-realistic modern. Course includes scene study, dance forms, and period manners and movement. Prerequisites, 253 for 351; 351 for 352; 352 for 353.

371, 372, 373 Special Studies (2,2,2) A,W,Sp
ROSS

Specialized and individualized work related to the main curriculum of the third year of the

Bachelor of Fine Arts program. Prerequisite, completion of two years in the Bachelor of Fine Arts program.

410, 411, 412 Advanced Theatre Technical Practices (3, max. 9; 3, max. 9; 3, max. 9) AWSp, AWSp, AWSp
CRIDER, DAVIS, LOUNSBURY

Apprenticeship, under faculty-staff supervision in theories, techniques, and equipment of stage scenery, lighting, costumes, and scene painting. 410, scene construction and scene painting; 411, costumes; 412, lighting and technical stage procedures. Prerequisites, 210 for 410; 211 for 411; 212 for 412.

413 Advanced Scene Construction (3) W
LOUNSBURY

Special problems in scene construction and rigging with laboratories in working drawings and scenic models. Prerequisite, 210 or equivalent.

414 Scene Design (3, max. 6) AW
DAVIS

Theory, practice, and rendering of scene designs. Repeat of course involves intermediate designs, models, etc. Prerequisites 210, Art 109 and Art History 203, or equivalent.

415 Stage Costume Design (3, max. 6) ASp
CRIDER, REVZAN

Theory, practice, and rendering of costume designs for the theatre. Repeat of course involves intermediate designs. Prerequisites, 211, Art 109 and Art History 203 or equivalent; 411 for repeat of course.

416 History of Clothing and Costume (5) A
REVZAN

Survey history of clothing and theatrical costume; emphasis on the dress of the audience and the actor in historic periods of theatrical activity. Prerequisites, 211 and Art History 203 or equivalent, or permission.

417 Advanced Stage Costume Construction (3) W
CRIDER

Techniques of costume construction, including study of fabrics, color, and fundamentals of pattern making and draping for historic clothing reconstruction. Prerequisite, 211 or permission. (Formerly 411).

418 Scene Painting (2) A
DAVIS

Pigments, color mixing, and techniques of application to stage scenery. Prerequisite, 210 or permission.

419 Stage Lighting (2) Sp
CONWAY, LOUNSBURY

Theories and methods of lighting with emphasis on lighting plots. Laboratories consist of analysis of lighting instruments and control, color experiments, and basic circuitries. Prerequisite, 212 or equivalent.

431 Fundamentals of Puppetry (2) Sp
VALENTINETTI

Puppetry as a theatre art; construction and use of puppets and marionettes for formal presentations; basic principles of playwriting and staging. Majors only. Prerequisites, 152 and 230.

432 Advanced Puppetry (2, max. 4) AWSp
VALENTINETTI

Projects and participation in formal theatre productions or field work in hospitals, clinics, and special schools. Prerequisite, 331 or permission.

435 Children's Theatre (3) W

Theory and technique, play selection and analysis, and rehearsal procedures. Practical experience in the laboratory. Prerequisite, 460. (Formerly 435, 435L.)

436 Drama in the Elementary School (3) Sp
SIKS

Teaching drama as a discipline emphasizing interpretation of text in play production; employing principles of space, mass, line, color, through such theatre elements as design, costuming, lighting. Prerequisites, 336, 338, and 325, or 210, 211, and 212.

437 Laboratory in Teaching Drama to Children (1) AWSp
SIKS

Practical experience in teaching drama as a discipline to children. (With permission may be taken concurrently with 436.) Prerequisite, 436.

438 Creative Dramatics and Laboratory (3) ASp
HAAGA

Application of basic principles and techniques of creative dramatics through leadership experience. Open to nonmajors. Prerequisite, 338. (Formerly 438, 438L.)

451, 452, 453 Rehearsal and Performance (3,3,3) A,W,Sp
LOPER

Prerequisite, 353 or permission.

455 Historic Manners and Movement (2)
CRIDER

A laboratory course on the fundamentals of body movement for the stage and a survey of historic manners and movement, with particular attention to the interrelationship with historic costume. Open to nonmajors. Prerequisites, 253 and 211, or permission.

459 Intensive Rehearsal and Performance (6, max. 18) AWSp

Prerequisite, completion of two years in the Bachelor of Fine Arts program.

460 Introduction to Directing (3) A
BLACK

Student is introduced to the art of the stage director. (Formerly 461.)

461, 462 Elementary Directing (3,3) W, Sp
BLACK

An elementary study of the art of the stage director. Prerequisites, 460 with grade of B or above for 461; 461 with grade of B or above for 462.

463 Intermediate Projects in Directing (2) AWSp
BLACK

Prerequisite, 462 or permission.

464 Musical Comedy Direction (3) Sp
CARR

Lectures and practical exercises dealing with the staging problems related to the components of drama, dance, and music in the musical-comedy form, and a brief history of the development of the American musical. Prerequisites, 460 and permission. (Formerly 462.)

474 History and Aesthetics of the Motion Picture (3) Sp
GALSTAUN

Lectures and exhibition of important and representative films, foreign and American,

ARTS AND SCIENCES

illustrating the evolution of this art form. Open to nonmajors. Prerequisite, junior-senior standing.

476 Seminar in History of the American Theatre (5) W WOLCOTT

A study of the American theatre, its playhouses, managers, and artists, from colonial to modern times. Open to nonmajors, with permission.

477, 478, 479 History of Far Eastern Theatre and Drama (3,3,3) A, W, Sp CONWAY

An inquiry into the origins and history of theatre and drama of India, China, and Japan and the conventions of their production. Classic and modern dramas will form the basis of the study.

482 Music in the Theatre (2, max. 4) W BERGSMA

Open to majors and nonmajors who are conductors, playwrights, or stage directors. Survey of representative examples of musical theatre; collaborative creation and production. Prerequisite, 460, or English 374, or Music 491 or 492. Offered jointly with the School of Music as Music 485.

490 Special Studies in Acting-Directing (1-6, max. 6) AWSp Prerequisite, permission. (Formerly 490A.)

491 Special Studies in Design-Technical (1-6, max. 6) AWSp Prerequisite, permission. (Formerly 490B.)

492 Special Studies in Children's Drama (1-6, max. 6) AWSp Prerequisite, permission. (Formerly 490C.)

493 Playwriting (3, max. 9) AWSp A professional course. Prerequisites, English 374, 375, and permission. (Formerly 492.)

495 Special Studies in the Theatre Arts of Asia (3, max. 9) MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theatre arts of Asia. The study of a given form or tradition of theatre art in any one quarter will depend on the visiting artists and the idioms of their choice. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 495.

496 Stage Costume Problems (2, max. 8) AWSp STAFF

A series of specialized courses directed to specific areas and problems of stage costume design and execution: accessories, textiles, masks, wigs, and analysis of construction of historic clothing and/or specialized clothing. Prerequisites, 211, 416, and permission.

497 Theatre Organization and Management (2) Sp FALLS

Personnel, box-office procedures, advertising, production costs, royalties, and executive policies. Prerequisite, senior standing.

499 Undergraduate Research (1-5, max. 15) AWSp Prerequisite, permission.

Courses for Graduates Only

501 Nature of Graduate Study in Drama (2) A FALLS

Prerequisite, graduate standing.

510 Seminar in Production (3) AWSp

DAVIS

Discussion of aesthetic unity and the potential of physical space in the problems of theatrical production and the limitation of representative types of stages and their supporting equipment and facilities. Prerequisite, permission.

511 Design Studio (3, max. 9) AWSp REVZAN

Artistic principles and techniques as a basis for creative work in theatre design. Studio work in composition, color, line, space, and light and shade. Reports and outside reading may be required.

513 Technical Direction (3, max. 9) AWSp LOUNSBURY

Practical experience in mounting scenery for a current production. Prerequisites, 413 and permission.

514 Advanced Scene Design (3, max. 6) AWSp CONWAY

Prerequisites, 4 credits in 414 or equivalent and 9 credits in 511.

515 Advanced Stage Costume Design (3, max. 6) AWSp CRIDER

Prerequisites, 4 credits in 415 or equivalent and 9 credits in 511.

517, 518, 519 Studies in Historic Design (3,3,3) CONWAY, CRIDER, REVZAN

The investigation of artistic principles and modes which influenced the art, architecture, furniture, and decor of selected historic periods. Prerequisites, 517 for 518; 518 for 519.

520 Advanced Theatre Practicum (1-5, max. 15) CRIDER, DAVIS, LOUNSBURY

Graduate student apprenticeship with professional theatre shops—scenery, lighting, scene painting, or costume. Prerequisites, 513 or 514 or 515, and permission.

530 Seminar in Children's Drama (5) W SIKS

Critical study of philosophies and practices—past and present—of the children's drama movement in the United States; examination of current problems in children's drama education. Prerequisite, permission.

551-552-553 Teaching of Acting (2-2-2) AWSp, WSp, Sp Prerequisites, 353 and permission.

561 Directing Apprenticeship (5, max. 15) AWSp BLACK

Apprenticeship with professional director or association with thesis director. Prerequisite, graduate standing.

562 Advanced Directing Projects (3, max. 6) AWSp

Special project in association with graduate design students from areas of scenery and costume (Drama 510). Prerequisite, 5 credits in 561 and 2 credits in 563 or equivalent, and permission.

563 Seminar in Directing (2, max. 12) AWSp BLACK

Seminar discussion on working problems of major productions in which the student is

involved; examination of problems of the stage director on the advanced level. Prerequisite, graduate standing.

571, 572, 573 Problems in Theatre History Research (3,3,3) A, W, Sp WOLCOTT

Methods and techniques of research in theatre history. Relationship of theatre arts to other arts and society in major periods of theatre history. Prerequisites, 571 for 572; 572 for 573.

575, 576, 577 Seminar in Theatre History (3,3,3) A,W,Sp WOLCOTT

Prerequisites, 571, 572, 573.

581, 582, 583 Seminar in Drama (3,3,3) A,W,Sp JOSEPH

Seminar inquiring into the relationships between scholarship, criticism, and theatre art. Prerequisite, permission.

599 Advanced Studies in Theatre Arts (1-5, max. 10) AWSp

Independent projects or group study of specialized aspects of theatre arts. Prerequisite, graduate standing and permission.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

ECONOMICS

Courses for Undergraduates

INTRODUCTORY COURSES

200 Introduction to Economics (5) AWSp BUECHEL, MORRIS, NORTH, THOMAS

Organization, operation, and control of the American economy; problems of inflation, unemployment, taxation, the public debt, monopoly, trade unions, and international trade. The basic analysis of the allocation of resources and the application of this basic theory through contemporary problems in the American society.

201 Introduction to Microeconomic Theory (5) AWSp EYSENBACH, FLOYD

A study of the allocation of resources and the distribution of income with emphasis on a market system. Some basic theoretical tools are developed and used to analyze a variety of problems of current interest. Prerequisite, 200 or equivalent, or permission.

211 General Economics (3) AWSp HUBER, WORCESTER

Survey of basic principles of economics: determination of national income, price analysis, and allocation of resources. Primarily for engineering and forestry students. Other students by permission. No credit if 201 has been taken.

260 American Economic History (5) AWSp HIGGS, MORRIS, THOMAS

An analysis of American economic growth and change interpreted as part of the general expansion of the North Atlantic economy, 1500 to the present. Stresses the historical background to contemporary American economic problems.

312 Current Economic Problems (5) S

Designed primarily for secondary school teachers of social studies with limited knowledge of economics. Emphasis on analysis of

major economic problems and policies relevant to high school courses in contemporary social problems. Prerequisite, 200 or equivalent, or permission.

GENERAL THEORY

300 Intermediate Price Theory (5) AWSp

BARZEL, BROWN, CHEUNG, HIGGS, HYNES, LEBER, MC GEE, MILLS, WORCESTER

Fundamental concepts and principles. Demand, supply, market price, and the determination of price under competitive and monopolistic conditions; relationships between price and costs. Prerequisites, 201 and Mathematics 105, or equivalent, or permission.

301 National Income Analysis (5) AWSp

BROWN, CARTWRIGHT, HADJIMICHALAKIS

Analysis of the determinants of the aggregate level of employment, output, and income of an economy. Prerequisites, 201 and Mathematics 105, or equivalent, or permission.

306 Development of Economic Thought (5) W

From the early modern period to the present, with some discussion of its relation to natural science and other social sciences. The main subjects treated will be Adam Smith and the classical school, Karl Marx, later Marxism, and the transition to J. M. Keynes. Prerequisites, 200, 201, or equivalent, or permission.

400 Fundamentals of Micro-theory (3) AW

BROWN, EYSENACH

Fundamentals of micro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if Economics 300 has been taken for credit. Prerequisite, 200 or equivalent is recommended.

401 Fundamentals of Macro-theory (3) WS

BROWN, DOWDLE

Fundamentals of macro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if Economics 301 has been taken for credit. Prerequisite, 200 or equivalent is recommended.

410 Introduction to Mathematical Economics I (3) A

OBST, SILBERBERG

Introduction to mathematics with a view of mathematics as both an economic tool and an aid in the development of logical thought. Introduction to differential and integral calculus as well as sets, sequences, and mappings with applications to economics.

411 Introduction to Mathematical Economics II (3) W

OBST, SILBERBERG

Continuation of 410. Prerequisite, 410.

412 Introduction to Mathematical Economics III (3) WSp

OBST, SILBERBERG

Theory and application of linear algebra and matrix methods with special emphasis on problems originating in economic theory. Prerequisite, 411 or Mathematics 124.

416 Urban Economics (5) Sp

BISH

The application of economic analysis to urban trends and problems, including changing urban form and function, urban public finance, housing and renewal, poverty and race, trans-

portation, and environmental problems. Offered jointly with the Department of Geography as Geography 416. Prerequisite, 300, 400, or equivalent.

MONEY, BANKING, AND CYCLES

320 Money and Banking (5) S

BORCHERDING, CRUTCHFIELD

Nature and functions of money; the banking system, other credit-granting institutions, and the relationship of money and bank deposits to the economy. Prerequisites, 200 and 201, or permission.

421 Money, Credit, and the Economy (5) S

CRUTCHFIELD

Supply and the use of money, bank deposits, and bank reserves. Relationship of Treasury, Federal Reserve, and commercial bank policies, and the value of money. Factors generating flows of money income. Prerequisites, 300, 301, and 320 or equivalent, or permission.

GOVERNMENT REGULATION AND INDUSTRIAL ORGANIZATION

330 Government and Business (5) AWSp

MUND

Development in the United States of public policy with respect to business. Federal antitrust legislation and its application to mergers, business concentration, and restrictive business practices. Government control of prices; regulation of public utilities; public ownership; economic planning. Prerequisite, 200 or equivalent, or permission.

404 Industrial Organization and Price Analysis (5) A

CRUTCHFIELD, MC GEE

Study of selected market structures. Directed toward developing more precise predictive techniques and more adequate bases for analysis of public policy. Prerequisite, 300 or equivalent, or permission.

435 Natural Resource Utilization and Public Policy (5) W

BROWN, CRUTCHFIELD

Special emphasis on elements of economic theory relating to resource-oriented industries. Case studies in the theory and practice of resource management dealing with both stock and flow resources. Benefit-cost analysis and the evaluation of multipurpose resource projects. Prerequisites, 200 and 201, or permission.

LABOR ECONOMICS

340 Labor Economics (5) AWSp

GILLINGHAM, RAHM

Trade unionism, collective bargaining, labor-management relations, public policy; economic effects of unionism and collective bargaining; manpower utilization and related labor market problems. Prerequisites, 211 or 200 and 201, or permission.

346 Economics of Health Care (3) Sp

MC CAFFREE

Economic analysis of the health care sector of economy: organization; demand and supply factors; pricing practices; financing mechanisms, public versus private; impact of third party, insurance and prepayment; health and economic development. Prerequisite, 200 or equivalent, or permission.

441 Union-Management Relations (5) ASp

GILLINGHAM, MC CAFFREE

The collective-bargaining process, with special reference to economic implications. Prerequisites, 201 and 340, or equivalent, or permission.

442 The American Labor Movement (5) S

GILLINGHAM

Analysis in historical perspective of the American labor movement, its organizational structure, ideology, programs, and policies. Comparison with labor movements in other countries. Prerequisite, 200 or 211, 340 or equivalent, or permission.

443 Labor Market Analysis (5) Sp

MC CAFFREE, RAHM

Factors which determine wage rates and employment levels in the firm, industry, and economy. Emphasis upon the union in the labor market. Prerequisite, 300 or equivalent, or permission.

445 Social Security (5) W

MC CAFFREE

Problems arising from economic hazards confronting individuals, including old age, unemployment, illness, and disability. Social institutions designed to meet these problems, with emphasis on economic effects. Prerequisites, 200 and 201, or permission.

PUBLIC FINANCE

350 Public Finance (5) AWSp

BISH, BORCHERDING, EYSENACH, FLOYD, MILLER, SILBERBERG

An elementary treatment of the theory of public finance: theory of nonmarket decisions; welfare and allocative effects of taxation; principles of fiscal policy; problems of the public debt. Prerequisites, 201 or equivalent, or permission.

450 Theory of Public Finance and Fiscal Choice (5) A

BORCHERDING

An advanced treatment of the theory of taxation and public spending. Designed for undergraduates majoring in economics and for graduate students majoring in fields other than economics. Prerequisite, 300 or equivalent, or permission.

451 State and Local Fiscal Economics (5) W

BISH

The development of the theory of externalities, public goods, and collective action to understand the structure and functioning of the state and local public economy. Special attention is given to governmental systems in metropolitan areas. Prerequisite, 300 or equivalent or permission.

ECONOMIC HISTORY

460 Economic History of Europe (5) W

MORRIS

The origins of the modern European economy: historical analysis of economic change and growth from medieval times. Offered jointly with the Department of History as General History 481. Economics 200, 201 recommended.

462 Economic History of the United States to the Civil War (5) W

NORTH, THOMAS

A systematic study of the changing pre-Civil War economic conditions and the consequences of these changes for the American society. Prerequisite, 201 or equivalent, or permission.

463 Economic History of the United States from the Civil War to the Present (5) Sp

HIGGS, NORTH, THOMAS

A systematic study of the changing economic conditions since the Civil War and the consequences of these changes for the American society. Prerequisite, 201 or equivalent, or permission.

465 Economic History of South Asia (5) Sp

MORRIS

Historical analysis of economic growth and stagnation in the region and an examination of the impact of imperialism and the international economy on the area in the nineteenth and twentieth centuries. Prerequisite, permission; 200, 201 recommended.

INTERNATIONAL TRADE

370 Introduction to International Economics (5) AWSp

HADJIMICHALAKIS, HUBER, MAH

International trade, commercial policy, and the balance of payments are studied in a theoretical context and used to examine current problems such as international monetary reform, trade and less-developed countries, and regional economic cooperation. Prerequisite, 201 or permission.

471 International Economics (5) AW

FLOYD, HUBER, HYNES, MAH

Income and price theory applied to international trade and finance. Analysis of balance of payments adjustments and alternative international monetary and commercial policies. Role of foreign trade and investment in economic growth. Prerequisites, 300, 301, or permission.

COMPARATIVE SYSTEMS AND DEVELOPMENT

390 Comparative Economic Systems (5) WSp

COX, LEBER, WORCESTER

A study of resource allocation, growth, and income distribution in capitalist, market socialist, and centrally planned economies. The theoretical models of these systems are developed and then illustrated by case studies of selected countries. Prerequisite, 201 or equivalent, or permission.

391 Economic Development (5) Sp

EYSENBACH

Critical appraisal of theories and problems of growth with emphasis on the less-developed countries of the world today. Prerequisite, 201 or permission.

493 Economy of Modern China (5) Sp

MAH

Economic development of contemporary China, with special emphasis on the objectives, performance, and problems of the mainland Chinese economy under the Communist regime. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 493. Prerequisites, 200 and 201.

495 The Economy of Soviet Russia (5) AS

LEBER

Analytical survey of techniques of planning and resource allocation in the Soviet economy. Criteria for evaluating economic performance, growth, and efficiency. Prerequisite, 201 or equivalent, or permission.

STATISTICS AND ECONOMETRICS

281 Introduction to Economic Statistics (5) AWSp

DOWDLE

Basic statistical concepts; characteristics of economic data; statistical analysis of economic data. Prerequisites, 200 and 201.

481 Economic Statistical Analysis (5) AW

BARZEL, DOWDLE, MILLER, SILBERBERG

Applications of statistical techniques to economic problems. Prerequisites, 201 and 281, or equivalent, or permission.

482 Advanced Economic Statistical Analysis (5) Sp

BARZEL, DOWDLE, MILLER, SILBERBERG

Advanced applications of statistical techniques to economic problems. Prerequisite, 481 or equivalent, or permission.

GENERAL

408 Problems of Peace and Conflict Resolution (3) W

Study of factors involved in conflict and in conflict resolution; application to international and other problems. Lectures, discussions and readings in social psychology, political science, and economics. Offered jointly with the Department of Political Science as Political Science 408. Prerequisite, permission.

496H Honors Seminar (5) A

THOMAS

Honors and other superior students will be given opportunity to develop research techniques, pursue topics in breadth and depth and apply their tools of economic analysis to selected topics in economic theory and to current issues of national and international economic policy. To be taken in the senior year.

497H Honors Directed Study (5) W

THOMAS

Students will individually arrange for independent study of selected topics in economic theory and its application under the direction of a member of the economics faculty. The research paper, if accepted, will be the student's senior thesis.

498 Special Topics: Honors Undergraduate Theory (5) Sp

MILLS

The course will introduce to advanced undergraduate honors students current research going on in economic theory and its application to contemporary problems. Prerequisite, honors Economics majors.

499 Undergraduate Research (1-6) AWSp

BUECHEL

May not be applied toward an advanced degree. Prerequisite, permission.

Courses for Graduates Only

GRADUATE CORE PROGRAM

500 Micro-Economic Analysis I (3) AW

BARZEL, BASSETT, BORCHERDING, MC GEE, SILBERBERG

Partial equilibrium analysis including demand theory, theory of the production function and of cost. Theory of price. Prerequisites, 300, 301, and 410, or Mathematics 125, or permission.

501 Micro-Economic Analysis II (3) WSp

BARZEL, BASSETT, BORCHERDING, MC GEE, SILBERBERG

Continuation of 500 with emphasis upon the theory of distribution. Prerequisite, 500

502 Macro-Economic Analysis I (3) AW

FLOYD, HYNES, SILBERBERG

Analysis of theories of income, employment, and output under static conditions; quantity theory of money; relation of monetary and "real" theories; stability and instability of income over time; growth of the economy. Prerequisites, 300, 301, and 410 or Mathematics 125, or permission.

503 Macro-Economic Analysis II (3) WSp

FLOYD, HYNES, SILBERBERG

Recent developments. Prerequisite, 502 or permission.

504 Economic History and Economic Development (3) A

EYSENBACH, HIGGS, NORTH, THOMAS

Analysis of determinants of long-run development; theoretical issues in the long-run supply and efficiency of productive factors; consideration of case studies in relation to theoretical issues.

507 History of Economic Thought (3) Sp

Classical and neoclassical economics with emphasis upon the latter.

ECONOMIC THEORY AND HISTORY OF ECONOMIC THOUGHT

507 History of Economic Thought (3) Sp

(See Graduate Core Program.)

511 Advanced Micro-Economic Theory: Selected Topics (3, max. 12) W

BROWN

Seminar in advanced micro-theory. Selected topics of special interest and significance. Prerequisites, 500, 501, 502, and 503.

512 Advanced Macro-Economic Theory: Selected Topics (3, max. 12) S

Seminar in advanced macro-theory. Selected topics of special interest and significance. Prerequisites, 500, 501, 502, and 503.

516 Seminar in Urban-Regional Economics (3) Sp

BISH

The examination of economic theories which help explain the location of economic activities within and between urban and regional areas. Offered jointly with the Department of Geography as Geography 516. Prerequisites, 300 and 301, or equivalent, or permission.

GOVERNMENT REGULATION AND INDUSTRIAL ORGANIZATION

530 Public Control of Industry (3) A

MUND

Public policy in the United States with respect to industrial organization and business conduct. Recent issues in public control of business.

533 Price Policy and Industrial Organization (3) W

CRUTCHFIELD, MC GEE

Advanced analysis of market structures and industry performance; selected empirical studies; principles of conservation and benefit-cost analysis; issues in public policy. Prerequisite, 500 or permission.

535 Economics of Natural Resources (3) Sp

CRUTCHFIELD, BROWN

Pricing, allocation, and utilization of natural resources; externalities; public investment criteria; technological relationships; alternative strategies of public decision-making; benefit-cost analysis; case studies. Prerequisites, 400 or 500, or permission.

LABOR ECONOMICS

541 Labor Economics (3) W

GILLINGHAM

Selected topics in labor economics. Prerequisite, permission.

542 Labor Economics (3) A

MC CAFFREE

Selected topics in labor economics. Prerequisite, permission.

PUBLIC FINANCE AND TAXATION**550 Public Finance I (3) W**

BISH, BORCHERDING

Theory of collective action: welfare economics, with special emphasis on public goods and external effects; theory of property rights, constitutions, and nonmarket decisions. Prerequisite, 500 or permission.

551 Public Finance II (3) Sp

BORCHERDING, FLOYD

The welfare, allocative, and stabilization effects of taxation and public spending; theory of shifting and incidence of taxation; analysis of fiscal policy; problems of the public debt; allocative and welfare consequences of inflationary finance. Prerequisites, 500 and 502, or permission.

553 Economic Analysis and Government Programs (3) Sp

BISH

Applications of economic analysis to public enterprises and programs. Prerequisites, 400, 401, or equivalent.

ECONOMIC HISTORY**504 Economic History and Economic Development (3) A**

(See Graduate Core Program.)

561 European Economic History (3) W

MORRIS, NORTH, THOMAS

The economic growth of the western world since the decline of the Roman Empire. Prerequisites, 504 and permission.

562 American Economic History (3) Sp

NORTH, THOMAS

The growth of the American economy with emphasis on theoretical issues involved in American economic development. Prerequisites, 504 and permission.

INTERNATIONAL TRADE**571 International Trade Theory I (3) Sp**

HADJIMICHALAKIS

Modern developments in general equilibrium theory and welfare economics, with relation to international trade. Prerequisite, permission.

572 International Trade Theory II (3) W

FLOYD, HUBER, HYNES

Problems of foreign trade and exchange controls, and international monetary policies. Prerequisite, permission.

ECONOMIC SYSTEMS AND DEVELOPMENT**504 Economic History and Economic Development (3) Sp**

See Graduate Core Program.

590 Theory and Practice of Economic Planning (3) W

LEBER

Theoretical issues, criteria, techniques, and applications of planning in the allocation of economic resources. Prerequisite, permission. (Offered alternate years; offered 1970-71.)

591 Theoretical Issues in Economic Development (3) W

EYSENACH

Analysis of theoretical issues in economic development with application to the less-developed countries of the world today. Prerequisite, 504.

595 Soviet Economics (3) Sp

LEBER

Analysis of problems of economic measurement, economic development, optimum resource allocation, national income, and plan-

ning in the Soviet Union. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 595. Prerequisite, permission. (Offered alternate years; offered 1970-71.)

MATHEMATICAL ECONOMICS**513 Mathematical Economics: Activity Analysis (3) A**

OBST, SILBERBERG

Linear programming. Theory of convex bodies. Input-output models. Competitive equilibrium and Pareto optimum. Linear activity analysis of production and applications. Prerequisites, 412, 500, or permission.

514 General Equilibrium Analysis (3) W

BASSETT, HADJIMICHALAKIS, SILBERBERG

A study of the existence, uniqueness, and stability of general equilibrium models under the assumptions of competition. Emphasis is upon recent developments in the literature with consideration given to both positive and normative economics.

515 Special Topics in Mathematical Economics (3) Sp

MILLS

Seminar will cover selected topics in mathematical economics—theory of general equilibrium analysis. Prerequisite, permission of instructor. (Formerly 519.)

517 Foundations of Economic Analysis (3) A

BASSETT, SILBERBERG

A study of the sources of meaningful comparative statics theorems in economics, with special emphasis on extremum problems, qualitative analysis, and dynamic stability. Mathematical concepts necessary for access to the current literature will be developed.

STATISTICS AND ECONOMETRICS**580 Econometrics I (3) A**

BARZEL, MILLER, SILBERBERG

Study of empirical estimation techniques and related methodological problems.

581 Econometrics II (3) W

BARZEL, MILLER, SILBERBERG

Advanced study of econometric methods and techniques. Prerequisites, 481, 482, and 580.

GENERAL**600 Independent Study or Research (*) AWSp****700 Thesis (*) AWSp****702 Degree Final (3) AWSp****800 Doctoral Dissertation (*)****ENGLISH****Courses for Undergraduates**

The lists of names under various literature courses indicate the kind of material covered, but are neither comprehensive nor exclusive of other significant figures.

BASIC REQUIRED COURSES**50 Fundamentals of English (Preparatory) (0)**

Required for students who fail English qualifying tests. Basic composition course, with review of fundamentals designed to improve the level and correctness of writing. Students who pass 50 are eligible for 101. (Offered only through Correspondence Study.)

101, 102, 103 Introductory English (3,3,3) AWSp, AWSp, AWSp

English 101 prerequisite to 102 and 103. Emphasis upon interpretive and analytical writ-

ing, based upon selected readings from world literature. May not be counted toward a major in English. Credit granted on basis of Advanced Placement Test of College Entrance Examination Board.

101H, 103H Introductory English Honors (3,3) ASp

Writing courses, with reading chosen by the instructor. Open to students who qualify by high performance on the English portion of the Pre-College Testing Program or the Advanced Placement Test of the College Entrance Board.

COURSES FOR FOREIGN STUDENTS

(These courses are administered by the Department of Linguistics.)

150 Elementary English for Foreign Students (5) AW

Concentration on pronunciation problems, basic grammatical patterns, and idioms from the point of view of oral practice and fluency.

151 Intermediate English for Foreign Students (5) AWSp

An advanced version of English 150, as well as an introduction to basic writing.

160 English for Foreign Students: Intensive (15)

An intensive course specifically intended to prepare the foreign student for the coming academic year. Oral and written work. This course will satisfy the foreign student English requirement.

303 Advanced English for Foreign Students (3, max. 9) AWSp

Content varies each quarter: composition, humanities, and science readings.

LOWER-DIVISION COURSES FOR NONMAJORS

These courses may be elected by students majoring in English but may not be counted toward the major.

Humanities 101 Literature (5) AWSp

An introduction to literary forms and techniques through analysis of representative examples of narrative and poetic art, with emphasis upon relationship of content and expression. One or two sections a year will have emphasis on Black literature.

Humanities 201 Literature (5) WSp

Reading and critical discussion of some of the greatest works in world literature.

257 Introduction to Poetry (5) AWSp

Poetic techniques; readings from nineteenth- and twentieth-century English and American poets.

258 Introduction to Fiction (5) AWSp

Fictional techniques; analysis of short stories and novels.

259 Introduction to Modern Drama (5) AWSp

Dramatic techniques; analysis of twentieth-century plays.

LOWER-DIVISION COURSES FOR MAJORS AND NONMAJORS: SURVEY COURSES**264 English Masterpieces: Beginnings through Shakespeare (to 1600) (5) AWSp**

Readings in principal works and authors, with examples of romances, ballads, and drama.

ARTS AND SCIENCES

265 English Masterpieces: Donne through Blake (1600-1800) (5) AWSp
Includes Milton, Restoration plays, Pope, Swift, Fielding, Johnson, and others.

266 English Masterpieces: Wordsworth through Hardy (1800-1900) (5) AWSp
Includes Romantic and Victorian poets, novelists, and essayists.

267 American Masterpieces: Beginnings to 1900 (5) AWSp
Includes Edwards, Franklin, Thoreau, Hawthorne, Melville, Twain.

WRITING COURSES FOR MAJORS AND NONMAJORS

271, 272 Expository Writing (3,3) AWSp, AWSp

Practice in writing information and opinion papers to develop easy and effective expression. 272 is somewhat more advanced. Prerequisites, 101 and 102 or 103, or equivalent for 271; 271 for 272.

274, 275, 276 Verse Writing (5,5,5) A,W,Sp
Prerequisites, 101 and 102 or 103, or equivalent.

277, 278 Beginning Short Story Writing (3,3) AWSp, AWSp
Prerequisites, 101 and 102 or 103, or equivalent for 277; 277 or permission for 278.

Upper-Division Courses

To register in 300 and 400 courses in English and American Literature a student must have upper-division standing or the permission of the Chairman, Undergraduate Programs. (In general, permission will be granted only if the student has completed English 101 and 102 or 103, and one lower-division course in literature.) All 300 and 400 courses are for majors and nonmajors unless otherwise specified.

PERIOD COURSES

321 The Renaissance (5) W
Wyatt and Surrey, Spenser, the Humanists, Elizabethan prose. Alternates with 335.

322 Medieval and Renaissance English Drama Exclusive of Shakespeare (5) Sp
Marlowe, Greene, Webster, Jonson, and others. Alternates with 323.

323 English Drama: 1660-1800 (5) Sp
Restoration and eighteenth-century English drama. Dryden, Etherege, Wycherley, Congreve, Goldsmith, Sheridan, and others. Alternates with 322.

324 Shakespeare (5) AWSp
General survey. From five to seven or eight plays, including plays from the major periods and representing the major types.

325 Shakespeare (5) AWSp
Types of plays, to 1603 (including *Hamlet*).

326 Shakespeare (5) WSp
Types of plays, after 1603.

331 Literature: 1600-1660 (5) A
Donne, Herbert, Marvell, Bacon, Browne, Burton.

332 Milton (5) AWSp
Major poems and selected prose.

335 Restoration Literature: 1660-1700 (5) W
Dryden and other satirists and playwrights, diarists, and essayists. Alternates with 321.

336 Early Eighteenth-Century Literature (5) AWSp
Swift, Pope, Defoe, Addison, and Steele.

337 Later Eighteenth-Century Literature (5) WSp

Johnson, Boswell, dramatists, novelists, pre-romantic poets.

341 Romantic Poets (5) AWSp
Blake, Wordsworth, Coleridge.

342 Romantic Poets (5) AWSp
Keats, Shelley, Byron.

344 Victorian Poets (5) A
Tennyson, Browning, and others.

347 Nineteenth-Century Prose (5) W
Lamb, Hazlitt, Carlyle, Mill, Ruskin, Morris, Newman, Huxley.

348 Modern British Poetry: A Survey (5) Sp
Housman, Bridges, Yeats, Eliot, Auden, Thomas.

361 American Literature: Beginnings to 1800 (5) AWSp
Including Taylor, Edwards, Franklin.

362 American Literature: 1800-1865 (5) AWSp
Including Irving, Cooper, Poe, Hawthorne, Melville, Emerson, Thoreau.

363 American Literature: 1865-1914 (5) AWSp
Including Twain, James, Howells, Henry Adams, Norris, Crane, Dreiser.

364 American Poetry: Beginnings to 1900 (5) W
Poetry in Colonial America; romantic and later nineteenth-century poetry, including such figures as Bradstreet, Taylor, Freneau, Bryant, Poe, Whitman, Dickinson, Longfellow, and others.

365 American Poetry Since 1900 (5) Sp
Major twentieth-century American poets. Likely to be included are Robinson, Frost, Moore, Pound, Eliot, Crane, Cummings, Ransom, Stevens, Williams.

369 The Literature of Black America (5) W
Selected works by Afro-American writers, with emphasis on twentieth-century literature.

NONPERIOD COURSES FOR MAJORS AND NONMAJORS

374, 375 Beginning Playwriting (3,3) AWSp, AWSp

387 English Grammar (5) AWSp
Word forms, structures, and usages in the present-day English sentence.

388 Current English Usage (3)
Principles for deciding what constitutes good English in an individual's speech and writing.

390 The Bible as Literature (5) ASp
For nonmajors; English majors may use as elective beyond the 50 specified credits.

LITERARY TYPES

410 Types of Dramatic Literature: Comedy (5) W

Analysis of dramatic structures.

411 Types of Dramatic Literature: Tragedy (5) Sp

Analysis of dramatic structures.

413, 414, 415 Types of Contemporary Poetry (5,5,5) A,W,Sp

417 The English Novel (5) AWSp
Eighteenth century: Swift, Defoe, Richardson, Fielding, Smollett, Sterne.

418 The English Novel (5) AWSp
Early and middle nineteenth century: Scott, Austen, Brontes, Dickens, Thackeray.

419 The English Novel (5) AWSp
Later nineteenth century: Trollope, Eliot, Meredith, Hardy, the Naturalists, Conrad.

423 Romances and Folk Literature (5) W

424 The Popular Ballad (5) W
Extensive reading of the English and Scottish popular ballads. Origins, transmission, themes, and music of the ballad form.

PERIODS AND OTHER TOPICS

425 Chaucer (5) AWSp
Reading in the *Canterbury Tales* and other major works.

426 Utopias and Social Ideals (5)
More, *Utopia*; Bellamy, *Looking Backward*; Mill, *On Liberty*; Huxley, *Brave New World*, etc.

430 English Literature: 1900-1930 (5) ASp
Content will vary. Likely to be included are Joyce, Lawrence, Forster, Woolf, Huxley, Shaw, O'Casey, selected poets.

431 English Literature: Since 1930 (5) W
Content will vary. Likely to be included are Bowen, Orwell, Waugh, Cary, Greene, Powell, Green, Murdoch, Auden, Thomas.

434 American Literature: 1914-1945 (5) AWSp
Content will vary. Likely to be included are Anderson, Lewis, Cather, Robinson, O'Neill, Frost, Pound, Eliot, Cummings, Hemingway, Fitzgerald, Faulkner, Steinbeck, Hart Crane, Stevens.

435 American Literature: Since 1945 (5) AWSp
Content will vary. Likely to be included are Miller, Warren, Tennessee Williams, Bellow, Lowell.

437 Modern European Literature (5) AWSp
Content will vary. Likely to be included are Mann, Proust, Kafka, Gide, Hesse, Rilke, Valery, Lagerqvist, Pirandello, Moravia, Sartre, Camus, Beckett, Robbe-Grillet.

LANGUAGE AND WRITING

447 History of the English Language (5) ASp
Growth and development of the English language from Anglo-Saxon times to the present. Open to sophomores.

449 English Prose Style (5)
Analysis of the traits of language that contribute to the effects of writings in prose.

451 Advanced Expository Writing (5) Sp
Work in nonfiction, including short biographies, historical narrative, opinion articles. Prerequisite, 271 or 272, or permission.

453, 454, 455 Advanced Verse Writing (5,5,5) A,W,Sp
Prerequisite, 274 or 275 or 276 or permission.

457, 458 Advanced Short Story Writing (5,5) AWSp, AWSp
Prerequisite, 277, 278, or permission.

461, 462, 463 Novel Writing (5,5,5) A,W,Sp
Prerequisite, permission.

471 Introduction to the Folktale Among Literate Peoples (3) A
Techniques of classification, geographic-historical distribution, theories of origin and interpretations, and related areas of investigation of the oral prose folk narrative of literate peoples. Offered jointly with the College of Engineering as Humanistic-Social Studies 471. Prerequisite, senior standing.

480, 481 Current Developments in English Studies (5,5)

Emphasis on composition, practical criticism, language study, and selected readings in literature. Open only to teachers and teaching cadets. Prerequisite, teaching experience.

482 Current Developments in English Studies: Conference (3)**483 Special Topics in English for Teachers (1-3, max. 5)****490, 491 Major Conference (3,3) AWSp, AWSp**

Individual study by arrangement with instructor.

492H Major Conference for Honors (5) ASp

Individual study (reading, papers) by arrangement with the instructor. Required of, and limited to Honors seniors in English.

493, 494 Advanced Writing Conference (3-5, 3-5) AWSp, AWSp

Revision of manuscripts. Preliminary work on writing projects should be completed before entrance. Prerequisite, permission.

499 Special Studies in Literature (5, max. 10) AWSp

To be offered occasionally by visitors or resident faculty. To be utilized in honors program.

Courses for Graduates Only

Graduate standing in English, or permission, is required for registration in courses numbered above the 400 level.

505 Graduate English Studies (5)**506 Studies in Literary Genres (5, max. 15)****507, 508 Literary Criticism (5,5)****509 Methods of Contemporary Criticism (5)****510, 511, 512 The Renaissance and Spenser (5,5,5)****513 Shakespeare's Dramatic Contemporaries (5)****515, 516 Chaucer (5,5)****517, 518, 519 Shakespeare (5,5,5)****521, 522, 523 Seventeenth-Century Literature (5,5,5)****524, 525, 526 American Literature (5, max. 10 each)****527, 528 Studies in Medieval Literature (5,5)****530 The English Language (5)****531 Introductory Reading in Old English (5)****532 Advanced Reading in Old English (5)****533 Foundations of American English (5)****534 American English Dialectology (5)****535 Comparative Grammars (5)**

A study in detail of one or more systems of grammar besides traditional grammar. Prerequisite, teaching experience.

538, 539, 540 Early Nineteenth-Century Literature (5,5,5)**541, 542, 543 Victorian Literature (5, max. 10 each)****544, 545, 546 Eighteenth-Century Literature (5,5,5)****547 Rhetoric (5)****548 Twentieth-Century Literature (5)****553 Current Rhetorical Theory (5)**
Prerequisite, teaching experience.**561 English Literature, Beginnings to 1500 (5)**

Graduate survey for first-year graduate students.

562 English Literature, 1500-1660 (5)

Graduate survey for first-year graduate students.

563 English Literature, 1660-1780 (5)

Graduate survey for first-year graduate students.

564 English Literature, 1780-1900 (5)

Graduate survey for first-year graduate students.

565 American Literature, Beginnings to 1900 (5)

Graduate survey for first-year graduate students.

566 Anglo-American Literature, Twentieth Century (5)

Graduate survey for first-year graduate students.

580 Critical Approaches to Literary Texts (5)
Prerequisite, teaching experience.**582 Studies in American Literature and Art (5, max. 10)**

Aesthetic relations among the literary and visual arts in America: problems of common historical foundations, stylistic and iconographic analysis, and relations to cultural context. Offered jointly with the School of Art as Art History 582. Prerequisite, graduate standing and permission.

586 Graduate Writing Conference (5)**599 Special Studies in Literature (5, max. 15)****600 Independent Study or Research (*)****700 Thesis (*)****702 Degree Final (3)****800 Doctoral Dissertation (*)**

FAR EASTERN AND SLAVIC LANGUAGES AND LITERATURE—See Asian Languages and Literature

FAR EASTERN AND RUSSIAN INSTITUTE**Courses for Undergraduates****210 The Far East in the Modern World (5) AWSp**

DULL, GASSTER, HELLMAN, PALAIS, TAYLOR, TOWNSEND

Social, economic, and political problems of China, Japan, Korea, and Southeast Asia. Includes development of Russia as an Asiatic power, as well as the role of Western powers in the Far East. (Formerly 110, 310.)

220 Introduction to Russian and East European Studies (5) A

BOBA

Geographic setting, ethnic composition, religions, cultural pattern, economic problems, social and political institutions of Eastern Europe in the past and present.

240 Chinese Civilization (5) Sp

SHIH

China's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Chinese society.

242 Korean Civilization (5) A

PALAIS

Korea's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Korean society.

243 Russian Civilization (5) AWSp

ELLISON, SWAYZE

Russia's material civilization, including fine arts, literature, religion, and history; political, social, and legal institutions; and thought, in relation to the general development of Russian society.

280 Ancient Indian Civilization (5) A

CONLON

An introductory course dealing with the religions, literature, philosophy, politics, arts, and history of India from earliest times to the Muslim invasion. Offered jointly with the Department of History as History of Asia HSTAS 201.

281 Modern Indian Civilization (5) W

CONLON

An introductory course dealing with the Islamic impact, British conquest, and contemporary India. Emphasis on the rise of nationalism, social organization, and contemporary life and history. Offered jointly with the Department of History as History of Asia HSTAS 202.

290 History of China (5) A

DULL

From earliest times to the present; emphasis on development of Chinese society offered jointly with the Department of History as History of Asia HSTAS 251.

295 Introduction to Japanese Civilization (5) Sp

PYLE

Survey of Japan's political, social, and cultural development from early times to the present. Offered jointly with the Department of History as History of Asia HSTAS 221.

302 World Classics of the Orient (5) Sp

MC KINNON

Great works of Chinese, Indian, Japanese, and Korean literature and thought, read in English and taught by specialists in Far Eastern literature. Offered jointly with the Department of Comparative Literature as Comparative Literature 302. Prerequisite, junior standing.

305 Eastern Europe (5) W

VELIKONJA

Geography. An analysis of the physical, historical and socio-economic characteristics of Eastern Europe. Offered jointly with the Department of Geography as Geography 305.

313 East Asia (5) W

KAKIUCHI

Geography. Nature and geographic setting of Far Eastern civilization with reference to origins, development, and present outlines of settlement; cultures, resource use, and economic structures in China, Japan, and Korea. Offered jointly with the Department of Geography as Geography 313.

324 Survey of Soviet Society (5) A

SWAYZE

A survey of the political, economic, and social institutions, and the literature and fine arts of the Soviet Union.

332 Islands of the Pacific (3)

Geography. Analysis of major islands and groups with respect to resources, settlement, population composition; role in modern transportation and communications; current political status. Offered jointly with the Department of Geography as Geography 332.

333 Geographic Patterns of Soviet Development (5) A

JACKSON

Geography. The structure and trends of geographic development with particular emphasis on the distribution of population, the spatial structure of the economy and regional interaction. Offered jointly with the Department of Geography as Geography 333.

336 Regional Geography of China (5) W

CHANG

A study of the geographic foundations, the pattern of the cultural and economic developments and the interrelationships among the major regions of China with special emphasis on the role of the key agricultural and manufacturing areas in the economic growth of the country. Offered jointly with the Department of Geography as Geography 336. Prerequisite, 100 or permission.

343 Government and Politics of Southeast Asia (5) A

MC VEY

Analysis of the organization and functioning of government and politics in the countries of Southeast Asia, with attention given to the nature of the social and economic environments which condition them. Offered jointly with the Department of Political Science as Political Science 343. Prerequisite, 201; 203 recommended.

378 Russia in Asia (3) Sp

BOBA

Relations of tsarist Russia and the Soviet Union with eastern Asia.

385 Problems of Modern India (5)

CONLON

An analysis of the problems in the fields of social life, international and domestic politics, education, economics, and other areas that confront India today and which may determine her future. Offered jointly with the Department of History as History of Asia HSTAS 301.

401, 402 Marxism-Leninism in Modern Intellectual History (5,5) WSP

LEGTERS

401: Teachings of Marx and Engels in the nineteenth century. Analysis of Marxism as a doctrine. 402: Marxism-Leninism in the twentieth century. Reference to Lenin and Stalin. Prerequisites, modern European, German, or Russian history or political thought, or permission.

405 Problems of Eastern Europe (5) Sp

VELIKONJA

Analysis of selected geographical aspects of Eastern Europe. Natural and human resource base, social and political organization. Their relationships and interdependencies. Lectures, 3 credits; independent study, 2 additional credits. Offered jointly with the Department of Geography as Geography 405. Prerequisite, 305 or permission.

406, 407 Revolutionary Movements in Eastern Europe (3,3) W,Sp

LEGTERS

Historical analysis of the ideological and social character of revolutionary movements, chiefly nationalist and communist, in eastern Europe from 1848 to World War II.

412 Indian Philosophy (3) Sp

GEROW

A survey of the leading Indian traditional schools of philosophy and theology, with emphasis on the origins and growth of Vedānta. Offered jointly with the Department of Philosophy as Philosophy 412.

414 Chinese Political Thought (5) Sp

Theories of the Oriental state as exhibited in the writings of statesmen and philosophers. Offered jointly with the Department of Political Science as Political Science 414.

415 Chinese Philosophy (5) A

SHIH

Development of Chinese philosophy from the sixth century B.C. to modern times. Emphasis on Confucianism, Mohism, Taoism, Legalism, the Dialecticians, Buddhism, and Neo-Confucianism; re-evaluation of them in the light of new trends of thought after contact with the West. Offered jointly with the Department of Philosophy as Philosophy 415.

416 Neo-Confucianism (5) W

SHIH

Systematic study of Neo-Confucianism, its background and development with emphasis on the Rationalistic school of Ch'eng-Chu and the Idealistic school of Lu-Wang. Offered jointly with the Department of Philosophy as Philosophy 416. Prerequisite, 415 or permission.

420 Foreign Relations of the Soviet Union (5) W

RESHETAR

Ideological, historical, and strategic components of Soviet foreign policy; Comintern, Cominform, and international Communist movement; Soviet policy in foreign trade, international law and organization, and in specific geographic areas. Offered jointly with the Department of Political Science as Political Science 420.

421 Kievan and Muscovite Russia: 850-1700 (5) A

SZEFTEL

Development of Russia from earliest times to the reign of Peter the Great. Offered jointly with the Department of History as History of Europe HSTEU 443. Prerequisites, HST 111 and 112, or HST 113, or permission.

422 Imperial Russia: 1700-1900 (5) W

SZEFTEL, TREADGOLD

Development of Russia from Peter the Great to Nicholas II. Offered jointly with the Department of History as History of Europe HSTEU 444. Prerequisites, 421 or HST 111 and 112, or HST 113, or permission.

423 Twentieth-Century Russia (5) Sp

ELLISON, TREADGOLD

Russia and the USSR from Nicholas II to the present. Offered jointly with the Department of History as History of Europe HSTEU 445. Prerequisites, 422 or HST 111 and 112, or HST 113, or permission.

424 Modern Russian Intellectual History (5)

ELLISON, TREADGOLD

Development of Russian social and political thought and philosophy from the seventeenth

century to the Revolution of 1917. Offered jointly with the Department of History as History of Europe HSTEU 441.

426 Origins of the East European States (5) Sp

BOBA

Analysis of social, cultural, and political development among the Slavs and other peoples of Eastern Europe leading to the emergence of national states of the Middle Ages. Offered jointly with the Department of History as Ancient and Medieval History HSTAM 426. Prerequisites, HST 111 and 112, or HST 113, or permission.

427- Eastern Europe: 1772-1918 (5-) A

SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the first partition of Poland to the end of World War I. Offered jointly with the Department of History as History of Europe HSTEU 451-.

-428 Eastern Europe Since 1918 (-5) W

SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the end of World War I to the present. Offered jointly with the Department of History as History of Europe HSTEU 452.

429 International Relations in the Far East (5)

HELLMANN

Analysis of the relations among the nations of East and Southeast Asia in the context of the global international system. Offered jointly with the Department of Political Science as Political Science 429.

430 Survey of Mongol Culture (3) A

OKADA

Nomadic culture and tribal organization in ancient times; present state and cultural life of Mongolia.

431 Tibetan History (3)

WYLIE

A survey of the history of Tibet from earliest times to the present, with emphasis on the status and relations of Tibet in Asian affairs and the evolution of the political institutions of a "lama-ruler" state.

432 American Foreign Policy in the Far East (5) W

TAYLOR

Relationship to diplomacy, trade, and internal politics. Offered jointly with the Department of Political Science as Political Science 432.

433 Spatial Perception and Organization in the USSR (5)

JACKSON

Geography. Selected problems posed by a dynamic society and a conditionally limited resource base. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Geography as Geography 433. Prerequisite, 333 or permission.

434 Problems in the Geography of Southeast Asia (5)

Analysis of regional and political structures; resources, economic activities, and problems of development; overseas and internal relationships. Offered jointly with the Department of Geography as Geography 434.

435 Problems in the Geography of China (5) A
CHANG

Origins and development of Chinese civilization in its geographic base and areal spread; political China and the Chinese sphere; physical base and resources; problems of agriculture, population, industrialization, urbanization, transportation, and contemporary development; communist China. Offered jointly with the Department of Geography as Geography 435.

437 Problems in the Geography of Japan (3 or 5) Sp
KAKIUCHI

Regional structure of Japanese urban, industrial, and agricultural geography. Analysis of contemporary patterns considering cultural and physical factors and selected aspects of their historical development. Offered jointly with the Department of Geography as Geography 437.

438 Soviet Regions and Regionalization (3 or 5) Sp
JACKSON

An evaluation of prerevolutionary and Soviet efforts to determine a basis for subdividing Russia into regions, together with an analysis of contemporary Soviet regions and their economic development. Lectures, 3 credits; independent study, 2 additional credits, with permission of instructor. Offered jointly with the Department of Geography as Geography 438. Prerequisite, 333 or permission.

439 Japanese Government and Politics (5) A
HELLMANN

Government and politics of Japan with emphasis on the period since 1945. Offered jointly with the Department of Political Science as Political Science 435. (Formerly 345.)

441 Political Institutions of the Soviet Union (5) A
RESHETAR

Ideological and historical bases of Soviet politics; Leninism-Stalinism; Communist Party structure and functions; administrative agencies, the police and military; law and the judiciary; Soviet federalism and nationality policy. Offered jointly with the Department of Political Science as Political Science 441.

442 Government and Politics of China (5) A
TOWNSEND

Introduction to post-1949 government and politics, with emphasis on problems of political change in modern China. Offered jointly with the Department of Political Science as Political Science 442. (Formerly 344). Prerequisite, junior standing.

443 Chinese Social Institutions (5) W

General survey of traditional institutions and their changes in modern times.

444-445-446 Survey of Vietnamese Cultural History (3-3-3) A,W,Sp

Vietnam's material civilization—including fine arts, literature, religion, and thought—in relation to general development of Vietnamese society.

448 History of Russian Culture to 1800 (5) W
SZEFTTEL, TREADGOLD

The development of religion, political ideas, philosophical and literary theories, art, architecture, drama, and music from Kievan times to the end of the eighteenth century.

Offered jointly with the Department of History as History of Europe HSTEU 442. Prerequisites, 421 or HST 111 and 112, or HST 113, or permission.

449 Russian Historiography (5) Sp
SZEFTTEL

Offered jointly with the Department of History as History of Europe HSTEU 446. Prerequisites, 421 or HST 111 and 112, or HST 113, or permission.

450 Survey of Turkic Culture of Central Asia (3) Sp
BOBA

Nomadic culture of the Turks of Central Asia, their history, social organization, present state and cultural life under Soviet Russia's or China's dominance. Prerequisites, 210, Anthropology 202, or permission.

452 History of Early Japan (5) A
PYLE

Political, social, economic, and cultural development of Japan to the beginning of the Tokugawa period (seventeenth century). Offered jointly with the Department of History as History of Asia HSTAS 421.

453 History of Tokugawa Japan (5) W
PYLE

Feudal development prior to 1600; establishment of the Tokugawa political structure; and the social, economic, and cultural history of the period from 1600 to 1868. Offered jointly with the Department of History as History of Asia HSTAS 422.

454 History of Modern Japan (5) Sp
PYLE

Political, social, economic, and cultural development of Japan from the late Tokugawa period to the present, with special emphasis on the cultural impact of the West. Offered jointly with the Department of History as History of Asia HSTAS 423.

456 Japanese-American Relations (5) W
BUTOW

The confrontation between Japan and the United States from Perry to MacArthur, with emphasis on the period from 1905 to 1945. Offered jointly with the Department of History as General History HST 443. Prerequisite, permission of instructor.

461, 462, 463 Studies in Buddhism (5,5,5) A,W,Sp
HURVITZ

461: the principal religious and philosophical ideas of pre-Buddhist India as well as fundamental Hinayana and Mahayana ideas. 462: the growth of Buddhism in China. 463: the history of Japanese Buddhism after its transmission from China. Prerequisite, permission.

464 Tibetan Buddhism (3) A
WYLIE

A survey of the development of Buddhist philosophy and its amalgamation with the teachings of Bon, the pre-buddhist shamanism in Tibet. The resulting doctrines and phenomenology of Tibetan Buddhism are examined in depth.

465 Chinese History: Earliest Times to 221 B.C. (5) A
DULL

Pre-Imperial China. Offered jointly with the Department of History as History of Asia HSTAS 451. (Offered alternate years; offered 1970-71.)

466 Chinese History: 221 B.C. to A.D. 906 (5) W
DULL

Development of the imperial Chinese state. Offered jointly with the Department of History as History of Asia HSTAS 452. (Offered alternate years; offered 1970-71.)

467 Chinese History: A.D. 906 to A.D. 1840 (5) Sp
DULL

The Wu Tai, Sung, Yuan, Ming, and early Ch'ing periods. Offered jointly with the Department of History as History of Asia HSTAS 453. (Offered alternate years; offered 1970-71.)

468 History of Modern China (5) Sp
GASSTER

China from approximately 1800 to the present, with major emphasis on political and intellectual history since 1895. Focuses on the processes of modernization and revolution and the relationship between them. Offered jointly with the Department of History as History of Asia HSTAS 454.

469, 470 History of Korea (5,5) W,Sp
PALAIS

A survey of Korean history from earliest times to the modern period. Offered jointly with the Department of History as History of Asia HSTAS 469, 470. Prerequisite, permission.

472 Introduction to Buddhism (3)

The basic doctrines: I. The Conditioned World. II. Its Origins. III. The Unconditioned World. IV. The Path Which Leads From One World to the Other and The Persons Who Use It. Prerequisite, permission.

473 Readings in the Prajnaparamita Literature in English (5, max. 10)
HURVITZ

Study of texts in the following sequence: *The Heart of Sutra*, *The Diamond Sutra*, selected passages from *The Large Sutra on Perfect Wisdom*. Prerequisite, permission.

476 Western Influences in Russian and Chinese Intellectual History (4)
TREADGOLD

Comparative analysis of stages of Western impact on Russian (1462-1917) and Chinese (1582-1949) thought prior to the proclamation of Marxism-Leninism as their official ideologies. Offered jointly with the Department of History as History of Asia HSTAS 476.

478 Introduction to Southeast Asian Linguistics (3) A
COOKE

Survey of language families of Southeast Asia. Typology and relationships. Research needs and problems. Offered jointly with the Department of Linguistics as Linguistics 478. Prerequisites, Linguistics 452, 462.

482 History of India: Earliest Times to A.D. 647 (5) W
CONLON

India in ancient times; emphasis on forms of political organizations and economic life, social organizations and cultural developments. Offered jointly with the Department of History as History of Asia HSTAS 401. Prerequisite, 201 or permission.

483 History of India: A.D. 647 to A.D. 1525 (5)
CONLON

Medieval India; emphasis on forms of political organizations and economic life, social

organizations, and cultural developments. Offered jointly with the Department of History as History of Asia HSTAS 402.

484 History of India: A.D. 1525 to the Present (5) Sp
CONLON

Modern India; emphasis on forms of political organizations and economic life, social organizations and cultural developments. Offered jointly with the Department of History as History of Asia HSTAS 403. Prerequisite, 202 or permission.

485 Ancient Indian Politics (3) A
CONLON

Emphasizes the role of kingship, administration of justice, principles of statecraft, economic aspects, and the role of society within the political framework. Offered jointly with the Department of History as History of Asia HSTAS 404. Prerequisite, 201 or permission.

489 Russian and East European Bibliography (5) W
BOBA

Analysis of bibliographical problems in the social sciences and humanities. For seniors and graduate students. Offered jointly with the Department of History as History of Europe HSTEU 447. Prerequisite, one East European language or German.

493 Economy of Modern China (5) W
MAH

Economic development of contemporary China, with special emphasis on the objectives, performance, and problems of the mainland Chinese economy under the Communist regime. Offered jointly with the Department of Economics as Economics 493. Prerequisites, Economics 200, 201.

495 Special Studies in the Theatre Arts of Asia (3, max. 9)
MCKINNON AND VISITING ARTISTS

Fundamentals in the theory and practice of the theatre arts of Asia. The study of a given form or tradition of theatre art in any one quarter will depend on the visiting artists and the idioms of their choice. Offered jointly with the School of Drama as Drama 495.

496H The Thought and Arts of Russia (5) W
SWAYZE

Honors Program seminar. Prerequisite, permission of College of Arts and Sciences Honors Program adviser.

499 Undergraduate Research (3-5, max. 15)
AWSp

For Far Eastern majors. Prerequisite, permission.

Courses for Graduates Only

500 Research Seminar on Asian Arts (3-5, max. 15)
MCKINNON, ROGERS

An interdisciplinary inquiry into the history, aesthetics, and forms of Asian Arts. Prerequisite, permission.

501 Seminar on Buddhist Terminology (5, max. 15)

The meaning of Buddhist technical terms will be determined chiefly from authoritative commentaries.

504 Seminar on the Modernization of Japan (5) A
HELLMANN, PYLE

Historical and theoretical approach to social, political, economic, and psychological problems of modernization in Japan. Offered

jointly with the Department of Political Science as Political Science 504 and with the Department of History as History of Asia HSTAS 526. Prerequisite, permission.

505 Research Seminar: China and Northeast Asia (3, max. 6) WSp
CHANG

Geography: Offered jointly with the Department of Geography as Geography 505.

506 Research Seminar: Southeast Asia (3, max. 6) AW

Geography: Offered jointly with the Department of Geography as Geography 506.

507 Research Seminar: Soviet Union (3, max. 6) AW
JACKSON

Geography: Offered jointly with the Department of Geography as Geography 507.

509 Research Seminar: Japan (3, max. 6) W
KAKIUCHI

Geography: Offered jointly with the Department of Geography as Geography 509.

510 Seminar on Soviet Literary Politics (5) Sp
SWAYZE

Examination of literary policies of the Soviet regime and their impact on Soviet belles-lettres. Prerequisites, History of Europe HSTEU 445 or Political Science 441. Russian 421, or permission. Reading knowledge of Russian desirable.

511-512-513 Seminar in Chinese History: Modern Period (3-6)-(3-6)-(3-6) A,W,Sp
GASSTER

Offered jointly with the Department of History as History of Asia HSTAS 556-557-558. Prerequisites, reading knowledge of Chinese and permission. (Formerly 611-612-613.)

514 Chinese History: Modern Period (3-6) W
GASSTER

Designed to introduce students to Western language materials dealing with the history of modern China. In addition to giving students bibliographical guidance to help them prepare for field examinations, the course seeks to familiarize students with the major issues being dealt with in current scholarship on modern China. Offered jointly with the Department of History as History of Asia HSTAS 555. (Formerly 614.)

516 Chinese History: Traditional Period (3-6) Sp
DULL

To introduce students to western language materials on traditional China in order to give the students bibliographical and other assistance in preparing for examinations in this field in history. Offered jointly with the Department of History as History of Asia HSTAS 551.

520 Seminar on the Foreign Policy of the Soviet Union (3) Sp
RESHETAR

Selected topics in the development, methods, and objectives of the foreign policy of the Soviet Union. Offered jointly with the Department of Political Science as Political Science 520. Prerequisite, permission.

521, 522, 523 Seminar: Introduction to the Interdisciplinary Study of China (3,3,3) A,W,Sp
TAYLOR, GASSTER

525, 526 Seminar on Far Eastern Diplomacy (3,3) W,Sp

528 History of Eastern Europe: 1772-1939 (5)
SUGAR

A study of the East-Central European region: Poland, Czechoslovakia, Hungary, Rumania, and the Balkan countries, from their rebirth to World War II. Offered jointly with the Department of History as History of Europe HSTEU 551. Prerequisite, reading knowledge of German, French, Russian, or one East European language.

530 Seminar on China (3, max. 6) Sp
DULL, WILHELM

Problems of Chinese history. Prerequisite, permission.

532-533 Seminar on Contemporary Chinese Politics (3-3) W,Sp
TOWNSEND

Advanced reading and research on the political institutions and processes of post-1949 China. Offered jointly with Political Science as Political Science 532-533. Prerequisite, permission; reading knowledge of Chinese desirable.

534 Modern Russian History (3-6) A
ELLISON, TREADGOLD

Graduate field course. Offered jointly with the Department of History as History of Europe HSTEU 544.

535-536-537 Seminar on Modern Russian History (3-6)-(3-6)-(3-6) A,W,Sp
ELLISON, TREADGOLD

Offered jointly with the Department of History as History of Europe HSTEU 545-546-547. Prerequisite, reading knowledge of Russian.

539 Medieval Russian History (3-6) Sp
SZEFTEL

Offered jointly with the Department of History as History of Europe HSTEU 541. Prerequisites, 421, 448, or permission; Russian or French, and German.

541 The Soviet Political System (4) A
RESHETAR

Critical appraisal of the principal research methods, theories, and types of literature dealing with the government and politics of the Soviet Union. Offered jointly with the Department of Political Science as Political Science 541. Prerequisite, permission.

545 Seminar on Japanese Government and Diplomacy (3, max. 6) W
HELLMANN

Offered jointly with the Department of Political Science as Political Science 545.

546-547 Seminar on Medieval Russian History (3-6)-(3-6) A,W
BOBA, SZEFTEL

Offered jointly with the Department of History as History of Europe HSTEU 542-543. Prerequisite, reading knowledge of Russian.

548 History of Eastern Europe: 1939 to the Present (5)
SUGAR

Offered jointly with the Department of History as History of Europe HSTEU 552. Prerequisite, reading knowledge of one major European language or one East European language.

549 Japan as a World Power, 1895-1945

(3-6) Sp

BUTOW

Field course. Offered jointly with the Department of History as History of Asia HSTAS 522. Prerequisite, permission of instructor.

550 War and Diplomacy: The Totalitarian Challenge, 1931-1945 (3-6) AW

BUTOW

A field course in the diplomacy of the Second World War with emphasis on the confrontation between the United States and the Axis Powers. Offered jointly with the Department of History as General History HST 543. Prerequisite, permission of instructor.

551-552 Seminar in War and Diplomacy: The Totalitarian Challenge, 1931-1945 (3-6)-(3-6) W,Sp

BUTOW

The diplomacy of the Second World War with particular reference to the confrontation between the United States and the Axis Powers. Offered jointly with the Department of History as General History HST 544-545. Prerequisite, permission of instructor.

554 Japan in the Twentieth Century (3-6) Sp

BECKMANN

Offered jointly with the Department of History as History of Asia (HSTAS) 525.

556-557-558 Seminar in Chinese History: Traditional Period (3-6)-(3-6)-(3-6) A,W,Sp

DULL

Offered jointly with the Department of History as History of Asia HSTAS 552-553-554. Prerequisites, reading knowledge of Chinese and permission.

560-561-562 Seminar on Modern East European History (3-6)-(3-6)-(3-6) A,W,Sp

SUGAR

Study and research involving special methods dealing with the histories of the East European countries in the modern period. Offered jointly with the Department of History as History of Europe HSTEU 553-554-555.

563 Modern Japanese History (3-6) A

PYLE

Field course. Offered jointly with the Department of History as History of Asia HSTAS 521. Prerequisites, 453, 454, or permission. (Formerly 559.)

564,565 Seminar in Modern Japanese History (3-6), (3-6) W,Sp

PYLE

Offered jointly with the Department of History as History of Asia HSTAS 523, 524. Prerequisite, permission.

566 Research Seminar in Modern Korea (3-6) A

PALAIS

Advanced instruction in problems and methods of research in Korean history. Prerequisite, permission. Offered jointly with the Department of History as History of Asia HSTAS 566.

567-568-569 Seminar in Korean History (3-6)-(3-6)-(3-6) A,W,Sp

PALAIS

Selected topics in Korean history and historiography. Offered jointly with the Department of History as History of Asia HSTAS 571-572-573. Prerequisite, permission of instructor.

570 Modern Korean History (3-6) Sp

PALAIS

Field course. Offered jointly with the Department of History as History of Asia HSTAS 570. Prerequisites, Far Eastern 470 (HSTAS 470) or permission.

571 Early Middle Ages (3-6) W

BOBA

Field course. Survey of early European history through the times of tribal migrations and invasions from Asia. Problems and methods of research. Offered jointly with the Department of History as Ancient and Medieval History HSTAM 530.

578 Seminar in Southeast Asian Linguistics (3, max. 9) A

COOKE

Advanced consideration of specialized problems in Southeast Asian Linguistics. Reports on individual research. Offered jointly with the Department of Linguistics as Linguistics 578.

583 Research in the U.S.S.R. (3-6) S

A course especially designed to assist graduate students who expect to do historical research in the Soviet Union, providing both disciplinary training and an introduction to the special problems of field research in Soviet archives and libraries. Offered jointly with the Department of History as History of Europe HSTEU 583. Prerequisite, graduate standing; knowledge of Russian desirable.

587 Indian History (3-6)

CONLON

Offered jointly with the Department of History as History of Asia HSTAS 501. Prerequisite, permission.

595 Soviet Economics (3) A

THORNTON

Analysis of problems of economic measurement, economic development, optimum resource allocation, national income, and planning in the Soviet Union. Offered jointly with the Department of Economics 595. Prerequisite, permission.

598 Inner Asia Research Colloquium

(5, max. 15) AWSp

CIRTAUTAS, OKADA, WYLIE

A research seminar whose geographical focus is the area comprising Tibet, Mongolia, and Turkestan. Prerequisite, permission.

599 Colloquium on Chinese History Research (5, max. 15) AWSp

BRIM, CHANG, CHEUNG, DULL, GASSTER,

MAH, SHIH, TAYLOR, TOWNSEND, WILHELM

A research seminar that deals with various aspects of Chinese society, modern and contemporary. Prerequisite, permission.

600 Independent Study or Research (*)

FRENCH—See Romance Languages and Literature

GENERAL STUDIES**300H Honors Colloquium (Humanities) (2, max. 6) W**

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

301H Honors Colloquium (Social Science)

(2, max. 6)

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

302H Honors Colloquium (Science)

(2, max. 6)

Discussion of selected topics in a variety of subject matter fields. Topics and reading material vary from year to year. Open to juniors and seniors in the College of Arts and Sciences Honors Program. Prerequisite, permission.

391 Supervised Study in Selected Fields

(*, max. 6) AWSp

Special supervised study in a field represented in the College of Arts and Sciences. Prerequisites, permission of major department, supervisor of study, and General Studies Office.

455-456 Critical Problems of Our Culture (3-3) W,Sp

Two interdisciplinary courses for seniors, in which faculty from several departments discuss the critical problems of our culture as seen from their various specialties. Prerequisite, senior standing; juniors by permission.

492 Latin-American Studies Seminar (5)

A proseminar, primarily for Latin-American Studies majors, involving readings and research on a broad topic concerning Latin America. Prerequisite, senior in Latin-American Studies major or permission.

493 Senior Study (1-5) AWSp

For General Studies majors only. Prerequisites, permission of supervisor of study and General Studies Office.

GENETICS**Courses for Undergraduates****351 Human Genetics: The Individual and Society (3) W**

GARTLER

A discussion of the genetic factors pertinent to problems confronting the individual and society. The genetic consequences of population structure and of environmental contamination, and the genetic components of disease, intelligence, and behavior, are some of the topics to be discussed. This course is appropriate for nonscience majors and is not recommended as a substitute for Genetics 451 for majors in biological sciences. Open for credit to all upper-division students who have not taken 451 or the equivalent.

451 Genetics (4) AWSp

HARTWELL, SANDLER, STADLER, ROMAN

A general course recommended for majors in the biological sciences and for those other students who are interested in the role of genetics in modern biology. Prerequisite, 10 credits in the biological or physical sciences or mathematics.

452 Advanced Genetics (3)

SANDLER

A discussion course designed to follow 451. For students outside the field of genetics with an interest in further examining selected topics in general genetics. Prerequisite, 451. (Offered alternate years; offered 1971-72.)

499 Undergraduate Research (*) AWSpS

Prerequisite, permission.

Courses for Graduates Only

501 Introduction to Research Materials (3, max. 9) AWSp

The student is assigned to one of the several research areas of the Department, to work with a research group for a quarter at a time. Prerequisite, graduate standing in the Department of Genetics, or permission.

520 Seminar (1, max. 15) AWSp Prerequisite, permission.

531 Problems in Human Genetics (2) W MOTULSKY

An advanced course in human genetics emphasizing modern aspects and research methods. Prerequisites, 451, or permission. (Offered alternate years; offered 1971-72.)

551 Genetics of Microorganisms (3) A STADLER

The contributions of research with microorganisms are discussed in relation to basic genetic concepts. Prerequisite, 451 or permission.

552 Molecular Genetics (3) W HALL

Recent advances in our understanding of the molecular bases of heredity: the structure of DNA, bacterial transformation, biochemical studies of DNA replication, mutagenesis, and recombination. Prerequisite, 551 or permission.

553 Gene Action (3) Sp GALLANT

Gene function, with emphasis on the biochemical mechanisms involved: transcription and translation of genetic information; regulation of gene function. Prerequisite, 552 or permission.

554 Topics in Genetics (2, max. 6) AWSp Current problems and research methods. Prerequisite, permission.

555 Bacteriophage Experiments (4) W DOERMANN

A sequence of laboratory experiments to familiarize students with current materials and methods of investigating genetic structure, replication, recombination, and mutation in virulent bacteriophages. Prerequisite, permission.

556 Bacteriophage Genetics (2) Sp DOERMANN

Inheritance mechanics of bacteriophages and structure and function of their apparatus will be discussed. Molecular models derived from genetic data will be emphasized. Prerequisite, permission.

561 Chromosomal Behavior (3) W SANDLER

Properties of chromosomes with special emphasis on recombination and segregation. Prerequisite, permission. (Offered alternate years; offered 1970-71.)

562 Population Genetics (3) Sp FELSENSTEIN

Mathematical and experimental approaches to the genetics of natural populations, especially as they relate to evolution. Prerequisite, permission.

583 Methodology in Biochemical Genetics (2) Sp HALL

Experiments and discussion sections on modern research techniques used in biochemical genetics. Prerequisite, permission.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

GEOGRAPHY

Courses for Undergraduates

Prerequisites: In addition to specified prerequisites for individual courses, students should also meet the general course level requirements as indicated by the numbers except where they may have special preparation or background in geography or in related fields.

INTRODUCTION TO GEOGRAPHY

100 Introduction to Geography (5) AWSp
Major concepts and methods in the field; analysis of selected problems and types of regions. Honors sections available for honors students by permission.

200 Introduction to Human Geography (5) W VELIKONJA

Survey of noneconomic components of patterns and systems of human occupancy of the world. Emphasis on cultural processes, dynamic change, functional relations and networks. No prerequisite; Geography 100 recommended.

INTRODUCTION TO FIELDS IN GEOGRAPHY

205 Physical Geography (5) ASp ROMANOWSKI

Survey of character and location of different types of land forms, climates, soils, vegetation, minerals, and water resources; their significance to human occupancy.

207 Economic Geography (5) AWSp BEYERS, BOYCE, THOMAS

Introductory analysis of the spatial order and changing locational patterns of man and his economic activities. Emphasis placed on concepts and theories pertaining to primary, secondary, and tertiary production, to transportation, and to the geography of consumption. Special attention given to cities and the distribution of activities within cities.

227 Historical Geography of Black America (3) A DONALDSON, MORRILL

Study of the historical processes of Afro-American migration and segregation in Afro-American settlement patterns in the United States; study of theories of the human use of space as related to Afro-American migration and settlement.

258 Maps and Map Reading (2) AWSp HEATH, SHERMAN

Categories of maps and aerial photographs and their special uses; map reading and interpretation.

277 Geography of Cities (5) Sp BOYCE

Survey of the spatial and functional orderliness of cities; their location, distribution, function, and spread. Particular emphasis on current urban problems—sprawl, city decline, and metropolitan transportation.

INTERMEDIATE AND ADVANCED COURSES

300 Advanced Regional Geography (5) Sp BACON

The region viewed as a major concept in geography. An intensive examination of major physical and biotic regions seen in the light of

human occupancy patterns. Prerequisite, 100 or upper-division standing.

SYSTEMATIC FIELDS

315 Agricultural Geography (5)

ROMANOWSKI

Survey of the physical, social, and economic elements comprising agriculture and their variation in time and space. Prerequisite, 207 or permission.

325 Historical Geography of America (3) A BACON

Exploration, migration routes, pioneer settlement, and the moving frontier in relation to geographical phenomena. Criteria for differential development of regional cultures.

370 Conservation of Natural Resources (5) ASp COOLEY

Principles and practices in effective utilization of resources; public policies relating to conservation.

375 Political Geography (5) A JACKSON, VELIKONJA

A study of the spatial variations and interrelationships of political activities and systems.

416 Urban Economics (5) Sp BISH

The application of economic analysis to urban trends, problems, and prescriptions, such as changing urban form and function, urban public finance, housing and renewal, poverty and race, transportation, and environmental problems. Offered jointly with the Department of Economics as Economics 416. Prerequisite, Economics 300 or 400.

440 Manufacturing (3 or 5) BEYERS, THOMAS

Analysis of linkages, structure, and distribution of manufacturing; study of selected industries focusing attention on factors which influence their development and location. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

441 Geography and Industrial Change (3 or 5) A THOMAS

Analyses of changes in the spatial and structural components of industrial activity patterns. Attention also focused on understanding the nature and influences of dominant forces affecting industrial change. Examples drawn primarily from North America and Western Europe. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

442 Social Geography (3 or 5) A MORRILL, VELIKONJA

Spatial patterns of population distribution and settlement; of migration and the spread of ideas; of social characteristics and social relations; social regions. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

444 Geography of Water Resources (3 or 5) W MARTS

Analysis and appraisal of water resources in land and industrial development; problems and policies of river basin planning with emphasis on the Pacific Northwest. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

448 Geography of Transportation (3) W ULLMAN

Circulation geography, principles of spatial interaction emphasizing commodity flow, the

nature and distribution of rail and water transport, the role of transport in area development. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

449 Geography of Ocean Transportation (3 or 5)
FLEMING

Geographic analysis of ocean trade routes, cargo and passenger flows, and port activities. Evaluation of the role of the transportation carrier in international trade. Lectures, 3 credits; independent study, 2 additional credits. Prerequisite, 207 or permission.

450 Theories of Location (5)
MORRILL, BEYERS

Principles governing location decisions. Spatial behavior of individual activities. Spatial equilibrium of sets of activities and settlements, and associated networks and movements: central services, manufactures, agriculture and trade.

451 Regional Planning and Development (3 or 5) Sp
THOMAS

Emphasis placed primarily on the process of implementing regional development policies in economically advanced and lesser developed countries. Resultant changes which occur in the distribution and structure of economic activities and settlement patterns are also studied and evaluated. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor. Offered jointly with the Department of Urban Planning as Urban Planning 451.

475 Problems in Political Geography (5) W
JACKSON, VELIKONJA

Selected problems of spatial patterns and dynamic relationships. Geographical problems of regional, national, and international organization. Lectures, 3 credits; independent study, 2 additional credits. Prerequisite, 375 or permission.

477 Urban Location and Structure (3) A
ULLMAN

Analysis of urban and other agglomerated settlements in terms of nature, economic base, site and situation, distribution, supporting areas, and new trends in metropolitan form and arrangements. Lectures, 3 credits; independent study, 2 additional credits with permission of instructor.

478 Urban Spatial Patterns (3) W
BOYCE

Analysis of intra-urban land-use patterns and structure; particular attention to locational theories pertaining to population, land-use linkages, rents, gradients, and normative spatial relationships. Prerequisite, upper-division standing.

REGIONAL FIELDS

301 Anglo-America (5)

Examination of the United States-Canada resource base and geographical implications of economic activities. Geographical aspects of contemporary problems and the future development of both countries. (Not offered 1970-71.)

302 The Pacific Northwest (3) AWSp
BEYERS

Survey of the economy of the Pacific Northwest in the light of factors of location, resources, resource-oriented industries, and re-

source policies. An introduction to regional studies on a local scale.

304 Western Europe (5) A
FLEMING

An analysis of the physical and socio-economic characteristics of Western Europe. Contemporary political and economic integration trends are evaluated in their regional context.

305 Eastern Europe (5) W
VELIKONJA

An analysis of the physical, historical, and socio-economic characteristics of Eastern Europe. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 305.

306 Africa (5)

Historical and economic geography, emphasizing the role of natural resources in settlement and economic development; problems of colonization, the foundations of commercial agriculture, and trends in industrial development. (Not offered 1970-71.)

307 Australia and New Zealand (5)

Pastoral and agricultural development; industrial potential; urbanization; immigration and trade policies; external economic and political relations. (Not offered 1970-71.)

308 Latin America (5)

Present and future development and problems of Caribbean and South America in terms of their natural resources, economic activities, and ethnic and settlement patterns. (Not offered 1970-71.)

313 East Asia (5) W
KAKIUCHI

Nature and geographic setting of Far Eastern civilization with reference to origins, development, and present outlines of settlement; cultures, resource use, and economic structures in China, Japan, and Korea. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 313.

332 Islands of the Pacific (3)

Analysis of major islands and groups with respect to resources, settlement, population composition; role in modern transportation and communications; current political status. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 332. (Not offered 1970-71.)

333 Geographic Patterns of Soviet Development (5) A
JACKSON

The structure and trends of geographic development, with particular emphasis on the distribution of population, the spatial structure of the economy and regional interaction. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 333.

336 Regional Geography of China (5) W
CHANG

A study of the geographic foundations, the pattern of the cultural and economic developments, and the interrelationships among the major regions of China with special emphasis on the role of the key agricultural and manufacturing areas in the economic growth of the country. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 336. Prerequisite, 100 or permission.

402 United States (5) Sp
MORRILL

The spatial pattern of economic and social life in America—how it evolved, the role of

the environment and resources; problems of regional inequality in development.

404 Problems in the Geography of Western Europe (3 or 5) Sp
FLEMING

Emphasis on problems stemming from contemporary political and socioeconomic changes underway in Europe. Topics include urbanization, regional development, economic integration, and patterns of trade. Lectures, 3 credits; independent study, 2 additional credits, with permission of instructor.

405 Problems of Eastern Europe (5) A
VELIKONJA

Analysis of selected geographical aspects of Eastern Europe. Natural and human resource base, social and political organization. Their relationships and interdependencies. Lectures, 3 credits; independent study, 2 additional credits, with permission of instructor. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 405. Prerequisite, 305 or permission.

433 Spatial Perception and Organization in the USSR (5)

JACKSON, ROMANOWSKI

Russian and Soviet views of the world, of man and society, and of the spatial structuring of the Soviet system. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 433. Prerequisite, 333 or permission.

434 Problems in the Geography of Southeast Asia (5)

Analysis of regional and political structures; resources, economic activities, and problems of development; overseas and internal relationships. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 434.

435 Problems in the Geography of China (5) A
CHANG

Origins and development of Chinese civilization in its geographic base and areal spread; political China and the Chinese sphere; physical base and resources; problems of agriculture, population, industrialization, urbanization, transportation, and contemporary development; communist China. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 435.

437 Problems in the Geography of Japan (3 or 5) Sp
KAKIUCHI

Regional structure of Japanese urban, industrial, and agricultural geography. Analysis of contemporary patterns considering cultural and physical factors and selected aspects of their historical development. Lectures, 3 credits; independent study, 2 additional credits, with permission of instructor. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 437.

438 Soviet Regions and Regionalization (3 or 5) Sp
JACKSON

An evaluation of prerevolutionary and Soviet efforts to determine a basis for subdividing Russia into regions, together with an analysis of contemporary Soviet regions and their economic development. Lectures, 3 credits; independent study, 2 additional credits, with permission of instructor. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 438. Prerequisite, 333 or permission.

439 Historical Geography of Kansai (3)

KAKIUCHI

Analysis of spatial patterns of cultural pictures in historical perspective. Both the geographical structure of the Kansai region, and its role in the geography of Japan will be discussed, based on lectures and frequent field trips. (Offered in conjunction with the School of Art's Kansai-Study-Aboard Program.) Selected participants.

CARTOGRAPHY

360 Principles of Cartography (5) ASp

HEATH, SHERMAN

Map scales, grid systems, symbolism, and map reproduction. Laboratory experience in application of these principles to map design and construction.

361 Experimental Cartography (5) A

HEATH, SHERMAN

Application of and experimentation with cartographic techniques and materials. Problems of relief representation, mapping of quantitative data, and their relation to reproduction processes. Prerequisite, 360.

363 Aerial Photographs as Source Materials (3) A

HEATH

Training in the use of aerial photographs as source materials in map compilation and other geographic purposes. Prerequisite, 360.

430 Map Projections (3) W

VERESS

Classification of projections, theory of distortion. Projection from ellipsoid to sphere. Theory of conformal projections (Lambert, Mercator, Stereographic). Equal area projections. Polyconic and other projections. Offered jointly with the Department of Civil Engineering as Transportation, Construction, and Materials Engineering CETC 430. Prerequisite, permission.

458 Map Intelligence (3) W

SHERMAN

Analysis and appraisal of United States and foreign maps and atlases; mapping agencies, coverage, organization, and indexing; symbolism, scales, projections, and military grids; map library problems and operation.

462 Problems in Map Compilation and Design (5) Sp

HEATH, SHERMAN

Application and analysis of map intelligence procedures as related to map compilation. Measurement and experimental study of psycho-physiological factors in design of map elements. Prerequisite, 360.

464 Problems in Map Reproduction (3) W

HEATH

Processes and photographic techniques applicable to cartographic and geographic presentations. Prerequisite, 360.

GEOGRAPHY AND EDUCATION

467 Geography in the Social Studies Curriculum (3) S

BACON

A discussion of the concepts and content of geography essential to effective social studies curricula. Offered jointly with the College of Education as Education Curriculum and Instruction EDC&I 467. (Formerly 475GJ.)

INTRODUCTORY RESEARCH TECHNIQUES

426 Statistical Measurement and Inference (5) A

MORRILL

Identification of geographic problems and

selection of data; tests of simple hypotheses; applications of unequation, simultaneous equation, and variance models; evaluation of findings. Prerequisite, an introductory course in statistics or permission.

490 Field Research (6, max. 12)

Development and application of skills essential to geographic field investigations: (1) training in the use of field techniques and base materials; (2) evaluation of these in a variety of research situations; (3) analysis and interpretation of field data; and (4) presentation of results of field investigations.

499 Special Studies (*, max. 15) AWSp

Supervised reading programs, undergraduate and graduate library and field research; special projects for undergraduate honors students. Prerequisite, senior class or graduate standing by permission.

Courses for Graduates Only

500 Contemporary Geographic Thought (3, max. 6) AW

501 Geographic Analysis (3)

502 Professional Writing in Geography (*, max. 6) Sp

503 Research Seminar: Eastern Europe (3, max. 6) Sp

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 503.

504 Research Seminar: Western Europe (3, max. 6) Sp

FLEMING, VELIKONJA

505 Research Seminar: China and Northeast Asia (3, max. 6) WSp

CHANG

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 505.

506 Research Seminar: Southeast Asia (3, max. 6) AW

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 506.

507 Research Seminar: Soviet Union (3, max. 6) AW

JACKSON

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 507.

508 Research Seminar: Historical Geography of Anglo-America (3, max. 6)

509 Research Seminar: Japan (3, max. 6) W

KAKIUCHI

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 509.

510 Research Seminar: Settlement and Urban Geography (3, max. 9) W

BOYCE, ULLMAN

516 Seminar in Urban-Regional Economics (3) Sp

Selected topics in urban and regional analysis with special attention to empirical testability of theoretical analysis. Offered jointly with the Department of Economics as Economics 516. Prerequisites, Economics 300 and 301.

520 Research Seminar: Cartography (3, max. 6) Sp

HEATH, SHERMAN

526 Research Seminar: Quantitative Methods in Geography (3, max. 6) W

MORRILL

527 Information Systems for Planning and Research (3) A

HORWOOD

Computer programming technology and data

systems design for large scale data inputs. Machine editing, data manipulation, and information retrieval. Laboratory problems adapted to specialized interests of students. No previous computer programming experience required. Offered jointly with the Departments of Civil Engineering as Transportation, Construction, and Materials Engineering CETC 527 and Urban Planning as Urban Planning 527.

528 Automated Mapping and Graphing (3) W

HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with the Departments of Civil Engineering as Transportation, Construction, and Materials Engineering CETC 528 and Urban Planning as Urban Planning 528. Prerequisites, basic statistics and 527, or permission.

529 Computer Applications to Urban and Regional Analysis (3) Sp

HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with the Departments of Civil Engineering as Transportation, Construction, and Materials Engineering CETC 529 and Urban Planning as Urban Planning 529. Prerequisite, 528 or permission.

530 Research Seminar: Geography and Development (3, max. 6) A

THOMAS

Offered jointly with the Department of Urban Planning as Urban Planning 530.

538 Research Seminar: Geography of Transportation (3, max. 6)

ULLMAN

539 Research Seminar: Utilization of Water Resources (3, max. 6)

540 Research Seminar: Industrial Geography (3, max. 6) Sp

THOMAS

542 Research Seminar: Social and Population Geography (3, max. 6) W

MORRILL, VELIKONJA

Prerequisite, graduate standing.

551 Regional Planning Seminar (3)

THOMAS

Regional planning and development theories and methodologies. Critical evaluation of regional planning in selected "economically advanced" and "lesser developed countries." Offered jointly with the Department of Urban Planning as Urban Planning 551. Prerequisites, 451 and graduate standing.

570 Research Seminar: Natural Resources Analysis (3, max. 6) W

COOLEY

Prerequisite, graduate standing.

575 Research Seminar: Political Geography (3, max. 6)

VELIKONJA

577 Research Seminar: Internal Spatial Structure of Cities (3, max. 9) ASp

BOYCE

Prerequisite, 478 or permission.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

GEOLOGICAL SCIENCES**Courses for Undergraduates****101 Physical Geology (5) AWSp**

BARKSDALE, BOSTROM, COOMBS, CROSSON, HANSON, MC KEE, MISCH, PORTER, STEWART, WASHBURN, WHETTEN

A survey of physical geology. This study deals with the identification and origin of rocks and minerals; the processes which have been important throughout geologic time, both on and beneath the surface, in giving the earth its present form; and the principles of scientific investigation that are used in interpreting geologic features. With laboratory and field trip. For nonscience majors.

103 Earth History (5) Sp

RENSBERGER, WHEELER

Geology through time, including the elements of stratigraphy and paleontology. With laboratory. For nonscience majors. Prerequisite, 101 or 205.

106 Geology in World Affairs (5) W

BARKSDALE

Geological occurrence, world distribution, and production of coal, petroleum, and the important industrial materials. With laboratory. For nonscience majors. Prerequisite, 101.

205 Physical Geology (5) ASp

CHRISTENSEN, GRESENS, VANCE

Introduction to geology, with laboratory, for science majors, with emphasis on the physics and chemistry of the earth. Prerequisite, a background in physics, chemistry, and mathematics is desirable. (Not open to students who have taken 101 or 310.)

308 Geology of the Northwest (5) S

MC KEE

The geologic history of Washington, Oregon, and Idaho. Emphasis to be on use of geologic principles in interpreting evidence found in landscape and rocks. Prerequisites, 101 or 205 or 310, or permission.

310 Geology for Engineers (4) W

CHENEY

The origin and development of minerals, rocks, land forms, and earth structures. Geology through time, including the principles of stratigraphy and paleontology. Engineering applications. Prerequisite, civil engineering major or permission. (Not open to students who have taken 101 or 205.)

311 Origin of Landforms (3)

Erosional processes and products; theories of landform evolution; characteristic landforms of the tropics, and semi-arid regions, polar and alpine regions, and humid-temperate regions; coastal and marine landforms. Prerequisite, 101.

320 Mineralogy (5) A

CHRISTENSEN

A systematic study of the common minerals, with emphasis on mineral identification and the importance of atomic structure on the physical and chemical properties of minerals. Prerequisites, 101, 205, or 310, or permission, Chemistry 101 or 140, Mathematics 104 or permission.

321, 322 Petrology I, II (5, 5)

GRESENS, STEWART, VANCE, WHETTEN

Description, classification, and origin of igneous, sedimentary, and metamorphic rocks. Laboratory includes hand specimens and microscopic study of rock specimens. Prerequisites, 320; 321 for 322.

330 General Paleontology (5) A

MALLORY

Systematic study of invertebrate fossils and the principles of paleontology. Prerequisite, 101 or 205, or permission.

340 Structural Geology (5) W

MC KEE

Interpretation of rock structures and their genesis. Prerequisite, 322 or permission.

362 Interpretation of Geologic History (5) W

WHEELER

Regional and interregional integration of physical geology and biostratigraphy as basis for geologic history of North America. Prerequisites, 330 and 461.

401-402 Field Course (8-7) Sp

Field work in general geology. Prerequisite, permission.

405 Introduction to Geophysics: The Earth (5) Sp

BOSTROM

Solid material in space, internal structure of the earth, sources of forces and stresses, the crust, tectonic cycles, correlations of rock types and structural setting. Offered jointly with Geophysics 405. Prerequisite, permission.

406 General Seismology (5) W

BOSTROM, CROSSON

Ray theory analysis applied to an inhomogeneous earth; travel time analysis; observational seismology, instruments, quantitative measurement of earthquakes; properties of earth's interior; tectonic significance of earthquakes. Offered jointly with Geophysics 406. Prerequisite, 405 or permission.

411 Fluvial Geomorphology (3) A

PORTER

Hydraulic and dynamic characteristics of streams, morphology of drainage basins, landscape evolution by stream sculpture and deposition, and climatic implications of changes in stream regimen. Prerequisite, senior standing or permission.

412 Regional Geomorphology (3)

PORTER

Regional geomorphology of principal geologic provinces. Prerequisite, 411.

414 Photogeology (3) A

PORTER

Geologic interpretations of aerial photographs with emphasis on solving field problems. Prerequisites, 340, 461, and permission. (Offered alternate years; not offered 1970-71.)

416 Glacial Geology (4) W

PORTER, WASHBURN

Interpretation of glacial history through study of sediments and landforms, with emphasis on climatic implications, chronology, and correlation. Prerequisite, senior standing or permission.

417 Quaternary Stratigraphy (4) Sp

PORTER

History of climatic changes during the Quaternary Period as revealed by physical and biological data. Global chronology and correlation of Quaternary sediments. Prerequisite, senior standing or permission.

418 Periglacial Processes and Environments (3) A

WASHBURN

An introduction to environmental processes in glacier-free areas, with emphasis on frost action and its effects.

423 Optical Mineralogy (5) A

VANCE

Petrographic microscope and recognition of common minerals in thin section. Prerequisite, 320.

424 Petrography and Petrology of Igneous Rocks (5) W

VANCE

Systematic study of igneous rocks and their origin, using the petrographic microscope. Prerequisite, 423.

425 Petrography and Petrology of Metamorphic Rocks (5) Sp

VANCE

Systematic study of metamorphic rocks and their origin, using the petrographic microscope. Prerequisite, 424.

436 Micropaleontology and Foraminiferida (5) Sp

MALLORY

Principles of paleontology as applied to micropaleontology; the systematic study of foraminifera. Prerequisites, 330 and permission. (Offered alternate years; offered 1970-71.)

437 History and Classification of the Vertebrates (5) W

RENSBERGER

This course traces the major groups of vertebrate animals from their origins, as they are currently known, through geologic time. It discusses the major morphologic changes and relates these to classification. In the laboratory the student learns to recognize groups by their skeletal structures as well as understand the adaptive meaning of modifications. Prerequisite, permission.

443 Advanced Structural Geology (5) A

MISCH

Analysis in space and time; genetic interpretation; principles of geotectonics. Prerequisite, 340.

450 Techniques in Geophysics (3) A

BOSTROM

Introduction to geophysics of the solid earth, outlining instruments, techniques, and interpretation. Prerequisite, senior standing in geology or permission.

461 Stratigraphy (5) A

WHEELER

Systematic study of spatial relations of surface-accumulated rocks and their space-time implications. Prerequisite 322.

472 Elements of Geochemistry (4) A

GRESENS

Introduction to the interpretation and understanding of geological processes from the chemical standpoint. Prerequisite, senior standing in geology or permission.

474 Introduction to Geological X-ray Methods (3) W

GRESENS

Introduction to the routine analysis of geologic materials by the methods of X-ray diffraction and fluorescence spectroscopy, with laboratory. Prerequisite, permission.

480 History of Geology (3) Sp

BARKSDALE

A study of the contribution of individuals to the evolution of geological concepts. Prerequisites, senior standing in geology or permission.

486 Nonmetallic Ores and Fuels (3) A

CHENEY

Description and origin of nonmetallic ore deposits, fuels, and water resources, and their

importance in world affairs. Prerequisite, senior standing in geology or permission. (Offered alternate years; offered 1970-71.)

487 Ore Deposits (5) Sp CHENEY

Description and origin of metallic ore deposits, and their importance in national and world affairs; four- or five-day field trip to neighboring mining region. Prerequisite, senior standing or permission.

498 Undergraduate Thesis (5) AWSp

The thesis must be submitted at least one month before graduation. Prerequisites, senior standing and permission.

499 Undergraduate Research (*, max. 5) AWSp

Prerequisites, senior standing and permission.

Courses for Graduates Only

501 Quaternary Climatic Change (1-3, max. 6) WSp WASHBURN

A seminar to critically evaluate criteria of Quaternary climatic change from the viewpoint of different disciplines. Prerequisite, permission.

510 Research in Geomorphology and Pleistocene Geology (*, max. 10) AWSp PORTER, WASHBURN

511 Seminar in Geomorphology (*) AWSp PORTER, WASHBURN

512 Seminar in Pleistocene Research (2) AWSp PORTER, WASHBURN

520 Advanced Studies in Mineralogy, Petrography, and Petrology (*) AWSp

521 Metamorphic Minerals (5) W MISCH

Nature and paragenesis of metamorphic minerals; physical, chemical, and geological interpretation of paragenesis. (Offered alternate years; offered 1970-71.)

522 Regional Metamorphism and Granitization (5) W MISCH

Deformation and crystallization, migmatization, and mobilization. (Offered alternate years; not offered 1970-71.)

523 Advanced Mineralogy (4) W CHRISTENSEN

524 Seminar in Igneous Petrology and Petrography (3) Sp VANCE

Prerequisite, permission.

530 Advanced Studies in Paleontology (*, max. 9) AWSp MALLORY, RENSBERGER

531 Biostratigraphy (5) W MALLORY

The date and principles of stratigraphic paleontology and chronologic biostratigraphy. (Offered alternate years; not offered 1970-71.)

532 Studies in Paleoecology (5) Sp MALLORY

Properties of fossil populations and interpretation of habit and habitat in the geologic past. Prerequisites, 322, 330, or permission.

540 Advanced Studies in Structural Geology (*) AWSp MCKEE, MISCH

545 Structure of Europe (5) Sp MISCH

Structural evolution and tectonic forms of Europe. (Offered alternate years; not offered 1970-71.)

546 Structure of Asia and West Pacific Rim (5) Sp MISCH

Structural evolution from Central Asia to West Pacific; geotectonic principles. (Offered alternate years; offered 1970-71.)

547 Literature on Structural Geology (3 or 5) W MISCH

Selected readings and seminars on Cordilleran structure.

550 Studies in Geophysics (*, max. 9) AWSp BOSTROM, CHRISTENSEN, CROSSON

551 Advanced Potential Theory and Applications (3) A CROSSON

Fundamental existence theorems of potential theory, geopotential, and the physical surfaces of the earth, special topics in physical geodesy: statistical methods, integral equation techniques, and celestial methods; implications with regard to the mass distribution in the earth. Offered jointly with Geophysics 551. Prerequisites, Geophysics 451, 452, 453; Mathematics 569 or equivalent.

552 Theoretical Seismology (3) W CROSSON

Wave motion in uniform and layered elastic solids, dispersion, surface waves, modal analysis; inhomogeneous and anisotropic media; effects of anelasticity, gravity, and curvature eigenvalues of the earth. Offered jointly with Geophysics 552. Prerequisite, Aeronautics and Astronautics 546.

553 Physical Properties of Earth Material (3) Sp CHRISTENSEN, CROSSON

Composition of rocks; mechanical, thermal, magnetic, and electrical properties of rocks; tensor properties of crystals; measurement of rock properties at high pressures and temperatures. Offered jointly with Geophysics 553. Prerequisite, Aeronautics and Astronautics 567 or permission.

560 Advanced Studies in Stratigraphy (*) AWSp MALLORY, WHEELER

563 West Coast Cenozoic Stratigraphy (5) A MALLORY

Lithologic and faunal studies of the West Coast Cenozoic. Offered alternate years; offered 1970-71.

565 Paleozoic Stratigraphy (5) Sp WHEELER

North American Paleozoic stratigraphy as a basis for interpretation of regional and interregional geologic episodes. (Offered alternate years; not offered 1970-71.)

568 Mesozoic Stratigraphy (5) Sp WHEELER

North American Mesozoic stratigraphy as a basis for interpretation of regional and interregional geologic episodes. (Offered alternate years; offered 1970-71.)

570 Advanced Studies in Geochemistry (*) AWSp GRESENS

571 Engineering Geology (3) W COOMBS

Geologic principles as applied to large engineering projects. Emphasis is on the physical properties of rocks and their relation to contemplated engineering structures.

573 Topics in Advanced Geochemistry (4) Sp GRESENS

574 Seminar in Geochemistry (2) W GRESENS

580 Research in Sedimentology (*) AWSp STEWART, WHETTEN

Advanced studies and research in sedimentology. Prerequisite, permission.

581 Analysis of Sediments and Sedimentary Rocks (5) A KELLEY, WHETTEN

Methods of analysis of sediments and sedimentary rocks, and statistical evaluation, presentation, and interpretation of data. Offered jointly with the Department of Oceanography as Oceanography 581. Prerequisites, 423, Mathematics 281, or permission.

582 Seminar in Sedimentology (2) W WHETTEN

Lectures, discussions, and readings on selected problems of current interest. Prerequisite, permission.

585 Advanced Studies in Economic Geology (*) AWSp CHENEY, COOMBS

587 Geochemistry of Ore Deposits (3) A CHENEY

Origin of metallic ores with emphasis on geochemistry and isotopic geology, four- to five-day field trip to mining region. Prerequisites, 472 or equivalent, and 487. (Offered alternate years; offered 1971-72.)

590 Seminar (*) AWSp

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

GEOPHYSICS

403 Introduction to Geophysics: The Atmosphere (5) W BADGLEY, BUSINGER, FLEAGLE

The atmosphere in its relation to the environment, gravity, geomagnetism, composition, transfer processes, motions, clouds, signal phenomena. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 403. Prerequisites, Mathematics 325, Physics 223, or equivalent.

405 Introduction to Geophysics: The Earth (5) Sp BOSTROM, CROSSON

Solid material in space, internal structure of the earth, sources of forces and stresses, the crust, tectonic cycles, correlation of rock types and structural setting. Offered jointly with the Department of Geological Sciences as Geological Sciences 405. Prerequisite, permission.

406 General Seismology (3) BOSTROM, CHRISTENSEN, CROSSON

Ray theory analysis applied to an inhomogeneous earth; travel time analysis; observational

seismology, instruments, quantitative measurement of earthquakes; properties of earth's interior; tectonic significance of earthquakes. Offered jointly with the Department of Geology as Geological Sciences 406. Prerequisite, 405, or permission.

415 Principles of Glaciology (4) A

LACHAPPELLE, PORTER, UNTERSTEINER, WASHBURN

Structure and properties of snow and ice: snow metamorphism, avalanches, heat and mass balance of valley glaciers, glacier structure and flow dynamics, continental ice sheets, sea, lake, and river ice, frozen ground, methods of paleoclimatology and ice-age theories. Prerequisites, upper-division standing and permission.

451, 452, 453 Fundamentals of Solid-Earth Geophysics (3,3,3) A,W,Sp

CROSSON, MERRILL

Mechanical behavior of earth materials with seismological applications; description and properties of the earth's gravity field; geomagnetism and geoelectricity; heat and the internal constitution of the earth; rheological character of the mantle. Prerequisites, Physics 223, 323; Mathematics 324, 438 for 451; 451 for 452; 452 for 453.

510 Physics of Ice and Snow (3) A

HOBBS

Structure of the water molecule. Crystallographic structures of ice. Electrical, optical, thermal, and mechanical properties of ice. Growth of ice from the vapor and liquid phases. Physical properties of snow. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 510. Prerequisite, permission.

511 Glaciology I: Formation of Snow and Ice Masses (3) W

HOBBS, UNTERSTEINER

Snow climatology. Transport of snow by wind. Transfer of radiative, sensible, and latent heat at the surface of snow and ice. Freezing of natural water bodies. Heat and mass budget of ice masses. Theories of ice ages. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 511. Prerequisite, 510 or permission.

512 Glaciology II: Structural Glaciology (3) Sp

RAYMOND, UNTERSTEINER

Heat and mass transfer in snow and ice. Metamorphism. Effects of heat conduction, vapor diffusion, radiation, solid impurities, brine inclusions. Petrography of snow and ice. Flow structures. Bulk physical properties of natural snow and ice. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 512. Prerequisite, 511 or permission.

513 Glaciology III: Dynamic Glaciology (3) A

MEIER, RAYMOND

Flow laws of ice, steady laminar flow. Sliding on bedrock. Kinematic waves, glacial surges. Snow and avalanche dynamics. Deformation and drift of sea ice. Relation of structures to deformation. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 513. Prerequisite, 512 or permission.

514 Field Glaciology (6) Sp

LACHAPPELLE, RAYMOND, UNTERSTEINER

Structure and metamorphism of snow cover. Energy exchange at melting snow and ice sur-

faces. Deformation and flow of glaciers. Climatology and mass budgets. Glacier features. Emphasis on instrumentation, field techniques, and data analysis. Offered jointly with the Department of Atmospheric Sciences as Atmospheric Sciences 514. Prerequisites, 511 or 512 or permission.

520 Seminar (1-2) AWSp

Review of current literature in geophysics and graduate student research with faculty participation. Prerequisite, graduate standing.

535 Introduction to Plasmas in Geophysics (3)

LIEMOHN

Kinetic theory of ionized gases, phase space distribution, magnetohydrodynamics of conducting fluids, transport processes, configuration-space instabilities in the magnetosphere, charged particle trajectories in nonuniform fields, geomagnetic trapping in radiation belts, electromagnetic and hydrodynamic waves in anisotropic media, velocity-space instabilities, propagation in the ionosphere and magnetosphere. Prerequisite, graduate standing or permission.

536 Geomagnetism (3) W

Description and theory of earth's permanent magnetic field. Secular variations. Solar and lunar magnetic variations. Atmospheric tides. Dynamo theory. Ionosphere. Solar-terrestrial relationships. Magnetic storms. Prerequisites, Physics 426 or Aeronautics and Astronautics 567, or permission.

537 Magnetosphere I (3) Sp

Formation by interaction of solar wind with geomagnetic field. Trapped particles. Electromagnetic waves in anisotropic plasma. Dynamic disturbances and plasma instabilities. Prerequisite, 535 or permission.

538 Magnetosphere II (3) A

Plasma waves. Propagation of very low frequency and hydromagnetic waves in the magnetosphere. Interactions between plasma waves and particles. Prerequisite, 537.

539 Structure and Dynamics of Upper Atmosphere (3) Sp

LEOVY

Properties of the ionosphere, electromagnetic wave propagation, the dynamics of the ionosphere. Offered jointly with Atmospheric Sciences. Prerequisite, Atmospheric Sciences 542 or permission.

551 Advanced Potential Theory and Applications (3) A

CROSSON

Fundamental existence theorems of potential theory, geopotential and the physical surfaces of the earth, special topics in physical geodesy: statistical methods, integral equation techniques, and celestial methods; implications with regard to the mass distribution in the earth. Offered jointly with the Department of Geological Sciences as Geological Sciences 551. Prerequisites, Geophysics 451, 452, and 453; Mathematics 569 or equivalent.

552 Theoretical Seismology (3) W

CROSSON

Wave motion in uniform and layered elastic solids, dispersion, surface waves, modal analysis; inhomogeneous and anisotropic media; effects of anelasticity, gravity, and curvature, eigenvalues of the earth. Offered jointly with the Department of Geological Sciences as Geological Sciences 552. Prerequisite, Aeronautics and Astronautics 546.

553 Physical Properties of Earth Material (3) Sp

CHRISTENSEN, CROSSON

Composition of rocks; mechanical, thermal, magnetic, and electrical properties of rocks; tensor properties of crystals; measurement of rock properties at high pressures and temperatures. Offered jointly with the Department of Geological Sciences as Geological Sciences 553. Prerequisite, Aeronautics and Astronautics 567 or permission.

571 Gravity and Geomagnetic Interpretation (3) A

BENNETT, BURNS

Fundamental concepts; the earth's magnetic field; instrumentation and reduction of magnetic measurements, interpretation of magnetic data; gravity measurements, reduction of gravity observations; interpretation of gravity anomalies. Offered jointly with the Department of Oceanography as Oceanography 571. Prerequisites, Mathematics 324, Physics 323, or equivalents; Geophysics 405 or Geological Sciences 450; permission.

572 Tectonophysics: Selected Topics (3) A

LISTER

A qualitative discussion of the processes which cause crustal movement, viewed on a global scale, and the techniques used to investigate these processes. Prerequisite, permission.

573 Terrestrial Magnetism (3) Sp

MERRILL

Advanced aspects of earth magnetism intended for specialists in this field. Extensive discussion of origin theories and their implications; physical basis and theories of magnetism in rocks; paleomagnetic techniques and results. Offered jointly with the Department of Oceanography as Oceanography 573. Prerequisite, Geophysics 453.

580 Special Topics in Geophysics (2-6, max. 12) Sp

Intensive treatment of a selected topic in geophysics presented by lectures or seminars for students in geophysics and related special fields. Subject is selected from all areas in geophysics and is expected to vary from year to year. Prerequisite, graduate standing or permission.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

GERMANIC LANGUAGES AND LITERATURE

Courses for Undergraduates

101-102, 103 First-Year German (5-5,5) AWS, AWSp, AWSpS

Track I: The methods and objectives are primarily oral-aural. Track II: Stresses reading.

121, 122 First-Year Reading German (5,5) AS,WS

A special beginning course devoted exclusively to the reading objective; 122 continuation of 121. For graduate students only.

123, 124, 125 German for the Elementary School (3,3,3) A,W,Sp

Training in basic German grammar, pronunciation, and intonation with practical techniques for using German in the elementary class-

room; organization of study units, songs, dialogues, and dramatizations. Open to those with little or no background in German.

201 Basic Second-Year German (5) AWSpS
Track I: Readings and oral practice in German, plus grammar review. Track II: Stresses reading. Prerequisite, 103 or equivalent.

202 Intermediate Second-Year German (5) AWSpS
Track I: Continuation of 201. Track II: Stresses reading. Prerequisite, 201 or equivalent.

203 Advanced Second-Year Reading (3) AWSpS
Track I: Introduction to literary analysis. Majors and minors take concurrently with 207. Track II: Stresses reading. Prerequisite, 202 or equivalent.

207 Advanced Second-Year Conversation (2) AWSpS
Discussion of general topics to develop oral fluency. Prerequisite, 202 or equivalent.

230 Conversational German (5) S
Intensive. For participants in the Living-Language Group Program only. Prerequisite, 103 or equivalent.

260 Lower-Division Scientific German (3) AWSpS
Nonmajors may substitute 260 for 203. Prerequisite, 202 or equivalent.

290, 291, 292 Survey of German Tradition (3,3,3) A,W,Sp
The interrelations of political, social, and economic developments in literature and the arts, middle ages through the twentieth century. Course offered in English. For majors and minors only.

299 Directed Reading (1-5, max. 10) AWSpS
This course is designed strictly for nonmajors who have demonstrated a level of proficiency equivalent to the completion of German 203, and who wish to go on with reading original texts in German literature and thought, and yet who do not wish to compete in a 300- or 400-level major course—or who do not wish to be restricted to the subject matter of these 300- and 400-level courses.

301, 302, 303 Grammar and Conversation (3,3,3) AW,WSp,SpS
The materials used aim not merely at an increase in ability to speak, write, and understand German, but also at broadening the student's understanding of the culture of German-speaking countries. Primarily for majors and minors. Prerequisites, 15 credits in second-year German.

307 Third-Year Composition (5) S
Not open for credit to those who have had 301, 302, 303.

310 Introduction to Twentieth Century Literature (3) AS
Critical analysis, interpretation, and comparison of individual works by twentieth century writers. Short stories, poems, and one play by Kafka, Zweig, Walser, Borchert, Böll, Aichinger, Trakl, Rilke, Heym, Brecht, Frisch, and others. Prerequisite, 15 credits in second-year German.

311 Introduction to the German Novelle (3) WS
Critical analysis, interpretation, and comparison of four German Novellen by Kleist, Brentano, Storm, and Keller, and considera-

tion of the theory and development of the German Novelle in the nineteenth century. Prerequisite, 15 credits in second-year German.

312 Introduction to Goethe (3) SpS
Critical analysis and interpretation of Goethe's *Faust*, Part I, with consideration of the literary and historical background of the work, and critical analysis and interpretation of selected poems by Goethe. Prerequisite, 15 credits in second-year German.

330 Conversational German (5) S
For participants in the Living-Language Group program only. Not open for credit to those who have had 301, 302, 303. Prerequisite, 207 or permission.

401, 402, 403 Grammar and Composition (3,3,3) A,W,Sp
Primarily for majors and minors. Prerequisites, 301, 302, and 303.

404 History of the German Language (3) Sp ALLARD, VOYLES
From early Germanic to the present. Open to junior majors. (Offered Summer Quarter 1970.)

405 Linguistic Analysis of German (3) A,Sp BARRACK, VOYLES
Prerequisite, third-year German, or permission.

407 Advanced Composition (5, max. 10) S
Not open for credit to those who have had 401, 402, 403.

410, 411, 412 Survey of Modern German Literature and Culture (3,3,3) A,W,Sp IMMERWAHR, HERTLING, LOEB

410 German Romanticism: Literature from 1800 to 1830 with aesthetic and historical consideration of works by Novalis, Brentano, Eichendorff, Heine, Kleist, Büchner, E.T.A. Hoffmann, Grillparzer, and others. 411 Nineteenth Century Realism: Literature from 1830 to 1890, with aesthetic and historical consideration of works by Keller, Hebbel, Meyer, Stifter, Fontane, and others. 412 The Twentieth Century: Literature from 1890 to 1945, with aesthetic and historical consideration of works by Hauptmann, Kaiser, Brecht, Kafka, Mann, Rilke, Trakl, Stadler, Stramm, van Hoddiss, and others. Prerequisite, for either 410, 411, or 412, 15 credits in third-year German or permission.

413, 414, 415 Survey of Older German Literature and Culture (3,3,3) Sp,W,A DYCK, HRUBY, HERTLING

413 Medieval Literature: German literature from 750 to 1400, with aesthetic and historical consideration of works from the Carolingian and Cluniac Periods, the Court Epic, the Heroic Epic, the Spielmannsepik, the Minnesang, the poetry of the epigones who followed the Age of High Chivalry, the German Mystics, and the *Ackermann aus Böhmen*. 414 Literature of the Sixteenth, Seventeenth, and Early Eighteenth Centuries: Aesthetic and historical consideration of works by Erasmus, Luther, Hans Sachs, the *Historia von Dr. Faustus*, Baroque poetry, and the literature of the early Enlightenment. 415 Literature of the Eighteenth Century: Aesthetic and historical consideration of works by Lessing, Schiller, and Goethe, with attention to the historical background and development of German Classicism. Prerequisite, for either 413, 414, or 415, 15 credits in third-year German or permission.

430 Advanced Conversational German (5, max. 10) S

For participants in the Living-Language Group program only. Not open for credit to those who have had 401, 402, 403. Prerequisite, 330 or permission.

473 Pedagogical Training of Teaching Assistants (3) (Formerly 474GJ.)

490 Contemporary German Literature (3) A BAUMGAERTEL
Interpretation of selected works by contemporary German authors. A senior colloquium for majors. Prerequisite, permission.

491 Introduction to Literary Analysis (3) W MC LEAN
An introduction to various methods of interpretation and to their practical application. For senior majors. Prerequisite, permission.

492 History of Germanic Philology (3) Sp MALOOF
An introduction to the works of outstanding scholars in the field of Germanics. For senior majors. Prerequisite, permission.

495 Proseminar in German Literature (3, max. 15) AWSpS
Special topics, the subject matter and depth of which are not included in other literature courses in the program, and which are to be arranged through cooperative consultation between students and faculty. Prerequisite, 15 credits in third-year German or permission.

497 Studies in German Literature (1-5, max. 15) AWSpS

498 Studies in the German Language (1-5, max. 15) AWSpS

COURSES IN ENGLISH

340 Friedrich Nietzsche and His Impact on German Literature (3) A
Concerned with the analysis of Friedrich Nietzsche's chief works and the discussion of his position within modern German literature and thought.

341 Kafka in English (3) W
Intensive study of the short stories and novels of Franz Kafka in English translation; emphasis on philosophical relevance and aesthetic significance.

342 Thomas Mann in English (3) Sp
Intensive study of some of Thomas Mann's theoretical writings, short stories, and novels, interpreted within the wider context of German literature and philosophy at the turn of the century.

Courses for Graduates Only

500 Methodology (3) W

501 Bibliography (3) A VON KRIES

502 History of German Criticism (3) W BEHLER

503 Modern Poetry (3) Sp

506 German Syntax and Semantics (3) SpS VOYLES
Advanced structural analysis of German grammar, with special emphasis on the application of descriptive techniques. (Offered Summer Quarter, 1970.)

510, 511, 512 German Civilization
(3,3,3) AS,WS,SpS

Aesthetic and historical presentation of modern German civilization with due emphasis on its cultural, political, and social aspects. Prerequisite, permission. (Offered in consecutive Summer Quarters; 511 was given in Summer 1969.)

513 Germany 1918-1968, A Study in German Fiction and Thought (3) Sp

ALLARD

German intellectual life from 1918 to 1968. A study in German fiction and thought in relation to the cultural, political, and social aspects of the period.

515 Romanticism (3) Sp

IMMERWAHR

516 Nineteenth-Century Drama (3) Sp

SAUERLANDER

517 Nineteenth-Century Prose (3) W

STRUC

518 Twentieth-Century Literature (3) Sp

REY

520 Contemporary German Literature (3) Sp

BAUMGAERTEL

Prerequisite, graduate standing.

521 Seminar in the Literature of the Reformation and Renaissance (3) Sp

HRUBY

522 Seminar in Baroque (3) Sp

524 Seminar in Eighteenth-Century Literature (3) A

HERTLING

525 Seminar in Romanticism (3) Sp

IMMERWAHR

526 Seminar in Nineteenth-Century Drama (3) Sp

SAUERLANDER

527 Seminar in Nineteenth-Century Prose (3) A

STRUC

528 Seminar in Twentieth-Century Literature (3) A

531 Lessing (3) A

LOEB

534 Goethe I (3) A

LOEB

535 Goethe II (3) W

AMMERLAHN

538 Schiller (3) W

BAUMGAERTEL

542 Storm and Stress and Classicism: Revolution and Resignation (3) W

LOEB

An analysis of the important theoretical and creative writings of the Storm and Stress period culminating in German Classicism, tracing this development in the context of the cultural and historical setting, and showing the significance for the future course of German history and civilization.

544 Seminar in Goethe (3) W

LOEB

550 Gothic (3) A

VOYLES

552 Old High German (3) W

555 Old Saxon (3) A

556 Middle High German (3) A

557 Middle High German Literature I (3) W

VON KRIES

558 Middle High German Literature II (3) Sp

HRUBY

560 Modern Dialects (3) W

BARRACK

564 Early Middle High German Literature (3) A

A comprehensive presentation of early Middle High German literature in the original.

565 Seminar in Courtly Epic (3) W

Aspects and methods of literary analysis pertaining to the study of medieval courtly epics.

566 Late Middle High German Narrative (3) Sp

Study of the evolution of the late Middle High German novelistic narrative.

567 Late 'Minnesang' (3) A

VON KRIES

A comprehensive study of the various developments of Middle High German lyric poetry from 1215 to the fifteenth century (Walther von der Vogelweide to Oswald von Wolkenstein).

568 Seminar in Heroic Epic (3) W

HRUBY

Literary and historic problems of the German heroic epic, with special emphasis on the *Nibelungenlied* and the *Dietrichsepik*.

569 Didactic and Religious Medieval Literature (3) Sp

VON KRIES

A comprehensive study of Middle High German religious and didactic poetry from the twelfth to the fifteenth century.

570 Nietzsche (3) A

BEHLER

Intensive study of the main works of Friedrich Nietzsche in the original. Emphasis on philosophical relevance and aesthetic significance. Prerequisite, graduate standing.

574 Introduction to Methods of Teaching German (3) AS

RABURA

Developments in the methods of teaching German, curriculum and programs on the elementary and secondary level; qualifications of a foreign language teacher are discussed. (Offered Summer Quarter, 1971.)

575 Teaching Advanced German Language and Literature on Secondary Level (3) WS

Teaching of German language and literature on the advanced level in secondary schools. Coordinated six-year program and the preparation for advanced college work. (Offered Summer Quarter, 1972.)

576 Modern Methods and Materials in Teaching German (3) SpS

RABURA

The audio-lingual method and its application; planning, organization, and use of a foreign language laboratory; tests and measurements; evaluation of teaching materials. (Offered Summer Quarter, 1970.)

580, 581, 582 Seminar in the Modern Period of German Literature (1-5, 1-5, 1-5) A,W,Sp

Prerequisite, permission.

590 German Mysticism of the Late Middle Ages (1-5) A

591 German Idealism and Its Relationship to Literature (1-5) W

592 German Existentialism and Its Relationship to Literature (15) Sp

595, 596, 597 Seminar in Germanic Philology (1-5, 1-5, 1-5) A,W,Sp

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

GREEK—See Classics

HEALTH EDUCATION—See Physical and Health Education

HEBREW—See Classics

HINDI-URDU—See Asian Languages and Literature

HISTORY

Specific areas in History are designated by area letters. These letters must precede course numbers on the student's Official Program. Designation letters and their definitions are:

HST—History (General)

HSTAA—History of the Americas

HSTAM—Ancient and Medieval History (including Byzantine)

HSTAS—Asian History

HSTEU—Modern European History

GENERAL HISTORY

Courses for Undergraduates

HST

111 The Ancient World (5) A

FERRILL

A history of the origins of Western civilization to the fall of Rome.

HST

112 The Medieval World (5) W

BACHARACH, MOSHER

A survey of the political, economic, social, and intellectual history of the Middle Ages. (Not open to students who have taken General History HST 301.)

HST

113 The Modern World (5) Sp

BRIDGMAN, PINKNEY

A survey of the political, economic, social, and intellectual history of Modern Europe. (Not open to students who have taken General History HST 302 or 303.)

HST

Social Science 150 Afro-American History (5) ASp

FRANKLIN

An examination of the Negro and his role in history, both in Africa and the Americas.

HST

261 Survey of the Muslim Near East (5)

BACHARACH

Survey of the history of the Near East (the Arab countries, Turkey, Iran, and Afghanistan) from the emergence of Islam in 622 to the present. The various aspects of history

(culture, economics, politics, etc.) will be discussed. (Formerly History 238.)

HST

299H Honors Colloquium (3) Sp
Introduction to historical method. Through the use of well-known tales, the student will examine historical evidence and study the difference between mythology and legend and the nature of history. (Formerly History 299.)

301 Early Modern European History: 1450-1648 (5) A
BRIDGMAN, EMERSON, GRIFFITHS, LEVY
Political, social, economic, and cultural history from the Late Renaissance to the Peace of Westphalia. (Formerly History 305.)

HST

302 Modern European History: 1648-1815 (5) W
BRIDGMAN, EMERSON, HANKINS, LYTLE, SUGAR
Political, social, economic, and cultural history from the Peace of Westphalia to the fall of Napoleon. (Formerly History 306.)

HST

303 Contemporary European History Since 1815 (5) Sp
BRIDGMAN, EMERSON, FARRAR, PINKNEY, SUGAR
Political, social, economic, and cultural history from the fall of Napoleon to the present. (Formerly History 307.)

HST

311 Science in Civilization: Antiquity to 1600 (5) A
HANKINS
From preclassical antiquity to the end of the Middle Ages, stressing the growth of scientific ideas, the cultural context in which they take shape, and their relationship to other movements of thought in the history of civilization. (Formerly History 316.)

HST

312 Science in Civilization: Science in Modern Society (5) W
HANKINS
The growth of modern science since the Renaissance, emphasizing the scientific revolution of the seventeenth century, the development of methodology, and the emergence of new fields of interest and new modes of thought. (Formerly History 317.)

HST

361 Slavery in History: A Comparative Study (5) Sp
BACHARACH
Slavery as an universal historical phenomena lending itself to a comparative analysis. Will be studied in terms of its philosophical justifications, economic importance, and local practices. The following historical periods will be surveyed: the ancient Near East, Greece, Rome, Islam, Africa, Latin America, and North America.

HST

391H-392H Colloquium in the History of Ideas (5-5) W,Sp
Discussion of selected topics in the history of ideas; writing of an interpretive essay. (Formerly History 390H-391H.)

HST

411 Origins of Modern Science: The Physical Sciences (5)
HANKINS
The history of the physical sciences seen through an intensive study of key periods in

their development. Emphasis will be placed upon the nature of scientific revolutions and the role of individual scientists. Prerequisite, one introductory course in a physical science. (Formerly History 418.)

HST

412 Science and the Enlightenment (5) A
HANKINS
The role of science in relation to intellectual, social, economic, and religious forces in the eighteenth century, and growth of the international community in science during the same period. (Formerly History 420.)

HST

413 Science in the Age of Revolution: 1776-1848 (5) W
A historical study of the sciences during that period when not only the sciences, but the arts and social institutions as well were undergoing great change. (Formerly History 425.)

HST

421 Africa South of the Sahara (5) Sp
Political and cultural evolution of the peoples inhabiting these lands. (Formerly History 478.)

HST

422 South Africa (3) Sp
South Africa in the nineteenth and twentieth centuries: social, political, and economic developments; nationalism and race relations; South Africa in crisis. (Formerly History 479.)

HST

423 History of Australia and New Zealand (5) W
The techniques of overseas colonization of the nineteenth century and development of egalitarian democratic communities in the late nineteenth and twentieth centuries. (Formerly History 477.)

HST

425 History of the British Empire and Commonwealth Since 1783 (5) Sp
BELL
Britain in the Caribbean, Africa, India, Southeast Asia, and the Pacific; and the settlement, economic development, and political evolution of Canada, Australia, New Zealand, and South Africa. (Formerly History 480 and History 481.)

HST

441 Diplomacy of Early Modern Europe (5) W
FARRAR
Relations between European States during period of French predominance, 1648-1870. (Formerly History 493A.)

HST

442 Diplomacy of Modern Europe (5) Sp
FARRAR
Relations between European states during period of German predominance, 1870-1945. (Formerly History 493B.)

HST

443 Japanese-American Relations (5) Sp
BUTOW
The confrontation between Japan and the United States from Perry to MacArthur with emphasis on the period from 1905 to 1945. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 456. Prerequisite, permission. (Formerly History 456.)

HST

461 History of the Near East: 622-1300 (5) A
BACHARACH
The Arab countries from the emergence of Islam. (Formerly History 438.)

HST

462 History of the Near East: 1300-1789 (5) W
BACHARACH
The Arab countries to the accession of Sultan Selim III. (Formerly History 439.)

HST

463 History of the Near East Since 1789 (5) Sp
BACHARACH
The Arab countries from the westernizing reform movements to the present. (Formerly History 440.)

HST

465 Numismatics Seminar (3)
BACHARACH
An introduction to the use of numismatic evidence for political, economic, and cultural history. Prerequisite, permission of instructor.

HST

481 Economic History of Europe (5) A
MORRIS, R. THOMAS
The origins of the modern European economy; an historical analysis of economic change and growth from medieval times. Offered jointly with the Department of Economics as Economics 468. Economics 200, 201 recommended. (Formerly History 460.)

HST

491H-492H Historical Method (5-5) A,W
The purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism. (Formerly History 490H-491H.)

HST

498 Senior Seminar (3-5, max. 15)
Each seminar will examine a different subject or problem. A list of the seminars and their instructors is available in the Department of History office. Students must have the permission of the instructor of the seminar in which they plan to enroll. (Formerly History 498.)

HST

499 Undergraduate Research (1-5, max. 15) AWSp
(Formerly History 499.)

Courses for Graduates Only

HST

511 History of Science (3-6)
HANKINS
(Formerly History 520.)

HST

512-513-514 Seminar in the History of Science (3-6)-(3-6)-(3-6) A,W,Sp
HANKINS
(Formerly 525-526-527.)

HST

524 British Empire History (3-6)
(Formerly History 576.)

HST

540-541 Diplomacy of World War I (3-6)-(3-6)
FARRAR

Seminar. European diplomacy from the July crisis, 1914, to the armistice, 1918. The relations among the European states will be interpreted broadly to include domestic problems as well as military and diplomatic decisions. (Formerly History 641-642.)

HST**542 European Diplomatic History 1870-1945 (3-6)**

FARRAR

(Formerly History 538.)

HST**543 War and Diplomacy: The Totalitarian Challenge, 1931-1945 (3-6) A**

BUTOW

Field course in diplomacy of World War II, with emphasis on the confrontation between the United States and the Axis powers. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 550. Prerequisite, permission of instructor. (Formerly History 550.)

HST**544-545 Seminar in War and Diplomacy: The Totalitarian Challenge, 1931-1945 (3-6)-(3-6) W,Sp**

BUTOW

The diplomacy of the Second World War with emphasis on the confrontation between the United States and the Axis Powers. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 551-552. Prerequisite, permission of instructor. (Formerly History 551-552.)

HST**561 Islamic History (3-6)**

BACHARACH

Field course. Introduction to advanced study in the major periods and problems of Islam. Bibliographical guidance is stressed. (Formerly History 615.)

HST**562 Ottoman History (3-6)**

SUGAR

Field course. Introduction to the major periods and problems of Ottoman history, 1300-1914, by acquainting the student with the major works in at least two languages. An attempt will be made to teach some use of Ottoman materials. A minor problem will be investigated in detail by every student. Prerequisite, knowledge of at least one major language besides English. French, German, Russian, or other.

HST**563 Modern Near East (3-6)**

BACHARACH

A field course introducing the student to the major periods and problems of Near Eastern history, 1798 to the present. Prerequisite, permission of instructor.

HST**571 History in the College (0) WSP**

SUGAR

Optional noncredit course for prospective college and university history instructors, preparing them for their duties. Prerequisite, M.A. in history. (Formerly History 571.)

HST**591 Historiography: Ancient and Medieval European (3) A**

(Formerly History 500.)

HST**592 Historiography: Early Modern European (3) W**

(Formerly History 501.)

HST**593 Historiography: Early Modern European and American (3) Sp**

(Formerly History 502.)

HST**594-595 Seminar in Philosophy of History (3-6)-(3-6) A,W**

(Formerly History 503-504.)

HST**600 Independent Study or Research (*) AWSpS****HST****700 Thesis (*) AWSpS****702 Degree Final (*)****800 Doctoral Dissertation (*)****HISTORY OF AMERICAS****Courses for Undergraduates****HSTAA****201 Survey of the History of the United States (5) AWSp**

Supplies the knowledge of American history which any intelligent and educated American citizen should have. Object is to make the student aware of his heritage of the past and more intelligently conscious of the present. (Formerly History 241.)

301 Foundations of American Civilization (5) A

SCHOLZ

The founding of Anglo-Saxon society in the Western Hemisphere, with attention to the earliest colonial establishments, the growth of a new culture, independence, and the organization of the American Union. (Formerly History 341.)

HSTAA**311 American Civilization: The First Century of Independence (5) W**

BESTOR, PEASE, PRESSLY, SAUM

Establishment of the constitutional system; national expansion; intellectual and cultural development; internal conflicts, the Civil War, and Reconstruction. (Formerly History 342.)

HSTAA**331 Modern American Civilization from 1877 (5) Sp**

BURKE, FOWLER, FRANKLIN,

PEASE, PRESSLY

The emergence of modern America, after the Civil War; interrelationships of economic, social, political, and intellectual developments. Not open to students who have taken History of the Americas HSTAA 431 (formerly History 450). (Formerly History 343.)

HSTAA**381 Latin America: The Colonial Period (5) A**

ALDEN, SOLBERG

Discovery and founding of Spanish and Portuguese empires in the New World and their development until the eve of independence. (Formerly History 386.)

HSTAA**382 Latin America: The National Period (5) W**

ALDEN, SOLBERG

Struggle for independence and later political, economic, social, and cultural history of the principal Latin American nations; their relations with each other, the United States, and other powers. (Formerly History 387.)

HSTAA**401 American Revolution and Confederation (5) W**

SCHOLZ

Causes of separation of the United States

from the British Empire; political theory of the Revolution; its military history; diplomacy of the Revolution; the Revolution as a social movement; intellectual aspects; readjustment after independence; the formation of the American Union; the Constitution. (Formerly History 441.)

HSTAA**402 The Colonial Mind (5) Sp**

SCHOLZ

An examination of the main currents of the colonial American mind, with special reference to Puritanism, the formation of a colonial mentality, and the relationship between colonial thought and institutions. (Formerly History 442.)

HSTAA**405-406 History of American Character and Values (5-5)**

SCHOLZ

A course designed to explore the origins and nature of American character and values, past and present, with special emphasis upon American Protestantism and the role of religion in American life. Prerequisite, permission of instructor.

HSTAA**411 The United States During the Era of Civil War and Reconstruction (5) Sp**

PEASE, PRESSLY

Conflicting interests, ideologies, and ways of life in the United States from the 1840's to the 1870's. (Formerly History 447.)

HSTAA**412 The Westward Movement (5) W**

CARSTENSEN, SAUM

Territorial and economic expansion of the United States from the Revolution to World War I; conditions affecting settlement and development of the West; political and social institutions; interregional relationships. (Formerly History 463.)

HSTAA**431 Twentieth-Century America (5) A**

BURKE, FOWLER, FRANKLIN,

PEASE, PRESSLY

Political, social, economic, and intellectual developments in the United States from 1900 to the present. Not open to students who have taken History of the Americas HSTAA 331. (Formerly History 450.)

HSTAA**432 History of Washington and the Pacific Northwest (5) ASP**

CARSTENSEN, SAUM

Exploration and settlement; economic development; growth of government and social institutions; statehood. (Formerly History 464.)

HSTAA**443 Black Americans, 1877-1933: From Reconstruction to the New Deal (5)**

FRANKLIN

A study of Black Americans from Reconstruction to the New Deal with special emphasis upon their institutional and social life, and the impact of society upon their development.

HSTAA**444 Black Americans Since 1933: From the New Deal to the Present (5)**

FRANKLIN

A study of Black Americans from the New Deal to the present, with special emphasis upon their institutional and social life, and the impact of society upon their development.

HSTAA

- 451 American Constitutional History: Foundations to 1800 (3) A**
BESTOR

English constitutionalism and its meaning for the colonies; the American Revolution; constitution-making in the states; the Articles of Confederation and the Constitution of 1787; inauguration of the new government and adoption of the Bill of Rights. (Formerly History 445A.)

HSTAA

- 452 American Constitutional History: Nineteenth Century (3) W**
BESTOR

Fundamental decisions of the Supreme Court under Marshall and Taney; democracy, sectionalism, and slavery. The Civil War and Reconstruction, the Supreme Court, and economic concentration. (Formerly History 445B.)

HSTAA

- 453 American Constitutional History: Twentieth Century (3) Sp**
BESTOR

The Constitution and social legislation from the progressive era to the great depression; the New Deal and its challenge to the Supreme Court; the shift of focus from economic issues to civil rights in recent constitutional interpretation. (Formerly History 445C.)

HSTAA

- 454 The Intellectual History of the United States (5) A**
SAUM

Lectures and discussions devoted to the development of the American mind, from historical beginnings to the present. (Formerly History 443.)

HSTAA

- 455 History of American Liberalism Since 1789 (5)**
BURKE, PRESSLY

Comparative study of aims and accomplishments of four major reform movements in the United States: Jeffersonian democracy, Jacksonian democracy, Progressivism, the New Deal. (Formerly History 461.)

HSTAA

- 458 History of American Education to 1865 (3)**
BURGESS

Development of American education in cultural context: colonial period, influence of enlightenment, and common school movement. Offered jointly with the College of Education as History, Philosophy, and Sociology of Education as EDHPS 494.

HSTAA

- 459 History of American Education Since 1865 (3)**
BURGESS

Development of American education in cultural context: progressive education, recent criticism, continuing issues and trends. Offered jointly with the College of Education as History, Philosophy, and Sociology of Education EDHPS 495.

HSTAA

- 461 Diplomatic History of the United States: 1776-1877 (5) A**

Foreign policy of the United States government. Emphases upon wars, territorial expansion, and the peculiarities of the American position in world politics.

HSTAA

- 462 Diplomatic History of the United States: 1877-1953 (5) A**

Foreign policy of the United States government, from the emergence of the United States as a great power through the presidency of Harry S. Truman.

HSTAA

- 475 History of Canada (5) A**

The struggle for unity and nationhood as determined by geographical conditions, by religious antagonism, by the impact of modern commercial and industrial society upon an old-world culture, and by pulls toward Europe and the United States. (Formerly History 475.)

HSTAA

- 481 The History of Mexico: 1517 to the Present (5) W**
ALDEN, SOLBERG

Political, social, and economic history of Mexico from its discovery by the Spanish to the present. (Formerly History 486.)

HSTAA

- 482 The History of Brazil: Colonial Period to the Present (5) Sp**
ALDEN

Colonial foundations; the first and second empires; the old and new republics; current problems; prospects for the future. (Formerly History 487.)

HSTAA

- 483 The River Plate Republics and Chile: Colonial Period to the Present (5)**
SOLBERG

The course will analyze political history, economic development, social change, and intellectual trends in Argentina, Uruguay, Paraguay, and Chile; it will also consider the relations of these countries with the United States and Europe, and with each other. (Formerly History 488.)

HSTAA

- 484 Twentieth-Century Latin America (5) Sp**
SOLBERG

Analysis of economic problems, political and social changes, and intellectual trends in major Latin American republics; Latin American relations with the United States. (Formerly History 489.)

Courses for Graduates Only

HSTAA

- 501 American History: Early (3-6) W**
SCHOLZ
(Formerly History 541.)

HSTAA

- 503-504 Seminar in American History: Early (3-6)-(3-6) W,Sp**
SCHOLZ
(Formerly History 554-555.)

HSTAA

- 511 American History: Civil War (3-6) W**
PRESSLY
(Formerly History 543.)

HSTAA

- 512 American History: Western (3-6) A**
CARSTENSEN, SAUM
(Formerly History 542.)

HSTAA

- 513-514-515 Seminar in American History: Western (3-6)-(3-6)-(3-6) A,W,Sp**
CARSTENSEN, SAUM
(Formerly History 563-564-565.)

HSTAA

- 516 American History: Nineteenth Century (3-6)**
BESTOR, SAUM
(Formerly History 544.)

HSTAA

- 517-518 Seminar in American History: Nineteenth Century (3-6)-(3-6)**
BESTOR, SAUM
(Formerly History 591-592.)

HSTAA

- 531 American History: Twentieth Century (3-6) AW**
BURKE, FOWLER, PEASE
(Formerly History 545.)

HSTAA

- 532-533-534 Seminar in American History: Recent Period (3-6)-(3-6)-(3-6) A,W,Sp**
BURKE, PEASE
(Formerly History 566A-566B-566C.)

HSTAA

- 554 American History: Intellectual (3-6)**
SAUM
(Formerly History 654.)

HSTAA

- 551- Seminar in American Constitutional History to 1800 (5-) A**
BESTOR
(Formerly History 645-.)

HSTAA

- 552- Seminar in American Constitutional History: Nineteenth Century (5-) W**
BESTOR
(Formerly History -646-.)

HSTAA

- 553 Seminar in American Constitutional History: Twentieth Century (5) Sp**
BESTOR
(Formerly History -647.)

HSTAA

- 555-556 Seminar: American Intellectual History (3-6)-(3-6)**
SAUM
Develops research and writing competence in American intellectual history. Prerequisite, permission of instructor.

HSTAA

- 561 History of American Foreign Policy (3-6) A**
FOWLER

- 562-563 Seminar in American Diplomatic History (3-6)-(3-6) WSp**
FOWLER

HSTAA

- 581 Latin American History: Colonial Period (3-6) W**
ALDEN
(Formerly History 580.)

HSTAA

- 582 Latin American History: National Period (3-6) Sp**
ALDEN, SOLBERG
(Formerly History 581.)

HSTAA

- 583-584-585 Seminar in Latin American History (3-6)-(3-6)-(3-6)**
ALDEN

Problems of historical research in the history of Latin America from colonial beginnings to the present. (Formerly History 577-578-579.)

HSTAA
586-587 Seminar in Comparative Colonial History (3-6)-(3-6)
 ALDEN

HSTAA
599 American History: New Findings and New Approaches (4-6) S

ANCIENT AND MEDIEVAL HISTORY (INCLUDING BYZANTINE)

Courses for Undergraduates

HSTAM
201, 202 Ancient History (5,5) WS
 FERRILL, THOMAS

Political, social, economic, and cultural development of the ancient Near East, Greece, and Rome; the elements of ancient civilization that contributed vitally to medieval and modern civilization. (Formerly History 201, 202.)

HSTAM
331 Early Middle Ages (5) W
 KAMINSKY, MOSHER

The dark ages, feudalism, emergence of the medieval order of civilization, and the development of Romanesque culture. (Formerly History 411.)

HSTAM
332 Central Middle Ages (5) S
 KAMINSKY, MOSHER

Europe in the central Middle Ages: culture of cathedrals and universities, formation of national states, development of urban society. (Formerly History 412.)

HSTAM
333 Late Middle Ages (5)
 KAMINSKY

The disintegration of the medieval order under the impact of the national state, the secularization of society, and the decline of the Church. Movements of reform and revolution. The culture of late Gothic Europe. (Formerly History 413.)

HSTAM
401 Early Greece (3) A
 FERRILL, THOMAS

A study of the political, institutional, and cultural history of early Greece, with emphasis on the origins of Greek civilization. (Formerly History 400.)

HSTAM
402 Greece in the Age of Pericles (3) Sp
 EDMONSON, THOMAS

A study of the political, institutional, and cultural history of classical Greece, with special emphasis on the legacy of Greece to Western civilization. (Formerly History 401.)

HSTAM
403 Alexander the Great and the Hellenistic Age (3) Sp
 EDMONSON, THOMAS

Political, social, economic, and cultural history of the Greco-Oriental world from Alexander to the Roman conquest, with special emphasis on the change from city-state to world-state and the fusion of Greek and Oriental cultures. (Formerly History 402.)

HSTAM
411 The Early Roman Republic (3) A
 FERRILL

Political, social, economic, and cultural history, with emphasis on the development of the constitution and territorial expansion. (Formerly History 403.)

HSTAM
412 The Late Roman Republic (3) Sp
 FERRILL

Political, social, and cultural history with special emphasis on the period of Cicero and Caesar. (Formerly History 404.)

HSTAM
413 The Early Roman Empire (3)
 FERRILL

Political, social, economic, and cultural history with emphasis on the Julio-Claudians. (Formerly History 405.)

HSTAM
414 The Late Roman Empire (3)
 FERRILL

Political, social, economic, and cultural history with emphasis on the decline of ancient civilization. (Formerly History 406.)

HSTAM
421 The Byzantine Empire (5)
 BOBA, KATZ

Political, institutional, and cultural history of the Eastern Roman Empire from the fourth to the fifteenth centuries, with emphasis on its relations with the Latin West and the Slavic and Moslem areas. (Formerly History 410.)

HSTAM
426 Origins of the East-European States (5)
 BOBA

Analysis of social, cultural, and political development among the Slavs and other peoples of Eastern Europe leading to the emergence of national states of the Middle Ages. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 426. Prerequisites, HST 111 and 112 or General History 113 or permission.

HSTAM
431 Topics in Medieval History, 500-1000 (5)
 BOBA, MOSHER

A study in depth of one or more topics in the history of Europe during the early Middle Ages. Prerequisite, a course in medieval history.

HSTAM
432 Topics in Medieval History, 1000-1250 (5)
 BOBA, KAMINSKY, MOSHER

A study in depth of one or more topics in the history of Europe during the High Middle Ages. Prerequisite, a course in medieval history.

HSTAM
433 Topics in Medieval History, 1250-1500 (5)
 KAMINSKY

A study in depth of one or more topics in the history of Europe during the Later Middle Ages. Prerequisite, a course in medieval history.

HSTAM
441 Church and State in the Middle Ages (5) W
 BOBA, KAMINSKY

Changing theories and realities of relationship between religious and secular elements of medieval civilization. (Formerly History 408.)

HSTAM
442 Central Europe in the Middle Ages (5) Sp
 BOBA, KAMINSKY

Origins and medieval history of Germany, Austria, Bohemia, and Poland, considered as

a region within the sphere of Western European civilization. (Formerly History 426.)

HSTAM
451 Medieval Italy (5)
 MOSHER

Italy, from the barbarian invasions to the Renaissance, considered in the framework of European and Mediterranean cultures. (Formerly History 407.)

HSTAM
452 The Early Renaissance (1300-1450) (3)
 GRIFFITHS

The growth of a Humanist culture in the Italian city-state in contrast with the Gothic values of the waning Middle Ages. (Formerly History 414.)

HSTAM
453 The High Renaissance (1450-1560) (3)
 GRIFFITHS

Climax of the Humanist tradition and the expansion of European culture. (Formerly History 415.)

Courses for Graduates Only

HSTAM
501 Greek History (3-6)
 EDMONSON, THOMAS

Problems in the history of the Athenian Constitution. (Formerly History 511.)

HSTAM
511 Roman History (3-6) W
 FERRILL

Roman History, 31 B.C.-A.D. 37. (Formerly History 512.)

HSTAM
521 Byzantine History (3-6)
 BOBA, KATZ

(Formerly History 513.)

HSTAM
530 Early Middle Ages (3-6) W
 BOBA

Field course. Survey of early European history through the times of tribal migrations and invasions from Asia. Problems and methods of research. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 571. Prerequisite, permission.

HSTAM
531 Medieval European History (3-6)
 KAMINSKY, MOSHER

(Formerly History 514.)

HSTAM
532, 533, 534 Medieval European Seminar (3-6, 3-6, 3-6) A,W,Sp
 KAMINSKY, MOSHER

Prerequisites, a reading knowledge of French or German and Latin. (Formerly History 517, 518, 519.)

HISTORY OF ASIA

Courses for Undergraduates

HSTAS
201 Ancient Indian Civilization (5) A
 CONLON

An introductory course dealing with the religions, literature, philosophy, politics, arts, and history of India from earliest times to the Muslim invasion. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 280. (Formerly History 280.)

HSTAS
202 Modern Indian Civilization (5) W
 CONLON

An introductory course dealing with the

Islamic impact, British conquest, and contemporary India. Emphasis on the rise of nationalism, social organization, and contemporary life and history. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 281. (Formerly History 281.)

HSTAS

221 Introduction to Japanese Civilization (5) Sp PYLE

Survey of Japan's political, social, and cultural development from early times to the present. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 295. (Formerly History 295.)

HSTAS

251 History of China (5) A DULL

From earliest times to the present; emphasis on the modern period. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 290. (Formerly History 290.)

HSTAS

301 Problems of Modern India (5) CONLON

An analysis of the problems in the fields of social life, international and domestic politics, education, economics, and other areas that confront India today and which may determine her future. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 385. (Formerly History 385.)

HSTAS

401 History of India: Earliest Times to A.D. 647 (5) W CONLON

India in ancient times; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 482. Prerequisite, History of Asia HSTAS 201 or permission. (Formerly History 482.)

HSTAS

402 History of India: A.D. 647 to A.D. 1525 (5) CONLON

Medieval India; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 483. (Formerly History 483.)

HSTAS

403 History of India: A.D. 1525 to the Present (5) Sp CONLON

Modern India; emphasis on forms of political organizations and economic life, social organizations, and cultural developments. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 484. Prerequisite, History of Asia HSTAS 202 or permission. (Formerly History 484.)

HSTAS

404 Ancient Indian Politics (3) A CONLON

Emphasizes the role of kingship, administration of justice, principles of statecraft, economic aspects, and the role of society within the political framework. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 485. Prerequisite, History of Asia HSTAS 201 or permission. (Formerly History 485.)

HSTAS

421 History of Early Japan (5) A PYLE

Political, social, economic, and cultural development of Japan to the beginning of the Tokugawa period (17th century). Offered jointly with the Far Eastern and Russian Institute as Far Eastern 452. (Formerly History 452.)

HSTAS

422 History of Tokugawa Japan (5) W PYLE

Feudal development prior to 1600; establishment of the Tokugawan political structure, and the social, economic, and cultural history of the period from 1600 to 1868. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 453. (Formerly History 453.)

HSTAS

423 History of Modern Japan (5) Sp PYLE

Political, social, economic, and cultural development of Japan from the late Tokugawa period to the present with special emphasis on the cultural impact of the West. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 454. (Formerly History 454.)

HSTAS

451 Chinese History: Earliest Times to 221 B.C. (5) A DULL, WILHELM

Pre-Imperial China. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 465. (Formerly History 465.)

HSTAS

452 Chinese History: 221 B.C. to A.D. 906 (5) W DULL, WILHELM

Development of the imperial Chinese state. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 466. (Formerly History 466.)

HSTAS

453 Chinese History: A.D. 906 to A.D. 1840 (5) Sp DULL, WILHELM

The Wu, Tai, Sung, Yuan, Ming and early Ch'ing periods. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 467. (Formerly History 467.)

HSTAS

454 History of Modern China (5) Sp GASSTER

China from approximately 1800 to the present, with major emphasis on political and intellectual history since 1895. The focus is on the processes of modernization and revolution, and on the relationship between them. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 468. (Formerly History 468.)

HSTAS

469, 470 History of Korea (5,5) PALAIS

A survey of Korean history from earliest times to the modern period. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 469, 470. Prerequisite, permission.

HSTAS

476 Western Influences in Russian and Chinese Intellectual History (4) TREADGOLD

Comparative analysis of stages of Western

impact on Russian (1462-1917) and Chinese (1582-1949) thought previous to the proclamation of Marxism-Leninism as the official ideology. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 476. (Formerly History 476.)

Courses for Graduates Only

HSTAS

501 Indian History (3-6) CONLON

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 587. Prerequisite, permission. (Formerly History 587.)

HSTAS

521 Modern Japanese History (3-6) A PYLE

Field course. Offered jointly with the Far Eastern and Russian Institute as Far Eastern. 563. Prerequisites, History of Asia HSTAS 422, 423, or permission. (Formerly History 559, later History 663.)

HSTAS

522 Japan as a World Power, 1895-1945 (3-6) Sp BUTOW

Field course. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 549. (Formerly History 549.) Prerequisite, permission of instructor.

HSTAS

523, 524 Seminar in Modern Japanese History (3-6), (3-6) W,Sp PYLE

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 564, 565. Prerequisite, permission. (Formerly History 664, 665.)

HSTAS

526 Seminar: The Modernization of Japan (5) A PYLE, HELLMAN

Historical and theoretical approach to social, political, economic, and psychological problems of modernization in Japan. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 504 and with the Department of Political Science 504. Prerequisite, permission. (Formerly History 509.)

HSTAS

551 Chinese History: Traditional Period (3-6) Sp DULL

To introduce students to Western language materials on traditional China in order to give the students bibliographical and other assistance in preparing for examinations in this field of history. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 516. (Formerly History 516.)

HSTAS

552-553-554 Seminar in Chinese History: Traditional Period (3-6)-(3-6)-(3-6) A,W,Sp DULL

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 556-557-558. Prerequisite, reading knowledge of Chinese. (Formerly History 556-557-558.)

HSTAS

555 Chinese History: Modern Period (3-6) W GASSTER

Designed to introduce students to Western language materials dealing with the history of modern China. In addition to giving students

bibliographical guidance to help them prepare for field examinations, the course seeks to familiarize students with the major issues being dealt with in current scholarship on modern China. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 514. (Formerly History 614.)

HSTAS

556-557-558 Seminar in Chinese History: Modern Period (3-6)-(3-6)-(3-6) A,W,Sp
GASSTER

Research seminar in modern Chinese history. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 511-512-513. Prerequisites, reading knowledge of Chinese. (Formerly History 611-612-613.)

HSTAS

566 Research Seminar: Modern Korea (3-6)
PALAIS

Advanced instruction in problems and methods of research in Korean history. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 566. No foreign language required. Prerequisite, permission.

HSTAS

570 Modern Korean History (3-6)
PALAIS

Field course. Offered jointly with the Far Eastern and Russian Institute as Far East 570. Prerequisite, Far Eastern 470, History of Asia HSTAS 470, or permission.

HSTAS

571-572-573 Seminar in Korean History (3-6)-(3-6)-(3-6)

Selected topics in Korean history and historiography. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 567-568-569. (Formerly History 567-568-569.)

MODERN EUROPEAN HISTORY

Courses for Undergraduates

HSTEU

271-272, 273 English Political and Social History (5-5,5) A,W,Sp
COSTIGAN

England from the earliest times to the present, stressing the origins of American institutions and social patterns. (Formerly History 271-272, 273.)

HSTEU

371 Intellectual History of Modern England (3) Sp
LEVY

This course will relate the changes in political theory, philosophy, science, and literature to the historical events of the period 1500 to the present. (Formerly History 365.)

HSTEU

380 History of Scandinavia to 1814 (3)
HILDEMAN

A survey of Scandinavian history from the Viking period to 1814 with primary emphasis on the development of Denmark, Finland, Iceland, Norway, and Sweden and the role of the Scandinavians in world history. Offered jointly with the Department of Scandinavian Languages and Literature as Scandinavian 380.

HSTEU

381 History of Scandinavia Since 1814 (3)
HILDEMAN

A survey of Scandinavian history from 1814 to the present with major emphasis on the political, social, cultural, and economic development of the Scandinavian countries.

Offered jointly with the Department of Scandinavian Languages and Literature as Scandinavian 381.

HSTEU

401 The Reformation (3) W
GRIFFITHS

The origins of the disunity of Europe in the crisis of sixteenth century with special emphasis upon the relations between religion and politics. (Formerly History 415.)

HSTEU

402 The Wars of Religion (3) Sp
GRIFFITHS

The effects of theology on the politics of the sixteenth century, with special emphasis on the changes in political thought occasioned by the Reformation crisis.

HSTEU

411 Europe: 1814-1870 (5) A
BRIDGMAN, EMERSON, FARRAR, LYTLE,
PINKNEY, SUGAR

The development of Europe during the age of Metternich, the revolutions of 1848, and the emergence of new national states. (Formerly History 431.)

HSTEU

412 Europe: 1870-1914 (5) Sp
BRIDGMAN, EMERSON, FARRAR, SUGAR

The impact of population increase and technological change on European society; stresses and strains in European life and outlook. (Formerly History 432.)

HSTEU

413 Europe: 1914-1945 (5) Sp
BRIDGMAN, EMERSON, FARRAR

The politics and society of Europe in the age of the concentration camp. (Formerly History 433.)

HSTEU

414 Europe Since 1945 (5) Sp
FARRAR, ULLMAN

Political, economic, and military developments in Europe under the impact of the cold war. (Formerly History 434.)

HSTEU

421 France, 1429-1789 (5) A
LYTLE, PINKNEY

Political and cultural history, from Joan of Arc to the eve of the French Revolution. (Villon, Rabelais, Montaigne, Molière, Voltaire, Rousseau, de Tocqueville.) (Formerly History 429.)

HSTEU

422 The French Revolution and Napoleon: 1789-1815 (5) W
LYTLE, PINKNEY

The transformation of France under the Revolution of 1789; the Reign of Terror and Napoleon; the impact of the Revolution and Napoleon upon Europe. (Formerly History 430.)

HSTEU

423 France Since 1815 (5) Sp
LYTLE, PINKNEY

Political, economic, and social history since the Congress of Vienna. Special emphasis will be laid upon the continuity of the revolutionary tradition. (Formerly History 444.)

HSTEU

431 Germany: 1648-1914 (5) W
BRIDGMAN, EMERSON

A survey of the society, economy, and political problems of Central Europe from the Thirty

Years' War to the First World War, with particular emphasis on the nineteenth century. (Formerly History 436.)

HSTEU

432 Germany: 1914-1945 (5)
BRIDGMAN, EMERSON, FARRAR

Politics and society from the collapse of the Bismarckian empire to the collapse of Hitler's empire. (Formerly History 437.)

HSTEU

441 Modern Russian Intellectual History (5)
ELLISON, TREADGOLD

Development of Russian social and political thought and philosophy from the seventeenth century to the Revolution of 1917. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 424. (Formerly History 424.)

HSTEU

442 History of Russian Culture to 1800 (5) W
SZEFTTEL, TREADGOLD

The development of religion, political ideas, philosophical and literary theories, art, architecture, drama, and music from Kievan times to the end of the eighteenth century. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 448. Prerequisites, History of Europe HSTEU 441 or General History HST 111 and 112 or permission. (Offered alternate years; offered 1971-72.) (Formerly History 448.)

HSTEU

443 Kievan and Muscovite Russia: 850-1700 (5) A
SZEFTTEL

Development of Russia from earliest times to the reign of Peter the Great. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 421. Prerequisites, General History HST 111 and 112 or permission. (Formerly History 421.)

HSTEU

444 Imperial Russia: 1700-1900 (5) W
SZEFTTEL, TREADGOLD

Development of Russia from Peter the Great to Nicholas II. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 422. Prerequisites, History of Europe HSTEU 444 or General History HST 111 and 112, or permission. (Formerly History 422.)

HSTEU

445 Twentieth-Century Russia (5) Sp
ELLISON, TREADGOLD

Russia and the USSR from Nicholas II to the present. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 423. Prerequisites, History of Europe HSTEU 444 or General History HST 111, 112, and 113, or permission. (Formerly History 423.)

HSTEU

446 Russian Historiography (5) Sp
SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 449. Prerequisites, General History HST 111 and 112 or History of Europe HSTEU 441 or 442, or permission. (Formerly History 449.)

HSTEU

447 Russian and East European Bibliography (5) W
BOBA

Analysis of bibliographical problems in the social sciences and the humanities. For seniors and graduate students. Offered jointly with

the Far Eastern and Russian Institute as Far Eastern 489. Prerequisite, one East European language or German. (Formerly History 417.)

HSTEU

451- Eastern Europe: 1772-1918 (5-) A
SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the first partition of Poland to the end of World War I. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 427-. (Formerly History 427.)

HSTEU

-452 Eastern Europe Since 1918 (-5) W
SUGAR

Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Albania, from the end of World War I to the present. Offered jointly with the Far Eastern and Russian Institute as Far Eastern -428. (Formerly History 428.)

HSTEU

461 Formation of the Spanish Nation (5) A
ULLMAN

A study of the major political, economic, and cultural events leading to the creation of the Spanish nation under Ferdinand and Isabel. (Formerly History 495.)

HSTEU

462 Spain in the Modern World (5) W
ULLMAN

A study of the political, economic, and cultural attempts of Spain to adjust to capitalism, liberalism, and secularism. (Formerly History 496.)

HSTEU

463 Portugal in the Age of Exploration (5)
ALDEN

The pivotal role of Portugal in the expansion of Europe from the eleventh to the seventeenth centuries. (Formerly History 497.)

HSTEU

471 England in the Sixteenth Century (5) A
LEVY

Political, administrative, and social history from Henry VII to Elizabeth I, with emphasis on the Reformation and its effects and on conditions of life in Elizabethan England. (Formerly History 469.)

HSTEU

472 England in the Seventeenth Century (5) W
LEVY

Political, administrative, and social history from the accession of James I to the Glorious Revolution. (Formerly History 470.)

HSTEU

473 England in the Eighteenth Century (5) Sp
COSTIGAN, LEVY

A study of political, social, economic, and cultural developments. Parliamentary government; rise of the British Empire; aristocratic culture. (Formerly History 471.)

HSTEU

474 England in the Nineteenth Century (5) W
COSTIGAN

Political, social, and cultural development; the agrarian, industrial, and French revolutions; the rise of parliamentary democracy; the Victorian age; political thought from Utilitarianism to Fabianism; Irish Home Rule. (Formerly History 472.)

HSTEU

475 England in the Twentieth Century (5) Sp
COSTIGAN

From the Boer War to the present; conservatism, liberalism, and socialism; England in two world wars; the decline of British imperialism. (Formerly History 473.)

HSTEU

476 Modern Irish History (5)
COSTIGAN

Growth of Irish national feeling in the nineteenth century through the Home Rule and Sinn Fein movements; establishment of the Irish Free State and the Republic of Eire; background of the Irish literary renaissance; establishment of Northern Ireland. (Formerly History 474.)

Courses for Graduates Only**HSTEU**

501 Renaissance and Reformation (3-6) A
GRIFFITHS
(Formerly History 515.)

HSTEU

502-503-504 Seminar in the Renaissance and Reformation (3-6)-(3-6)-(3-6) A,W,Sp
GRIFFITHS
(Formerly 529-530-531.)

HSTEU

521 Modern European History: France (3-6) Sp
LYTLE, PINKNEY
(Formerly History 533.)

HSTEU

522-523-524 Seminar in French History (3-6)-(3-6)-(3-6) A,W,Sp
LYTLE, PINKNEY
(Formerly History 524A-524B-524C.)

HSTEU

531 Modern European History: Germany (3-6) W
BRIDGMAN, EMERSON
(Formerly History 532.)

HSTEU

532-533-534 Seminar in Modern European History: Germany (3-6)-(3-6)-(3-6) A,W,Sp
BRIDGMAN, EMERSON
(Formerly History 521-522-523.)

HSTEU

541 Medieval Russian History (3-6) Sp
SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 539. Prerequisites, History of Europe HSTEU 441, 442, or permission; Russian or French, and German. (Formerly History 539.)

HSTEU

542-543 Seminar in Medieval Russian History (3-6)-(3-6) A,W
BOBA, SZEFTTEL

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 546-547. Prerequisite, reading knowledge of Russian. (Formerly History 546-547.)

HSTEU

544 Modern Russian History (3-6) A
ELLISON, TREADGOLD

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 534. (Formerly History 534.)

HSTEU

545-546-547 Seminar in Modern Russian History (3-6)-(3-6)-(3-6) A,W,Sp
ELLISON, TREADGOLD

Seminar in modern Russian history. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 535-536-537. Prerequisite, reading knowledge of Russian. (Formerly History 535-536-537.)

HSTEU

551 History of Eastern Europe: 1772-1939 (5)
SUGAR

A study of the East-Central European region: Poland, Czechoslovakia, Hungary, Rumania, and the Balkan countries, from their rebirth to World War II. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 528. Prerequisite, reading knowledge of German, French, Russian, or one East European language. (Formerly History 528.)

HSTEU

552 History of Eastern Europe: 1939 to the Present (5)
SUGAR

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 548. Prerequisite, reading knowledge of one major European or one East European language. (Formerly History 548.)

HSTEU

553-554-555 Seminar in Modern East European History (3-6)-(3-6)-(3-6) A,W,Sp
SUGAR

Study and research involving special methods dealing with the histories of the East European countries in the modern period. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 560-561-562. (Formerly 560-561-562.)

HSTEU

562 Early Spanish History (3-6)
ULLMAN

Problems in the history of Spain, antiquity through the Middle Ages.

HSTEU

563 Modern Spanish History (3-6)
ULLMAN

Problems in the history of Spain, 1500 to the present.

HSTEU

571 English History: Tudor and Stuart (3-6)
LEVY

(Formerly History 574.)

HSTEU

572 English History (3-6) A
BELL, COSTIGAN
(Formerly History 575.)

HSTEU

573-574 Seminar in Modern English History (3-6)-(3-6)
BELL, COSTIGAN
(Formerly History 572-573.)

HSTEU

583 Research in the U.S.S.R. (3-6) S

A course especially designed to assist graduate students who expect to do historical research in the Soviet Union, providing both disciplinary training and an introduction to the special problems of field research in Soviet archives and libraries. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 583. Prerequisite, graduate standing; knowl-

edge of Russian desirable. (Formerly History 583.)

HOME ECONOMICS

Courses for Undergraduates

110 Food and Nutrition (5) AWSp

CRUM, ARLIN

Meal management and food preparation with emphasis on nutritive and economic values. For nonmajors. Not open to students who have had 300.

125 Textiles (3) AWSp

BROCKWAY

Relationship of raw materials, construction, and finish to quality and cost; identification of fibers, yarns, and fabrics; microscopic and chemical tests; economic development of textile industry.

134 Clothing (3 or 5) AWSp

EKENES, MURDOCH, SHIGAYA

Sociological, psychological, economic, and aesthetic aspects of clothing selection. Custom techniques in construction of cotton and linen garments. Students having had 231 will receive only 3 credits.

148 The Home, Its Equipment, and Management (3) AWSp

WILSON

Management of resources to achieve family goals. Principles of management, kitchen and laundry planning, work simplification, wiring, and selection and care of household equipment.

216 Food Preparation and Meal Management (1-3) AWSp

CRUM

Principles of food selection and preparation, with emphasis on meal management. Prerequisites, 148, Chemistry 101 and 102, or equivalent.

231 Clothing Selection (2) ASp

EKENES

Sociological, psychological, economic, and aesthetic aspects of clothing for the individual. Not open to students who have had 134.

234 Costume Design (3) AWSp

SHIGAYA, SMITH

Principles of flat pattern technique applied to design and construction of wool garments. Prerequisites, 125, 134, and Art 109 or 129, or equivalent.

240 Home Furnishing (3)

SCHROEDER

A study of the house and its furnishings for present-day living. Not open to freshmen or to students who have taken 347.

300 Nutrition (2) WSp

ARLIN

Importance of food to the maintenance of health; nutritive values and human needs; ways of meeting requirements at different cost levels. For upper-division nonmajors. Not open to students who have had 110.

307 Nutrition (3 or 5) AW

ARLIN

Chemistry of digestion and metabolism. Food values; human requirements and ways of meeting them at different cost levels. Qualified transfer students receive 3 credits. Prerequisites, general and organic chemistry and human physiology.

315 Advanced Food Selection and Preparation (3 or 5) AWSp

MARTINSEN

Scientific principles and experimental method applied to food preparation and preservation. Management related to food purchasing, meal preparation, and service. Prerequisites, 110 and permission, or 216, and organic chemistry.

316 Demonstration Techniques (3) AWSp

MARTINSEN

Principles and techniques of food and equipment demonstrations; food photography; recipe development. Prerequisites, 315 or permission.

319 Family Nutrition (4) A

MONSEN

Chemistry and metabolism of the nutrients essential for maintenance of health. Normal nutritional needs of individuals at various age levels. Nutritional value of foods. Simple dietary modifications as appropriate to medical or dental fields. Prerequisites, Conjoint (Medical) 316, 317-318, or permission.

321 Applied Design (2)

Functional and decorative phases in the development of needlework and their application to contemporary design and textile art. Illustrated by a unique collection of historic lace. Prerequisites, 134 and Art 109 or 129 or equivalent, or permission.

322 Applied Design (2)

History of European national costume and embroidery as source material for modern design. Illustrated by rich collection of authentic folk costumes. Prerequisites, 134 and Art 109 or 129 or equivalent, or permission.

329 Hand Weaving (2) AWSp

BROCKWAY

Weaving as an art form; fundamentals of loom design and operation; experimental problems in basic fabric structure. Prerequisites, permission and junior standing.

334 Costume Design (3) W

KATZ

Designing as interpreted by techniques of draping, appropriate for silk and synthetic fabrics. Study of economic factors involved in clothing production at various price levels. Prerequisite, 234.

338 Clothing for the Family (3) AWSp

KATZ, SHIGAYA

Social and psychological aspects of family clothing, mass production, and the retail market. Individual problems of family clothing as affected by income, age, sex, and geographic locations. Prerequisite, 234.

347 Home Furnishing (3 or 5) AWSp

SCHROEDER

Analysis of problems with relation to today's family living. Selection and arrangement of furnishings based on good design and appropriateness. Field trips and individual laboratory problems. Not open to students who have taken 240. Prerequisites, 125 and Art 109 or 129, and upper-division standing.

348 Home-Management House (3) AWSp

WILSON

Home-Management House Laboratory. Application of principles of time, energy, and money management to group living. Advance reservation required. Prerequisites, 148, 307, 315, 347, 354 senior standing, and permission.

350 Managing Family Finances (3)

HALL

Use of financial resources to further family goals. Changes in income and in prices of consumer goods in relationship to family budgeting. Consumer credit, savings, insurance, social security, investments, taxes, trusts, and wills.

354 Family Economics and Finances (3 or 5) AWSp

HALL

Economic and social conditions affecting the consumer. Use of financial resources to further family goals. Family budgeting, credit, savings, insurance, social security, investments, taxes, trusts, and wills. Not open to those who have had 350. Prerequisites, Economics 200 and junior standing.

356 Family Relationships (3) AWSp

STONE

Principles underlying good family relationships; wholesome adjustment of the home to a changing society. Prerequisite, upper-division standing.

372 Institution Food Preparation (5) WSp

ANDERSEN

Laboratory and institution practice in large-quantity food preparation and cost control. Prerequisite, 315 or permission.

380 Field Work in Apparel Manufacturing (2, max. 6) AWSp

SMITH

Open only to apparel manufacturing majors. A program of part-time employment planned in advance with the instructor to provide on-the-job training correlated with periodic reports and evaluation of experience. Prerequisites, senior standing and permission.

406 Recent Developments in Nutrition (3) AWSpS

ARLIN, MONSEN

Review of nutrition in the light of recent developments; interpretation of current research; special needs of various age groups.

407 Advanced Nutrition (3) W

MONSEN

Recent research on vitamins, minerals, amino acids, lipids, and their interrelationships. Methods of utilizing knowledge in public health work, teaching, and research. Prerequisites, 307 and organic chemistry, or permission.

408 Diet Therapy (3) Sp

MONSEN

Nutrition as a curative and preventive factor in disease. Journal readings. Prerequisite, 407.

409 Food and People (3) A

FEENEY

Economic, cultural, and social determinants of food patterns. Problems of population and food supply. Meaning of food to different peoples. An ecological approach to malnutrition as a major world problem. Programs of national and international scope designed to combat malnutrition.

415 Experimental Foods (3) W

MARTINSEN

Illustrating scientific principles by subjective and objective testing of foods. Individual research problems. Prerequisite, 315 or permission.

425 Advanced Textiles (3) W

BROCKWAY

Textile testing in research and in measuring fabric performance; textile legislation, standards, and methods of quality control; economic factors in world production and distribution of raw materials. Prerequisites, 125, organic chemistry, and Economics 200 or equivalent.

429 Advanced Weaving (3) A

BROCKWAY

Experimental problems, creative techniques, in designing decorative textiles; cloth analysis and design; library investigations of historic and contemporary contributions to textile arts. Prerequisite, 329 or equivalent.

432 History of Costume and Textiles (4) W

SMITH

Fabrics and costumes of ancient civilizations and medieval European countries with consideration of their respective cultural origins. Prerequisites, General History (HST) 111 and 112, or equivalent, junior standing in Home Economics or permission.

433 History of Costume and Textiles (4) Sp

SMITH

Continuation of 432 from the Renaissance to the present time. Prerequisite, 432.

434 Costume Design (3) Sp

SHIGAYA

Principles of tailoring. Analysis of methods and comparative costs of custom made and ready-to-wear garments. Appreciation of fine quality in clothing; discrimination in selection. Prerequisites, 338 or 334, and permission.

435 Advanced Costume Design (5) A

SMITH

Application of the principles of flat pattern designing to problems in custom and mass production. Prerequisites, 334, 434, and Art 369 (which may be taken concurrently).

436 Advanced Costume Design (5) Sp

Application of the art of draping to custom and mass production. Prerequisite, 435.

447 Advanced Home Furnishing (3) Sp

SCHROEDER

Individual projects in specific fields of furnishings. Evaluation of standards in professionally constructed furniture and furnishings. Laboratory problems. Prerequisites, 240 and permission, or 347, and upper-division standing.

454 Advanced Family Economics and Finances (2) W

HALL

Family adjustment to differing social and economic conditions. Legislation affecting consumers. Prerequisites, 354, or equivalent, and Economics 200.

456 Advanced Family Relationships (3) AWSp

STONE

Advanced study in interpersonal relationships in the family; growth and development during various phases of the family life cycle. Synthesis and evaluation of knowledge and concepts from the behavioral sciences concerned with family relationships. Prerequisite, 356 or teaching experience and upper-division standing

457 Child Nutrition and Care (3) WSp

JOHNSON

Physical, mental, and emotional health of children. Experience with parents and children in nutrition clinic under supervision of a pediatrician. Prerequisite 300 or 307, or permission.

462 Improvement of Teaching: Home Economics (3, max. 6) AS

MC ADAMS, GRANBERG

Identification of goals, concepts, and generalizations in home economics units at the secondary level with emphasis on teaching techniques, evaluation, and use of resources. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 427. Prerequisite, teaching experience in home economics or permission. (Formerly 475FJ.)

472 Institution Food Purchasing (3) W

ANDERSEN

Market organization, buying procedures, payment and credit; food selection and care; inspection of merchandise. Prerequisites, 315 and 372.

473 Institution Management (5) Sp

ANDERSEN

Organization and administration in food service institutions. A study of types of institutions, work planning, personnel direction, quality and cost controls, sanitation, budget analysis, professional ethics, executive qualifications. Prerequisite, 372.

474 Institution Management (5) A

SANDSTROM

Food and food service accounting problems. Recording financial transactions; cost controls; profit and loss statements. Prerequisite, 372.

475 Institution Equipment (3) A

ANDERSEN

Equipment requirements and flow of work in institutions. Institution kitchens and serving units; equipment selection, operation, and care; repair and depreciation records. Prerequisite, 372.

480 Special Problems in Family Economics (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in family economics. Prerequisite, permission. (Formerly 495E.)

481 Special Problems in Institution Administration (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in institution administration. Prerequisite, permission (Formerly 495B.)

482 Special Problems in Home Economics Education (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in home economics education. Prerequisite, permission. (Formerly 495G.)

483 Special Problems in Family Relationships (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in family relationships. Prerequisite, permission. (Formerly 495H.)

484 Special Problems in Costume Design (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in costume design. Prerequisite, permission. (Formerly 495A.)

485 Special Problems in Textiles (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in textiles. Prerequisite, permission. (Formerly 495D.)

486 Special Problems in Foods (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in foods. Prerequisite, permission. (Formerly 495F.)

487 Special Problems in Home Furnishing (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in home furnishing. Prerequisite, permission. (Formerly 495K.)

488 Special Problems in Home Management (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in home management. Prerequisite, permission. (Formerly 495I.)

489 Special Problems in Nutrition (*. No more than 10 credits in the 480 series may be applied toward any one degree.) AWSp

Individual study and research in nutrition. Prerequisite, permission. (Formerly 495C.)

494 Workshop in Home Economics Education (2½) S

Current problems in Home Economics Education. Prerequisites, Education Curriculum and Instruction (EDC&I) 327 and Education (EDUC) 375, or equivalent.

496H Senior Honors Thesis (2 or 3, min. 6 and max. 6) AWSp

For undergraduate home economics honors students only. Requires 6 credits taken over a minimum of two quarters.

Courses for Graduates Only

507 Readings in Nutrition (*) Sp

MONSEN

Library research and seminar on selected topics in recent developments in the field of nutrition. Prerequisite, 407 or equivalent.

509 Evaluation of Nutritional Status (2) W

FEENEY

Dietary, clinical, and biochemical aspects as an integral part of evaluating nutritional status. Critical examination of major nutritional status surveys. Experimental design. Dietary methodology.

510 Community Nutrition (3) S

FEENEY

Survey of major nutritional problems facing American communities, with special emphasis on the problems of pregnancy and childhood. Practical approaches to nutrition education and the dynamics of changing food habits. Program planning and exposure to available resources for interdisciplinary services. Current programs in the United States and other countries.

511 Field Work in Public Health Nutrition (2-12, max. 12) AWSp

Observation and participation in community agency nutrition programs. Prerequisite, permission.

515 Readings in Food Selection and Preparation (*) W

MONSEN

Library research and seminar on selected topics in recent developments in food chemistry, selection, processing, and preparation. Prerequisite, 315 or equivalent, or permission.

525 Seminar in Textiles (3) Sp

BROCKWAY

Readings and discussion of factors affecting economic utilization and technical development of textile products. Trends in current research and methods of investigation. For graduate students in textiles and clothing. Prerequisites, 125, 425, or equivalent.

554 Social and Economic Problems of the Consumer (3 or 5) Sp

HALL

Selected topics in the family economics field. Prerequisites, 454 or equivalent, and permission.

556 Seminar in Family Relationships (3)

ASp

STONE

Seminar on recent developments in the field of family relationships, with emphasis on current research methods and findings. Prerequisites, 456 or equivalent, and permission.

562 Home Economics Education (*) W

MCADAMS

Study of achievements, trends, functions, methods, and teaching materials.

576, 577, 578 Supervised Field Work (4,4,4) AWSp, AWSp, AWSp

TERRELL

Three quarters of practice and organized classwork for graduates in institution management and dietetics. An administrative dietetics internship approved by the American Dietetic Association. Fee, \$25.00 (payable first quarter).

600 Independent Study or Research (*) AWSp**700 Thesis (*) AWSp****HUMANITIES****101 Literature (5) AWSp**

An introduction to literary forms and techniques through analysis of representative examples of narrative and poetic art, with emphasis upon relationship of content and expression. One or two sections a year will have emphasis on Black literature.

102 The Arts (5) AWSp

Painting, sculpture, music, architecture, the dance, and drama studied through example, discussion, and criticism.

103 The Arts of Africa, the Caribbean, and Black America (5)

Creative achievements by the Blacks of Africa, the Caribbean, and America in visual arts, music, dance, literature, and theatre. Guest lecturers and performing artists.

201 Literature (5) WSp

Reading and critical discussion of some of the greatest works in world literature.

LINGUISTICS**101-102-103 Introduction to Language (5-5-5) A,W,Sp**

An introduction to the nature of language; patterns of language change; the relevance of the study of language to the study of mental processes.

200 Introduction to Linguistics (5) AWSp

An introduction to the scientific study of language; language and writing; phonological and grammatical analysis; language change; related disciplines.

201 Language and Human Behavior (5) Sp

The course will cover the elements of the biological basis of human language, the differences between animal and human communications of linguistic theory and the function of language in society. Prerequisite, 200.

400 Survey of Linguistic Method and Theory (3) AWSp

The background and scope of modern linguistics; languages of the world; language analysis; relation to other disciplines. (Not open to students who have had Linguistics 200.)

404, 405, 406 Indic and Indo-European (3,3,3) A,W,Sp

Reading of simple Sanskrit texts with emphasis on structure of Sanskrit and its comparison with other Indo-European languages. Introduction to principles of comparative linguistics.

441 Linguistics and Poetic Language (3) A

Relationship between linguistic structures, linguistic universals, and the poetic uses of language; linguistic description in the analysis of literature. Prerequisite, 400 or permission.

443 Philosophy and Linguistics (3)

A study of recent work in linguistics and its implications for philosophy. Offered jointly with the Department of Philosophy as Philosophy 443. Prerequisite, permission.

445 Teaching English as a Foreign Language (3) W

Linguistic analysis as a basis for the teaching of English as a foreign language; language as rule-governed behavior. Prerequisite, 400.

447 Language Development (3) W

The study of first-language acquisition by children. Emphasis will be placed on theoretical issues and research techniques.

451, 452, 453 Phonology (3,3,3) A,W,Sp

Detailed study of speech sounds, mechanisms of their production, and structuring of sounds in languages; practical experience with a wide variety of languages; field techniques. Offered jointly with the Department of Anthropology as Anthropology 451, 452, 453.

454 Methods in Comparative Linguistics (3) WS

Method and theory of comparative linguistics in relation to anthropological research. Offered jointly with the Department of Anthropology as Anthropology 454. Prerequisite, 400 or permission.

455 Areal Linguistics (3, max. 6) ASp

Linguistic analyses of the languages of a selected area. Offered jointly with the Department of Anthropology as Anthropology 455.

461, 462, 463 Syntax (3,3,3) A,W,Sp

Study of the structuring of meaningful elements in language; practical experience with a wide variety of languages; taxonomic and generative views of grammar; field techniques. Offered jointly with the Department of Anthropology as Anthropology 461, 462, 463. Prerequisite, 400 (may be taken concurrently) or permission.

464 Phonetic Transcription (2½) S

Practice in the transcription and analysis of phonological data from non-Indo-European languages. Prerequisite, permission.

465 Problem Solving in Phonology (5) S

Training in practical solutions to phonological problems from a variety of languages. Prerequisite, permission. (Formerly 457.)

466 Problem Solving in Grammar (5) S

Training in practical solutions to grammatical problems from a variety of languages. Prerequisite, permission. (Formerly 458.)

467 Grammatical Exercises (2½) S

Practice in eliciting, recording, and analyzing grammatical data of a non-Indo-European language. Prerequisite, 466, which may be taken concurrently. (Formerly 465.)

471 Survey of Linguistic Theories (5) S**472 Linguistic Analysis (5) S****473 Informant Techniques (5) S**

Guided practice in analyzing the phonology and grammar of a non-Indo-European language. Prerequisites, 471 and 472, which may be taken concurrently. (Formerly 484-485.)

478 Introduction to Southeast Asian Linguistics (3) A

COOKE

Survey of language families of Southeast Asia. Typology and relationships. Research needs and problems. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 478. Prerequisites, 452, 462.

484-485 Informant Techniques (2½-2½) S

Guide practice in analyzing the phonology and grammar of a non-Indo-European language. Prerequisites, 471, 472, which may be taken concurrently.

499 Undergraduate Research (1-5) AWSp**Courses for Graduates Only****500 Proseminar (3) A**

Introduction to bibliography and research in linguistics.

501, 502, 503 Linguistic Analysis Laboratory (3,3,3) A,W,Sp

Guided analysis of a language unfamiliar to all students of the class; construction of a grammar based on material elicited from native informant. Prerequisites, 453, 463, or permission.

504 Indo-European Comparative Phonology (2) A

Sound systems of the principal families of Indo-European and the relation of these to a hypothetical parent tongue. Prerequisite, 406 or permission. (Offered alternate years; offered 1970-71.)

505, 506 Indo-European Comparative Grammar (2,2) W,Sp

Systematic treatment, with extensive surveys of individual language groups. Prerequisite, 504.

514, 515, 516 Seminar in Comparative Linguistics (2,2,2) A,W,Sp

Advanced problems emphasizing work with languages having few or no written records. Prerequisite, 406 or permission.

519 Mathematical Models of Grammar (3) W

A study of some mathematical models of language recognition, emphasizing context-free and context-sensitive grammars. Offered jointly with the Department of Mathematics as Mathematics 519. Prerequisite, graduate standing in mathematics, linguistics, or psychology, or permission of the instructor. (Offered alternate years; offered 1971-72.)

524 Seminar in Descriptive Linguistics
(2, max. 6)

Individual and joint research on selected topics in descriptive linguistics. Topics to change each quarter. Typical topics are semantics, generative grammar, phonological theories. Prerequisites, 453, 463.

530 Dialectology (3) Sp

The principles of dialect deviation as related to linguistic structure and usage. Prerequisite, 452 or permission.

553 Analysis of Linguistic Structures
(3, max. 6) AW

Offered jointly with the Department of Anthropology as Anthropology 553. Prerequisite, permission.

565 Contrastive Linguistics (3) Sp

The attempt to look across linguistic systems for comparable and contrastive classes and subclasses. Problems of subcategorization and universal grammar. Three conceptually distinct models: structural, transfer grammar, generative. Prerequisites, 452, 463.

578 Seminar in Southeast Asian Linguistics
(3, max. 9) A
COOKE

Advanced consideration of specialized problems in Southeast Asian linguistics. Reports on individual research. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 578. (Offered alternate years; offered 1971-72.)

579 Comparative Altaic Linguistics (3) W
Comparative phonology and morphology of Mongol and Turkic and other related languages. Offered jointly with the Department of Asian Languages and Literature as Mongolian 579. Prerequisite, permission. (Not offered 1969-70.)

580 Problems in Linguistics (3, max. 12)
AWSp

For advanced students of linguistics, dealing with significant movements, techniques, skills, and theories in the field. Prerequisite, permission.

599 Linguistics Colloquium (1, max. 6)
AWSp

Biweekly seminar attended by faculty and graduate students to discuss research in progress and topics of general interest. Attendance is required for a minimum of three quarters during the student's residence. Prerequisite, permission.

600 Independent Study or Research (1-5)
AWSpS**700 Thesis (*) AWSpS****800 Doctoral Dissertation (*)**

HUNGARIAN—See *Slavic Languages and Literature*

ICELANDIC—See *Scandinavian Languages and Literature*

INDIAN—See *Asian Languages and Literature*

INDIC—See *Asian Languages and Literature*

ITALIAN—See *Romance Languages and Literature*

JAPANESE—See *Asian Languages and Literature*

JOURNALISM—See *Communications*

KOREAN—See *Asian Languages and Literature*

LATIN—See *Classics*

MATHEMATICS**Courses for Undergraduates****MATHEMATICS****100-102 Algebra (5-5) AW, WSp**

Similar to the first two terms of high school algebra. Assumes no previous experience in algebra. Not open to students who have had two terms of high school algebra with a grade of C or better.

101 Intermediate Algebra (0) AWSp

Similar to third term of high school algebra. Not open for credit to students who have taken one and one-half years of algebra in high school. Prerequisite, one year of high school algebra.

104 Plane Trigonometry (3) AWSp

Trigonometric functions, identities, equations, inverse functions, graphs, logarithms, and solution of triangles. Not open for credit to students who have taken trigonometry in high school. Prerequisites, 101 or equivalent and one year of plane geometry.

105 Elementary Functions (5) AWSp

Elementary functions with emphasis on the general nature of function, polynomial and rational functions, exponential and logarithmic functions and trigonometric functions. Prerequisites, one and one-half years of high school algebra and qualifying test, or 101.

114 Elementary Computer Programming (2)
AWSp

Programming and coding of problems for automatic digital computers. Flow charts, loops, subroutines. Codes written will be executed by machine. Prerequisite, 101 or equivalent; 105 or equivalent recommended.

124, 125, 126 Calculus with Analytic Geometry (5, 5, 5) AWSp, AWSp, AWSp

Plane analytic geometry, differentiation of algebraic and transcendental functions, anti-derivatives, definite integrals, technique of integration, vector algebra, solid analytic geometry, multiple integrals, partial derivatives. Applications. No more than 5 credits from among 124, 134H, and 157 may be counted toward any degree. Prerequisites, 105 or qualifying test, and 104 or equivalent for 124; 124 or 134H for 125; 125 or 135H for 126.

134H, 135H, 136H Calculus with Analytic Geometry (5, 5, 5) A, W, Sp

Honors sections of 124, 125, 126. No more than 5 credits from among 124, 134H, and 157 may be counted toward any degree. Prerequisites, four years of high school mathematics and permission.

157 Elements of Calculus (4) AWSp

Elementary treatment of the differential and integral calculus of simple functions. Intended for students who wish only a brief course in calculus. No more than 5 credits from among 124, 134H, and 157 may be counted toward any degree. Prerequisite, 105 or qualifying test.

170, 171 Theory of Arithmetic (3,3)
AWSpS, SpS

Numerals and systems of numeration; concept of a set; relations and their properties; sys-

tematic development of the integers, rational numbers; real numbers and their properties. Prerequisites, one year of high school algebra, one year of geometry and either Mathematics 101 or Philosophy 120 or equivalent for 170; 170 for 171. Ordinarily, credit may not apply toward a major in mathematics.

201H, 202H, 203H Selected Topics in Mathematics (3,3,3) A, W, Sp

Honors course for liberal arts students. Not limited to membership in the College Honors Program. Various topics in mathematics selected to provide some acquaintance with mathematical thinking and some of the important concepts of mathematics. Not open to physical science majors and students having completed mathematics courses numbered 124 or above. Ordinarily, credit may not apply toward a major in mathematics. Prerequisites, three years of high school mathematics and permission of the Mathematics Department for 201H; 201H for 202H; 202H for 203H.

224 Intermediate Analysis (3) AWSp

Theory of limits, infinite series, elementary differential equations. Prerequisite, 126.

234H, 235H, 236H Advanced Calculus (3,3,3)
A, W, Sp

Honors courses covering the material of 238, 324, 325, and selected other topics. Prerequisites, 136H or permission for 234H; 234H for 235H; 235H for 236H.

238 Elements of Differential Equations (3)
AWSp

Elementary methods of solution, linear differential equations of second and higher order. Prerequisite, 136H or 224.

301 Elementary Number Theory (3) AWSp
A brief introduction to some of the fundamental ideas of elementary number theory. Prerequisite, 126 or 136H.

302, 303 Elementary Linear Algebra
(4,3) AWSp AWSp

Vector spaces; linear transformations; systems of linear equations; equivalence and similarity of matrices; quadratic forms. 302 not open for credit to students who have taken 413. Prerequisites, 126 or 136H for 302; 302 for 303.

305 Introduction to Mathematical Logic
(3) WSp

Formal principles of inference and definition. Propositional inference and inference involving quantifiers. Applications to elementary mathematical theories and to the axiomatic method are stressed. Prerequisites, 126, or 105 and Philosophy 120.

324 Advanced Calculus I (3) AWSp

Functions of several variables, transformations and mappings, implicit function theorem. Prerequisite, 224 or 136H; 302 recommended.

325 Advanced Calculus II (3) AWSp

Vector analysis, theorems of Stokes, Gauss, and Green. Prerequisite, 224 or 136H; 302 and 324 recommended.

326 Advanced Calculus III (3) AWSp

Properties of continuous functions, uniform continuity, theory of integration, series, uniform convergence, improper integrals. Prerequisites, 324 and 325.

374 Principles of Digital Computers and Coding (3) AWSp

High-speed digital computation, number systems, machine components, programming, operation. Prerequisites, 114 and 124 or 134H.

400 Elementary Set Theory (3) Sp

Basic axioms of set theory, algebra of sets, Peano axioms, axiom of choice and Zorn's Lemma, transfinite recursion, cardinal numbers and arithmetic. Prerequisite, 236H or 325, or permission.

402, 403, 404 Introduction to Modern Algebra (3,3,3) A,W,Sp

Algebraic systems; elementary theory of groups, rings, and fields; polynomials; topics in linear algebra; reductions of forms. Prerequisites, 236H or 302 for 402; 402 for 403; 403 for 404.

405 Introduction of Metamathematics (3) Sp

Formal systems; propositional calculus and predicate calculus of first order. The concepts of consistency, completeness, and decidability are introduced and applied to these systems. Prerequisite, 305 or permission.

407, 408 Mathematical Optimization Theory I, II (3,3) WSp, Sp

The theory of linear programs and its applications: Systems of linear inequalities, duality, the simplex algorithm, matrix games. Non-linear programs and Lagrange multipliers. Assignment problems and various combinatorial extremum problems involving directed graphs. Prerequisites, 302 for 407; 407 for 408.

411, 412 Introduction to Modern Algebra for Teachers (3,3) A,W

Development of the number systems of elementary algebra; groups, rings, integral domains and fields; polynomials. Restricted to teaching majors. 411, 412 not open for credit to students who have taken 402, 403. Prerequisites, 302 for 411; 411 for 412.

424, 425, 426 Fundamental Concepts of Analysis (3,3,3) A,W,Sp

Sets, real numbers, topology of metric spaces, normed linear spaces, multivariate calculus from an advanced viewpoint. Prerequisites, 324 or 236 and 303 or permission for 424; 424 for 425; 425 for 426.

427, 428, 429 Topics in Applied Analysis (3,3,3) AW, WSp, Sp

427: Elementary complex variable. Prerequisite, 224 or 136H. 428, 429: Orthogonal functions and boundary value problems, calculus of variations. Prerequisites, 238 or 236H for 428; 428 for 429.

438 Principles of Differential Equations (3) AWSp

Linear systems, existence of solutions, solution by series, special functions. Prerequisite, 236H or 224; 238 and 302 recommended.

441, 442, 443 Advanced Geometry (3,3,3) A,W,Sp

Selected topics from among: projective geometry, differential geometry, advanced analytic geometry, algebraic geometry, algebraic topology, and the geometry of convex bodies. Prerequisites, 126 or 136H and 302 or permission, for 441; 441 for 442; 442 for 443.

444, 445 Foundations of Geometry (3,3) A,W
Axiomatic treatment of the foundations of Euclidean geometry. Introduction to non-Euclidean geometry. Designed for teaching majors. Prerequisites, 126 or 136H for 444; 444 for 445.

464 Numerical Analysis I (3) A

Basic principles of numerical analysis, classical interpolation and approximation formulas, finite differences and difference equations. Prerequisite or corequisite, 238 or equivalent.

465 Numerical Analysis II (3) W

Numerical methods in algebra. Systems of linear equations, matrix inversion, successive approximations, iterative and relaxation methods. Prerequisites, 302, 303, 374, and 464.

466 Numerical Analysis III (3) Sp

Numerical differentiation and integration. Solution of differential equations and systems of such equations. Prerequisites, 374 and 464.

496H Honors Seminar (*, max. 9) AWSp

Problem seminar for senior honors students and first-year graduate students. Prerequisite, permission.

497 Special Topics in Mathematics for Teachers (2-5, max. 15)

Study of selected areas of mathematics designed for the improvement of teachers of mathematics. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 478.

498 Special Topics in Mathematics (2-5, max. 15) AWSp

Reading and lecture course intended for special needs of advanced students. Offered when demand is sufficient. Prerequisite, permission of the instructor.

PROBABILITY AND STATISTICS**281 Elements of Statistical Method (5) AWSp**

Elementary concepts of probability. Binomial and normal distributions. Basic concepts of testing hypotheses and estimation. Application to binomial and normal distribution. Chi-square tests. Linear regression theory. For nonmajors only. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Prerequisite, 105.

391 Elementary Probability (3) AWSp

Sample space, random variables, laws of probability. Combinatorial probabilities. Distributions: binomial, normal; expectation, variance. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Not intended for nonteaching majors in mathematics or the physical sciences. Prerequisite, 126 or 136H.

392 Elements of Statistics (3) WSp

Basic concepts of testing hypotheses and of estimation (interval and point). Binomial, normal tests, and estimates. No more than 6 credits from among 281, 391, 392, and Psychology 301 may be counted toward any mathematics degree. Not intended for nonteaching majors in mathematics or the physical sciences. Prerequisite, 391.

394 Probability (3) A

Sample spaces; basic axioms of probability; combinatorial probability; conditional probability and independence; binomial, Poisson and normal distributions. Prerequisite, 224 or 136H.

395 Probability (3) W

Random variables; expectation and variance; laws of large numbers; normal approximation and other limit theorems; multidimensional distributions and transformations. Prerequisite, 394.

396 Probability (3) Sp

Characteristic functions and generating functions; recurrent events and renewal theory; random walk. Prerequisite, 395.

482, 483 Statistical Inference (3,3) A,W

Introduction to sampling and general theory of statistical inference; general theory of estimation and hypothesis testing; multivariate theory and correlation. Prerequisites, 395 for 482; 482 and 303 for 483.

484 Distribution-Free Inference (3) Sp

Distribution-free methods in estimation and testing; Chi-square theory. Prerequisite, 483.

485 Analysis of Variance (3) Sp

General linear hypothesis-tests and estimates. Distribution theory of tests. Tests of all contrasts. Fixed, mixed, and random models. Prerequisite, 483.

491, 492 Introduction to Stochastic Processes (3,3) A,W

Random walks, Markov chains, branching processes, Poisson process, point processes, birth and death processes, queuing theory, stationary processes. Prerequisites, 396 for 491; 491 for 492.

Courses for Graduates Only**MATHEMATICS COURSES****501, 502, 503 Mathematical Logic (3,3,3) A,W,Sp**

Theory of formal systems. Formal development of number theory. Completeness and incompleteness, decidability, and undecidability. The theorems of Gödel, Henkin, Church, Rosser, and Tarski. Selected topics from axiomatic set theory, recursive function theory, theory of models, or advanced theory of formal systems. Prerequisites, 405 or equivalent for 501; 501 for 502; 502 for 503.

504, 505, 506 Modern Algebra (3,3,3) A,W,Sp

Theory of groups, rings, integral domains, and fields; polynomials; vector spaces, Galois Theory, and theory of ideals. Prerequisite, 404 or equivalent for 504; 504 for 505; 505 for 506.

507, 508 Foundations of Mathematics (3,3) S,S

Fundamental concepts and methods of mathematics; the axiomatic method; the logical foundations of mathematics. Prerequisite, 507 for 508.

510 Seminar in Algebra (*, max. 5) AWSp
Prerequisite, permission.**511, 512, 513 Special Topics in Algebra (2-3, max. 9; 2-3, max. 9; 2-3, max. 9) A, W, Sp**

In recent years the following subjects have been covered: Abelian Groups, Algebraic Function Fields, Algebraic Number Theory, Classical Groups, Game Theory, Group Extensions, Lattice Theory, Lie Algebras, Number Theory, and Structure of Rings.

524, 525, 526 Real Variable (3,3,3) A,W,Sp
Metric spaces; general measures and integration; differentiation of set functions; real valued functions on the line; Banach spaces. Prerequisites, 426 or equivalent for 524; 524 for 525; 525 for 526.

527 Elements of Real Variables for Scientists (3) A

Compactness theorems, Lebesgue integration and limit theorems, Fubini theorem, L_p spaces, L_2 Fourier transform theory. Prerequisites, 427, 428, 429, or permission.

528, 529 Hilbert Space Operators (3,3) W,Sp
Spectral theorem for bounded Hermitian

operators, statement for unbounded operators, application to ordinary and partial differential operators with Fourier transforms, construction of Green functions, contour integral representation. Prerequisites, 527 for 528; 528 for 529.

530 Seminar in Analysis (*, max. 5) AWSp
Prerequisite, permission.

531, 532, 533 Special Topics in Analysis
(2-3, max. 9; 2-3, max. 9; 2-3, max. 9)
A, W, Sp

In recent years the following subjects have been covered: Functional Analysis, Abstract Harmonic Analysis, Linear Operations in Hilbert Space, Group Representations, Fourier Series and Integrals, Topological Lineal Spaces, Potential Theory, and Numerical Analysis.

534, 535, 536 Complex Variable (3,3,3)

A,W,Sp
Complex numbers; analytic functions; contour integration; power series; analytic continuation; sequences of analytic functions; conformal mapping of simply connected regions. Prerequisites, 426 for 534; 534 for 535; 535 for 536.

537 Applications of Operator Theory (3) A
Schrodinger equations; eigenvalue distributions; perturbation theory; special functions. Prerequisite, 529.

538, 539 Nonlinear Ordinary Differential Equations (3, 3) W, Sp

Phase plane; analysis of critical points (nodes, saddle points, foci); theory of oscillations, limit cycles, Poincaré-Bendixon theory; topological methods, fixed-point theorems. Prerequisites, 324 (or 236H) and 438 for 538; 538 for 539. (Offered alternately with 578, 579; offered 1971-72.)

541, 542, 543 Special Topics in Applied Mathematics (3, max. 9; 3, max. 9; 3, max. 9) A,W,Sp

Such topics as mathematical quantum theory, fluid mechanics, optimization and operations research, and control theory will be covered.

544, 545, 546 Differential Geometry (3,3,3) A,W,Sp

544: Differential analysis in R^n , inverse function theorem, vector fields, Stokes's theorem, existence theorems concerning differential equations. Prerequisite, graduate standing or permission. 545, 546: Differentiable manifolds, differential forms, differential geometry in the large. Prerequisites, 544 for 545; 545 for 546.

550 Seminar in Geometry (*, max. 5) AWSp
Prerequisite, permission.

551, 552, 553 Special Topics in Geometry
(2-3, max. 9; 2-3, max. 9; 2-3, max. 9)
A,W,Sp

In recent years the following subjects have been covered: Riemannian Geometry, Differentiable Manifolds, Complex Manifolds, Geometry of Convex Bodies.

557, 558, 559 Special Topics in Numerical Analysis (3, max. 9; 3, max. 9; 3, max. 9) A,W,Sp

Such topics as linear systems, approximation theory, or the numerical solution of differential equations will be covered.

561, 562, 563 General Topology (3,3,3)

A,W,Sp
Theory of sets; metric spaces; topological spaces; compactness and other covering prop-

erties; function spaces; polyhedra; dimension theory. Prerequisites, 400 (may be taken concurrently) and 426 for 561; 561 for 562; 562 for 563.

564, 565, 566 Algebraic Topology (3,3,3)

A,W,Sp
Classical and modern approaches; complexes and their homology theory; applications. Fixed points, primary obstruction; products and Poincaré duality; axiomatic approach, covering spaces. Prerequisites, 506 for 564; 564 for 565; 565 for 566.

569 Partial Differential Equations (3) Sp

Classification of second order partial differential equations; solution by separation of variables and reduction to a boundary value problem; theory of characteristics and solutions by means of Green's functions. Examples from classical mechanics of continua. Offered jointly with the Department of Aeronautics and Astronautics as Aeronautics and Astronautics 569. Prerequisite, 428 or Aeronautics and Astronautics 568.

570 Seminar in Topology (*, max. 5) AWSp
Prerequisite, permission.

571, 572, 573 Special Topics in Topology
(2-3, max. 9; 2-3, max. 9; 2-3, max. 9)
A,W,Sp

Special topics from general and algebraic topology.

574, 575, 576 Advanced Partial Differential Equations (3,3,3) A,W,Sp

Classification, existence, uniqueness, and boundary value problems for partial differential equations. Green's function and associated integral equations. Prerequisite, 426 or 527.

578, 579 Special Functions (3,3) W,Sp

Special functions arising from eigenvalue problems, asymptotic developments by contour integration, analytic continuation, complex variable aspects of Fourier integrals. Prerequisite, 427. (Offered alternately with 538, 539; offered 1970-71.)

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

PROBABILITY AND STATISTICS

521, 522, 523 Probability (3,3,3) A,W,Sp

Measure theory and integration, independence, laws of large numbers, Fourier analysis of distributions, central limit problem and infinitely divisible laws, conditional expectations, martingales. Prerequisite, 426.

581, 582, 583 Advanced Theory of Statistical Inference (3,3,3) A,W,Sp

Elements of decision theory; Neyman-Pearson theory; randomized tests; maximum likelihood statistics; confidence regions; distribution-free statistics; linear hypotheses; analysis of variance; block design. Prerequisites, 482 and 483 or permission for 581, 581 for 582; 582 for 583.

590 Seminar in Probability and Statistics (*, max. 5) AWSp
Prerequisite, permission.

591, 592, 593 Special Topics in Statistics
(3, max. 9; 3, max. 9; 3, max. 9)
A,W,Sp

In recent years the following subjects have been covered: Advanced Probability Theory, Stochastic Processes, Distribution-Free Inference, Game and Decision Theory, Advanced Theory of Estimation (including Sequential Estimation).

METEOROLOGY—See Atmospheric Sciences

MICROBIAL GENETICS—See Genetics, also Microbiology

MONGOLIAN—See Asian Languages and Literature

MUSIC

Courses for Undergraduates

Courses Primarily for Nonmajors (See also ENSEMBLES.)

100 University Singers (1, max. 12) AWSp
EICHENBERGER
(Formerly 100 and 300.)

116, 117, 118 Elementary Music Theory (2,2,2) AW, WSp, Sp
Prerequisites, 116 for 117; 117 for 118. (Formerly 121,122,123.)

120 Survey of Music (5) AWSp
CLARKE

Illustrated lectures with supplementary readings to provide the general student with understanding of common forms, idioms, and styles. (Formerly 107.)

121 The Orchestra (2) AWSp
HOKANSON, MC INNES, SOKOL
Development of the orchestra and its literature. (Formerly 108.)

122 Orchestral Music: Seventeenth and Eighteenth Century (2) A
(Formerly 117.)

123 Symphonic Music: Nineteenth Century (2) WSp
HOKANSON, O'DOAN, SOKOL
(Formerly 118.)

124 Symphonic Music: Contemporary (2) Sp
HOKANSON, SOKOL
(Formerly 119.)

125, 126, 127 Opera (2,2,2) A,W,Sp
CHAPPLE
(Formerly 217,218,219.)

128 The Concerto (2) A
O'DOAN, SOKOL
(Formerly 227.)

129 Afro-American Music (5) AWSp
GARFIAS

A survey course centering on Black music in the United States, but also clarifying the relationship of this music to the musics of other Afro-American cultures as well as to their African roots.

316, 317, 318 Music Cultures of the World (5,5,5) A,W,Sp
GARFIAS

316: music of India, Southeast Asia, Indonesia (formerly 314). 317: Africa, Western Europe, North and South America (for-

merly 315). 318: Eastern Europe, Middle East, Central Asia, Far East (formerly 316).

329 Chamber Music (2) W

MC INNES

Survey of literature for ensembles. (Formerly 317.)

330 Music in the United States (2) W

CLARKE

Contribution of music to the development of American culture. (Formerly 347.)

331 History of Jazz (3) AWSp

GARFIAS, SMITH

The development of jazz in the United States, from its beginnings to its present trends. (Formerly 349.)

485 Music in the Theatre (2, max. 4) W

BERGSMAN

Open to majors and nonmajors who are conductors, playwrights, or stage directors. Survey of representative examples of musical theatre; collaborative creation and production. Prerequisite, 491 or 492, Drama 461, or English 374. Offered jointly with the School of Drama as Drama 482. (Formerly 482.)

COURSES PRIMARILY FOR MUSIC MAJORS

Permission of undergraduate adviser required for all courses except Music 100.

100 University Singers (1, max. 12) AWSp

EICHENBERGER

(Formerly 100 and 300.)

101 University Symphony Orchestra

(1, max. 15) AWSp

CHAPPLE

(Formerly 160 and 360.)

102 University Band (1, max. 12) WSp

COLE

(Formerly 140 and 340.)

103 Chamber Music (1, max. 12) AWSp

HEINITZ, MC INNES, ZETLIN

(Formerly 170 and 370.)

104 Piano Ensemble (1, max. 12) AWSp

GEISSMAR

(Formerly 171 and 371.)

105 Brass Ensemble (1, max. 12) WSp

COLE

(Formerly 173 and 373.)

106 Woodwind Ensemble (1, max. 12) AWSp

WELKE

(Formerly 172 and 372.)

107 Opera Workshop (1, max. 12) AWSp

ROSINBUM

(Formerly 180 and 380.)

110, 111, 112 First-Year Theory

(2,2,2) A,W,Sp

STAFF

A study of basic musical concepts and terminology through a program of listening, analysis, and keyboard practice. To be taken concurrently with 113, 114, 115. Prerequisite, permission. (Formerly 101, 102, 103.)

113, 114, 115 Sight Singing (1,1,1) A, W, Sp To be taken concurrently with 110, 111, 112. Prerequisite, permission. (Formerly 114, 115, 116.)

119 Music Fundamentals (2) AWSp

For majors in elementary education. (Formerly 104.)

136 Class Instruction: Piano (1, max. 6) AWSp

For music majors only. (Formerly 110A.)

137, 138, 139 Class Instruction: Voice (1,1,1) A, W, Sp

For music majors only. (Formerly 110C.)

Courses 140 through 159 are private instruction primarily for majors not specializing in performance. Also available to qualified nonmajors. Prerequisites, examination and permission.

140 Private Instruction: Piano (2-3, max. 9) AWSp

GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI

(Formerly 130A.)

141 Private Instruction: Violin-Viola (2-3, max. 9) AWSp

MC INNES, SOKOL, ZETLIN

(Formerly 130B.)

142 Private Instruction: Voice (2-3, max. 9) AWSp

BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER

(Formerly, 130C.)

143 Private Instruction: Violoncello (2-3, max. 9) AWSp

HEINITZ

(Formerly 130D.)

144 Private Instruction: Double Bass (2-3, max. 9) AWSp

WARNER

(Formerly 130E.)

145 Private Instruction: Organ (2-3, max. 9) AWSp

EICHINGER

(Formerly 130F.)

146 Private Instruction: Flute (2-3, max. 9) AWSp

SKOWRONEK, WELKE

(Formerly 130G.)

147 Private Instruction: Oboe (2-3, max. 9) AWSp

STORCH

(Formerly 130H.)

148 Private Instruction: Clarinet (2-3, max. 9) AWSp

MC COLL, WELKE

(Formerly 130I.)

149 Private Instruction: Bassoon (2-3, max. 9) AWSp

GROSSMAN

(Formerly 130J.)

150 Private Instruction: Saxophone (2-3, max. 9) AWSp

(Formerly 130T.)

151 Private Instruction: Horn (2-3, max. 9) AWSp

LEUBA, WELKE

(Formerly 130K.)

152 Private Instruction: Trumpet (2-3, max. 9) AWSp

COLE, WELKE

(Formerly 130L.)

153 Private Instruction: Trombone (2-3, max. 9) AWSp

DEMPSTER

(Formerly 130M.)

154 Private Instruction: Tuba (2-3, max. 9) AWSp

RUSSELL

(Formerly 130N.)

155 Private Instruction: Harp (2-3, max. 9) AWSp

VOKOLEK

(Formerly 130O.)

156 Private Instruction: Percussion (2-3, max. 9) AWSp

SHRADER

(Formerly 130P.)

157 Private Instruction: Harpsichord (2-3, max. 9) AWSp

KIND

(Formerly 130Q.)

158 Private Instruction: Viola da gamba (2-3, max. 9) AWSp

HEINITZ

(Formerly 130R.)

159 Private Instruction: Non-Western Instruments (2-3, max. 9) AWSp

GARFIAS

(Formerly 130S.)

Courses 160 through 178 are for music majors specializing in performance.

160 Private Instruction: Piano (3-4, max. 12) AWSp

GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI

(Formerly 150A.)

161 Private Instruction: Violin-Viola (3-4, max. 12) AWSp

MC INNES, SOKOL, ZETLIN

(Formerly 150B.)

162 Private Instruction: Voice (3-4, max. 12) AWSp

BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER

(Formerly 150C.)

163 Private Instruction: Violoncello (3-4, max. 12) AWSp

HEINITZ

(Formerly 150D.)

164 Private Instruction: Double Bass (3-4, max. 12) AWSp

WARNER

(Formerly 150E.)

165 Private Instruction: Organ (3-4, max. 12) AWSp

EICHINGER

(Formerly 150F.)

166 Private Instruction: Flute (3-4, max. 12) AWSp

SKOWRONEK, WELKE

(Formerly 150G.)

167 Private Instruction: Oboe (3-4, max. 12) AWSp

STORCH

(Formerly 150H.)

168 Private Instruction: Clarinet (3-4, max. 12) AWSp

MC COLL, WELKE

(Formerly 150I.)

- 169 Private Instruction: Bassoon (3-4, max. 12) AWSp**
GROSSMAN
(Formerly 150J.)
- 170 Private Instruction: Saxophone (3-4, max. 12) AWSp**
(Formerly 150T.)
- 171 Private Instruction: Horn (3-4, max. 12) AWSp**
LEUBA, WELKE
(Formerly 150K.)
- 172 Private Instruction: Trumpet (3-4, max. 12) AWSp**
COLE, WELKE
(Formerly 150L.)
- 173 Private Instruction: Trombone (3-4, max. 12) AWSp**
DEMPSTER
(Formerly 150M.)
- 174 Private Instruction: Tuba (3-4, max. 12) AWSp**
RUSSELL
(Formerly 150N.)
- 175 Private Instruction: Harp (3-4, max. 12) AWSp**
VOKOLEK
(Formerly 150O.)
- 176 Private Instruction: Percussion (3-4, max. 12) AWSp**
SHRADER
(Formerly 150P.)
- 177 Private Instruction: Harpsichord (3-4, max. 12) AWSp**
KIND
(Formerly 150Q.)
- 178 Private Instruction: Viola da gamba (3-4, max. 12) AWSp**
HEINITZ
(Formerly 150R.)
- 191 Composition (2, max. 6) AWSp**
BEALE, BENSHOOF, BERGSMAN, KECHLEY, SMITH, SUDERBURG, TUFTS, VERRALL
One half-hour private lesson and a one-hour laboratory session each week. Intended to develop skill in creative musical expression. Prerequisite, permission.
- 200 University Chorale (1, max. 12) AWSp**
EICHENBERGER
(Formerly 200 and 400.)
- 201 Wind Sinfonietta (1, max. 12) AWSp**
WELKE
(Formerly 240 and 440.)
- 202 Madrigal Singers (1, max. 12) AWSp**
KECHLEY
(Formerly 190 and 390.)
- 203 Marching Band (1, max. 5) A**
COLE
(Formerly 220.)
- 204 Percussion Ensemble (1, max. 12) AWSp**
SHRADER
(Formerly 174 and 374.)
- 205 Non-Western Ensemble (1, max. 12) AWSp**
GARFIAS
(Formerly 175 and 375.)
- 206 Jazz Ensemble (1, max. 12) AWSp**
BRAZIL
(Formerly 176 and 376.)
- 207 University Oratorio Chorus (1) AWSp**
EICHENBERGER
A choral ensemble that performs major works with orchestra. Prerequisite, permission of instructor.
- 208 University Laboratory Band (1) AWSp**
COLE
Large ensemble performance practices in the jazz idiom. Prerequisite, permission.
- 210, 211, 212 Second-Year Theory (3,3,3) A,W,Sp**
BABB, BEALE, KECHLEY, TUFTS
Practical writing and analytic experience in diatonic and chromatic harmony as it was used during the eighteenth and nineteenth centuries. To be taken concurrently with 213, 214, 215. Prerequisites, 112 and 115. (Formerly 201, 202, 203.)
- 213, 214, 215 Music After 1750 (2,2,2) A,W,Sp**
TROY
To be taken concurrently with 210, 211, 212. 213: 1750-1820; 214: 1820-1870; 215: 1870-1920. Prerequisites, 112 and 115. (Formerly 207, 208, 209.)
- 216, 217, 218 Introductory Composition (2,2,2) A,W,Sp**
BENSHOOF
For students not majoring in composition. Prerequisite, 112. (Formerly 221, 222, 223.)
- 220, 221, 222 String Techniques I (1,1,1) A,W,Sp**
CUNHA
Violin, viola, cello, stringbass. (Formerly 214, 215, 216.)
- 223, 224, 225 String Techniques II (1,1,1) A,W,Sp**
CUNHA
(Formerly 234, 235, 236.)
- 226, 227, 228 Woodwind Techniques (1,1,1) A,W,Sp**
WELKE
226: clarinet; 227: flute; 228: double reeds. (Formerly 244, 245, 246.)
- 229, 230, 231 Brass Techniques (1,1,1) A,W,Sp**
COLE
229: trumpet; 230, 231: lower brass. (Formerly 264, 265, 266.)
- 232 Percussion Techniques (1) Sp**
SHRADER
(Formerly 256.)
- 233 Music Theatre Technique (1) A**
ROSINBUM
Stage deportment and dramatic movement for singers. (Formerly 211.)
- 236 Class Instruction: Piano (1, max. 6) AWSp**
For music majors only. (Formerly 210A.)
- 237 Class Instruction: Voice (1, max. 6) AWSp**
For music majors only. (Formerly 210C.)
- Courses 240 through 259 are private instruction primarily for majors not specializing in performance. Also available to qualified non-majors. Prerequisites, examination and permission.*
- 240 Private Instruction: Piano (2-3, max. 9) AWSp**
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 230A.)
- 241 Private Instruction: Violin-Viola (2-3, max. 9) AWSp**
MC INNES, SOKOL, ZETLIN
(Formerly 230B.)
- 242 Private Instruction: Voice (2-3, max. 9) AWSp**
BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER
(Formerly 230C.)
- 243 Private Instruction: Violoncello (2-3, max. 9) AWSp**
HEINITZ
(Formerly 230D.)
- 244 Private Instruction: Double Bass (2-3, max. 9) AWSp**
WARNER
(Formerly 230E.)
- 245 Private Instruction: Organ (2-3, max. 9) AWSp**
EICHINGER
(Formerly 230F.)
- 246 Private Instruction: Flute (2-3, max. 9) AWSp**
SKOWRONEK, WELKE
(Formerly 230G.)
- 247 Private Instruction: Oboe (2-3, max. 9) AWSp**
STORCH
(Formerly 230H.)
- 248 Private Instruction: Clarinet (2-3, max. 9) AWSp**
MC COLL, WELKE
(Formerly 230I.)
- 249 Private Instruction: Bassoon (2-3, max. 9) AWSp**
GROSSMAN
(Formerly 230J.)
- 250 Private Instruction: Saxophone (2-3, max. 9) AWSp**
BRAZIL
(Formerly 230T.)
- 251 Private Instruction: Horn (2-3, max. 9) AWSp**
LEUBA, WELKE
(Formerly 230K.)
- 252 Private Instruction: Trumpet (2-3, max. 9) AWSp**
COLE, WELKE
(Formerly 230L.)
- 253 Private Instruction: Trombone (2-3, max. 9) AWSp**
DEMPSTER
(Formerly 230M.)
- 254 Private Instruction: Tuba (2-3, max. 9) AWSp**
RUSSELL
(Formerly 230N.)
- 255 Private Instruction: Harp (2-3, max. 9) AWSp**
VOKOLEK
(Formerly 230O.)
- 256 Private Instruction: Percussion (2-3, max. 9) AWSp**
SHRADER
(Formerly 230P.)
- 257 Private Instruction: Harpsichord (2-3, max. 9) AWSp**
KIND
(Formerly 230Q.)

258 Private Instruction: Viola da gamba
(2-3, max. 9) AWSp
HEINITZ
(Formerly 230R.)

259 Private Instruction: Non-Western Instruments (2-3, max. 9) AWSp
GARFIAS
(Formerly 230S.)

Courses 260 through 278 are for music majors specializing in performance.

260 Private Instruction: Piano (3-4, max. 12) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 250A.)

261 Private Instruction: Violin-Viola
(3-4, max. 12) AWSp
MC INNES, SOKOL, ZETLIN
(Formerly 250B.)

262 Private Instruction: Voice (3-4, max. 12) AWSp
BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER
(Formerly 250C.)

263 Private Instruction: Violoncello
(3-4, max. 12) AWSp
HEINITZ
(Formerly 250D.)

264 Private Instruction: Double Bass
(3-4, max. 12) AWSp
WARNER
(Formerly 250E.)

265 Private Instruction: Organ (3-4, max. 12) AWSp
EICHINGER
(Formerly 250F.)

266 Private Instruction: Flute (3-4, max. 12) AWSp
SKOWRONEK, WELKE
(Formerly 250G.)

267 Private Instruction: Oboe (3-4, max. 12) AWSp
STORCH
(Formerly 250H.)

268 Private Instruction: Clarinet
(3-4, max. 12) AWSp
MC COLL, WELKE
(Formerly 250I.)

269 Private Instruction: Bassoon
(3-4, max. 12) AWSp
GROSSMAN
(Formerly 250J.)

270 Private Instruction: Saxophone
(3-4, max. 12) AWSp
BRAZIL
(Formerly 250T.)

271 Private Instruction: Horn (3-4, max. 12) AWSp
LEUBA, WELKE
(Formerly 250K.)

272 Private Instruction: Trumpet
(3-4, max. 12) AWSp
COLE, WELKE
(Formerly 250L.)

273 Private Instruction: Trombone
(3-4, max. 12) AWSp
DEMPSTER
(Formerly 250M.)

274 Private Instruction: Tuba (3-4, max. 12) AWSp
RUSSELL
(Formerly 250N.)

275 Private Instruction: Harp (3-4, max. 12) AWSp
VOKOLEK
(Formerly 250O.)

276 Private Instruction: Percussion
(3-4, max. 12) AWSp
SHRADER
(Formerly 250P.)

277 Private Instruction: Harpsichord
(3-4, max. 12) AWSp
KIND
(Formerly 250Q.)

278 Private Instruction: Viola da gamba
(3-4, max. 12) AWSp
HEINITZ
(Formerly 250R.)

280 Basic Principles of Conducting (1) Sp
CHAPPLE
Prerequisite, 212. May be taken concurrently.
(Formerly 284.)

291 Composition (2, max. 6) AWSp
BEALE, BENSHOOF, BERGSMAN, KECHLEY, SMITH, SUDERBERG, TUFTS, VERRALL
One half-hour private lesson and a one-hour laboratory session per week. Prerequisite, 191 or permission.

309 Advanced Music Theatre Techniques
(1) W
ROSINBUM
Dramatic interpretation of musical style as represented by the major opera composers since Mozart. Prerequisite, 233. (Formerly 311.)

310 Modal Counterpoint (3) A
BABB
Sixteenth-century style. To be taken concurrently with 313. Prerequisites, 212 and 215. (Formerly 321.)

311 Tonal Counterpoint (2) W
VERRALL
The process of invention as exemplified in the music of the Baroque era. To be taken concurrently with 314. Prerequisites, 212 and 215. (Formerly 322.)

312 Contemporary Idioms (3) Sp
Analytical studies of present-day composition techniques with emphasis on contrapuntal qualities. To be taken concurrently with 315. Prerequisites, 212 and 215. (Formerly 323.)

313, 314 Music Before 1750 (2,3) A,W
CLARKE, HARMAN, TERRY
313: before 1600; 314: 1600-1750. To be taken concurrently with 310, 311. Prerequisites, 212, 215 for 313; 313 for 314. (Formerly 307, 308.)

315 Music After 1920 (2) Sp
IRVINE
Neoclassicism, neoromanticism, serialism, electronic music. To be taken concurrently with 312. Prerequisites, 212, 215. (Formerly 309.)

320, 321, 322 Keyboard Transposition and Improvisation (2,2,2) A,W,Sp
BABB

323, 324, 325 Accompanying (2,2,2) A,W,Sp
HOKANSON, O'DOAN
Study and performance of music of different

types and periods for voice or instruments in combination with the piano. (Formerly 334, 335, 336.)

326, 327, 328 Repertoire (1,1,1) A,W,Sp
EICHINGER, HOKANSON
For applied music majors. (Formerly 337, 338, 339.)

332 Musical Form (3) W
BEALE, VERRALL
Analysis of principal forms of musical composition. Prerequisite, 212. (Formerly 352.)

333 Orchestration (3) AW
SMITH, VERRALL
Prerequisite, 212. (Formerly 353.)

334 Band Arranging (2) W
WELKE
Prerequisite, 212. (Formerly 354.)

335 Keyboard Harmony (3) Sp
BABB, BENSHOOF
Prerequisites, 212 and permission. (Formerly 303.)

337 History of Chamber Music (3) A
MC INNES
(Formerly 367.)

338 Keyboard Performance Practices (2) AWSp
KIND
Problems in interpreting early keyboard music with special reference to the harpsichord. Prerequisite, permission. (Formerly 341.)

Courses 340 through 359 are private instruction primarily for majors not specializing in performance. Also available to qualified non-majors. Prerequisites, examination and permission.

340 Private Instruction: Piano (2-3, max. 9) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 330A.)

341 Private Instruction: Violin-Viola
(2-3, max. 9) AWSp
MC INNES, SOKOL, ZETLIN
(Formerly 330B.)

342 Private Instruction: Voice (2-3, max. 9) AWSp
BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER
(Formerly 330C.)

343 Private Instruction: Violoncello
(2-3, max. 9) AWSp
HEINITZ
(Formerly 330D.)

344 Private Instruction: Double Bass
(2-3, max. 9) AWSp
WARNER
(Formerly 330E.)

345 Private Instruction: Organ (2-3, max. 9) AWSp
EICHINGER
(Formerly 330F.)

346 Private Instruction: Flute (2-3, max. 9) AWSp
SKOWRONEK, WELKE
(Formerly 330G.)

347 Private Instruction: Oboe (2-3, max. 9) AWSp
STORCH
(Formerly 330H.)

ARTS AND SCIENCES

348 Private Instruction: Clarinet
(2-3, max. 9) AWSp
MC COLL, WELKE
(Formerly 330I.)

349 Private Instruction: Bassoon
(2-3, max. 9) AWSp
GROSSMAN
(Formerly 330J.)

350 Private Instruction: Saxophone
(2-3, max. 9) AWSp
BRAZIL
(Formerly 330T.)

351 Private Instruction: Horn (2-3, max. 9)
AWSp
LEUBA, WELKE
(Formerly 330K.)

352 Private Instruction: Trumpet
(2-3, max. 9) AWSp
COLE, WELKE
(Formerly 330L.)

353 Private Instruction: Trombone
(2-3, max. 9) AWSp
DEMPSTER
(Formerly 330M.)

354 Private Instruction: Tuba (2-3, max. 9)
AWSp
RUSSELL
(Formerly 330N.)

355 Private Instruction: Harp (2-3, max. 9)
AWSp
VOKOLEK
(Formerly 330O.)

356 Private Instruction: Percussion
(2-3, max. 9) AWSp
SHRADER
(Formerly 330P.)

357 Private Instruction: Harpsichord
(2-3, max. 9) AWSp
KIND
(Formerly 330Q.)

358 Private Instruction: Viola da gamba
(2-3, max. 9) AWSp
HEINITZ
(Formerly 330R.)

359 Private Instruction: Non-Western Instruments (2-3, max. 9) AWSp
GARFIAS
(Formerly 330S.)

Courses 360 through 378 are for music majors specializing in performance.

360 Private Instruction: Piano
(3-4, max. 12) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 350A.)

361 Private Instruction: Violin-Viola
(3-4, max. 12) AWSp
MC INNES, SOKOL, ZETLIN
(Formerly 350B.)

362 Private Instruction: Voice
(3-4, max. 12) AWSp
BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER
(Formerly 350C.)

363 Private Instruction: Violoncello
(3-4, max. 12) AWSp
HEINITZ
(Formerly 350D.)

364 Private Instruction: Double Bass
(3-4, max. 12) AWSp
WARNER
(Formerly 350E.)

365 Private Instruction: Organ
(3-4, max. 12) AWSp
EICHINGER
(Formerly 350F.)

366 Private Instruction: Flute
(3-4, max. 12) AWSp
SKOWRONEK, WELKE
(Formerly 350G.)

367 Private Instruction: Oboe
(3-4, max. 12) AWSp
STORCH
(Formerly 350H.)

368 Private Instruction: Clarinet
(3-4, max. 12) AWSp
MC COLL, WELKE
(Formerly 350I.)

369 Private Instruction: Bassoon
(3-4, max. 12) AWSp
GROSSMAN
(Formerly 350J.)

370 Private Instruction: Saxophone
(3-4, max. 12) AWSp
BRAZIL
(Formerly 350T.)

371 Private Instruction: Horn
(3-4, max. 12) AWSp
LEUBA, WELKE
(Formerly 350K.)

372 Private Instruction: Trumpet
(3-4, max. 12) AWSp
COLE, WELKE
(Formerly 350L.)

373 Private Instruction: Trombone
(3-4, max. 12) AWSp
DEMPSTER
(Formerly 350M.)

374 Private Instruction: Tuba
(3-4, max. 12) AWSp
RUSSELL
(Formerly 350N.)

375 Private Instruction: Harp
(3-4, max. 12) AWSp
VOKOLEK
(Formerly 350O.)

376 Private Instruction: Percussion
(3-4, max. 12) AWSp
SHRADER
(Formerly 350P.)

377 Private Instruction: Harpsichord
(3-4, max. 12) AWSp
KIND
(Formerly 350Q.)

378 Private Instruction: Viola da gamba
(3-4, max. 12) AWSp
HEINITZ
(Formerly 350R.)

379 Junior Recital (1) AWSp
For participants in department honors program only. (Formerly 351.)

380, 381, 382 Conducting (1,1,1) A, W, Sp
EICHENBERGER, SOKOL, WELKE
Prerequisite, 280. (Formerly 384, 385, 386.)

383 Elementary School Music (3) Sp
SWANSON
Prerequisite, Educational Psychology (EDPSY) 304. (Formerly 344.)

384 The Teaching of Secondary School Music (3) AW
NORMANN
Prerequisite, Educational Psychology (EDPSY) 304. (Formerly 346.)

391 Composition (2, max. 6) AWSp
BEALE, BENSHOOF, BERGSMAN, KECHLEY, SMITH, SUDERBURG, TUFTS, VERRALL
One half-hour private lesson and a one-hour laboratory session each week. Prerequisite, 291.

Courses 400 through 423. Prerequisite, 309.

400 Medieval Music: to 1400 (3) A
HARMAN
Gregorian chant through Machaut and Landini. (Not offered 1970-71.)

401 Early Renaissance Music: 1400-1525 (3) W
HARMAN
Dunstable through Josquin. (Not offered 1970-71.)

402 Late Renaissance Secular Music: 1525-1630 (3) A
HARMAN
The madrigal in Italy, England, and Germany. The Chanson, Jannequin through Lassus.

403 Late Renaissance Sacred and Instrumental Music: 1525-1630 (3) W
HARMAN
Latin Church music, Willaert through G. Gabrieli; early Reformation Church music, Walther through Gibbons; instrumental music, Cabezón, the English virginal school, and Sweelinck.

404 Keyboard Music: 1630-1770 (3) A
TERRY
Forms and styles: Frescobaldi through J.S. and C.P.E. Bach.

405 Keyboard Music: 1770-1850 (3) Sp
Haydn through Schumann.

406 Keyboard Music: 1850-1920 (3) W
Liszt through Debussy.

407 Baroque Solo Song (3) A
Monody and Cantata, Caccini through Handel.

408 The German Lied (3) Sp
TERRY
Schubert through Strauss.

409 French Art-Song: 1850 to the Present (3) W
TERRY
Fauré through Poulenc.

410 Chamber Music: 1660-1770 (3) W
HARMAN
Frescobaldi through Bach.

411 Chamber Music: 1770-1830 (3) Sp
Haydn through Schubert. (Not offered 1970-71.)

412 Chamber Music: 1830-1920 (3) A
Schumann through Ravel.

413 Orchestral Music: 1620-1760 (3) W
HARMAN
Corelli through the Mannheim School. (Not offered 1970-71.)

414 Orchestral Music: 1760-1850 (3) Sp
Haydn through Berlioz. (Not offered 1970-71.)

415 Orchestral Music: 1850-1920 (3) A
IRVINE
Liszt through Elgar; the National Schools and the Impressionists. (Not offered 1970-71.)

416 Choral Music: 1600-1770 (3) W
HARMAN
Monteverdi through Handel.

417 Choral Music of Bach (3) Sp
TERRY
The cantatas and larger works. Choral compositions of Bach's immediate predecessors. (Formerly 477.)

418 Choral Music: 1770-1850 (3) A
TERRY
Large works for chorus and orchestra. Haydn through Berlioz. (Not offered 1970-71.) (Formerly 478.)

419 Choral Music: 1850 to the Present (3) Sp
TERRY
Selected choral masterpieces. Brahms through Britten. (Not offered 1970-71.) (Formerly 479.)

420 Opera: 1600-1750 (3) W
TROY
Monteverdi through Handel. (Not offered 1970-71.) (Formerly 487.)

421 Opera: 1750-1850 (3) A
TROY
Gluck through Bellini. (Formerly 488.)

422 Opera: 1850-1920 (3) W
TROY
Wagner through Puccini. (Formerly 489.)

423 Music in the Twentieth Century (3) A
CLARKE
Western art music from Debussy to the present, emphasizing techniques adapted from other arts, sciences, continents, and centuries.

424 A Conspectus of the History of Music to 1760 (5) A
HARMAN, TROY
A concentrated course in Renaissance, Baroque, and preclassical music. Intended primarily for senior transfers and graduates.

425 A Conspectus of the History of Music from 1760 (5) W
IRVINE, TROY
A concentrated course in Classical, nineteenth- and twentieth-century music. Intended primarily for senior transfers and graduates.

426 Music of Korea (3)
Prerequisites, 316, 317, 318 or permission. (Formerly 457.)

427 Music of Africa (3)
Music of the different ethnic groups of Africa and their influence on each other. Prerequisites, 316, 317, 318, or permission. (Formerly 411.)

428 Music of India (3)
Prerequisites, 316, 317, 318, or permission. (Formerly 459.)

429 Introduction to Ethnomusicology (3) A
GARFIAS
Prerequisite, permission. (Formerly 471, 472.)

430 Organology (3) W
KAUFFMAN
A systematic study of musical instruments, involving the history, acoustical phenomena, and physical typologies of instruments from around the world, with emphasis upon non-Western music. Prerequisite, 429 or permission.

431 The Curriculum in Music Education (2) Sp
NORMANN
Prerequisite, student teaching. (May be taken concurrently.)

432 The General Music Class (2) A
The teaching of music and its literature in nonperforming classes on the junior and senior high school level. Prerequisite, 383. (Formerly 476.)

433 Music of Latin America (3)
The Indian, African, and European music of the Spanish-, French-, and Portuguese-speaking New World countries. Prerequisites, 316, 317, 318, or permission. (Formerly 416.)

434, 435, 436 Pedagogy (2,2,2) A,W,Sp
COLE, HARRIS, HEINITZ, MOORE, WARNER, ZETLIN
Principles of effective studio teaching; survey and evaluation of teaching materials. (Not offered 1970-71.)

437 Harmonic Analysis (3) Sp
(Formerly 481.)

438 Psychology of Music (3) A or W
CARLSEN
A study of human response to musical phenomena, with particular emphasis upon perception, learning, measurement, and functional applications. (Formerly 514, later 445.)

439 Music of Indonesia and the Philippines (3)
Prerequisites, 316, 317, 318, or permission. (Formerly 417.)

Courses 440 through 459 are private instruction primarily for majors not specializing in performance. Also available to qualified non-majors. Prerequisites, examination and permission.

440 Private Instruction: Piano (2-3, max. 18) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 430A.)

441 Private Instruction: Violin-Viola (2-3, max. 18) AWSp
MC INNES, SOKOL, ZETLIN
(Formerly 430B.)

442 Private Instruction: Voice (2-3, max. 18) AWSp
BERGER, CURTIS-VERNA, HARRIS, LISHNER, MESLER
(Formerly 430C.)

443 Private Instruction: Violoncello (2-3, max. 18) AWSp
HEINITZ
(Formerly 430D.)

444 Private Instruction: Double Bass (2-3, max. 18) AWSp
WARNER
(Formerly 430E.)

445 Private Instruction: Organ (2-3, max. 18) AWSp
EICHINGER
(Formerly 430F.)

446 Private Instruction: Flute (2-3, max. 18) AWSp
SKOWRONEK, WELKE
(Formerly 430G.)

447 Private Instruction: Oboe (2-3, max. 18) AWSp
STORCH
(Formerly 430H.)

448 Private Instruction: Clarinet (2-3, max. 18) AWSp
MC COLL, WELKE
(Formerly 430I.)

449 Private Instruction: Bassoon (2-3, max. 18) AWSp
GROSSMAN
(Formerly 430J.)

450 Private Instruction: Saxophone (2-3, max. 18) AWSp
BRAZIL
(Formerly 430T.)

451 Private Instruction: Horn (2-3, max. 18) AWSp
LEUBA, WELKE
(Formerly 430K.)

452 Private Instruction: Trumpet (2-3, max. 18) AWSp
COLE, WELKE
(Formerly 430L.)

453 Private Instruction: Trombone (2-3, max. 18) AWSp
DEMPSTER
(Formerly 430M.)

454 Private Instruction: Tuba (2-3, max. 18) AWSp
RUSSELL
(Formerly 430N.)

455 Private Instruction: Harp (2-3, max. 18) AWSp
VOKOLEK
(Formerly 430O.)

456 Private Instruction: Percussion (2-3, max. 18) AWSp
SHRADER
(Formerly 430P.)

457 Private Instruction: Harpsichord (2-3, max. 18) AWSp
KIND
(Formerly 430Q.)

458 Private Instruction: Viola da gamba (2-3, max. 18) AWSp
HEINITZ
(Formerly 430R.)

459 Private Instruction: Non-Western Instruments (2-3, max. 18) AWSp
GARFIAS
(Formerly 430S.)

Courses 460 through 478 are for music majors specializing in performance.

460 Private Instruction: Piano (3-4, max. 18) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 450A.)

- 461 Private Instruction: Violin-Viola (3-4, max. 18) AWSp**
MC INNES, SOKOL, ZETLIN
(Formerly 450B.)
- 462 Private Instruction: Voice (3-4, max. 18) AWSp**
BERGER, CURTIS-VERNA, HARRIS,
LISHNER, MESLER
(Formerly 450C.)
- 463 Private Instruction: Violoncello (3-4, max. 18) AWSp**
HEINITZ
(Formerly 450D.)
- 464 Private Instruction: Double Bass (3-4, max. 18) AWSp**
WARNER
(Formerly 450E.)
- 465 Private Instruction Organ (3-4, max. 18) AWSp**
EICHINGER
(Formerly 450F.)
- 466 Private Instruction: Flute (3-4, max. 18) AWSp**
SKOWRONEK, WELKE
(Formerly 450G.)
- 467 Private Instruction: Oboe (3-4, max. 18) AWSp**
STORCH
(Formerly 450H.)
- 468 Private Instruction: Clarinet (3-4, max. 18) AWSp**
MC COLL, WELKE
(Formerly 450I.)
- 469 Private Instruction: Bassoon (3-4, max. 18) AWSp**
GROSSMAN
(Formerly 450J.)
- 470 Private Instruction: Saxophone (3-4, max. 18) AWSp**
BRAZIL
(Formerly 450T.)
- 471 Private Instruction: Horn (3-4, max. 18) AWSp**
LEUBA, WELKE
(Formerly 450K.)
- 472 Private Instruction: Trumpet (3-4, max. 18) AWSp**
COLE, WELKE
(Formerly 450L.)
- 473 Private Instruction: Trombone (3-4, max. 18) AWSp**
DEMPSTER
(Formerly 450M.)
- 474 Private Instruction: Tuba (3-4, max. 18) AWSp**
RUSSELL
(Formerly 450N.)
- 475 Private Instruction: Harp (3-4, max. 18) AWSp**
VOKOLEK
(Formerly 450O.)
- 476 Private Instruction: Percussion (3-4, max. 18) AWSp**
SHRADER
(Formerly 450P.)
- 477 Private Instruction: Harpsichord (3-4, max. 18) AWSp**
KIND
(Formerly 450Q.)

- 478 Private Instruction: Viola da gamba (3-4, max. 18) AWSp**
HEINITZ
(Formerly 450R.)
- 479 Senior Recital (1) AWSp**
(Formerly 451.)
- 480 Sinfonietta (1, max. 6) AWSp**
CHAPPLE
(Formerly 460.)
- 481 Chamber Music (1, max. 6) AWSp**
HEINITZ, ZETLIN
Prerequisite, graduate standing. (Formerly 470.)
- 482 Opera Theatre (2, max. 6) AWSp**
CHAPPLE, ROSINBUM
Preparation for participation in public performance of roles in chamber opera. (Formerly 480.)
- 483 Collegium Musicum (1, max. 6) AWSp**
HEINITZ, KIND
- 484 Problems in Twentieth-Century Ensemble (1, max. 6) AWSp**
SMITH, SUDERBURG
Exploration of notation and performance problems in today's music; preparation for public performance. (Formerly 492.)
- 485 Music in Theatre (2, max. 4) W**
BERGSMA
Open to majors and nonmajors who are conductors, composers, playwrights, or stage directors. Survey of representative examples of musical theatre; collaborative creation and production. Prerequisite, 491 or 492, or Drama 461, or English 374. Offered jointly with the School of Drama as Drama 482. (Formerly Music 482.)
- 486 Modal Counterpoint (3) W**
BABB
Prerequisite, 310. (Formerly 421.)
- 487 Tonal Counterpoint (3) Sp**
VERRALL
The evaluation of fugal practice from the Baroque era to the present. Prerequisite, 311. (Formerly 422.)
- 488 Contemporary Idioms (3) W**
Prerequisite, 312. (Formerly 423.)
- 489 Musical Form (3) Sp**
Prerequisite, 332. (Formerly 452.)
- 490 Orchestration (3) Sp**
Prerequisite, 333. (Formerly 453.)
- 491 Composition (2, max. 12) AWSp**
BEALE, BENSHOOF, BERGSMA, KECHLEY,
SMITH, SUDERBURG, TUFTS, VERRALL
One half-hour private lesson and a one-hour laboratory session each week. Prerequisite, 391.
- 492, 493 Opera Direction and Production (4,4) A,W**
ROSINBUM
Practical experience with problems of the theater. Prerequisite, 492 for 493. (Formerly 464, 465.)
- 494 Music of Japan (3)**
The music of Japan from earliest known record until 1700. Prerequisites, 316, 317, 318, or permission. (Formerly 454.)
- 495 Music of Japan (3)**
The music of Japan from 1700 to the

present. Prerequisites, 316, 317, 318, or permission. (Formerly 455.)

- 496 Workshop in Music Education (1-2, max. 10) S**
The workshops are special sessions designed to reflect contemporary emphases and concerns in the music education profession. A variety of workshop sessions are offered each Summer Quarter.

- 497 Music of China (3)**
The music of China from the earliest times to the present. Prerequisites, 316, 317, 318, or permission. (Formerly 456.)

- 499 Undergraduate Research (*, max. 6) AWSp**

Courses for Graduates Only

- 500 Seminar in Methods of Musical Research (3) ASp**
IRVINE
Music 500 is a prerequisite for all graduate history courses except 515, 516, 519.
- 501 Advanced Analysis (3) A**
Comparative analysis of works of the Palestrina period and earlier works.
- 502 Advanced Analysis (3) W**
KECHLEY
Examination of the influences and an analysis of the technical devices that characterize Baroque and Classical compositional procedures.
- 503 Advanced Analysis (3) Sp**
BERGSMA
The influence of dramatic aesthetics on musical form in the Romantic period.
- 504 Seminar in Medieval Music (3, max. 6) Sp**
HARMAN
Prerequisite, 400 or permission. (Not offered 1970-71.)
- 505 Seminar in Renaissance Music (3, max. 6) Sp**
HARMAN
Prerequisite, one or more courses from 401, 402, and 403, or permission.
- 506 Seminar in Baroque Music (3, max. 6) W**
TERRY
Prerequisite, one or more courses from 404, 407, 410, 413, 416, 417, or 420, or permission.
- 507 Seminar in Rococo and Pre-Classical Music: 1700-1760 (3, max. 6) A**
Prerequisite, one or more courses from 404, 410, 413, 420, or permission. (Not offered 1970-71.)
- 508 Seminar in the Viennese Classical Period: 1760-1830 (3, max. 6) W**
Prerequisite, one or more courses from 405, 411, 414, 418, or 421, or permission.
- 509 Seminar in Nineteenth-Century Music: 1830-1890 (3, max. 6) A**
IRVINE
Prerequisite, one or more courses from 406, 408, 409, 412, 415, 419, or 422, or permission.
- 510 Seminar in Music Since 1890 (3, max. 6) W**
IRVINE
Prerequisite, one or more courses from 406, 408, 409, 412, 415, 419, 422, or 423,

or permission. (Not offered 1970-71.) Formerly 509.)

511 Seminar in Field and Laboratory Methods (3) W
KAUFFMAN

A study of the methodology of research in ethnomusicology along with practical experience in recording and processing field and laboratory materials. Prerequisite, 429 or permission.

512 Seminar in Ethnomusicology (3) Sp
KAUFFMAN

A study of methodological procedures in ethnomusicology applied to specific research problems. Prerequisite, permission.

513 Historiography (3) A
IRVINE

Prerequisite, 500 or permission. (Not offered 1970-71.) (Formerly 568, 569.)

514 Systematic Musicology (3) A
CARLSEN

The use of the scientific method and empirical research procedures in musical investigation. (Formerly 505.)

515 Medieval Notation: to 1400 (3) Sp
HARMAN

Gregorian Chant through the Mannered School. Prerequisite, permission. (Not offered 1969-70.) (Formerly 577.)

516 Renaissance Notation: 1400-1600 (3) Sp
HARMAN

Dunstable through De Rore; lute and keyboard tablatures. Prerequisite, 401 or permission. (Not offered 1970-71.) (Formerly 578.)

517 Seminar in Musical Styles (3, max. 6) W
CLARKE

Investigations into the stylistic criteria for specific composers and groups of composers. Prerequisite, permission.

518 Aesthetics (3) W
IRVINE

Aesthetic theories; practical aspects of aesthetics in relation to music criticism, composition, and performance. Prerequisite, permission.

519 Editing of Early Music (3, max. 6)
TERRY

The study of performance practices through the editing of vocal and instrumental music of the seventeenth and early eighteenth centuries. Problems of ornamentation, bowing, figured bass, notation, etc. Collaborative student preparation and conducting of old scores. Prerequisite, permission.

520 Seminar in American Music (3, max. 6) W
CLARKE

Research in the life, works, and times of composers in the United States from colonial days to the present. Prerequisite, permission. (Formerly 547.)

522 Contemporary Contrapuntal Technique (3) A
VERRALL

A study of the art of invention, canon, and fugue in the twentieth century, from both analytic and practical viewpoints.

523 Music and Society (3) A
NORMANN

524 Seminar in Music Education (3) W
SWANSON

Special problems in the teaching and supervision of music in the elementary grades.

Prerequisites, one year of teaching experience and permission.

525 Seminar in Music Education (3) W
NORMANN

Special problems in the teaching and administration of music in the secondary school and junior college. Prerequisites, one year of teaching experience and permission.

526, 527, 528 History of Theory (3,3,3) A,W,Sp
SUDERBURG

526: ancient, medieval, early renaissance; 527: renaissance, baroque, early classic; 528: classic, romantic, twentieth century.

529 Practicum in Teaching Elementary Music Methods (3) Sp
SWANSON

Elementary music education curriculum, methods, and materials. Prerequisites, 524 and teaching experience. (Formerly 544.)

530 Seminar in Musical Learning (3, max. 6) A or Sp
CARLSEN

A study of learning research as it relates to nonverbal musical learning. Prerequisites, 438, 514, Psychology 400, or permission.

531 Experimental Design in Musical Research (3) Sp
CARLSEN

Experimental and quasi-experimental research designs and the application of experimental research methods to the investigation of problems in music teaching and learning, performance, and theoretical studies. Prerequisites, 514, and Psychology 303 or Educational Psychology (EDPSY) 490. (Formerly 555.)

532 Opera Direction and Production (4 or 6, max. 12) AWSp
ROSINBUM

Practical experience with problems of the opera theatre. (Formerly 566.)

533, 534, 535 Preceptorial Reading in Ethnomusicology (5,5,5) A,W,Sp
GARFIAS

Graduate course dealing with basic literature in ethnomusicology in geographic areas of India, Southeast Asia, and Indonesia; laboratory and listening sections meeting concurrently, Music 533 with 316, 534 with 317, and 535 with 318.

536 Transcription and Analysis (3) W
KAUFFMAN

A study of practice in different notational analytical systems used in non-Western music. Prerequisite, 471.

559 Master's Recital (2, max. 4) AWSp

Public performance in solo recital, chamber music, cantata, oratorio, or conducting. For students in the Master of Music program. Prerequisite, permission. (Formerly 551.)

Courses 560 through 578 are for graduate performance majors.

560 Private Instruction: Piano (3, max. 27) AWSp
GEISSMAR, HOKANSON, MOORE, O'DOAN, SIKI
(Formerly 550A.)

561 Private Instruction: Violin-Viola (3, max. 27) AWSp
MC INNES, SOKOL, ZETLIN
(Formerly 550B.)

562 Private Instruction: Voice (3, max. 27) AWSp
CURTIS-VERNA, HARRIS, LISHNER, MESSLER
(Formerly 550C.)

563 Private Instruction: Violoncello (3, max. 27) AWSp
HEINITZ
(Formerly 550D.)

564 Private Instruction: Double Bass (3, max. 27) AWSp
WARNER
(Formerly 550E.)

565 Private Instruction: Organ (3, max. 27) AWSp
EICHINGER
(Formerly 550F.)

566 Private Instruction: Flute (3, max. 27) AWSp
SKOWRONEK, WELKE
(Formerly 550G.)

567 Private Instruction: Oboe (3, max. 27) AWSp
STORCH
(Formerly 550H.)

568 Private Instruction: Clarinet (3, max. 27) AWSp
MC COLL, WELKE
(Formerly 550I.)

569 Private Instruction: Bassoon (3, max. 27) AWSp
GROSSMAN
(Formerly 550J.)

570 Private Instruction: Saxophone (3, max. 27) AWSp
BRAZIL
(Formerly 550T.)

571 Private Instruction: Horn (3, max. 27) AWSp
LEUBA, WELKE
(Formerly 550K.)

572 Private Instruction: Trumpet (3, max. 27) AWSp
COLE, WELKE
(Formerly 550L.)

573 Private Instruction: Trombone (3, max. 27) AWSp
DEMPSTER
(Formerly 550M.)

574 Private Instruction: Tuba (3, max. 27) AWSp
RUSSELL
(Formerly 550N.)

575 Private Instruction: Harp (3, max. 27) AWSp
VOKOLEK
(Formerly 550O.)

576 Private Instruction: Percussion (3, max. 27) AWSp
SHRADER
(Formerly 550P.)

577 Private Instruction: Harpsichord (3, max. 27) AWSp
KIND
(Formerly 550Q.)

578 Private Instruction: Viola da gamba (3, max. 27) AWSp
HEINITZ
(Formerly 550R.)

580, 581, 582 Advanced Conducting (2,2,2) A,W,Sp

CHAPPLE, EICHENBERGER
(Formerly 584, 585, 586.)

590 Doctoral Recital (3-9, max. 18) AWSp
Public performance in solo recital, chamber music, concerto, a major operatic role, or conducting. For students in the Doctor of Musical Arts Program. Prerequisite, permission.

591 Graduate Composition (*) AWSp
BEALE, BENSHOOF, BERGSMAN, KECHLEY, SMITH, SUDERBURG, TUFTS, VERRALL

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

NEAR EASTERN LITERATURE— See Classics

NORWEGIAN—See Scandinavian Languages and Literature

OCEANOGRAPHY

Courses for Undergraduates

101 Survey of Oceanography (5) AWSpS
Origin and extent of the oceans; nature of the sea bottom; causes and effects of currents and tides; animal and plant life in the sea. Intended for nonmajors.

109H Survey of Oceanography—Honors (5) Sp
ENGLISH

Origin and extent of the oceans; nature of the sea bottom; causes and effects of currents, waves, and tides; animal and plant life in the sea. Not intended for oceanography majors. Prerequisites, College of Arts and Sciences Honors Program and permission.

110, 111, 112 Lectures in Oceanography (1,1,1) AWSp

Lectures intended for oceanography majors. Students who might major in oceanography can learn more about the field. May be entered any quarter.

180H Lower-Division Tutorial—Honors (6) S

Research with a departmental program. Prerequisites, College of Arts and Sciences Honors Program and permission.

203 Introduction to Oceanography (5) Sp
A description of the oceans and their relation to man; physical, chemical, biological, and geological aspects of the sea; areal distribution and seasonal cycles of properties; currents; factors affecting populations. Intended for science majors. Prerequisite, sophomore standing in a science curriculum, or permission.

280H Introduction to Oceanography—Honors (5) Sp

Descriptive and regional oceanography covering the physical, chemical, biological, and geological aspects of the sea. Intended for science majors. Prerequisites, sophomore stand-

ing in College of Arts and Sciences Honors Program and permission.

360 Methods and Instruments in Oceanography (3) Sp
LISTER

The oceanographic environment: design and maintenance requirements for shipboard and for overboard equipment. Modern sensing techniques and sampling considerations, the fundamentals of popular telemetry and recording methods; navigation. Calibration and stability of instruments; the effects of pressure and soft water; unattended instrument platforms. Prerequisite, 402 or 418.

380H Upper-Division Tutorial—Honors (6) S

Research under faculty supervision. Prerequisites, junior standing in College of Arts and Sciences Honors Program and permission.

385 The Oceans I (10) S

Application of basic scientific principles to water on the surface of the earth. Institute for high school teachers. Open to selected participants only. Held at Skagit Valley College. (Subject to annual N.S.F. approval.)

386 The Oceans II (10) S

Application of basic scientific principles to the solid earth and its atmosphere. Sequential institute for high school teachers. Open to selected participants only. Prerequisite, 385. Held at Skagit Valley College. (Subject to annual N.S.F. approval.)

388 Oceanography for Science Teachers (5) S

DUXBURY, FLEMING

A survey of marine science for secondary school teachers. Emphasis on material that can be adapted for use in the high school. Prerequisites, 20 credits in natural sciences and permission.

401, 402 General Physical Oceanography I, II (5,5) A,W

BARNES, COACHMAN

Physical properties and processes; theories and methods involved in ocean currents, waves, and tides. Not open to physical oceanography majors. Prerequisites, for 401, one year of chemistry, one year of physics, Mathematics 126; 401 for 402.

403 General Biological Oceanography (5) W
KACZYNSKI

Organisms of the sea; quantitative distribution; interrelationships of organisms; influence of environment; methods of sampling. Intended for oceanography majors (other than those in the biological option) and students in related fields. Prerequisite, 203 or 401 or 417, or permission.

405 General Geological Oceanography (5) Sp
CREAGER

Shorelines and nearshore sedimentation; structure and morphology of the continental terrace and deep-sea floor; sediment types and distribution; marine geological methods and applications. Not open to majors in geological oceanography. Prerequisites, 402 or 419 (or concurrent registration), Geological Sciences 205 or 310.

406 Introduction to Geological Oceanography (5) A

Coastal processes and shoreline development; topography and sediment distribution on the continental terrace and deep-sea floor; geology and geophysics of mid-ocean ridges. Intended for oceanography majors (other than

those in the geological option) and students in related fields. Prerequisite, permission.

415 Fundamentals of Underwater Acoustics (3) A
SANDS

Vibrating strings, bars, and membranes; plane and spherical acoustic waves; transmission and reflection at boundaries. Prerequisites, 402 or 418, Mathematics 126 or 136H, or permission.

416 Applications of Underwater Acoustics (2) W
SANDS

Transducers and arrays, absorption and refraction in sea water, sound channels and bottom effects, ambient noise, scattering, passive and active tracking, acoustic telemetering. Prerequisite, 415.

417, 418 Physical Oceanography I, II (5,5) A,W

AAGAARD, BARNES, CANNON, COACHMAN

Geographic and hydrodynamic aspects of oceanography. Topics: physical properties of sea-water; observed distributions of properties and currents; budgets; kinematics; hydrostatics; momentum dynamics of ocean circulation; vorticity dynamics; viscosity; Ekman's studies; eddy fluxes; estuaries. Prerequisites for 417: Mathematics 324, Physics 223, Chemistry 160, or permission; 417 for 418.

419 Ocean Tides and Waves (5) Sp
LARSEN, MARTIN, SMITH

Theory of surface waves; wave forecasting, transformation of waves in shallow water, wave forces. Tide Theory: analysis and prediction of tides and tidal currents. The course includes laboratory and computer simulation. Prerequisite, 418 or permission.

421-422 Chemical Oceanography (2-2) A,W
HEALY, RICHARDS

Physical and chemical properties of sea water and marine products; processes determining the chemical make-up of the oceans. Prerequisite, 401 or 417 (or concurrent registration in one).

423, 424 Chemical Oceanography Laboratory (2,2) AWSp,W
HEALY, RICHARDS

Laboratory problems in the analytical and physical chemistry of sea water and marine materials. Prerequisites for 423; 421-, Chemistry 221; for 424; -422 and 423. 423 and 424 may be taken concurrently with 421- and -422 respectively.

433 Biological Oceanography: Organisms and Processes (3) W
FROST, LEWIN, TAYLOR

Marine organisms with emphasis on bacteria, the microscopic plants, the protozoa, and smaller animals; biological processes affecting the sea. Recommended for non-biologists. Prerequisites, 401 or 417 and Biology 101-102, or permission.

434 Biological Oceanography: Organisms and Environments (3) W
FROST, LEWIN, TAYLOR

Organisms of the plankton, nekton, and benthos; their adaptations to ocean environments and their relationships to each other. Prerequisites, 401 or 417, and 20 credits in biological sciences, or permission.

435 Biological Oceanography: Quantitative Aspects (3) Sp
BANSE

Quantitative distribution in time and space of pelagic and bottom organisms in the open

ocean and on the shelf; rates of processes. Prerequisite, 433 or 434, or permission.

443 Regional Oceanography (2) Sp

FLEMING

Application of modern methods to the comprehensive description of selected areas of the oceans. Prerequisite, advanced senior standing.

444 Design and Analysis of Oceanographic Experiments (3) A

KELLEY

Planning of field and laboratory experiments in oceanography; evaluation and processing of oceanographic data. Prerequisite, Quantitative Science 281 or permission.

450 Geological Oceanography (5) A

Shore processes; structure and morphology of the continental terrace and deep-sea floor; marine sedimentary deposits and stratigraphy; geological history of ocean basins and sea water. Prerequisites, major in geological oceanography or Geological Sciences 401, or 417 (or concurrent registration), or permission.

452 Physical Sedimentology (5) Sp

SMITH

An introduction to theoretical and experimental techniques used in studying erosion, transportation, and deposition of sediment. Analysis of sediment samples, initial motion of sediments, bed-load motion, suspension of sediment by turbulent flows, erosion and deposition of sediment by turbulent flows, mass movement of sediments, and applications of sediment transport theory to problems of geological interest. Prerequisites, 402 or permission.

454 Biogenic Sediments I (3) A

ECHOLS

Ecology and systematics of plant and animal groups contributing to Neogene marine sediments. Emphasis on microfossils. Prerequisites, 433 or 434, and 435, 450 or Geological Sciences 322, 330, or permission.

455 Biogenic Sediments II (3) W

LING

Survey of silicate microorganisms and microfossils with emphasis on their geological and geographical occurrences and their application to deep-sea stratigraphy. Prerequisite, 454 or permission.

456 Acoustic and Seismic Techniques (2) W

BENNETT

Acoustic data-taking techniques; analysis and interpretation of acoustic bathymetry and seismic reflection and refraction data. Prerequisite, 415 or permission.

457 Marine Sedimentation (3) Sp

STERNBERG

Origin, transportation, and deposition of marine sediments; marine sedimentary environments; physical aspects of marine sedimentary processes. Prerequisite, 452 or permission.

458 Chemical Aspects of Marine Sediments (5) W

CARPENTER

A survey of minerals in marine sediments: their origin or mode of formation, their isotopic and chemical composition, their rate of deposition, their chemical alteration after deposition, their distribution and relative importance in the major sedimentary cycle. Prerequisite, Chemistry 160.

460-461 Field Experience in Oceanography (1)-(5) AWSpS, AWSpS

Work ashore and on research vessels; design of experiments; cruise planning; chemical,

physical, biological, geological, and geophysical analyses; preparation of reports. A cruise is required; normally, it extends about ten days between quarters. One credit for 460- and one credit for 461 are given for the cruise; additional credits in 461 can be earned by arrangement. Prerequisite, permission.

462 Applications of Oceanography (3) W

FLEMING

Analysis of special cases involving application of oceanography to practical problems. Prerequisite, a physical or biological science major or permission. (Formerly 461.)

480H Undergraduate Research—Honors (6) S

Independent research. Prerequisites, 180H or 380H, and permission.

485 Topics in Oceanography (2) A

A series of weekly lectures on oceanographic topics, including physical and chemical properties of water, motions, life in the sea, geological features, data collection and analysis, etc. Also offered at the Center for Graduate Study, Richland, Washington. For nonmajors. Prerequisite, upper-division status in science.

488H Field Experience—Honors

(2-6, max. 6) AWSp

Participation in extended oceanographic field operations on a research vessel; data analysis and reduction, report preparation. Prerequisites, 380H or 480H, and permission.

489H Undergraduate Thesis—Honors

(1-6, max. 6) AWSp

A theoretical or experimental contribution to oceanography. Prerequisites, 480H and permission.

499 Undergraduate Research (1-3, max. 6)

AWSp

Research on assigned topics which may involve laboratory work, field work, or literature surveys. Prerequisite, permission.

Courses for Graduates Only

505 Current Problems in Geological Oceanography (1)

Discussion of research topics which are currently being investigated within the Department. Prerequisite, permission.

511, 512, 513 Marine Hydrodynamics I, II, III (4,4,4) A,W,Sp

CRIMINALE, LARSEN, RATTRAY

Methods for solving problems in physical oceanography. Prerequisite, a major in a physical science.

514 Seminar in Physical Oceanography

(1, max. 9) AWSp

Discussion of selected problems of current interest in physical oceanography. Prerequisites, 402 or 419, and permission.

515 Waves (4) A

LARSEN

Application of marine hydrodynamics principles to wave motion in oceans. Prerequisite, 513. (Offered only in odd-numbered years.)

516 Ocean Circulation (2) W

ARONS, RATTRAY

Hydrodynamic theories concerning origin and characteristics of major ocean currents. Prerequisite, 513 (Offered only in even-numbered years.)

517 Oceanography of Inshore Waters (5) Sp

BARNES, RATTRAY

Theories and techniques of investigation and interpretation of conditions existing in inshore waters with particular reference to mixing and flushing and to areas adjacent to the state of Washington; use of dynamic models. Prerequisite, 512. (Offered only in odd-numbered years.)

518 Seminar in Dynamical Oceanography

(1, max. 9) AWSp

Selected problems of current importance concerning the dynamics of the ocean. Concentrates on those topics which are considered fundamental, of central importance to most of the areas of applications.

519 Interaction of the Sea and Atmosphere (5) Sp

CRIMINALE

Interchange of heat, water, and energy; study of budgets and of mechanisms of exchange. Prerequisites, 418, Atmospheric Sciences 462.

520 Seminar (1, max. 6) AWSp

521 Seminar in Chemical Oceanography

(*, max. 9) AWSp

RICHARDS

Lectures, discussions, and readings on selected problems of current interest. Prerequisite, permission.

523 Advanced Problems in Chemical Oceanography (1-4, max. 18) AWSp

Field and laboratory work on selected problems of current interest. Prerequisites, 424 and permission.

530 Marine Primary Productivity (3) Sp

ANDERSON

General concepts of marine phytoplankton production; laboratory and field studies; critical examination of special problems. Not open to students who have taken 534. Prerequisites, 433 or 434, and 435, and permission.

531 Seminar in Biological Oceanography

(*, max. 9) AWSp

Lectures, discussions, and work on selected problems of current interest. Prerequisite, permission.

532 Marine Microbiology (1-4) Sp

ORDAL

Ecology and biochemistry of marine bacteria. Prerequisites, Microbiology 400 and permission.

533 Zooplankton Ecology (6) S

Identification of plankton animals; evaluation of sampling methods; rate measurements on selected species; work on ecological problems. (Offered only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

534 Phytoplankton Ecology (6) S

Contemporary problems in marine phytoplankton investigations. Evaluation of methods used in field and laboratory studies. (Offered only in even-numbered years at Friday Harbor Laboratories.) Prerequisite, permission.

535 Advanced Plankton Ecology (3) W

BANSE

Factors controlling the abundance of plankton organisms; methods of sampling and analysis of standing stock. Prerequisite, permission.

536 Benthos Ecology (3) Sp

TAYLOR

Distributions, abundances, and interrelationships of the organisms of the ocean floor; methods of sampling and analysis. Prerequisite, permission.

537 Environmental Physiology of Marine Microalgae (4) A

LEWIN

Culture and nutrition of marine unicellular algae; use of algal cultures for the study of problems in biological oceanography. Prerequisite, permission.

538 Identification and Structure of Marine Benthic Communities (2) Sp

LIE

Sampling gear and sampling techniques; qualitative and quantitative methods for identification and ordination of communities; structure of benthic communities; biomass, productivity and benthos/fish relationships; historic review of benthos research. Prerequisite, permission.

540 Seminar in Geometronics (1-3) AWSp

KELLEY

Lectures and discussions on selected problems in the applications of statistics in earth science. Prerequisite, Quantitative Science 383.

544 Statistical Models in Oceanography (3) W

KELLEY

Multivariate analysis: regression, trend surface analysis, factor analysis, discriminant functions, and stochastic-process models in oceanography. Prerequisite, Quantitative Science 383 or permission.

548 Topics in Physical Oceanography (1-4, max. 9) AWSp

Lecture series on topics of major importance in physical oceanography.

550 Seminar in Geological Oceanography (*, max. 9) AWSp

Lectures, discussions, and field and laboratory work on selected problems of current interest. Prerequisite, permission.

551 Marine Sediments (2) Sp

MC MANUS

Topics in interpreting environmental significance of marine sediments. Prerequisite, permission.

553 Research Techniques in Marine Geochemistry (2)

CARPENTER

Analytical techniques and instruments applicable to problems of marine geochemistry. Prerequisite, Chemistry 351.

554 Research Techniques in Marine Geology (3) A

CREAGER

Planning field programs; selection of equipment and survey procedures; collection, analysis, compilation, and presentation of bathymetric and sediment data; evaluation of techniques and results. Prerequisites, 450, 453 or 551, and 552 (which may be taken concurrently).

555 Marine Geochemistry (3)

CARPENTER

Topics in geochemistry of the oceans and marine sediments. Prerequisites, Chemistry 351 and permission.

556 Advanced Marine Geology (*, max. 9) AWSp

CREAGER, MC MANUS

Contemporary problems in marine geology; concepts supporting or at variance with ac-

cepted hypotheses; discussion of recent advances. Prerequisite, permission.

560 Fluid Mechanics of Erosion and Sediment Transport (3) W

SMITH

Advanced study of the erosion, deposition, and transportation of sediments by turbulent flows. Emphasis on the use of theoretical fluid mechanics to formulate and solve problems of bed load and suspended load transport of sediments, erosion, and deposition of sediments, erodible boundary-wave problems, turbidity currents, beach erosion. Prerequisites, 452, 511, and permission.

561 Seminar in Geological Fluid Mechanics (3) Sp

SMITH, STERNBERG

Reading and discussion of topics of current interest in geological fluid mechanics. Course work will include a report on a specialized topic. Prerequisite, permission.

571 Gravity and Geomagnetic Interpretation (3) A

BENNETT

Fundamental concepts; the earth's magnetic field; instrumentation and reduction of magnetic measurements, interpretation of magnetic data; gravity measurements, reduction of gravity observations; interpretation of gravity anomalies. Offered jointly with Geophysics 571. Prerequisites, Physics 323 or equivalent, Geophysics 405 or Geological Sciences 450, or permission.

573 Terrestrial Magnetism (3) Sp

MERRILL

Advanced aspects of earth magnetism intended for specialists in this field. Extensive discussion of origin theories and their implications; physical basis and theories of magnetism in rocks; paleomagnetic techniques and results. Offered jointly with Geophysics 573. Prerequisite, Geophysics 453.

581 Analysis of Sediments and Sedimentary Rocks (5) A

KELLEY, WHETTEN

Methods of analysis of sediments and sedimentary rocks, and statistical evaluation, presentation, and interpretation of data. Offered jointly with the Department of Geological Sciences as Geological Sciences 581. Prerequisites, Geological Sciences 423, Quantitative Science 281, or permission.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

PERSIAN—See Classics

PHILOSOPHY

Courses for Undergraduates

100 Introduction to Philosophy (5) AWSp

Introduction to major philosophical questions relating to such matters as ethics, the existence of God, the foundations of knowledge, and the nature of the real world. The number and nature of the problems studied and the works read vary from instructor to instructor.

110 Introduction to Social Ethics (5)

The nature of a good social order and right social action. The rival ideals of aristocracy,

fascism, liberalism, and socialism, with emphasis upon the nature and ideals of democracy.

113 Philosophy and Racial Conflict (5)

A study of some of the intellectual causes of racial conflict. Relations between racial and international conflicts are examined.

120 Introduction to Logic (5) AWSp

Deductive and inductive logic; conditions of clear statement and valid reasoning; propositions, contradiction, definition, inference, types of argument, detection and avoidance of fallacies; probability and the methods by which theories and laws are established in daily life and in the sciences. Application of logic to other fields.

200 Types of Philosophy (5)

A course in philosophy at the introductory level. The content of the course is entirely at the discretion of the instructor.

215 Introduction to Ethics (5) A

MISH'ALANI

Systematic study of typical analyses of the distinction between good and evil, right and wrong. The appeals to custom, theology, reason, human nature, and happiness as standards for solution of moral problems. Readings in Plato, Hume, Kant, Bentham, and Mill.

230 Philosophic Issues in World Affairs (2)

Philosophic issues in the conflict between soviet and liberal interpretations of democracy, and the bearing of these differences on world order. Ideals of the more neutralist nations. Philosophical basis of a world order.

231 Philosophy of Human Rights (2)

Historical development of the concept of human rights with particular attention to original sources.

250 Introduction to Epistemology (3)

MARKS

Introduction to some of the problems involved in general philosophical accounts of knowledge or in philosophical accounts of our knowledge of certain kinds of statements, e.g., statements about the external world, *a priori* statements, statements about the past, statements about other minds.

260 Introduction to Philosophy of Science (3)

CLATTERBAUGH

An examination of formal languages, the nature of probability, the problem of induction, and determinism.

267 Introduction to Philosophy of Religion (5)

DIETRICHSON

A study of Western religious thought. Examination of the problem of evil, the nature of mysticism, atheism, theism, and the relationship between religion and morality.

280H Introduction to Philosophical Studies (5, max. 10)

An intensive analysis of selected philosophical problems for students who have shown a special aptitude and interest in philosophy. Prerequisites, one course in philosophy and permission of the honors adviser.

320 History of Ancient Philosophy (5) A

KEYT

The pre-Socratics; Plato and Aristotle; the Stoics, Epicureans, and Skeptics; Plotinus.

321 History of Medieval Philosophy (5) A

BOLER

Development of main lines of philosophical thought in the Latin West from 400-1400, with

emphasis on Augustine, Anselm, Abelard, Aquinas, and Occam. Prerequisite, 320 or permission.

322 History of Modern Philosophy (5) W
Development of philosophical ideas from beginning of the Renaissance through the Continental Rationalists, the British Empiricists, and Kant.

325 History of Nineteenth-Century Philosophy (5)

Post-Kantian idealism: Fichte, Schelling, Hegel, and Schopenhauer. Development of absolute idealism in England. Resurgence of empiricism in England and America. Prerequisite, 322 or permission.

326 History of Recent Philosophy (5) Sp
MISH'ALANI

A survey of the main problems in Philosophical Analysis from the English Realist reaction against Idealism to the present. Prerequisite, 120 or permission.

347 Philosophy in Literature (3)

Study of philosophical ideas expressed in great works of literature.

348 Philosophy in the Romantic Poets (2)

RADER

A study of the philosophical ideas implicit in the great poetry of the Romantic Period.

370 Intermediate Logic (5) A

KEYT

An advanced treatment of sentential logic. Proof theory, model theory, and their interrelations.

410 Social Philosophy (5)

Philosophical theories of the nature of society. The epistemological, metaphysical, and ethical issues in the conflict between individualism and collectivism.

412 Indian Philosophy (3)

GEROW

A survey of the leading Indian traditional schools of philosophy and theology, with emphasis on the origins and growth of Vedānta. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 412.

414 Philosophy of Law (3)

SIEGLER

Nature and function of law. Relation of law to morality. Logic of legal concepts. Prerequisite, 110 or 215, or permission.

415 Chinese Philosophy (5) A

SHIH

Development of Chinese philosophy from the sixth century B.C. to modern times. Emphasis on Confucianism, Mohism, Taoism, Legalism, the Dialecticians, Buddhism, and Neo-Confucianism; re-evaluation of them in the light of new trends of thought after contact with the West. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 415.

416 Neo-Confucianism (5) W

SHIH

Systematic study of Neo-Confucianism, its background and development with emphasis on the Rationalistic school of Ch'eng-Chu and the Idealistic school of Lu-Wang. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 416. Prerequisite, 415 or permission.

421 Studies in Medieval Philosophy (3, max. 9)

BOLER

Detailed study of an individual figure or problem in Medieval Philosophy (of the Latin West), selected by the instructor. Prerequisite, 321.

422 Studies in Continental Rationalism (3, max. 9)

MARKS

A study of the philosophical system, or some part of the philosophical system, of one or more of the major continental Rationalists: Descartes, Spinoza, Leibniz. Prerequisite, 322 or permission.

424 American Philosophy (3)

BOLER

The philosophies of Pierce, Royce, Dewey, James, and Santayana. Recent developments in analytic and speculative philosophy. Current issues and problems. Prerequisite, 322 or permission.

431 Philosophy of Plato (3)

CLATTERBAUGH, KEYT

A reading of selected middle and late dialogues. (Alternates with 433.) Prerequisite, 320 or permission.

433 Philosophy of Aristotle (3)

KEYT, SIEGLER

A study of the Aristotelian system with emphasis on two major works. (Alternates with 431.) Prerequisite, 320 or permission.

436 British Empiricism (3)

Development of empiricism in writings of Locke, Berkeley, and Hume. Detailed attention to application of empiricist views of origin and nature of ideas to the problems of substance, self, nature, causation, mathematics, and induction. Prerequisite, 322 or permission.

437 Philosophy of Hume (3)

Study of principles and methods employed by Hume in elaboration of his system of philosophy, comprising his analyses of knowledge, the passions, and morals. Prerequisite, 322 or permission.

438 Philosophy of Kant (3)

DIETRICHSON

A systematic study of *The Critique of Pure Reason*. Prerequisite, 322 or permission.

439 The Later Philosophy of Wittgenstein (3)

MARKS

A detailed study of topics in the later philosophy of Wittgenstein. Particular attention will be directed to the *Philosophical Investigations*. Prerequisite, 322 or permission.

440 Advanced Ethics (3) W

MISH'ALANI

A critical examination of the concepts and judgments of value, including an analytical treatment of the notions of right and wrong, obligation, good and evil, and the relationship between ethical and aesthetic value. Prerequisite, 215 or permission.

443 Philosophy and Linguistics (3)

SMALL

A study of recent work in linguistics and its implications for philosophy. Offered jointly with the Department of Linguistics as Linguistics 443. Prerequisite, permission.

445 Philosophy of Art (5)

MOULTON

A critical examination of characteristic accounts of the nature of art, artistic activity,

the aesthetic experience, and the artist and his art in relation to society. The philosophy of criticism: the role of the critic, and problems in interpretation and evaluation of works of art.

446 Development of Aesthetic Theory (5)

RADER

The historical development of aesthetics, emphasizing such major figures as Plato, Aristotle, Plotinus, Hume, Kant, and Hegel. Prerequisite, 100 or 445, or permission.

447 Philosophy of Literature (3)

Inquiry into concepts, values, and presuppositions necessary for the creation of traditional literary forms of epic, dramatic, and lyric poetry.

450 Epistemology (3)

RICHMAN

Problems in the theory of knowledge, the nature, possibility, criteria, and limitations of knowledge; critical evaluation of subjectivism and realism, dogmatism and skepticism, intuitionism, pragmatism, empiricism, rationalism, and positivism; theories of meaning, truth, and perception; synthesis of various positions around the scientific method. Prerequisite, 100.

453 Philosophy of Language (5)

MOULTON, SMALL

Theories of meaning, reference, predication, and related concepts. Typical authors include Frege, Russell, Strawson, and Austin. Prerequisite, 120 or permission.

456 Metaphysics (5)

BOLER, DIETRICHSON

A critical examination of alternative metaphysical theories on such topics as the nature of substance, causality, the self, freedom, space, time, monism, pluralism. Prerequisite, one history of philosophy course, or permission.

458 Phenomenology (5)

The contribution of phenomenology to selected topics in the theory of meaning, philosophy of mind, ontology, and epistemology.

460 Philosophy of Science (5)

CLATTERBAUGH

Concepts and methods fundamental in mathematics and in physical and social sciences. Relations of the sciences to each other as well as to ethics, religion, and philosophy. Speculations on the nature of the world suggested by past and present scientific theories. Operational tendencies in recent interpretations of science. Prerequisite, 100, 120, or 260.

463 Philosophy of Mind (3)

MARKS

Theories of the nature of mind, the relation between mind and body, the self, memory, the unconscious, introspection, and our knowledge of other minds. Prerequisite, 100.

464 Philosophical Psychology (3)

SIEGLER

Philosophic analysis of relations between mental events and their expression, especially their linguistic expression. Prerequisites, 100, 326, or 463.

465 Philosophy of History (5)

RADER

Analyses of basic concepts employed in historical interpretation, and some of the principal philosophers of history: Plato, St. Augustine, Hegel, Marx, Spengler, Toynbee, etc.

467 Philosophy of Religion (5)

DIETRICHSON

A critical examination of three approaches to religion: reason, intuition, faith. Prerequisite, one history of philosophy course, or 267, or permission.

469 Existentialist Philosophy (3)

DIETRICHSON

A critical study of major ideas in the philosophies of Kierkegaard, Heidegger, Sartre, and Marcel. Prerequisite, 322 or 325 or 326, or permission.

470 Advanced Logic (5) W

KEYT

An advanced treatment of predicate logic. Proof theory, model theory, and their interrelations.

472, 473, 474 Logical Theory I, II, III

(3,3,3) A,W,Sp

CHATEAUBRIAND

Selected topics in logic, philosophy of language, and philosophy of mathematics. Prerequisite, 470 or permission.

480H Philosophical Studies (3, max. 6)

Discussion and the writing of philosophical essays on advanced topics. The reading materials vary from year to year. For selected junior and senior honors students only.

484 Reading in Philosophy (1-4, max. 12)

AWSp

Reading of approved philosophical works. (The name of the staff member with whom research will be done *must* be indicated in registration.) Prerequisite, permission.

490 Undergraduate Seminar (4)

An intensive study in some philosophical problem. A seminar intended to prepare undergraduate majors for graduate work. Prerequisite, permission.

Courses for Graduates Only

514 Seminar in Legal Philosophy

(3, max. 12)

520 Seminar in Ancient Philosophy

(3, max. 12)

KEYT

521 Seminar in Medieval Philosophy

(3, max. 12)

BOLER

522 Seminar in Modern Philosophy

(3, max. 12)

526 Seminar in Recent Philosophy

(3, max. 12)

540 Seminar in Ethics (3, max. 12)

545 Seminar in Philosophy of Art

(3, max. 12)

MOULTON

550 Seminar in Epistemology (3, max. 12)

556 Seminar in Metaphysics (3, max. 12)

565 Seminar in Philosophy of History

(3, max. 12)

RADER

567 Seminar in Philosophy of Religion

(3, max. 12)

DIETRICHSON

570 Seminar in Logic (3, max. 12)

KEYT

584 Reading in Philosophy (1-4, max. 12)

AWSp

Intensive reading in the philosophical literature. (The name of the staff member with

whom research will be done *must* be indicated in registration.) Prerequisite, permission of the graduate adviser.

587 Contemporary Analytic Philosophy

(3, max. 12)

RICHMAN

600 Independent Study or Research (1-6)

AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

PHYSICAL AND HEALTH EDUCATION

Courses for Undergraduates

PHYSICAL EDUCATION—MEN

101 through 255 (Men) (1 each)

101, adapted activities; 104, squash; 105, canoeing (\$3.00 per quarter); 106, handball; 107, basketball; 108, tennis; 109, softball; 110, golf (\$5.00 per quarter); 111, track; 112, rowing, prerequisite, swimming; 113, fencing; 114, boxing; 115, gymnastics; 117, wrestling; 118, volleyball; 120, soccer; 121, touch football; 122, badminton; 123, archery; 124, calisthenics (body conditioning); 125, skiing; 127, bowling (\$5.00 per quarter); 128, weight-training; 129, sailing; 130, Korean dance; 131, American folkdance; 132, international folkdance; 136, mountain climbing; 137, advanced mountain climbing; 138, ballet I; 139, contemporary dance II; 151, contemporary dance I; 153, contemporary dance III; 154, social dance; 156, beginning swimming; 157, intermediate swimming; 158, advanced swimming; 159, springboard diving; 160, skin diving; 161, life saving; 162, water polo; 208, intermediate tennis; 215, intermediate gymnastics; 217, judo; 227, intermediate bowling (\$5.00 per quarter); 238, ballet II; 239, ballet III.

141, freshman, 241, varsity, basketball; 142, freshman, 242, varsity, crew (prerequisite, swimming); 143, freshman, 243, varsity, football; 144, freshman, 244, varsity, track; 145, freshman, 245, varsity, swimming; 146, freshman, 246, varsity, baseball; 247, varsity, tennis; 148, freshman, 248, varsity, golf; 149, freshman, 249, varsity, skiing; 152, freshman, 252, varsity, gymnastics; 155, freshman, 255, varsity, wrestling.

256 through 499 (Men)

(See also courses listed under men and women.)

164 Skills and Materials in Aquatics (2) A

TORNEY

165 Skills and Materials in Gymnastics

(2) W

166 Skills and Materials in Team Sports

(2) Sp

HENDERSHOTT

168 SCUBA Diving (2) Sp,A,W

Scientific principles and techniques of SCUBA (Self-contained Underwater Breathing Apparatus) diving based on marine physics, physiology, and medical requisites to a safe exposure in an underwater environment.

190 Introduction to Physical and Health

Education (2) A

Survey of and orientation to the professional fields of physical education, health education, recreational leadership, and coaching. History and philosophies; personnel qualifications,

training and preparation; opportunities; organizations; related fields.

264 Skills and Materials in Track and Field

and Weight Training (2) A

HUGHES

265 Skills and Materials in Low-Organized

Games (2) W

266 Skills and Materials in Individual Sports

(2) Sp

290 Officiating (2) W

HENDERSHOTT

Techniques of officiating football, basketball, track and field, swimming, tennis, volleyball, softball, and speedball.

293 Physiology of Muscular Exercise (3) Sp

Muscular efficiency, fatigue, recovery, chemical changes and neuromuscular control, with special reference to games, sports, corrective work, and body mechanics. Prerequisite, Zoology 118, or 208, or 358.

322 Kinesiology (3) A

Analysis of leverage in body movements and problems of readjustment in relationship to body mechanics and to physical education activities. Prerequisites, 293 and Biological Structure 301.

336 Athletic Training and Conditioning

(2) Sp

MARTY

Prerequisite, 292 or permission.

340 Administration of Intramural Sports

(3) Sp

STEVENS

358 Methods of Teaching Gymnastics (2) W

HUGHES

Prerequisite, 165 or permission.

361 Methods of Teaching Wrestling

(2) A

SMITH

Prerequisite, 264 or permission.

363 Methods of Teaching Sports (2) Sp

PEEK

Organization, presentation, and evaluation of student lesson plans in teaching team sports in the school physical education program. Prerequisites, 164, 165, 166, 264, 265, 266.

364 Methods of Teaching Aquatics (2) Sp

TORNEY

Prerequisite, 164 or equivalent, or permission.

370 Coaching of Football (2) Sp

OWENS, TIPPS

371 Coaching of Basketball (2) A

WINTER

372 Coaching of Track and Field

(2) W

SHANNON

373 Coaching of Baseball (2) Sp

LEHMAN

435 Adapted Physical Education (3) Sp

HENDERSHOTT

Programs for atypical cases from the standpoint of individual needs. Prerequisites, 293, 322, and Zoology 118, or 208, or 358.

493 Problems in Athletics (3) Sp

TORNEY

The place of interschool athletics in education. Control, finance, eligibility, safety measures, publicity, and public relations. Qualifications and duties of coaches, managers, and officials. Prerequisites, 345 and 450.

PHYSICAL EDUCATION—WOMEN**101 through 199 (Women)**

All 100-level courses and course 201 satisfy one of the three required quarters of physical education activity. Courses designated II or III carry prerequisites of I or II, respectively, or evidence of proficiency equivalence in that activity; level I courses are for beginners only.)

101, 102 Archery I, II (1,1) AWSp,Sp**104, 105 Badminton I, II (1,1) AWSp,WSp****107, 108, 109 Bowling I, II, III (1,1,1) AWSpS,AWSpS,WSpS**
\$5.00 fee.**110, 111 Fencing I, II (1,1) AWSp, WSp****113 Golf I (1) AWSpS**

\$5.00 fee; following hour must be free for travel time.

116, 117, 118 Riding I, II, III (1,1,1) AWSp,AWSp,AWSp (Section A, English; Section B, Western)

\$20.00 for lessons; insurance recommended.

119, 120 Skating (Ice) I, II (1,1) AWSp,WSp

\$15.00 for lessons and skates; insurance recommended.

122 Ski Conditioning (1) AW**123, 124, 125 Skiing I, II, III (1,1,1) WSp,WSp,WSp**

\$52.00, including lessons and transportation. \$22.00, lessons only.

126, 127, 128 Tennis I, II, III (1,1,1) ASpS, ASpS, ASpS**129 Squash I (1) AWSp**

Following hour must be free for travel time.

130 Korean Dance (1)**131 Basketball I (1) WSp****133 Field Sports (1) ASp****134 Volleyball I (1) AWSp****136, 137 Mountain Climbing I, II, (1,1) S,S****139 American Folk Dance I (1) AWSp****145 International Folk Dance I (1) AWSp****148 Social Dance I (1) AWSp****151, 152, 153 Contemporary Dance I, II, III (1,1,1) AWSpS,WSpS,WSpS**
Concepts and techniques of dance as a modern art form.**155 Jazz Dance (1)****156, 157, 158 Ballet I, II, III (1,1,1) AWSp,AWSp,AWSp****160 Adapted Swimming (1) AWSp**

For handicapped students requiring individually designed programs. Prerequisite, permission only.

161, 162, 163, 164 Swimming I, II, III, IV (1,1,1,1) AWSpS,AWSpS,AWSpS, AWSpS

Level II for students who can swim 25 feet but not 50 yards. Level IV prerequisite, 50 yards' crawl and reasonable proficiency on side and back.

165 Aquatic Art I (1) AWSp

Prerequisite, well-coordinated front and back crawl, breast stroke, front dive, and underwater swimming.

167 Diving I (1) AWSp

Springboard diving. Prerequisite, ability to swim fifty yards and tread or float for five minutes.

168 SCUBA Diving (2) AWSpS

Scientific principles and techniques of SCUBA (Self-contained Underwater Breathing Apparatus) diving based on marine physics, physiology, and medical requisites to a safe exposure in an underwater environment.

169 Life Saving (1) AWSp

Prerequisite, swim 440 yards. (American Red Cross certification possible.)

171, 172 Canoeing I, II (1,1) SpS, Sp

\$5.00 fee. Prerequisite, ability to swim fifty yards and swim, tread, or float for 15 minutes. Following hour must be free for travel time.

174 Sailing I (1) Sp**180 Adapted Activity (1, max. 3) AWSp**

For students with physical problems and disabilities. Prerequisite, permission only.

181 Special Activity (1) AWSp

Prerequisite, permission only.

182 Relaxation Techniques (1) AWSp

Designed to reduce general muscular tension and to improve physical efficiency.

183 Basic Activity (1) ASp

Analysis of structure and exploration of movement patterns utilized in sports and daily activities.

184 Basic Activity Applied (1) AWSp

Designed for nurses and prephysical therapy majors; principles of movement applied to nursing techniques.

186 Conditioning (1) AWSpS

189, 190 Gymnastics I, II (1,1) AWSp, WSp
Free calisthenics, balance beam, side horse vaulting, uneven parallel bars, tumbling, and trampoline.

201 through 499 (Women)

(See also courses listed under men and women.)

(Courses designed primarily for women whose area of concentration is human movement. Exceptions: Course 201 and courses designated for men and women.)

201 Meaning and Modification of Movement (2) WSp

KERR, PURDY

Assessment and interpretation of personal movement skill and activity preference. A course designed for nonmajors that may be substituted for one quarter of required physical education activity and be counted in the 180 credits required for graduation.

271 Field Sports (2) A

MAC LEAN

Strategy, interaction, and movement effectiveness in women's field sports.

273 Individual Sports (2) Sp

FOX

Development of an understanding of individual and dual projectile activities through the

application of mechanical principles and common movement patterns.

281 Women's Gymnastics (2) W

MAC LEAN

Principles and application of mechanics to gymnastics.

284 Aquatics (1) Sp

MAC LEAN

Basic hydromechanics and application to aquatic movement.

304 Officiating (2) A

KERR

Techniques of officiating in volleyball; opportunity for national and local ratings. (Offered alternate years; not offered 1970-71.)

305-306 Officiating (1-1) A,W

Techniques of officiating in basketball. (Offered alternate years; offered 1970-71.)

350 Learning and Movement Performance (5) W
PURDY

Interrelationships among perceptual mechanisms, individual characteristics, and tasks, organizational, and situational variables as related to the learning of movement skills. Prerequisite, Psychology 100.

366 Practicum (0) AWSp

Prerequisite, permission.

375 Methods in Physical Education I (4) Sp

PURDY, WALTZ

General methodology, methods in team and individual sports. Prerequisites, 333, 374, or permission.

376 Methods in Physical Education II (7) W

BROER, MAC LEAN

Methods and materials in gymnastics, marching, stunts and tumbling, apparatus, aquatics. Prerequisites, 169, 284, 332 or permission.

436 Adapted Activities (3) A

MILACEK

A study of activities suited to the interests, capacities, and limitations of students with handicaps. Prerequisites, 333, 350, or permission.

480 Biomechanics (3) Sp

BROER

Experimentation with the integration of the physical laws of the universe and the structure and function of the human body with the requirements of various movement tasks. Prerequisite, 332 or permission.

498, 498H Special Studies in Physical Education (2-3, max. 6) AWSp, AWSpS
Prerequisite, permission.**499, 499H Undergraduate Research (2-3, max. 6) AWSp,AWSp**

BROER, PURDY

Prerequisite, permission.

PHYSICAL EDUCATION—MEN AND WOMEN

(See also courses listed separately for men and for women.)

231 Introduction to Movement Analysis (5) AW

FOX, WALTZ

Exemplary topics in the study of human movement, including behavioral, experiential, and interpretive perspectives.

295 Water Safety Instructor Course (2) WSp (Women); ASp (Men)

BUCKLEY, MAC LEAN

(W.S.I. certification) A course designed to prepare students for employment as teachers or administrators in aquatic programs. Prerequisites, for men, 158 or 161; for women, 169 and American Red Cross lifesaving card; or permission for men and women.

312 Physical Fitness Activities for Children (2½) S

Movement activity that contributes to physical fitness and motor efficiency; performance standards as related to physical growth and development levels; criteria and techniques for evaluation of physical performance of children.

314 Movement Exploration for Children (3) S

Theory and techniques of movement exploration utilizing time, space, force, and flow variables as elements of movement organization.

331, 332, 333 Human Kineoenergetics (3,3,3) AW,WSp,SpA

BROER, MILACEK

Maturational and functional explanations of human movement potential; interaction among structural patterning, mechanisms, regulatory processes, and external physical forces; reciprocal effects of moving and potential for movement. Prerequisites, Zoology 118, 119, or 208, Biological Structure 301, Physical Education 231 (W) for 331; 331 for 332; 332 for 333.

345 Principles of Physical Education (3) A TORNEY, WILSON

Beliefs and facts that determine physical education objectives, policies, standards, and methods. Prerequisites, Zoology 118 or 208 or 358, Sociology 110, Psychology 100, junior standing.

359 Workshop in Gymnastics (3) S HUGHES

Lectures, practice, and supervised teaching in gymnastics. Prerequisite, 358 or equivalent.

438 Developmental Motor Activities for the Exceptional Child (3) Sp MILACEK

Principles of developmental motor activities and their application in the education of the exceptional child. Prerequisites, 435 or 436, Special Education (EDSPE) 404, or permission.

447 Tests and Measurements (3) W

Evaluative procedures in physical education; criteria for selection; formulation of a testing and measuring program.

450 The School Physical Education Program (Men, 3; Women, 2) Sp (Women); W (Men)

PEEK, WILSON

Problems of organization and administration. Prerequisites, for men, 345, senior standing, or permission; for women, 333, 375, and senior standing.

478 Programs in Elementary Physical Education (2½) S

HORNE

Progress and problems in modern programs. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 425.

DANCE—MEN AND WOMEN

(See also courses listed under Dance.)

278 Intermediate Folk Dance (3) Sp

Prerequisite, Physical Education 139 or permission.

282 Fundamentals of Rhythm (2) Sp

HORNE

Understanding of fundamental rhythm concepts and their application in the development of technique and style in basic dance forms. Prerequisites, Physical Education 139 and 145, or permission.

283 Contemporary Dance (2) AW

SKINNER

Understanding of fundamental rhythm concepts and their application in the development of technique and style in contemporary dance forms.

309 The School Dance Program: Secondary (2) Sp

HORNE

Practice in basic skills in folk, square, and ballroom dancing; methods and opportunity for presentation, including "calling"; source materials; organization of coeducation dance program. Prerequisite, junior standing or permission.

310 Traditional Dance Forms (2½) S

HORNE

Dance and rhythmic activities appropriate for older children; folk and ethnic dance, American traditional dances, and creative forms of dance.

311 Rhythmic Activities for Small Children (2) S

SKINNER

Activities suited to the kindergarten and primary child. Educational value, significance in child growth and development, and methods of presentation.

355 Dance Composition (2, max. 6) WSp

SKINNER

Practice in modern dance; analysis of choreography; creative work. Prerequisite, Physical Education 151 or permission.

364 History of Dance (3) Sp

Survey of the function and form of dance from primitive culture in its present art form with emphasis on Western civilization.

377 Methods in Physical Education III

(6) A

HORNE, SKINNER

Methods and materials in ballroom, folk, square, and contemporary dance. Prerequisites, Dance 282, 283, Physical Education 375, or permission.

HEALTH EDUCATION—MEN AND WOMEN

250 Contemporary Health Concepts

(2) AWSp

FEINSTEIN, MILLS

Investigation of contemporary health problems and the scientific concepts and knowledge essential to the comprehension and solution of these problems within society.

291 Personal and Community Health (3)

AWSp

PATTERSON

Advanced course designed for the professional student in health and physical education areas. Prerequisites, sophomore standing or permission.

292 First Aid (2) AWSp

HENDERSHOTT, MAC LEAN

The student may meet requirements for both Standard and Advanced American Red Cross First Aid certification.

330 Safety and Accident Prevention (2) Sp

MAC LEAN, MILLS

Pertinent problems and programs in accident prevention. Special consideration is given to home, industrial, institutional, recreational, and transportation safety. (Formerly 429.)

451 Health Education for the Classroom

Teacher (2½) S

Health instruction in elementary schools, including subject matter, source material, and methods of instruction.

453 Theory and Practice of Health Education (3) A

Application of motivation and learning concepts to health education.

454 Curriculum Development and Evaluation in Health Education (2-3) Sp

Development and evaluation of objectives in health education. Content determination and progression at all levels of instruction. Evaluation tools and their utilization in health education. Prerequisite, Health Education 453 or permission.

465 The School Environmental Health Program (3) W

MILLS, REEVES

Schoolroom construction; lighting, heating, ventilation; sanitation of spaces; selection and location of equipment; medical inspection and supervision; communicable disease; the school lunch; fatigue, rest, and play. Prerequisites, Health Education 291, Preventive Medicine 461, or equivalents. Not open to students who have credit for Preventive Medicine 422 and 424.

481 Foundations of Sex Education (2 or 3) AWSp

PATTERSON

Scientific exploration of physiological, psychological, and cultural aspects of sexual development. Expression, problems, and adjustments of youth and adults. Basic concepts underlying sex education. Offered jointly with the Department of Obstetrics and Gynecology as Obstetrics and Gynecology 481. Prerequisite, permission.

498 Special Studies in Health Education (2-6, max. 6) AWSp

MILLS, PATTERSON

Prerequisite, permission.

499 Undergraduate Research (3, max. 6)

MILLS, PATTERSON

Prerequisite, permission.

RECREATION EDUCATION—MEN AND WOMEN

254 Recreation Resources (3) AWSp

HOVIS, KUNDE

Directed observations of recreational resources, including general and community, public schools, youth-serving agencies, hospitals, and other institutional and industrial organizations.

304 Introduction to Recreation (2) A

HOVIS, KUNDE

Nature, function, and scope of organized recreation; historical background, philosophy, theories of play; leadership implications; organized play in the United States. Prerequisites, Sociology 110 and Psychology 100.

324 Recreation Program (3) W

KUNDE

Lectures, demonstrations, and reading assignments for orientation in recreation skills and techniques suitable for various age groups; classifying, adapting, and utilizing materials. Prerequisites, Recreation Education 304 and 6 credits in recreation program competencies.

334 Conduct of Recreation (2) W

KUNDE

Leadership in operation of areas and facilities. Duties and responsibilities, personnel regulations. Motivating and conducting a diversified program. Prerequisites, Recreation Education 324 and 8 credits in program competencies.

344 Organization and Administration of Camp Programs (3) Sp

KUNDE

The educational and social significance of camping; organization of activities and problems of administration. Prerequisites, men, junior standing; women, sophomore standing, Psychology 100, and Sociology 110, or permission.

354 Recreation Practicum (3) AWSp

HOVIS, KUNDE

Directed experience in recreational activities and program services for the enhancement of leadership techniques. Prerequisites, Recreation Education 304, 324, and 12 credits in recreation program competencies.

374 Social Recreation Leadership (2) W

KUNDE

Methods and materials in organizing programs for social recreation.

384 Camp Counseling (3) S

HUGHES

On-the-job experience in camp counseling. Students will be quartered at Camp Waskowitz, act in the capacity of camp counselors for select groups, and assist in the direction of evening and Sunday educational and social activities.

434 Administration of Recreation (5) Sp

KUNDE

Practices and procedures in management and operation of areas and facilities. Duties and responsibilities, personnel regulations and staff organization. Motivating and conducting a diversified program. Prerequisite, senior standing.

454 Recreation Internship (6)

AWSp (Women); ASp (Men)

HOVIS, KIDWELL, KUNDE

On-the-job experience under agency executives and their supervisors for experiences in all phases of administration and supervision. Prerequisites, men: recreation majors with 135 credits and permission; women: senior recreation leadership majors.

Courses for Graduates Only**PHYSICAL EDUCATION—MEN and WOMEN****501 Seminar in Physical Education (3, max. 9) AW (Women); A (Men)**

ABERNATHY, BROER, TORNEY, WILSON

Prerequisites, 345 and 450 or equivalents, or permission.

502 Problems in Physical Education

(2½, max. 7½) S

ABERNATHY, TORNEY, WILSON

Prerequisite, permission.

506 The Curriculum (3) A

FOX, TORNEY

Selection and organization of program content in relation to characteristics and needs of pupils and local conditions. Prerequisite, 345 or permission.

507 Supervision in Physical Education

(2½) S

PEEK

Functions, supervisory organization, evaluation, workshops, in-service education, application of democratic leadership to specific program and personnel problems. Prerequisites, 345 and 450, or permission.

547 Seminar in Research Procedures (3) A

BROER

Prerequisite, 447 or equivalent, or permission.

580 Seminar in Human Performance I

(3) W

Analysis of gross human movement considered from the physiological bases of movement. Prerequisites, 322, 331, 480, or permission.

581 Seminar in Human Performance II

(3) WS

PURDY

Analysis of gross human movement considered from the psychological bases of movement. Prerequisite, 350 or permission.

590 Research Methods in Health, Physical

Education, and Recreation (Men) (3) Guidance and methods of research. Prerequisite, 447 or equivalent.

591 Research Seminar (Men) (2, max. 6)

Development and critique for a research prospectus. Initial reporting, refinement, and endorsement of research proposal. Prerequisite, permission.

600 Independent Study or Research (2-5)

AWSpS

700 Thesis (*) AWSpS**HEALTH EDUCATION—MEN AND WOMEN****503 Seminar in Health Education**

(3, max. 9) Sp

MILLS, PATTERSON

Prerequisites, 453, 465, or permission.

508 Administrative Relationships in Health

Education (3) Sp

ABERNATHY, REEVES

Decision making, management theory, and interagency programs.

600 Independent Study or Research (*)

AWSpS

700 Thesis (*) SpS**RECREATION EDUCATION—MEN AND WOMEN****504 Public Recreation (3) Sp**

KUNDE

Legal basis and responsibilities; internal organization; financial support and budgeting. The acquisition, construction, development, maintenance, and operation of areas and facilities. Personnel selection and management. Prerequisite, graduate standing.

524 Seminar in Community Resources for Recreation (3) W

KUNDE

Functional analysis of integrated community recreation services. Experience in recreation

fact-finding, analysis, and evaluation. Study of pertinent problems and needs in the field. Prerequisite, graduate standing.

PHYSICS**Courses for Undergraduates****101-102, 103 Physics for Teachers**

(5-5,5) A,W,Sp

Basic concepts of physics, with particular emphasis on background needed for confident use of the new science-curriculum materials in the schools. Serves general education objectives by simultaneously dealing with historical, philosophical, and humanistic aspects of science. Prerequisites, 101- for -102; -102 for 103.

110, 111, 112 General Physics (3,3,4) A,W,Sp

Basic concepts of physics, their origin, and their impact on society and the Western intellectual tradition. Not open to students majoring in mathematics, the natural sciences, or engineering. Prerequisites, 110 for 111; 111 for 112.

114, 115, 116 General Physics (4,4,4)

AWSpS, AWSpS, AWSpS

Concurrent registration in 117, 118, 119 recommended and may be required by individual departments. 114: mechanics and sound. Prerequisites, some working knowledge of trigonometry, one year of high school physics or one quarter of any college-level physical science. 115: heat and electro-magnetism. Prerequisite, 114. 116: light and modern physics. Prerequisite, 115.

117, 118, 119 General Physics Laboratory

(1,1,1) AWSpS, AWSpS, AWSpS

117: mechanics and sound laboratory. Prerequisite, 114 or concurrent registration in 114. 118: heat and electromagnetism laboratory. Prerequisite, 115 or concurrent registration in 115. 119: light and modern physics laboratory. Prerequisite, 116 or concurrent registration in 116.

The courses 121, 122, 123, 131, 132, 133, 221, and 222 taken together make up the general physics sequence for science and engineering students.

121, 121H Mechanics (4) AWSpS, AWSpS

Basic principles of Newtonian and relativistic mechanics. Prerequisites, one year of high school physics or permission, concurrent or previous Mathematics 124 or 134H.

122, 122H Electromagnetism and**Oscillatory Motion (4) AWSpS, AWSpS**

Basic principles of electromagnetism, the mechanics of oscillatory motion. Prerequisites, 121 or 121H, concurrent or previous Mathematics 125 or 135H.

123, 123H Waves (4) AWSpS, AWSpS

Electromagnetic waves, optics, quantum waves, and waves in matter. Prerequisites, 122 or 122H, concurrent or previous Mathematics 126 or 136H.

131, 132, 133 General Physics**Laboratory (1,1,1) WSpS, ASpS, WAS**

Experimental topics in physics for science and engineering majors. Prerequisites, 121 for 131; 122 for 132; 123 and 132 for 133.

221 Quantum Physics (3) A

Introduction to the physics of atoms, molecules, and nuclei; elementary quantum phys-

ics. Not open to students who have completed 320. Prerequisites, 123 or 123H, concurrent or previous Mathematics 126 or 136H.

222 Statistical Physics (3) W
Heat, thermodynamics, and the statistical description of matter. Prerequisites, 221 or 320 (may be concurrent), Mathematics 126 or 136H.

223 Elementary Mathematical Physics (3) Sp
Applications of mathematics to physics, particularly as illustrated by classical mechanics. Prerequisites, 123 or 123H, and Mathematics 224.

231, 232 Electric Circuits Laboratory (3,3) W,Sp
Basic linear elements in DC, AC, and transient circuits; solid-state and vacuum-tube devices; electrical measurements. Prerequisites, 123 or 123H, Mathematics 126 or 136H for 231; 231 for 232.

320 Introduction to Modern Physics (3) AWSpS
Discoveries in modern physics particularly basic to engineering and science, including the structure of atoms, molecules, and solids, elementary particles, the interaction of radiation with matter, nuclear disintegrations and reactions. Prerequisite, 123 or 123H, or permission.

321, 322, 323 Electromagnetism (3,3,3) A,W,Sp
Charges at rest and in motion; dielectric and magnetic media; electromagnetic waves; relativity and electromagnetism; physical optics. Prerequisites, 123 or 123H, Mathematics 324 or 234H for 321; 321 for 322; 322 for 323.

324, 325 Quantum Mechanics (3,3) A,W
Introduction to non-relativistic quantum mechanics. Prerequisites, 221, Mathematics 324 or 234H for 324; 324 for 325.

327 Introduction to Nuclear Physics (3) W
A study of nuclear structure including nuclear reactions, fission, particle accelerators, and nuclear instrumentation; applications of nuclear phenomena in atomic energy and astrophysics. Not open to students who have completed 422. Prerequisite, 221 or 320, or permission.

331 Optics Laboratory (3) Sp
Optical and spectroscopic measurements. Prerequisite, concurrent or previous 323.

400 Basic and Modern Physics (11) S
A review of the fundamental and modern developments in physics with suggestions for lecture demonstration and laboratory. Primarily for Summer Institute students. Prerequisite, permission.

401, 402, 403; 401H, 402H, 403H Special Problems (*,*,*) AWSpS
Supervised individual study. Prerequisite, permission.

405 Laboratory for Physics Teachers (3) S
Laboratory work in selected topics in teaching physics, especially at the high school and lower-division college level. Prerequisite, one year of college physics.

421 Atomic and Molecular Physics (3) A
A survey of the principal phenomena of atomic and molecular physics. Prerequisites, 323 and 325, or permission.

422 Nuclear and Elementary Particle Physics (3) W
A survey of the principal phenomena of nuclear and elementary particle physics. Prerequisites, 323 and 325, or permission.

423 Solid State Physics (3) Sp
A survey of the principal phenomena of solid state physics. Prerequisites, 323 and 325, or permission.

424, 425, 426 Mathematical Physics (3,3,3) A,W,Sp
424: Advanced classical mechanics. 425, 426: Mathematical techniques of particular use in physics, including partial differential equations. Prerequisites, 323 and 325, or permission for 425; 425 for 426.

431, 432, 433 Modern Physics Laboratory (3,3,3) A,W,Sp
431, 432: Measurement in modern atomic, molecular, and solid state physics. Prerequisites, 30 credits in physics or permission. 433: Techniques in nuclear and elementary particle research. Prerequisite, 327 or 422, or permission.

440 Basic Concepts of Physical Science (3) Sp
Deals with the nature and origin of some of the basic concepts of the physical sciences. Not open to science or engineering majors. Prerequisite, junior standing.

485H, 486H, 487H Senior Honors Seminar (1,1,1) A,W,Sp
Prerequisite, permission.

Courses for Graduates Only

505, 506 Analytical Mechanics (3,3) A,W
Topics from mechanics and applied mathematics including variational principles, Lagrange's equations, Hamilton's equations, and canonical transformations.

509, 510, 511 Atomic, Molecular, and Nuclear Structure (2,2,2) A,W,Sp
Fundamental experiments and concepts of modern physics; introduction to quantum theory and application of quantum mechanics to problems in atomic, molecular and nuclear structure. This course should be particularly appropriate to graduate students in other areas of science and engineering who wish to acquire some understanding of modern physics.

513, 514, 515 Electromagnetism and Relativity (4,4,4) A,W,Sp
Properties of electric and magnetic fields in free space and material media; boundary value problems; radiation from accelerated charges and electromagnetic waves; the theory of special relativity leading to a relativistic formulation of electromagnetism and particle dynamics.

517, 518, 519 Quantum Mechanics (4,4,4) A,W,Sp
Physical and historical basis for quantum theory; solutions of the Schrödinger wave equation for discrete and continuous energy eigenvalues; representation of physical variables as operators and matrix formulation of quantum mechanics; theory of angular momentum; identical particles; elementary collision theory; various approximation methods for solution of the Schrödinger equation.

520 Seminar in Physics, History, and Society (*) Sp
Lectures and discussions on subjects of current interest in physics, but which are not

included in conventional courses. Emphasis is on relationships between physics and other disciplines and activities. Prerequisite, graduate standing or permission.

524, 525 Thermodynamics and Statistical Mechanics (3,3) A,W
Statistical mechanical basis for the fundamental thermodynamical laws and concepts; applications of thermodynamic reasoning to selected physical problems; classical statistical distribution functions; quantum statistical mechanics; introduction to equilibrium many-body problems. Prerequisite, 517 or concurrent registration in 517.

527, 528, 529 Current Problems in Physics (1,1,1) A,W,Sp
Introduction to current research topics for beginning graduate students.

530 Physics Colloquium (*) AWSp
Seminar. Prerequisite, permission.

531 Seminar in High Energy Physics (*) AWSp
Prerequisite, permission.

532 Seminar in Atomic Collisions and Spectroscopy (*) AWSp
Prerequisite, permission.

533 Journal Colloquium (*) AWSp
Seminar. Prerequisite, permission.

534 Seminar in Magnetic Resonance and Solid State Physics (*) AWSp
Prerequisite, permission.

535 Seminar in Nuclear Physics (*) AWSp
Prerequisite, permission.

536 Seminar in Low Temperature and Solid State Physics (*) AWSp
Prerequisite, permission.

537 Seminar in Theoretical Physics (*) AWSp
Prerequisite, permission.

538 Seminar in Cosmic Ray Physics (*) AWSp
Prerequisite, permission.

539 Seminar in Problems of Physics Education (*) AWSp
Prerequisite, permission.

541 Survey of Elementary Particle Physics (3)
A survey of topics in elementary particle physics. Intended for the nonspecialist having a background of quantum mechanics. Prerequisite, 519.

542 Survey of Nuclear Physics (3)
A survey of topics in nuclear physics. Intended for the nonspecialist having a background of quantum mechanics. Prerequisite, 519.

543 Atomic and Molecular Physics Survey (3)
A survey of topics in atomic and molecular physics. Intended for the nonspecialist having a background of quantum mechanics. Prerequisite, 519.

544 Solid State Physics Survey (3)
A survey of solid state physics. Intended for the nonspecialist having a background of quantum mechanics. Prerequisite, 519.

550 Theory of Spectra (3) Sp
Selected topics in atomic spectroscopy. Prerequisite, 519.

558, 559 High Energy Physics (3,3) W,Sp
Basic experimental facts and theoretical framework of elementary particle physics. Various topics of current research will be taken up in the second quarter. Prerequisite, 519.

560, 561, 562 Theoretical Nuclear Physics (3,3,3) A,W,Sp
Nuclear structure, scattering, reactions, and decays in terms of elementary properties of nucleons and current theoretical models. Prerequisite, 519.

564, 565 General Relativity (3,3) W,Sp
General covariance and tensor analysis, the relativistic theory of gravitation as given by Einstein's field equations, experimental tests and their significance, and applications of general relativity, particularly in the areas of astrophysics and cosmology. Prerequisites, 506 and 515.

566 Advanced Quantum Mechanics (4) A
Second quantization; applications to the many-body problem; Klein-Gordon equation; radiation theory; elementary meson theory. Prerequisite, 519.

567, 568, 569 Theory of Solids (3,3,3) A,W,Sp
A three-quarter course covering the fundamentals of solid state physics. Various topics in solid state physics are covered in more detail bringing knowledge up to the current literature. Prerequisite, 519.

570, 571 Quantum Field Theory (3,3) W,Sp
Emphasis will vary in different years between relativistic quantum field theory and the many-body problem. Prerequisite, 566.

574 Collision Theory (3) A
Emphasis will vary in different years among topics involving elementary particles, nuclei, and atoms and molecules.

576 Selected Topics in Experimental Physics (*) AWSp
Prerequisite, permission.

578 Selected Topics in Theoretical Physics (*) AWSp
Prerequisite, permission.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

POLISH—See Slavic Languages and Literature

POLITICAL SCIENCE

Courses for Undergraduates

These courses are primarily for sophomores, but are also open to freshmen. Either 201 or 202 is normally a prerequisite for all upper-division courses.

201 Modern Government (5) AWSp
Political life in the modern world; the ideas behind its democratic and non-democratic forms. A systematic and comparative study of political structures, institutions, behavior, and processes.

202 American Government and Politics (5) AWSp
Popular government in the United States; the theory and practice of national institutions.

203 International Relations (5) AWSp
An analysis of the world community, its politics and government.

210 Ethnic Minorities and American Politics (5) W
Roles of ethnic groups in American politics; the situation of minorities in urban society; sources of tension and frustration; historical relationship of Blacks to the political process; protest as political activity; urban services and urban politics; the effect of national politics and policies on urban minorities.

POLITICAL THEORY AND PUBLIC LAW

311 Theories of Modern Government (5) ASP PRANGER
The principal political ideas of recent times with particular reference to their significance for democracy and liberal values. An introduction intended especially for other than political science majors.

362 Introduction to Public Law (5) A
The general significance of the legal order; private rights and public duties; nature of the judicial process; sources of law.

411 The Western Tradition of Political Thought: Ancient and Medieval (5) A
Origin and evolution of major political concepts from ancient Greece to the eighteenth century which underlie much contemporary thinking. A background in history is desirable. Prerequisite, 201 or equivalent.

412 The Western Tradition of Political Thought: Modern (5) W
Continuation of 411, treating materials from the seventeenth century through the early nineteenth, Hobbes through Hegel. Prerequisite, 411 or permission.

413 Contemporary Political Thought (5) Sp PRANGER
Developments from the eighteenth century to the present, as a basis for contemporary philosophies of democracy, communism, and fascism. Prerequisite, 411 or equivalent.

414 Chinese Political Thought (5) Sp
Theories of the Oriental state as exhibited in the writings of statesmen and philosophers. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 414. (Offered alternate years; offered 1971-72.)

415 Analytical Political Theory (5) Sp CASSINELLI
Analysis of principal problems, approaches, concepts, values, and hypotheses of political science.

418 American Political Thought (5) W MINAR
Major thinkers and movements from the Colonial period to the present. (Formerly 412.)

460 Introduction to Constitutional Law (5) ASP
Growth and development of the United States Constitution as reflected in decisions of the Supreme Court; political, social, and economic effects.

461 The Courts and Civil Liberty (5) W
Cases and literature bearing on protection of constitutionally guaranteed private rights, with particular reference to period since 1937.

GOVERNMENT, POLITICS, AND ADMINISTRATION

350 Government and Interest Groups (5) Sp GOTTFRIED
Agrarian, labor, professional, business, and ethnic interest in politics; impact on representative institutions and governmental processes. Prerequisite, 202 or equivalent.

351 The American Democracy (5) ASP BONE, GOTTFRIED, PRANGER
Selected aspects and problems of contemporary American government: parties and politics; the presidency; Congress; the role of the Supreme Court; civil rights and civil liberties. Prerequisites, 202 or equivalent, or junior standing, and permission of instructor.

360 The American Constitutional System (3) A
Fundamental principles, function, evolution, and unwritten constitution; recent tendencies.

370 Government and the American Economy (5) W
Government regulation, promotion, and services affecting such principal interest groups as business, labor, agriculture, and consumers. The independent regulatory agencies, public ownership, government corporations, and the cooperative movement.

450 Political Parties and Elections (5) A BONE
Theories of American parties, campaigns and voting behavior; party leadership; political socialization and participation. Political Science 202 recommended.

451 The Legislative Process (5) W BONE
Organization and procedure of Congress; state legislative politics; lobbying; legislative roles; the theory and practice of representative government. Prerequisite, 202 or permission.

452 Political Processes and Public Opinion (5) W BEST
The foundations and environment of opinion; organization and implementation of opinion in controlling government, and public opinion as a force in the development of public policy; public relations activities of government agencies.

470 Public Bureaucracies in the Political Order (5) ASP KAGI, KROLL
An analysis of the growth, power, and roles of governmental bureaucracies in America; conflict and conformity with American political thought, other political institutions, and publics in policy making.

471 Administrative Processes (5) W KAGI
Focus upon the theories of organization and social control processes (primarily personnel and budgeting) utilized in American governmental bureaucracies; special problems of responsiveness, executive and political direction, and regional administration.

472 Introduction to Administrative Law (5) Sp KAGI
The legal context of American administration, the public function, public management, ad-

ministrative powers, the nature of judicial control.

473 Administration in Modern Democracies (5) W
KROLL

The changing formal and informal structure of administrative organization and processes in non-communist urban-industrial societies; the nature and role of bureaucracy; the effect of attitudes toward the state on administrative practices. Prerequisites, 470 and one or more of 346, 444, 445, or permission of instructor.

474 Administration in Developing Nations (5) Sp
KROLL

Administrative aspects of governmental change and modernization in developing nations; colonial influences on administration; problems of establishing new nations and adapting to change in established states; bureaucratic development and behavior; theories of development administration. Prerequisites, 470 and at least one course in the politics of developing nations, or permission of instructor.

480 Metropolitan Area Government (5) W
MINAR, WARREN

Conceptual problems in metropolitan analysis; urban governmental systems; regional political decision making structures; metropolitan, state, and federal relations; value implications of formal organization. Offered jointly with the College of Architecture and Urban Planning as Urban Planning 460.

481 Urban Government and Administration (5) A
MINAR, WARREN

Reform ideology; formal organization, external relations; structure and distribution of influence and leadership; role of bureaucracies; policy issues. (Formerly 375.)

482 State Government (5) Sp
BEST

Focus on the structures, processes, and policy outputs of state governments in the United States.

487 Intergovernmental Relations (5) W
GORE

Analysis of the content and dynamics of the relations between federal, state, and local governments, with emphasis upon patterns in these relationships which reflect program structures. Prerequisite, 202.

490 Analysis of Political Behavior (5) AW
BEST

Examination of concepts, techniques, and results of research on political behavior.

491 Political Behavior Methodology (5) W
FRANCIS

Course will emphasize numeric and symbolic approaches to the study of political phenomena. Consideration will be given to typologies, scales, measurement techniques, sampling of elites, and selected multivariate procedures and the results of their application to legislative, voting, judicial, and administrative behavior. Prerequisite, 490 or permission.

COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS

321 American Foreign Policy (5) W
TODD

Constitutional framework; major factors in formulation and execution of policy; policies as modified by recent developments; the prin-

cipal policy makers—President, Congress, political parties, pressure groups, and public opinion. Prerequisite, 202; 203 recommended.

322 Diplomatic Practices and Procedures (5) ASp
RILEY

Department of State; diplomatic and consular services; American diplomatic practice and procedure.

323 International Relations of the Western Hemisphere (5) W
MYHR

The Monroe Doctrine; Pan-Americanism; special interests in the Caribbean; hemisphere solidarity; the "Good Neighbor" policy; Latin America and World War II; Latin America and the United Nations.

324 Contemporary International Relations in Europe (5) Sp
HITCHNER

European diplomacy and international relations between the two world wars; problems of European integration; contemporary developments.

328 The United Nations and Specialized Agencies (5) A
TODD

The structure and functions of the United Nations and specialized agencies; accomplishments; proposals for strengthening; relations of regional bodies and member states.

341 Government and Politics of Canada (5) A
FLETCHER

A critical analysis of parliamentary institutions, political parties, and the federal system in Canada. Prerequisite, 201.

342 Government and Politics of Latin America (5) A
MYHR

An analysis of the political dynamics of change in Latin America comparing various national approaches to the political problems of modernization, economic development, and social change. Prerequisite, upper-division standing.

343 Government and Politics of Southeast Asia (5) A

Analysis of the organization and functioning of government and politics in the countries of Southeast Asia, with attention given to the nature of the social and economic environments which condition them. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 343. Prerequisite, 201; 203 recommended.

346 Governments of Western Europe (5) A
HITCHNER

Modern government and politics of Great Britain, France, and Germany.

347 Governments of Eastern Europe (3) W
RESHETAR

Survey of the Communist regimes of Poland, Hungary, Czechoslovakia, East Germany, and the Balkans. (Offered alternate years; offered 1970-71.)

348 The European Community (5) W
ROHN

The movement toward a political union of European states; national, international, and supranational elements in the law and politics of the community.

408 Problems of Peace and Conflict Resolution (3) W
TODD

Study of factors involved in conflict and in conflict resolution; application to international and other problems. Lectures, discussions, and readings in social psychology, political science, and economics. Offered jointly with the Department of Economics as Economics 408. Prerequisite, permission.

420 Foreign Relations of the Soviet Union (5) W
RESHETAR

Ideological, historical, and strategic components of Soviet foreign policy; Comintern, Cominform, and international Communist movement; Soviet policy in foreign trade, international law and organization, and in specific geographic areas. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 420.

425 International Law (5) A
ROHN

History and present status of international law. Feedback between law and politics in international relations. Current trends in treaties and court cases.

426 World Politics (5) A
MODELSKI

The nation-state system and its alternatives; world distributions of preferences and power; structure of international authority; historical world societies and their politics.

427 International Government and Administration (5) A
MYHR

Comparative study of regional and general governmental international organizations.

429 International Relations in the Far East (5) ASp
HELLMANN

Analysis of the relations among the nations of East and Southeast Asia in the context of the global international system. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 429.

430 Government and Politics in the Middle East and North Africa (5) W
MIKHAIL

Breakdown of traditional society and the problems of building modern political systems.

432 American Foreign Policy in the Far East (5) W
TAYLOR

Relationship to diplomacy, trade, and internal politics. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 432.

433 International Relations in Southeast Asia (5) W

Analysis of the problems affecting the relations among the countries of Southeast Asia. Prerequisites, 203, 343, or permission of instructor.

434 International Relations of South Asia (5) W
BRASS

Interrelationships of domestic, interstate, and extra-regional forces and their effects upon the resolution or expansion of interstate conflicts in South Asia.

435 Japanese Government and Politics (5) A
HELLMANN

Government and politics of Japan with emphasis on the period since 1945. Offered

jointly with the Far Eastern and Russian Institute as Far Eastern 439. (Formerly 345.)

439 Government and Politics of Sub-Saharan Africa (5) W
FLETCHER

A survey of government and politics in the countries of tropical Africa, with major emphasis on political development and national integration in former British Africa. Prerequisite, 201 or permission of instructor.

440 Government and Politics of South Asia (5)
BRASS

A comparison of problems of national integration and political development in India, Pakistan, and Ceylon.

441 Political Institutions of the Soviet Union (5) A
RESHETAR

Ideological and historical bases of Soviet politics; Leninism-Stalinism; Communist Party structure and functions; administrative agencies; the police and military; law and the judiciary; Soviet federalism and nationality policy. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 441.

442 Government and Politics of China (5) A
TOWNSEND

Introduction to post-1949 government and politics, with emphasis on problems of political change in modern China. Offered jointly with Far Eastern and Russian Institute as Far Eastern 442. Prerequisite, junior standing.

444 Systems of Modern Government (5) A
CASSINELLI

A comparative study of democratic, autocratic, and transitional types of modern government, related to their social, economic, and historical environments.

445 Comparative Political Institutions (5) W
HITCHNER

Comparative study of the nature, structure, and function of the major institutions of government, including the party, executive, legislature, and judiciary. Prerequisites, 201 and one 300-level course in comparative government, or permission.

447 Comparative Politics in Selected Systems (5) W
MYHR

Comparative study of nationally inherent and globally derived aspects of national political systems. Emphasis will be on the extranational influences on national political cultures, governmental and political organization, and political processes in two or three national political systems. Prerequisite, permission of instructor.

448 Comparative Federal Systems (5) Sp
FLETCHER

An intensive analysis of the development and operation of typical federal systems in established states, and comparisons with those recently adopted in developing areas. Attention will be devoted to legal, political, and socioeconomic problems in these federal regimes.

449 Politics of Developing Areas (5) ASp
BRASS, HELLMANN, MYHR, TOWNSEND

Comparative study of problems of national integration and political development in the new states of Asia and Africa. Prerequisite, junior standing.

GENERAL

398H Honors Seminar (5, max. 15) AWSp
Intensive and advanced studies in various aspects of political science. Open only to participants in the departmental honors program.

499 Individual Conference and Research (2-5, max. 10) AWSp

Open to qualified majors in the senior year. No more than one registration in 499 under the same instructor will be permitted. A second registration with a different instructor may be permitted only in very exceptional cases and with departmental approval. Prerequisite, permission of instructor.

Courses for Graduates Only

504 Seminar on the Modernization of Japan (5) A

HELLMANN

Historical and theoretical approach to social, political, economic, and psychological problems of modernization in Japan. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 504 and the Department of History as History of Asia (HSTAS) 526. Prerequisite, permission.

506 Contemporary Problems, Domestic and Foreign (3) S

511 Studies in Ancient and Medieval Political Theory (3, max. 6) A

Selected topics. Prerequisite, permission of instructor.

512 Studies in Modern Political Theory (3, max. 6) W

Selected topics from the sixteenth to the nineteenth centuries. Prerequisite, permission of instructor.

513 Studies in Recent and Contemporary Political Theory (3, max. 6) Sp

PRANGER

Selected topics from nineteenth and twentieth centuries. Prerequisite, permission of instructor.

514 Seminar in Problems of Political Theory (3, max. 9) Sp

CASSINELLI, GORE, MIKHAIL, PRANGER

Selected topics, historical and conceptual, national, regional, and universal. Prerequisite, permission of instructor.

515 Scope and Methods in Political Science (3) AW

GORE, PRANGER

Inquiry into the philosophic foundations of various approaches in political science and their possible contributions to an understanding of politics. Substantial background in philosophy, as well as in political science, is highly desirable.

519 Theories of Decision Making (3) Sp

FRANCIS

A survey of the several theories of collective decision making, including analysis of alternative strategies and the spectrum of decisional functions associated with each strategy.

520 Seminar on the Foreign Policy of the Soviet Union (5) Sp

RESHETAR

Selected topics in the development, methods, and objectives of the foreign policy of the Soviet Union. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 520. Prerequisite, permission.

521 Theories of International Relations (3) Sp

MODELSKI

Review of contemporary theory, research, and methodology in the study of world politics. Prerequisites, 426 and permission.

522 Seminar in World Politics and Organizations I (3) W

MODELSKI

Principles of world politics and problems of world order: war and systemic conflict. Prerequisites, 426 and permission.

523 Seminar in World Politics and Organizations II (3) Sp

MODELSKI

World organizations and interorganizational behavior: selected cases. Prerequisite, permission.

524 Seminar in World Politics and Organizations III (3) Sp

TODD

The United Nations: selected problems.

525 International Law I: Policy (3) A

ROHN

Inputs of international law into the decisional process in foreign policy. Effect of policy on law. Relevant roles of individuals and institutions in routine and crisis situations. Prerequisite, 425 or permission.

526 International Law II: Treaties (3) W

ROHN

Classical and modern views of treaties. Quantitative research in treaties as a reflection of trends in international law and politics. Global, regional, and national treaty patterns. Prerequisite, 425 or permission.

527 International Law III: Courts (3) Sp

ROHN

Past and present roles of courts and quasi-judicial agencies in the development of international law. International judicial behavior. Prerequisite, 425 or permission.

528 Seminar in National Security Policy Formation (3) A

DENNY

The principal elements of national security. Constitutional, historical, theoretical, and administrative analysis of United States foreign and defense policy formation and execution.

529 Problems of American Foreign Policy (3)

Critical analysis of the historical foundations and contemporary problems of foreign-policy making, with attention given to selected foreign-policy decisions. Prerequisite, 321 or permission of instructor.

530 Seminar in Regional Foreign Policy (3) Sp

Regionalism in the world order and economy; the "region" as a basis of foreign policy; foreign interests and policies of the major regions of the world: the U.S.S.R., Central Europe, Western Europe, the British Empire, the Middle and Near East, the Far East, and Latin America. Prerequisite, permission of instructor.

531 Problems of Southeast Asian Politics (3)

Inquiry into selected domestic and international problems. Prerequisite, permission of instructor.

532-533 Seminar on Contemporary Chinese Politics (3-3) W,Sp TOWNSEND

Advanced reading and research on the political institutions and processes of post-1949 China. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 532-533. Prerequisite, permission; reading knowledge of Chinese desirable.

538 Government and Politics in the Middle East and North Africa (3) Sp MIKHAIL

Study of political change in the area within the context of comparative politics; breakdown of traditional political systems; new range of choice expressed in competing ideologies; governmental and nongovernmental instrumentalities of change; and problems of international relations and regional conflict and integration.

539 Politics in Sub-Saharan Africa (3) Sp FLETCHER

Selected problems of government and politics in the countries of Sub-Saharan Africa. Prerequisite, 439 or permission.

540 Seminar in Modern Indian Politics (3) Sp BRASS

Research problems in contemporary Indian politics.

541 The Soviet Political System (4) A RESHETAR

Critical appraisal of the principal research methods, theories, and types of literature dealing with the government and politics of the Soviet Union. Offered jointly with the Far Eastern and Russian Institute as Far Eastern 541. Prerequisite, permission.

542 Seminar in Commonwealth Governments (3) Sp FLETCHER

Comparative analysis of the government and politics of selected Commonwealth states; the Commonwealth as an institution.

543 Seminar in British Government (3) Sp HITCHNER

Advanced studies in British parliamentary government.

544 Problems in Comparative Government (3, max. 9) W CASSINELLI, HITCHNER

Selected problems in the comparative analysis of political institutions, organizations, and systems.

545 Seminar on Japanese Government and Diplomacy (3, max. 6) W HELLMANN

Offered jointly with the Far Eastern and Russian Institute as Far Eastern 545.

546 Seminar in Problems of Soviet Politics (3) W RESHETAR

Selected problems of Soviet domestic politics. Prerequisite, 541 or permission.

547 Problems in Latin American Political Systems (3) Sp MYHR

Prerequisite, permission of instructor.

548 Comparative Political Parties (3) WSp BONE, BRASS

An examination of the role of political parties in the modern state. Similarities and differences in the origins and development of political parties and the functions they perform, both in established democracies and in the developing countries, will be discussed.

549 Problems of Political Development (3, max. 9) Sp BRASS

Comparison of aspects of political change and development in both contemporary and historical developing societies.

550-551-552 Seminar in Politics (3-3-3) A,W,Sp BONE, GOTTFRIED

Topical and regional studies of political associations in the United States; leading principles and motivations of political action and leadership; legislative processes; methodology and bibliography. All three seminars are to be taken in sequence. Prerequisites, at least three of the following courses or their equivalent: 350, 370, 450, 451, 452.

553 Public Opinion (3) W BEST

Selected problems in opinion formation, characteristics, and the role of public opinion in the policy-making process. Prerequisite, 452 or permission of instructor.

554 Legislative Politics (3, max. 6) AW BONE, FRANCIS

Selected problems in legislative processes and leadership, state, and national. Prerequisite, 451 or equivalent.

562, 563, 564 Public Law (3,3,3) A,W,Sp

Constitutional and legal concepts governing governmental authority and institutions and the conduct of governmental activities.

570, 571, 572 The Administrative Process (3,3,3) A,W,Sp KAGI, KROLL

An analysis of the administrative process relying primarily upon case materials and emphasizing policy formation, organization behavior, the nature of administrative roles, and the mechanism of responsibility. Same as Public Administration 501, 502, 503.

573, 574, 575 Public Management (3,3,3) A,W,Sp LYDEN

Expression of public policy through program activity, program planning, programming and scheduling, budgeting, staffing, fiscal and other operating controls, evaluations of effectiveness. Same as Public Administration 521, 522, 523. Prerequisite, permission.

576, 577, 578 Administrative Problems (3,3,3) A,W,Sp SHIPMAN

Methods employed in the analysis of administrative problems, programs, organization, process, procedure, and staffing; the design of organizations and operations. Same as Public Administration 511, 512, 513. Prerequisite, permission.

579 Comparative Administrative Systems (3) Sp KROLL

Methodological problems of research in comparative administration. Theoretical and substantive aspects of administrative systems in urban-industrial and developing nations. Same as Public Administration 551. Prerequisites, 470, 473, and one graduate course in public administration, or permission of instructor.

580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3) A,W,Sp

The metropolitan community; nature, characteristics, functions, governmental structure, and intergovernmental relations. Urban planning; theory, law and administration, policy determination, and public relations. Methods and devices for plan implementation. Drafting local ordinances for planning, zoning, subdivision control, and urban renewal.

584 Approaches to Subnational Government (3) A WARREN

An analysis of current approaches and concepts in the study of subnational government—urban, state, and regional public organization.

585, 586 Local, State, and Regional Politics and Administration (3,3) W,Sp MINAR, WARREN

Exploration and analysis of political and organizational behavior at the local, state, and regional levels of government, with emphasis upon methodology and field research.

590 Seminar in Political Behavior (3, max. 6) WSp BEST, GORE

Analysis of behavioral research in selected fields of political science.

600 Independent Study or Research (*)

700 Thesis (*)

702 Degree Final (3)

800 Doctoral Dissertation (*)

PORTUGUESE—See *Romance Languages and Literature*

PROVENCAL—See *Romance Languages and Literature*

PSYCHOLOGY

Courses for Undergraduates

100 General Psychology (5) AWSpS

BEACH, BOLLES, DOUGLAS, FIELDS, ROTH, WOODBURN

An introductory survey of various fields of work in scientific and professional psychology, illustrating basic principles derived from experimental studies of human and animal behavior, including applications in the measurement, prediction, and development of human capabilities. Participation as a subject in experiments is required.

190, 190H Introduction to the Scientific Analysis of Behavior (5) AWSp,AW M. SMITH, TELLER

Concepts and methods of various sub-fields of psychology, including their scope and limitations. Emphasis is on certain basic aspects of rationale and methods, with no attempt to survey all substantive findings of psychology. Prerequisite for 190H, permission of College of Arts and Sciences Honors Program Adviser.

201, 201H Laboratory in Human Performance (3) AWSp, W or Sp BEACH, MAKOUS

Lectures and laboratory on selected aspects of human learning, perception, and performance.

ance. Prerequisites, 100 or 190; for 201H, permission of College of Arts and Sciences honors program adviser. (Formerly 191, 191H.)

202, 202H Laboratory in Animal Learning (3) AWSp, W or Sp

MAKOUS, PAGANO, ROSE, ROTH

Lectures and laboratory on selected aspects of animal learning. Operant techniques with the rat are stressed. Prerequisites, 100 or 190; for 202H, permission of College of Arts and Sciences honors program adviser. (Formerly 191, 191H.)

203 Laboratory in Animal Behavior (3) Sp

ALCOCK, LOCKARD

Experience with a variety of animal species and a variety of experimental procedures and instrumentation. Prerequisite, 100 or 190.

205 Introduction to Personality and Individual Differences (4) AWSpS

BERBERICH, FENNER, R. SMITH

Introduction to basic concepts and methods within the field of personality and background for more intensive study in the field of personality. Prerequisite, 100 or 190, or permission.

210 Psychology of Human Sexual Behavior (3) Sp

WAGNER

A survey of the current literature concerning the development of human sexual behavior. Physiological and psychological components of human sexuality and its deviations will be considered.

222 Intermediate Physiological Psychology (3) SpS

ROTH, WOODBURN

An introduction to physiological principles involved in activity of sensory receptors; chemical integration, reflex activity, and organization of muscular activity of animal organisms. Prerequisite, 100 or 190.

250 Mental Health of Minority Groups (3) AWSpS

WAGNER

A survey of the problems of minority groups with particular emphasis on the conditions related to the development of mental health. Emphasis will be placed on the situation of the Negro, although American Indian, Oriental, and Spanish-American groups will be included.

260 Psychological Aspects of Poverty (3) W

BEACH

Information about the psychological effects of poverty and related social phenomena; the effects on psychological development, personality, mental health, and social behavior. Where possible, remedial steps will be discussed.

302 Statistical Methods I (3) AWSpS

BOBROW, CAMPIONE, HEATHERS, LOCKARD, ROTH

Descriptive statistics in psychology; frequency distributions and computations and interpretation of measures of the center of the distribution, measures of variability, and measures of relatedness; and elementary sampling theory. Prerequisites, 100 and Mathematics 101 or equivalents, or permission. (Formerly 301.)

303 Statistical Methods II (3) AWSpS

BOBROW, CAMPIONE, HEATHERS, LOCKARD, ROTH, URBANO

Inferential statistics: elementary sampling theory, some nonparametric statistics, includ-

ing binomial experiments and use of chi squares; errors of inference and power of a test; t test and introduction to analysis of variance. Prerequisite, 302 or permission. (Formerly 301.)

305 Deviant Personality (5) AWSpS

BERBERICH, KOHLENBERG

Introduction to the field of psychopathology; analysis of forms, nature, and causes of disorders of behavior and personality. Prerequisite, 10 credits in psychology, including 100 or 190, or permission.

306 Developmental Psychology (5) AWSpS

BEE, CAMPIONE, RABINOWITZ, ROBINSON, URBANO

An analysis of psychological development of the child in relation to biological, physical, and sociological antecedent conditions from infancy to adolescence. Occasional hours arranged for supervised observation, analysis, and interpretation of behavior in the Laboratory Preschool. Prerequisite, 100 or 190.

320 Field Analysis of the Behavior of Young Children (3) AWSp

HARRIS

Objective analysis of the behavior of young children with interpretations of data for research and guidance purposes. One hour weekly arranged for supervised observation in the Laboratory Preschool. Prerequisite, 306 or equivalent.

345 Social Psychology (5) AWSpS

CANON, MITCHELL, STOTLAND

A study of the interaction of the individual and the group with emphasis upon interpersonal processes, social motivation, attitude formation and change, leadership, and the relation between personality and social behavior. Prerequisite, 100 or 190.

350H Honors Seminar I (5) W or Sp

Intensive study of selected research problems of contemporary interest. Prerequisites, 201H and 202H or equivalent, junior standing and permission of departmental honors adviser.

355 Thinking and Problem Solving (5) W or Sp

BOBROW

Empirical and theoretical approaches to thinking, problem-solving, and concept formation. Prerequisite, 10 credits in psychology, including 100 or 190, or permission.

361 Laboratory in Social Psychology (5) W or Sp

CANON, STOTLAND

Practice and discussion of methods of systematic observation, content analysis, etc.; experimental manipulation in social psychology; individual research projects. Prerequisites, 303, 345 and major standing, or permission.

400 Learning (5) AWSpS

MC KEEVER

Experimental research and basic theories in the psychology of learning. Prerequisite, 100 or 190.

402 Theories of Learning (5)

BOLLES

A review of the major theories and an analysis of contemporary theoretical issues in learning. Prerequisite, 400.

403 Motivation (5) AW or ASp

BOLLES, LOCKARD, M. SMITH

Theory and research on reinforcement, punishment, frustration, preference, instinctual mech-

anisms, and other factors controlling the performance of organisms. Prerequisite, 100 or 190.

405 Advanced Personality: Theory and Research (5) WSp

CARR, DOERR

A more intensive survey of theoretical concepts in the field of personality and a more detailed review of experimental methods and experiments in the field of personality. Prerequisite, 205 or permission.

406 Instrumentation for Behavioral Scientists (5) AW

PAGANO

Training in electricity and electronics to enable understanding, selection, and use of basic general-purpose psychological research apparatus. Topics include direct- and alternating-current circuits, measuring instruments, direct-current power supplies, amplifiers, relays, transducers, and bioelectrical recording. Emphasis is on first-hand experience with research-caliber equipment. Registration limited to 15. Prerequisites, junior or senior major standing and permission.

407 History of Psychology (5) W

BOLLES

Historical and theoretical background of the basic assumptions of modern psychology. Such doctrines as behaviorism, determination, and associationism are considered as well as the men who developed them. Prerequisite, 400 or permission.

410 Deviant Development (5) W

STROTHER

Introduction to developmental deviations, including sensory-motor handicaps, mental retardation, brain injury and emotional disturbances. Particularly for students interested in advanced work in clinical psychology or special education. Prerequisites, 305 and 306, or permission.

411 Experimental Child Psychology (4) A or W

RABINOWITZ

Logical problems or methodological issues in child psychology; discussion of recent theoretical developments in children's learning; student-led discussion of recent literature. Prerequisites, 201 and upper-division major standing, or permission. Concurrent registration in 413 (laboratory) is strongly recommended.

412 Learning and Motivation in Children (5) A

CAMPIONE

Experimental literature dealing with learning and motivation in children, particularly topics such as discrimination learning, generalization and transposition, operant conditioning, and reinforcement factors in learning. Comparisons between normal and deviant development will be included where appropriate and possible. Prerequisite, 306.

413 Laboratory in Experimental Child Psychology (1) A or W

RABINOWITZ

Laboratory experiments with preschool children. Limited to 12 students per quarter. Prerequisites, concurrent registration in 411 and permission of instructor.

414 Cognitive Development (5) W or Sp

BEE, DALE

Exploration of the various aspects of cognitive development, with particular attention

to the following areas: concept formation, intelligence and its measurement, creativity, cognitive styles, and language development. There also will be emphasis on alternative theoretical approaches to the general questions of cognitive development. Prerequisite, 306.

416 Animal Behavior (5) WSp ALCOCK, LOCKARD

Analysis of laboratory experiments, field investigations, and current theory of the behavior of animals from protozoa to man, including theoretical accounts of selected problems. Prerequisite, 400. (Formerly 316.)

417 Ethology and Human Behavior (3) W ALCOCK

A seminar for undergraduates with primary emphasis on a critical reading of recent literature which has claimed that ethology is relevant for an understanding of human behavior. Prerequisite, 200 or permission of instructor.

421 Neural Basis of Behavior (5) ASpS DOUGLAS, WOODBURN

Anatomical and physiological principles involved in the integrative action of the nervous system and the results in behavior of this neural activity. Prerequisites, 100 or 190 and 10 credits in biology or zoology.

422 Physiological Psychology (5) W or Sp DOUGLAS

Physiological mechanisms in behavior, including those basic to emotion, fatigue and sleep, learning and memory. Prerequisite, 421 or permission.

423 Sensory Basis of Behavior (5) Sp HORTON

Sensory and perceptual phenomena; sensory equipment; theories of sense-organ function. Prerequisites, 421 or equivalent, or permission.

425 Surgical and Histological Techniques (5) W WOODBURN

Practicum in important surgical and histological techniques used in psychophysiological experimentation. Prerequisites, 421 and permission.

427 Conditioning and Learning (5)

A survey of the current literature concerning the experimental and theoretical aspects of classical conditioning and instrumental learning in humans and animals. Prerequisite, 15 credits in psychology.

428 Survey of Psychoacoustics (3) Sp EGAN

Study of the auditory stimulus, the hearing mechanism, and man's abilities to discriminate simple and complex sounds. Topics included are speech perception, hearing tests, and the effects of noise upon efficiency, speech communication, and the hearing mechanism. Prerequisite, 303 or equivalent. (Not offered 1970-71.)

430 Problems of Assessment in Psychology (5) W C. LUNNEBORG

The appraisal of human differences and the use of such appraisals in evaluation, selection, and classification. Emphasis will be on the utilization of psychological tests and related measures. Prerequisite, 303 or permission.

435 Applied Experimental Psychology (3) CULBERT

A survey of experimental studies on the relation of human abilities and limitations to problems of design and operation of industrial machines, display systems, and special devices. Prerequisite, 100 or 190, or permission. (Not offered 1970-71.)

441 Perception (5) ASp CULBERT

A consideration of the ways in which experience is organized. Perceptual aspects of the various sensory modalities, relations between physical and psychological dimensions, non-stimulus determiners of the perceived world, and mediational feedback are among the central topics treated experimentally and theoretically. Prerequisite, 15 credits in psychology.

443 Social Psychology of Prejudice (3) Sp CANON

Examination of social psychological theory and research regarding the development, maintenance, and dissolution of prejudicial attitudes, with particular emphasis on anti-Black sentiment. Prerequisite, 345.

444 Social Influence and Attitude Change (3) W CANON

Discussion of research on the nature and effects of social influence, with special emphasis on attitude formation and change, conformity, behavior, "brainwashing", prejudice, and propaganda. Prerequisite, 345.

445 Theories of Social Psychology (5) W STOTLAND

Individual determinants of social behavior, processes, and outcomes of social interaction, their effects on the individual and groups. Prerequisites, 345 and senior or graduate major standing, or permission.

446 Objective Assessment of Personality (3) Sp EDWARDS

Methods and techniques of observing and measuring personality variables. Problems of research design in personality and social psychology. Prerequisites, 205 and 302, or permission. (Extra credit may be earned for research activity by registering concurrently in 499 with the permission of the instructor.)

447 Psychology of Language (5) W CULBERT

Psychological principles applied to linguistic development and organization; language in both its stimulus and response aspects. Prerequisite, 15 credits in psychology.

448 Seminar in Psychology (5)

Study of selected research topics of contemporary interest. Prerequisites, major standing and permission.

450H Honors Seminar II (5) A

Intensive study of selected research problems of contemporary interest. Prerequisites, 350H and permission of departmental honors adviser.

451H-452H Honors Thesis (3-3) AWSpS, AWSpS

An original contribution to psychology of a theoretical or experimental nature. Prerequisites, 450H, senior standing, and permission of departmental honors adviser.

457 Language Development (3) W DALE

The study of first-language acquisition and use by children. Emphasis will be placed on theoretical issues and research techniques. Offered jointly with the Department of Linguistics as Linguistics 447. Prerequisites, senior or graduate major standing, or permission.

461, 462 Verbal Learning (3,3) AW or WSp MC KEEVER

Selected experimental problems and theoretical interpretations relevant to verbal behavior and learning. Discussion in the first quarter will emphasize acquisition and transfer (461) and in the second quarter retention and forgetting (462). Prerequisite, 100 or 190. Students may register for either course without the other as prerequisite. (Formerly, 401.) Offered 1970-71.

475 Computing in Behavioral Sciences (5) HUNT

The application of computers to research problems in the behavioral and social sciences; functional and performance characteristics of batch processing, interactive and control computing systems; computing languages; computer methods of data processing, control of experiments, and automated instruction. Prerequisites, upper-division or graduate standing in behavioral or social sciences, some knowledge of statistics and computer programming, or permission of instructor.

497 Undergraduate Field Work (1-3, max. 6) AWSpS

P. LUNNEBORG
Individual consultation with faculty member and supervised practicum experience in a broad range of community settings and agencies dealing with psychological problems. Prerequisites, junior or senior major standing and permission of supervising instructor.

498 Readings in Psychology (1-3, max. 9) AWSpS

Reading in special interest areas under supervision of staff members. Discussion of reading in conference with instructor. The name of the staff member with whom research will be done should be indicated in registration. Prerequisite, permission of supervising instructor.

499 Undergraduate Research (1-3, max. 9) AWSpS

The name of the staff member with whom research will be done should be indicated in registration. Prerequisite, permission of supervising instructor.

Courses for Graduates Only

SEMINARS AND SPECIAL TOPICS

The content of each graduate seminar (numbered 540 through 560) offered by the Department changes from quarter to quarter. A list of offerings is published each quarter and can be obtained from the Department of Psychology. Students registering for independent study or research courses must receive permission of the instructor.

500 Learning and Motivation (3) Sp BOLLES

A general survey of animal learning and motivation; emphasis on recent problems, findings and theoretical developments; topics may include avoidance learning, cyclic behavior, defensive behavior, food preferences, incentive motivation, noncontingent reinforcement.

ment, and territoriality. Prerequisite, graduate major standing.

503 Advanced Social Psychology (3) A
STOTLAND

Problems in person perception; attitude; socialization; and group processes. Prerequisite, graduate major standing.

504 Theories and Issues in Developmental Psychology (5) A
BEE

An examination of major theoretical approaches to the study of human development, with presentation of representative empirical literature for each theory. Selected research areas will also be discussed, including such topics as language, intelligence, and parent-child interaction. Prerequisite, graduate major standing.

505 Advanced Learning and Motivation in Children (5) W
CAMPIONE

Developmental considerations of theories of motivation and relevant experimental child literature with consideration of both extrinsic (e.g., reward, delay of reward, punishment) and intrinsic (e.g., novelty, complexity, etc.) factors. Prerequisite, graduate major standing. (Formerly 513.)

506 Personality and Social Development (5) Sp
BEE, ROBINSON

A survey of the theories and empirical literature in the area of personality and social development of children. Prerequisite, first-year graduate standing.

509 Leadership (3) W
FIEDLER

A critical review of leadership literature and research with emphasis on empirical studies on leadership selection, training, and prediction of *group and organizational effectiveness*. Prerequisites, 345 and 514 or equivalents, or permission.

510 Consistency Theories in Social Psychology (3) W
CANON

Theoretical and empirical work that focuses on the ramifications of a need or pressure for cognitive consistency; dissonance, balance, and congruity theories will be critically evaluated on the basis of current research. Prerequisites, 503 and graduate major standing.

511 Experimental Approaches to Personality (3) W
SARASON

A survey of current methodology and experimental research in the area of personality. Topics include the relationships of anxiety, hostility, need achievement, and personal styles to behavior. Prerequisite, graduate major standing or permission.

514-515 Experimental Design (3-3) A,W
EDWARDS

The design of experiments and the analysis of experimental data in the behavioral sciences. Required of all first-year graduate majors. Must be taken in sequence. Prerequisites, 302 and Mathematics 105, or permission.

516 Psychometric Techniques (3)
C. LUNNEBORG

Topics in regression analysis, measurement reliability and validity, and the development of models for prediction, selection, and classification.

517 Mathematical Psychology (3)

ROSE

Application of mathematics (drawn from calculus, set theory, finite mathematics, and probability) in the areas of psychophysics, learning, motivation, and social processes. Should be taken subsequent to 515. Prerequisite, 515 or equivalent. (Not offered 1970-71.)

518 Mathematical Models of Learning (3)

ROSE

Application of mathematical models in basic learning situations, such as partial reinforcement and discrimination-learning experiments, probability learning, and paired-associate learning. Open to undergraduates with permission of instructor. Prerequisites, 517 or Mathematics 391, or permission of instructor.

519 Statistical Methods for Developmental Psychology (3) Sp

URBANO

Presentation of those aspects of statistics and experimental design which are unique to or heavily used in research in developmental psychology. Prerequisites, graduate standing and 515.

524 Psychophysiology of Vision (5) W

MAKOUS

The current status of knowledge concerning the physiological mechanisms that serve vision: The nature of light; the effects of ocular media on the physical stimulus; early and late receptor potentials in relation to the photochemical changes wrought by light absorption electrical signals arising in the various retinal structures; properties of neurons in the retina, lateral geniculate, and cortex, and the relation of these to the phenomenon of vision. Data gathered by techniques varying from intracellular microelectrodes and microphotodensitometry to psychophysics, is drawn from species varying from single-celled organisms to man. Prerequisite, permission of instructor.

525 Psychodiagnostic Testing (3) Sp

NYMAN

Training in administration, scoring, and interpretation of individual intelligence tests, projective tests, and other major clinical techniques. Required of all first-year graduate majors in clinical psychology. Prerequisite, graduate major standing.

526 Psychophysics of Audition I (3) A

EGAN

Psychophysical analysis of the auditory system, including the study of absolute sensitivity, monaural and binaural masking, localization of sounds in space, adaptation, fatigue, and aural distortion. Emphasis is placed upon the theoretical interpretation of experimental results. Prerequisites, graduate standing and permission of instructor. (Not offered 1970-71.)

528 Decision Processes (5) Sp

BEACH

Literature on predecisional diagnosis of environmental states relevant to subsequent decisions, various models for decisions, and relevant evidence for decisions. Prerequisite, 303 or equivalent; undergraduates may register for this course by permission of instructor only. (Formerly 463.)

532 Factor Analysis and Multivariate Measurement (5)

C. LUNNEBORG

Special quantitative techniques, including matrix algebra, used in multivariate psychological

research. Theoretical foundations of factor analysis. Computational procedures and application of fact or analytic models to psychology. Emphasis will be on the development and use of appropriate computer techniques. Prerequisite, 303 or permission. (Not offered 1970-71.)

533 Test Construction (5) W or Sp

Correlation analysis; statistical bases of test construction and of the use of test batteries; practice in test construction. Prerequisite, 532 or permission. (Not offered 1970-71.)

540 Seminar in Clinical Psychology (2)

BECKER, BERBERCH, BROEDEL, KOHLENBERG, SARASON, STROTHER, WAGNER

May be repeated for credit. Prerequisite, permission.

541 Seminar in Cognitive Processes (2)

BOBROW

May be repeated for credit. Prerequisite, permission.

542 Seminar in Animal Behavior (2)

ALCOCK, BOLLES, LOCKARD

May be repeated for credit. Prerequisite, permission.

543 Seminar in Developmental Psychology (2)

BEE, CAMPIONE, DALE, RABINOWITZ, ROBINSON, URBANO

May be repeated for credit. Prerequisite, permission.

544 Seminar in Experimental Psychology (2)

M. SMITH

May be repeated for credit. Prerequisite, permission.

545 Seminar in Human Learning (2)

LUMSDAINE, MC KEEVER

May be repeated for credit. Prerequisite, permission.

546 Seminar in Learning (2)

LOCKARD, MC KEEVER, RABINOWITZ, ROSE, SMITH

May be repeated for credit. Prerequisite, permission.

547 Seminar in Motivation (2)

BOLLES, LOCKARD, M. SMITH

May be repeated for credit. Prerequisite, permission.

548 Seminar in Perceptual Processes (2)

CULBERT

May be repeated for credit. Prerequisites, 441 and permission.

549 Seminar in Physiological Psychology (2)

DOUGLAS, HUNT, PAGANO, ROTH, WOODBURN

May be repeated for credit. Prerequisite, permission.

550 Seminar in Psycholinguistics (2)

CULBERT, DALE

May be repeated for credit. Prerequisites, 447 and permission.

551 Seminar in Psychophysics (2)

TELLER

May be repeated for credit. Prerequisite, permission.

552 Seminar in Quantitative Techniques (2)

EDWARDS, C. LUNNEBORG, ROSE

May be repeated for credit. Prerequisite, permission.

- 553 Seminar in Social Psychology (2)**
CANON, FIEDLER, STOTLAND
May be repeated for credit. Prerequisite, permission.
- 554 Seminar in Decision Processes (2)**
BEACH
May be repeated for credit. Prerequisite, permission.
- 555 Seminar in Programmed Learning (2)**
LUMSDAINE
May be repeated for credit. Prerequisite, permission.
- 560 Seminar (*)**
May be repeated for credit. Prerequisite, permission.
- 561 Advanced Cognitive Development (3) W**
BEE, DALE
Survey and discussion of the literature in the area of cognitive development in children, including language, attention, problem solving, and concept formation. Prerequisite, graduate standing.
- 562 Discrimination Learning in Children (3) A**
CAMPIONE, RABINOWITZ
Theories of discrimination learning and some of the relevant literature with special consideration to areas which are relevant to developmental changes in learning, i.e., transfer of training, transposition, acquired distinctiveness of cues. Prerequisite, graduate major standing. (Formerly 512.)
- 585 Experimental Problems in Clinical Psychology (5)**
SARASON
Analysis of research and theories of concepts and processes of deviant behavior. Prerequisite, permission.
- 586 Psychological Approaches to Rehabilitation (3) W or Sp**
SARASON
Survey of psychological approaches to the rehabilitation of persons with a variety of types of disabilities. Emphasis is placed on reactions to physical disability, the concept of work, the assessment of disabled persons, and the interaction between physical and mental disabilities. Prerequisite, graduate major standing.
- 591 Introduction to Clinical Psychology (3) A**
WAGNER
Introduction to clinical psychological problems, methods, and techniques. Required of all first-year graduate majors in the clinical psychology training program. Prerequisite, graduate major standing.
- 592, 593 Clinical Methods (6,6) AWSpS**
NYMAN, WAGNER
Advanced training in the application of clinical psychological testing and interviewing. Prerequisites, 591 and graduate major standing. Required of all second-year graduate majors in the clinical psychology training program.
- 594 Advanced Personality Theory (3) A**
KOHLENBERG, R. SMITH
Theoretical problems in the study of personality development relating to the psychodynamics of personality organization. Required of all graduate majors in the clinical psychology training program. Prerequisite, 405 or permission.

- 595 Psychopathology (3) A or W**
BERBERICH
Major historical and contemporary theories of psychopathology and research in the main categories of the behavior disorders. Required of all graduate majors in the clinical psychology training program. Prerequisites, 594 and permission.
- 596 Theories and Systems of Psychotherapy (3) A or W**
BROEDEL
A review of some of the principal theories and systems. Prerequisites, 595 and permission. Required of all graduate majors in the clinical psychology training program.
- 597 Field Work (3-5, max. 36) AWSpS**
BECKER, BERBERICH, BROEDEL, NYMAN, SARASON, R. SMITH, STROTHER, WAGNER
Prerequisites, second-year graduate major standing and permission.
- 599 Readings in Psychology (*) AWSpS**
Selected topics. The name of the staff member with whom readings will be done should be indicated in registration. Prerequisite, permission of instructor.
- 600 Independent Study or Research (*) AWSpS**
- 700 Thesis (*) AWSpS**
- 800 Doctoral Dissertation (*)**

RADIOLOGICAL SCIENCES—See Interdisciplinary Graduate Degree Programs

RADIO-TELEVISION—See Communications

RECREATION EDUCATION—See Physical and Health Education

ROMANIAN—See Slavic/Romance Languages and Literature

ROMANCE LANGUAGES AND LITERATURE

Courses in English translation appear at the end of the departmental listing.

ROMANCE LINGUISTICS AND LITERATURE, GENERAL AND COMPARATIVE

Courses for Undergraduates

- 401 Introduction to Romance Linguistics (3) AWSpS**
CONTRERAS, HANZELI, KLAUSENBURGER, ROLFE, SAPORTA
Descriptive analysis of the phonological, morphological, and syntactical structures of the modern Romance languages. Prerequisites, the equivalent of two college years of a Romance language, French or Spanish 409, or permission.
- 402 Introduction to Romance Linguistics (3) Sp**
CONTRERAS, HANZELI, KLAUSENBURGER, ROLFE
Comparative historical survey of the development of the principal Romance tongues. Prerequisite, Romance 401.
- 475 The Teaching of Foreign Literature (3, max. 6)**
KELLER
The methodology of teaching a foreign literature, with demonstrations by the instructor

and practice by students; preparation of lectures; study of discussion techniques. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 435. Prerequisites, senior standing and permission. (Formerly 475DJ, 475EJ.)

Courses for Graduates Only

- 505, 506 Advanced Romance Linguistics (3,3)**
Advanced problems in the phonological, morphological, and syntactical analysis of the Romance languages. Descriptive, comparative, and historical considerations. Prerequisites, French 401, 402, or Spanish 400, or French or Spanish 541, 542.
- 521, 522 Seminar in Romance Linguistics (3,3)**
Specific problems in linguistic analysis of the Romance languages. Prerequisites, 401, 402.
- 531 Problems in Romance Linguistics (2-5, max. 10)**
Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.
- 549 Medieval Romance Paleography (3)**
FIELD, FRIEDMAN
Prerequisite, 402, French 404, or permission.
- 572, 573 Romance Language Teachers' Seminar (3,3) S**
The teaching of foreign languages. Conducted as a workshop. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 530 and 531.
- 581, 582 Methodology and Bibliography of Research (3,3) A,W**
W. LEINER
Bibliographical resources for Romance literatures; recurrent types of research problems and the accumulating methodology; standards of evidence; the evaluation and organization of evidence; the philosophies of literary history and its relation to bibliography and criticism.
- 584, 585, 586 Seminar in Romance Culture (3,3,3)**
NOSTRAND
Individual and collective research in the evolution of concepts common to Romance literatures and cultures. Open to graduates of this and other departments.
- 590 Special Seminar and Conference (3-9, max. 18)**
Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.
- 599 Graduate Readings (*)**
Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.
- 600 Independent Study or Research (*)**
- 700 Thesis (*) AWSpS**
- 702 Degree Final (3) AWSpS**
- 800 Doctoral Dissertation (*)**
- CATALAN**
- 535 Catalan Language and Literature (3, max. 9)**
ALGEO, FIELD

FRENCH**101-102, 103 Elementary (5-5,5)****W,AWSp,AWSp**

Methods and objectives are primarily oral-aural. Oral practice in the Language Laboratory is required. No credit is granted for 101-until -102 (or a more advanced course, as approved by the Department) has been completed satisfactorily. Prerequisite for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

111-112, 113 Elementary (5-5, 5)

Administered by the Division of Correspondence Study. Basic study of French grammar and idiomatic usage of the language. No credit is given for 111- until -112 has been completed. The three courses correspond to 101-102, 103, but students who wish to transfer to day school courses must satisfactorily complete placement examinations, including an oral proficiency test. All assignments are written, but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Correspondence Study, is highly recommended.

201, 202 Intermediate (5,5) AWSp,AWSp

Intensive practice in reading and writing. Systematic review of French grammar. Oral practice through imitation of assigned dialogues and free oral composition. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test.

221 French Expository Prose (5) AWSp

Readings in and discussion of classical and modern French texts, primarily in the sciences and social sciences: Montesquieu, Comte, Seignobos, Bernard, and others. Recommended for students planning to pursue scientific disciplines. Satisfies the foreign language proficiency requirement for the College of Arts and Sciences. Cannot be used by majors as a prerequisite to French 304, 305, 306. Prerequisite, 202 or college equivalent, or placement test.

222 Introduction to French Literature (5) AWSp

Transition between reading for content on the intermediate level and the critical reading ability required for more advanced courses in French literature. Introduction to problems of style, genre, and aesthetics. Prerequisite, 202 or college equivalent, or placement test.

230 Conversational French (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 103 or equivalent, and permission.

237 Conversational French (2-8, max. 8)

For participants in the Study Abroad Program. Prerequisites, 103 or college equivalent, and permission.

297 French Civilization (3 or 6) S

For participants in the Study Abroad program. Readings on aspects of French literary tradition; discussion of social and cultural values as reflected in French literature. Field trips to sites of literary, historical, and artistic interest. Substantial paper (written in English), and higher degree of participation, required for 6 credits. Course conducted in English. Prerequisites, two years of college French, and permission.

301, 302, 303 Advanced French (5,5,5)

Prerequisites, 222 or college equivalent, or placement test for 301; 301 for 302; 302 for 303.

304 Survey of French Literature: 1100-1635 (3) A

Middle Ages through the Renaissance. Prerequisite, 222 or college equivalent, or placement test.

305 Survey of French Literature: 1635-1800 (3) W

Classical period, age of enlightenment, and pre-romanticism. Prerequisite, 222 or college equivalent, or placement test.

306 Survey of French Literature: 1800-1960 (3) Sp

Romanticism, realism, naturalism, symbolism, and twentieth-century literature. Prerequisite, 222 or college equivalent, or placement test.

307 Composition (3) S

For participants in the Study Abroad Program. Compositions on topical subjects of intermediate difficulty relating to the civilization of the French-speaking countries of Europe. Grammar review, as needed. Prerequisites, 222 or college equivalent, and permission.

308 Seventeenth-Century French Literature (3)

W. LEINER, WORTLEY

Readings in seventeenth-century drama, novel, and essay. Lectures and discussions on Baroque, classicism, and the history of genres. Prerequisite, 222 or college equivalent, or placement test.

309 Eighteenth-Century French Literature (3) W

ELLRICH, HANZELI

Readings in eighteenth-century drama, novel, and essay. Lectures and discussions on Enlightenment, Rococo, and the history of genres.

310 Nineteenth-Century French Literature (3)

DALE, W. LEINER, WILSON

Major French literary figures and works of the nineteenth century. Prerequisite, 222 or college equivalent, or placement test.

311 Twentieth-Century French Literature (3)

JONES, KERN, VERNIER

Lectures and historical commentary. Readings and discussions in French of representative works of the twentieth century. Prerequisite, 222 or college equivalent, or placement test.

314 Survey of French Literature: Honors Discussion (1) A

Concurrent registration in 314 is required of "College Honors" and "With Distinction" students enrolled in 304. Prerequisite, permission of Honors Adviser.

315 Survey of French Literature: Honors Discussion (1) W

Concurrent registration in 315 is required of "College Honors" and "With Distinction" students enrolled in 305. Prerequisite, permission of Honors Adviser.

316 Survey of French Literature: Honors Discussion (1) Sp

Concurrent registration in 316 is required of "College Honors" and "With Distinction" students enrolled in 306. Prerequisite, permission of Honors Adviser.

327 Advanced Conversation (2, max. 8)**AWSp**

Prerequisite, 222 or college equivalent, or placement test.

330 Conversational French (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 222 or college equivalent, and permission.

337 Conversational French (2-8, max. 8) Sp or S

For participants in the Study Abroad Program. Prerequisites, 222 or college equivalent, and permission.

350 Drama (3)

Generic study of French drama. Prerequisite, 222, or college equivalent, or placement test.

351 Poetry (3)

Generic study of French poetry. Prerequisite, 222, or college equivalent, or placement test.

352 Fiction (3)

Generic study of French fiction. Prerequisite, 222, or college equivalent, or placement test.

390 Supervised Study (2-5, max. 20) AWSp

Prerequisite, permission of the instructor and the Undergraduate French Adviser.

397 French Civilization (3 or 6) S

For participants in the Study Abroad Program. Readings on aspects of French literary tradition; discussion of social and cultural values as reflected in French literature. Field trips to sites of literary, historical, and artistic interest. Taught in French. Substantial paper (written in French), and higher degree of participation, required for 6 credits. Prerequisites, two years of college French, and permission.

400 The Phonological Structure of French (3)

HANZELI

A linguistic study of the French sound system. Prerequisite, Romance 401 or Linguistics 400.

401 The Morphological Structure of French (3)

HANZELI

A linguistic study of French morphology. Prerequisite, Romance 401 or Linguistics 400.

402 The Syntactic Structure of French (3)

HANZELI

A linguistic study of French syntax. Prerequisite, Romance 401 or Linguistics 400.

404 Old French (3)

FIELD

Designed for acquisition of reading facility in Old French through intensive study of selected texts. Prerequisite, Romance 401.

407 Advanced Composition (3) S

For participants in the Study Abroad Program. Compositions on topics of considerable complexity and difficulty relating to French civilization. Emphasis on matters of style rather than on grammar. Prerequisites, 301 or 304 or college equivalent, and permission.

408 Explication de Texte (3)

Close study of short pieces of French prose and poetry. The method consists of a literary analysis of the text from the different viewpoints: biographical, historical, etc. Lectures, discussion, and student *explications*.

409 Advanced Phonetics (3) AWSp

CREORE

Training in diction and oral expression; interpretation of literary texts; phonetics as a teaching device. Prerequisite, 301 or equivalent.

420 Fiction: 1600-1680 (3)

W. LEINER

Prerequisites, 304, 305, 306.

421 Fiction: 1680-1800 (3)

ELLRICH

Prerequisites, 304, 305, 306.

424 Fiction: 1800-1850 (3)

DALE

Prerequisites, 304, 305, 306.

425 Fiction: 1850-1900 (3)

DALE

Prerequisites, 304, 305, 306.

426 Fiction: 1900-1950 (3)

JONES, KERN

Prerequisites, 304, 305, 306.

427 Fiction Since 1950 (3)

JONES, KERN

Prerequisites, 304, 305, 306.

430 Advanced Conversational French (2½ or 4, max. 8) S

Continuation of 330. Advanced conversational problems. For participants in the Living Language Group Program only. Prerequisites, 330 or equivalent, and permission.

437 Advanced Conversational French (2-8, max. 8)

For participants in the Study Abroad Program. Prerequisites, 327 or equivalent, and permission.

441 Poetry: Renaissance (3)

CREORE, KELLER, O'CONNELL

Prerequisites, 304, 305, 306. (Formerly 436.)

442 Poetry: Baroque (3)

W. LEINER

Prerequisites, 304, 305, 306. (Formerly 431.)

444 Poetry: Romantic (3)

DAVID

Prerequisites, 304, 305, 306. (Formerly 432.)

445 Poetry: Parnassian and Symbolist (3)

VERNIER

Prerequisites, 304, 305, 306. (Formerly 433.)

446 Poetry: Twentieth Century (3)

VERNIER, C. WILSON

453 Sixteenth-Century Literary Prose (3)

O'CONNELL

Prerequisite, 304.

454 Nonfiction of the Classic Period (3)

KELLER, WORTLEY

Prerequisites, 304, 305, 306.

455 Eighteenth-Century Nonfiction (3)

ELLRICH

Prerequisites, 304, 305, 306.

456 Nineteenth-Century Nonfiction (3)

VERNIER, C. WILSON

Prerequisites, 304, 305, 306. (Formerly 434.)

457 Twentieth-Century Nonfiction (3)

DAVID, KERN

Prerequisites, 304, 305, 306.

460 Sixteenth-Century Drama (3)

O'CONNELL

Prerequisite, 304.

461 Seventeenth-Century Drama (3)

WORTLEY

Prerequisites, 304, 305, 306.

462 Eighteenth-Century Drama (3)

ELLRICH

Prerequisites, 304, 305, 306.

463 Romantic Drama (3)

DALE

Prerequisites, 304, 305, 306.

464 Realist and Naturalist Drama (3)

Prerequisites, 304, 305, 306.

465 Twentieth-Century Drama (3)

KERN, W. LEINER

Prerequisites, 304, 305, 306. (Formerly 464.)

470 Cinema (3)

DALE

Major films and figures of French cinema from the beginnings to the present. Prerequisites, 304, 305, 306.

474 Linguistics and the Teaching of French (3)

ROLFE

An examination of areas of linguistics which can be particularly helpful to the French teacher. Prerequisite, 401 or permission.

480 Social and Cultural Background (3)

H. NOSTRAND

Common values, presuppositions, social behavior patterns and institutions of the culture area, as differentiated by social classes, regions, age groups, and time change over the past twenty years. Conducted in English, depending on the major. For French majors, some reading in French, with papers written in French. Prerequisite, 222.

485 The French Enlightenment (6)

ELLRICH

French thought and literature of the eighteenth century. Students may not receive credit both for this course and for French 421 or 455. Prerequisite, 305 or permission.

490H Honors Seminar (5, max. 10) AWSp

491H The French Moralists: Montaigne to Chamfort (3)

CHRISTOFIDES, ELLRICH

Selected readings, covering the development of French culture from the late Renaissance to the early Romantic period. Meetings will consist of lecture and discussion. Each student will present an oral *explication de texte*. A paper will be required and there will be a final exam.

497 French Civilization (3 or 6) S

For participants in the Study Abroad Program. Readings on aspects of French literary tradition; discussion of social and cultural values as reflected in French literature. Field trips to sites of literary, historical, and artistic interest. Taught in French. Substantial paper (written in French), and higher degree of participation, required for 6 credits. Prerequisites, 304, 305, 306, or college equivalent, and permission.

Courses for Graduates Only

105 Elementary (5) AW

A course to prepare graduate students to pass the reading examination required for advanced degrees. Credit will be granted only to students who have received no previous credit in French. Students receiving credit in 105 may

not later register for credit in 101-. Credits earned in 105 may not be applied toward an advanced degree. Prerequisite, graduate standing or permission of the Department.

106 Elementary (5) WSp

Continuation of 105. Students who have received credit for -102 and/or 103 may also receive credit for 106. Credits earned in 106 may not be applied toward an advanced degree. Prerequisite, 105 or permission of the Department.

513 Chanson de Geste (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

514 Le Roman: Twelfth and Thirteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

520 Renaissance Prose: Rabelais (3)

KELLER

522 Studies in Fiction: Seventeenth Century (3-5)

LEINER

523 Studies in Fiction: 1660-1800 (3)

ELLRICH

524 Studies in Fiction: 1800-1850 (3)

DALE

525 Studies in Fiction: 1850-1900 (3)

DALE

526 Studies in Fiction: 1900-1950 (3)

JONES, KERN

527 Verse Narrative: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

528 Prose Narrative: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

529 Romance Lyric Poetry (3, max. 9)

An examination of the genres common to poets writing in French, Provençal, Spanish, Catalan, Portuguese, Italian, and English in the twelfth and thirteenth centuries; the evolution of poetic societies; medieval poetic theory in practice and as outlined in medieval poetics; e.g., Dante, *De Vulgari Eloquentia*; the *Leys d'Amors*.

530 Studies in Renaissance Poetry (3)

CREORE, KELLER

531 Renaissance Poetry: Ronsard (3)

CREORE

532 Studies in Nineteenth-Century Poetry (3)

533 Studies in Parnassian and Symbolist Poetry (3)

VERNIER

534 Studies in Twentieth-Century Poetry (3)

536 Lyric Poetry: Twelfth and Thirteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

537 Lyric Poetry: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

540 Text Edition and Tradition (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

541, 542 History of the French Language (3,3)

FIELD, KLAUSENBURGER, ROLFE

A survey of the phonological, morphological, and syntactical development of the French language from its origins to the present.

550 Satiric and Didactic Literature: Eleventh Through Thirteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

551 Satiric and Didactic Literature: Fourteenth and Fifteenth Centuries (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

552 Renaissance Prose: Montaigne (3)

KELLER

553 Eloquence (3)

DAVID

French eloquence of the sixteenth, seventeenth, and eighteenth centuries: d'Urfe, G. de Balzac, Pascal, Bossuet, Fenelon, Massillon, Mirabeau, Danton, de Maistre. Prerequisite, graduate standing.

554 Studies in Seventeenth-Century Nonfiction (3)

CHRISTOFIDES, W. LEINER, WORTLEY

555 Studies in Eighteenth-Century Nonfiction (3)

ELLRICH

556 Studies in Nineteenth-Century Nonfiction (3)

DAVID

557 Studies in Twentieth-Century Nonfiction (3)

JONES, KERN

558 Twentieth-Century Ideas and Symbols (3)

DAVID

559 Historical Prose and Poetry (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

560 French Medieval Theatre (3, max. 9)

FIELD, FRIEDMAN

Prerequisite, 404, Romance 402, or permission.

561 Studies in Seventeenth-Century Drama (3)

KERN, WORTLEY

562 Studies in Eighteenth-Century Drama (3)

ELLRICH

563 Studies in Nineteenth-Century Drama (3)

DALE

564 Studies in Twentieth-Century Drama (3)

KERN, W. LEINER

565 Studies in French Drama (3-5) Sp

LEINER

Studies in French Drama, sixteenth-twentieth centuries.

570 Seminar in Cinema (3)

DALE

Prerequisite, permission of instructor.

575, 576, 577 Literary Criticism (3,3,3)

KERN

590 Special Seminar and Conference (3-9, max. 30) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser.

591 Literary Problems: Middle Ages (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

592 Literary Problems: Renaissance (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

593 Literary Problems: Seventeenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

594 Literary Problems: Eighteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

595 Literary Problems: Nineteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

596 Literary Problems: Twentieth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser.

599 Graduate Readings (*)

Supervised reading in specific fields. Prerequisite, permission of Graduate Program Adviser.

600 Independent Study or Research (*) AWSp**700 Thesis (*) AWSp****702 Degree Final (3) AWSp****800 Doctoral Dissertation (*)****ITALIAN****101-102, 103 Elementary (5-5, 5) A,W,Sp**

Methods and objectives are primarily oral-aural. Oral practice in the language laboratory is required. No credit is granted for 101- until -102 (or a more advanced course, as approved by the Department) has been completed satisfactorily. Prerequisite for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

107 Italian Civilization (3)

Deals with varied aspects of Italian culture, past and present. Point of departure will be the language, considered both in its essential structure and as a reflection of the society for which it serves as a means of communication. One of the major aims of the course will be to develop a reading knowledge of Italian. The range and complexity of the readings will be coordinated with the in-

creasing mastery of the language. Students receiving credit in 107 may not later register for credit in 101-.

108 Italian Civilization (3)

Continuation of 107. Students who have received credit for -102 and/or 103 may also receive credit for 108.

111-112, 113 Elementary (5-5, 5)

Administered by the Division of Correspondence Study. Basic study of Italian grammar and idiomatic usage of the language. No credit is given for 111- until -112 has been completed. The three courses correspond to 101-102, 103, but students wishing to transfer to day-school courses must satisfactorily complete examinations, including oral proficiency test. All assignments are written, but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Correspondence Study, is highly recommended.

201, 202, 203 Intermediate (5,5,5) A,W,Sp

Intensive practice in speaking, reading, and writing. Functional review of grammar. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test; for 203: 202 or college equivalent, or placement test.

211, 212, 213 Intermediate (5,5,5)

Administered by the Division of Correspondence Study. Intensive practice in reading and writing. Functional review in grammar. The three courses correspond to 201, 202, 203, but students wishing to transfer to day-school courses must satisfactorily complete placement examinations, including oral proficiency test. All assignments and examinations are written, but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Correspondence Study, is highly recommended. Prerequisites, 113 for 211; 211 for 212; 212 for 213; or college equivalent.

301, 302 Advanced Syntax and Composition (3,3) A,W

Prerequisites, 203 or college equivalent or placement test for 301; 301 for 302.

303 Italian Stylistics (3) Sp

Functional grammar review; creative written and oral composition and reading, with special attention to problems of style. Prerequisite, 302.

304, 305, 306 Survey of Italian Literature (3,3,3) A,W,Sp

Prerequisite, 203 or college equivalent, or placement test.

327 Advanced Conversation (2, max. 8) AWSp

Prerequisite, 203 or college equivalent, or placement test.

390 Supervised Study (2-5, max. 20) AWSp

Prerequisite, permission of the instructor and the Undergraduate Italian Adviser.

410, 411, 412 Literature of the Renaissance (3,3,3)

MASCIANDARO

Study of the main currents and writers of the Italian Renaissance—the lyric, drama, epic, and prose as exemplified by such writers as Poliziano, Sannazzaro, Guarini, Boiardo, Ariosto, Castiglione, Machiavelli, Guicciardini, and Tasso. Prerequisites, 304, 305, 306.

420, 421, 422 Eighteenth-Century Italian Literature (3, 3, 3)

PACE

420: Arcadia and the Melodrama: Metastasio. 421: Drama: Goldoni and Alfieri. 422: Poetry: Parini, Monti, Foscolo.

450 Manzoni and the Romantic Movement (3) A

PACE

A study of Manzoni's works, especially the *Promessi Sposi*, as products of Italian romanticism. Prerequisites, 304, 305, 306.

451 Leopardi and the Lyric (3) Sp

PACE

A reading of the *Canti* with lectures, discussions, reports. Prerequisites, 304, 305, 306.

460 Verismo (3)

FRIEDRICH

A study of representative realistic writers such as Capuana, Verga, Serao, Fucini, and Deledda. Prerequisites, 304, 305, 306.

465 Contemporary Italian Narrative (3)

FRIEDRICH

A critical reading of selected modern exponents of the short story and novel. Prerequisites, 304, 305, 306, or equivalent.

Courses for Graduates Only

512, 513, 514 Dante (3,3,3)

MASCIANDARO

541, 542 History of the Italian Language (3,3)

PACE

Phonological, morphological, and syntactical development of the Italian language from its origin to the present.

551, 552, 553 Seminar in Humanist and Renaissance Prose and Poetry (3,3,3)

MASCIANDARO

561, 562, 563 Italian Literature of the Nineteenth and Twentieth Centuries (3,3,3)

590 Special Seminar and Conference (3-9, max. 30) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser. (Formerly 581.)

591 Literary Problems: Middle Ages and Fourteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590A.)

592 Literary Problems: Renaissance (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590B.)

593 Literary Problems: Baroque (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590C.)

594 Literary Problems: Eighteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590D.)

595 Literary Problems: Nineteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590E.)

596 Literary Problems: Twentieth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590F.)

599 Graduate Readings (*)

Supervised reading in specific fields. Prerequisite, permission of the Graduate Program Adviser.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

PORTUGUESE

101-102, 103 Elementary (5-5,5) A,W,Sp

Methods and objectives are primarily oral-aural. Oral practice in the language laboratory is required. No credit is granted for 101- until -102 (or a more advanced course as approved by the Department) has been completed satisfactorily. Prerequisite for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

111-112, 113 Elementary (5-5, 5)

Administered by the Division of Independent Study. Basic study of Portuguese grammar and idiomatic usage of the language. No credit is given for 111- until -112 has been completed. The three courses correspond to 101-102, 103, but students wishing to transfer to day-school courses must satisfactorily complete placement examinations, including oral proficiency test. All assignments are written, but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Independent Study, is highly recommended.

150 Accelerated (5)

For graduate students in Spanish who wish to develop a rapid command of Portuguese primarily for reading purposes. Prerequisite, graduate standing in Spanish or instructor's permission.

201, 202, 203 Intermediate (5,5,5) A,W,Sp

Modern texts, composition, conversation, and functional grammar. Students with advanced standing in Spanish courses may apply to instructor for permission to enter 301, instead of 201, after 103. Prerequisites, for 201: 103 or equivalent, or permission; for 202: 201; for 203: 202.

301, 302 Advanced Syntax and Composition (3,3) A,W

Students with advanced standing in Spanish courses may apply to instructor for permission to enter 301 after 103. Prerequisites for 301: 203 or equivalent, or permission; for 302: 301.

303 Portuguese Stylistics (3) Sp

Functional grammar review; creative written and oral composition and reading with special attention to problems of style. Prerequisite, 302.

304 Survey of Luso-Brazilian Literature: Middle Ages and Renaissance (3) A GOETZINGER

Prerequisite, 203 or equivalent, or permission.

305 Survey of Luso-Brazilian Literature: Seventeenth, Eighteenth, and Early Nineteenth Centuries (3) W GOETZINGER

Prerequisite, 203 or equivalent, or permission.

306 Survey of Luso-Brazilian Literature: Late Nineteenth and Twentieth Centuries (3) Sp GOETZINGER

Prerequisite, 203 or equivalent, or permission.

310 Introduction to Brazilian Literature (3) Sp

GOETZINGER

Prerequisite, 302 or permission.

327 Advanced Conversation (2, max. 8)

Prerequisite, 203 or equivalent, or permission.

390 Supervised Study (2-5, max. 20) AWSp

GOETZINGER

Prerequisite, permission of the instructor and the Undergraduate Portuguese Adviser.

409 Portuguese Phonetics (3)

ALGEO

Phonetic structure of the Portuguese language as spoken in Portugal and Brazil; practice in Portuguese and Brazilian pronunciation. Prerequisite, 4 credits in 327 or equivalent, or permission.

424, 425, 426 Fiction: 1800-1950 (3,3,3)

A,W,Sp

GOETZINGER

Romanticism, realism, symbolism, and modernism in Portugal and Brazil. Eça de Queirós, Machado de Assis, twentieth-century novelists. Prerequisites, 304, 305, and 306.

Course for Graduates Only

541, 542 History of the Portuguese Language (3,3)

ALGEO

Phonological, morphological, and syntactical development of the Portuguese language from its origin to the present. Prerequisite, Romance 401 or equivalent.

590 Special Seminar and Conference (3-9, max. 30) AWSp

Group seminars or individual conferences are scheduled under this number to meet special needs. Prerequisite, permission of Graduate Program Adviser.

PROVENÇAL

535 Provençal Language (3)

(Formerly 534.)

536 Provençal Literature (3)

FIELD

(Formerly 534.)

ROMANIAN

401-402, 403 Elementary Romanian (5-5, 5) AWSp

401-402: a comprehensive introduction to both spoken and literary Romanian. 403: designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short fictional material in modern Romanian. Offered jointly with the Department of Slavic Languages and Literature as Romanian 401-402, 403. (Formerly 411-412, 413.)

420, 421 Structure of Romanian (3, 3)

Descriptive analysis of the phonological, morphological, syntactical, and lexical structures of modern Romanian. Prerequisite, Romance 401 or permission.

SPANISH

101-102, 103 Elementary (5-5,5) W,AWSp, AWSp

Methods and objectives are primarily oral-aural. Oral practice in the Language Laboratory is required. Prerequisites for -102: 101- or college equivalent, or placement test; for 103: -102 or college equivalent, or placement test.

111-112, 113 Elementary (5-5, 5)

Administered by the Division of Independent Study. Basic study of Spanish grammar and idiomatic usage of the language. No credit is given for 111- until -112 has been completed. The three courses correspond to 101-102, 103, but students wishing to transfer to day-school courses must satisfactorily complete placement examinations, including oral proficiency test. All assignments are written but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Independent Study, is highly recommended.

128 Spanish for the Elementary School (5) S FRIEDRICH

Practice in the basic language skills is combined with the demonstration and analysis of methods and techniques appropriate to FLES. Emphasis is given to the language structures and vocabulary that normally occurs in elementary school Spanish. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 132.

201, 202, 203 Intermediate (5,5,5)**AWSp, AWSp, AWSp**

Intensive practice in speaking, reading, and writing. Systematic review of Spanish grammar. Oral practice based on selected pieces of Spanish literature. Prerequisite for 201: 103 or college equivalent, or placement test; for 202: 201 or college equivalent, or placement test; for 203: 202 or college equivalent, or placement test.

211, 212, 213 Intermediate (5,5,5)

Administered by the Division of Independent Study. Intensive practice in reading and writing. Functional review in grammar. The three courses correspond to 201, 202, 203, but students wishing to transfer to day-school courses must satisfactorily complete placement examinations, including oral proficiency test. All assignments and examinations are written, but oral practice is provided through purchase and use of tape recordings. Purchase of a tape recording, available only from the Division of Independent Study, is highly recommended. Prerequisites, 113 for 211; 211 for 212; 212 for 213; or college equivalent.

221 Prose Readings in Spanish (5) Sp

Readings and discussion of nonfiction prose texts in Spanish. Reading material will concentrate on the social sciences, such as aspects of Hispanic cultures, recent History and contemporary social issues of Spanish speaking countries. Prerequisite, Spanish 202 or permission of instructor.

230 Conversational Spanish**(2½ or 4, max. 8) S**

For participants in the Living Language Group Program only. Prerequisites, 103 or college equivalent, and permission.

237 Conversational Spanish (2 or 4 or 6) Sp

For participants in the Study Abroad Program. Prerequisites, 103 or college equivalent, and permission.

301, 302 Advanced Syntax and Composition (4,4) AW, WSp

Prerequisites for 301: 203 or college equivalent, or placement test; for 302: 301.

303 Spanish Stylistics (4) ASp

Functional grammar review; creative written and oral composition and reading with special

attention to problems of style. Prerequisite, 302.

304 Survey of Spanish Literature: 1140-1498 (3) A

Masterpieces of Spanish literature from *Poema de Mio Cid* to 1498. Prerequisite, 203 or college equivalent, or placement test.

305 Survey of Spanish Literature: 1498-1681 (3) W

Prerequisite, 203 or college equivalent, or placement test.

306 Survey of Spanish Literature: 1681 to the Present (3) Sp

Prerequisite, 203 or equivalent, or placement test.

327 Advanced Conversation (2, max. 8) AWSp

Prerequisite, 203 or equivalent, or placement test.

330 Conversational Spanish (2½ or 4, max. 8) S

For participants in the Living Language Group Program only. Prerequisites, 203 or college equivalent, and permission.

337 Conversational Spanish (2 or 4 or 6) Sp

For participants in the Study Abroad Program. Prerequisites, 203 or equivalent, and permission.

350 Drama (3) A

Generic study of Spanish drama. Prerequisite, 203 or college equivalent, or placement test.

351 Poetry (3) A

Generic study of Spanish poetry. Prerequisite, 203 or college equivalent, or placement test.

352 Fiction (3) W

Generic study of Spanish fiction. Prerequisite, 203 or college equivalent, or placement test.

390 Supervised Study (2-5, max. 20) AWSp

Prerequisite, permission of the instructor and the Undergraduate Spanish Adviser.

400 The Structure of Modern Spanish (3) W SAPORTA

Analysis of the spoken language from a linguistic point of view; phonological, morphological, and syntactic analysis. Prerequisites, 203, and Romance 401 or Linguistics 400.

409 Advanced Phonetics (3) AWSp

ALGEO, CONTRERAS, SALINERO, VARGAS-BARON

Analysis of sounds; training in correct and natural pronunciation. Prerequisite, 4 credits in 327 or equivalent.

410 Hispanic Poetry: Late Middle Ages Through the Sixteenth Century (3)

SHIPLEY

Prerequisites, 304, 305, 306.

411 Hispanic Poetry: Seventeenth Through the Nineteenth Century (3)

SHIPLEY

Prerequisites, 304, 305, 306.

412, 413, 414 Hispanic Poetry (3, 3, 3)

PREDMORE

Modern lyric poetry of the Hispanic world. The period studied extends from 1870 to 1936 and deals with thirteen major poets, from Becquer to Hernández. Prerequisites, 306, 351.

417 The Epoch of Cervantes (3)

SALINERO

An introductory study of Cervantes' environment emphasizing the cultural and artistic background of this outstanding period. Pre-

liminary to Spanish 418. Prerequisites, 304, 305, 306.

418 Cervantes and Modern Fiction (3)

SALINERO

A study of Cervantes' *Don Quixote* as a milestone in modern fiction. Prerequisites, 304, 305, 306.

420 Spanish Literature of the Eighteenth Century (3)

PENUELAS

Study of the main literary currents and authors of the eighteenth century in Spain with emphasis on the ideological crisis of that time. Prerequisites, 304, 305, 306.

430 Advanced Conversational Spanish (2½ or 4, max. 8) S

Continuation of 330. Advanced conversational problems primarily for teachers. For participants in the Living Language Group Program only. Prerequisites, 330 or college equivalent, and permission.

437 Advanced Conversational Spanish (2 or 4 or 6) S

For participants in the Study Abroad Program. Prerequisites, 327 or equivalent, and permission.

441 Spanish Drama: 1150-1600 (3)

From the beginning to Lope de Vega. Prerequisites, 304, 305, 306.

442 Spanish Drama: 1600-1635 (3)

Lope de Vega through Ruiz de Alarcón. Prerequisites, 304, 305, 306.

443 Spanish Drama: 1635-1681 (3)

Calderón de la Barca and dramatists of his school. Prerequisites, 304, 305, 306.

444 The Modern Theatre in Spain, 1700-Romanticism (3)

ANDERSON

A study of the directions, documents, and literature of Spain's theatre during the eighteenth and early nineteenth centuries. Special attention to the concepts and manifestations of Neoclassicism and Romanticism. Prerequisites, 304, 305, 306.

445 The Modern Theatre in Spain, 1850-1900 (3)

ANDERSON

The theories and literature of the Spanish theatre in the second half of the nineteenth century. Post-romantic drama, *género chico*, Naturalism. Prerequisites, 304, 305, 306.

446 The Modern Theatre in Spain, 1900-Present (3)

ANDERSON

Major currents and literature of Spain's theatre in this century. Special attention to modern reactions against Realism. Benavente, Valle-Inclán, Sastre, Lorca, and others. Prerequisites, 304, 305, 306.

450 Spanish Drama and Play Production (2-6)

ANDERSON

Prerequisites, 304, 305, 306.

451, 452, 453 Spanish Literature Since 1700 (3,3,3) A,W,Sp

ANDERSON, PENUELAS

451: 1700 through the Romantic Period. 452: 1850-1898. 453: 1898 to the present. Prerequisites, 304, 305, 306.

461, 463 Spanish Literature of the Golden Era (3,3)

SHIPLEY

Poetry, historical narrative, and prose fiction of the Golden Era from 1498 to 1681. 461:

ARTS AND SCIENCES

Poetry. 463: Prose. Prerequisites, 304, 305, 306.

471 Individual Authors (3, max. 9)

This course is devoted to one or more representative Spanish or Spanish-American authors. Prerequisites, 304, 305, 306.

474 Application of Linguistics to the Teaching of Spanish (3) A

Current theory and practical application of methods and techniques of teaching Spanish, as based on the findings of linguistics.

481, 482, 483 Spanish-American Literature (3,3,3) A,W,Sp

BODDEN

General survey. 481: The colonial period and early years of independence. 482: The middle years of the nineteenth century. 483: The twentieth century. Prerequisites, 304, 305, and 306.

484 Twentieth-Century Spanish-American Poetry (3)

GOETZINGER

Lectures on major trends in modern Spanish-American poetry; close reading and discussion of poems by representative contemporary poets. Prerequisites, 304, 305, 306.

485 Romanticism, Realism, and Naturalism in Spanish America (3) A

VARGAS-BARON

Leading Romantic and Costumbrista authors (1810-1890). Prerequisites, 304, 305, and 306.

486 The Modernista Movement in Spanish-American Literature (3) W

VARGAS-BARON

The leading poets, essayists, and novelists of Spanish America (1890-1920). Prerequisites, 304, 305, and 306.

487 The Contemporary Spanish-American Novel (3) Sp

VARGAS-BARON

Prerequisites, 304, 305, and 306.

488 Cultural Background of Latin-American Literature (3)

SOMMERS

Survey of ideas and art forms and their relationship to literature in four periods: pre-Columbian, colonial, early independence, and twentieth century. Prerequisite, 203.

489 Problems in the Spanish-American Novel (3)

SOMMERS

Prerequisite, 352 or permission.

Courses for Graduates Only

105 Elementary (5)

A course to prepare graduate students to pass the reading examination required for advanced degrees. Credit will be granted only to students who have received no previous credit in Spanish. Students receiving credit in 105 may not later register for credit in 101-. Credits in 105 may not be applied toward an advanced degree. Prerequisite, graduate standing or permission of the Department.

106 Elementary (5)

Continuation of 105. Students who have received credit for 102 and/or 103 may also receive credit for 106. Credits in 106 may not be applied toward an advanced degree. Prerequisite, 105 or permission of the Department.

500 Seminar in Spanish Linguistics (3) Sp

SAPORTA

Problems in the phonological and grammatical analysis of modern Spanish. Prerequisite, 400.

501-502 Graduate Study of Hispanic Literature (3-3)

Close studies of literary texts exemplifying a variety of practical critical methods. Required of candidates for the master's degree.

511, 512, 513 Early Spanish Literature (3,3,3)

A detailed survey of early Spanish literature, from its beginning through the fifteenth century. Examination of primary texts of epic and lyric poetry, brief prose fiction, drama, the ballad, didactic materials, the histories.

515 The Contemporary Spanish-American Short Story (3)

GOETZINGER

521, 522 The Renaissance in Spain (3,3)

SHIPLEY

541, 542 History of the Spanish Language (3,3) W,Sp

SALINERO

A survey of the phonological, morphological, and syntactical development of the Spanish language, with particular emphasis on early literary texts.

553 The Generation of '98 (3)

PENUELAS

561 Spanish-American Novel from 1940 to the Present (3, max. 9)

SOMMERS

562 Spanish Literature from 1940 to the Present (3)

PENUELAS

571 The Modern Essay (3)

VARGAS-BARON

572 Twentieth-Century Spanish Poetry (3)

PENUELAS, PREDMORE

573 Twentieth-Century Spanish-American Poetry (3)

GOETZINGER

575 Hispanic Literary Criticism (3)

590 Special Seminar and Conference (3-9, max. 30) AWSp

Group seminars, or individual conferences, are scheduled under this number to meet special needs. Prerequisite, permission of the Graduate Program Adviser. (Formerly 531.)

591 Literary Problems: Middle Ages (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590A.)

592 Literary Problems: Renaissance (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590B.)

593 Literary Problems: Golden Age (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590C.)

594 Literary Problems: Eighteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590D.)

595 Literary Problems: Nineteenth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590E.)

596 Literary Problems: Twentieth Century (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590F.)

597 Literary Problems: Spanish-American Colonial Literature (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 590G.)

598 Literary Problems: Latin America (3, max. 9)

Prerequisite, permission of the Graduate Program Adviser. (Formerly 490H.)

599 Graduate Readings (*) AWSp

Supervised reading in specific fields. Prerequisite, permission of the Graduate Program Adviser.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

ENGLISH TRANSLATION

These courses are recommended as appropriate minor or supporting studies for students majoring in other departments. Courses in English translation are not applicable toward undergraduate or graduate majors in the Department of Romance Languages and Literature.

Courses for Undergraduates

FRENCH

414 French Poetry from Baudelaire to the Present in English (5)

VERNIER

Analysis in English of the major trends and movements in modern French poetry, e.g., Symbolism, Surrealism, etc. Textual studies of representative works, from Baudelaire to the poets of the 1950's.

415 Trends in Twentieth-Century Theatre in English (5)

STOKLE

A study of the evolution of the French theatre from the turn of the century to the present. Special emphasis will be given to the French theatrical scene since World War II.

416 Rabelais and Montaigne in English (3)

417 Racine and Molière in English (3)

418 Literature of the Enlightenment in English (3)

419 Nineteenth-Century Fiction in English (3)

ITALIAN

318 Italian Literature in English (5)

319 The Italian Short Story in English (3)

FRIEDRICH

The short story from the *Novellino* and Boccaccio to modern masters of the form. The translations will be studied both as examples of narrative technique and as reflections of particular moments in Italian cultural history. Prerequisite, at least sophomore standing.

384 Renaissance Literature of Italy in English (3)

481 The Divine Comedy in English (5)

A study of Dante's *Divine Comedy* in English translation, with consideration of its back-

ground and influence. May be counted as an elective in an English major.

ROMANCE LITERATURE

- 460 **The Literature of the Renaissance in English (5)**

SPANISH

- 315 **Latin-American Authors in English (5)**

- 345 **Spanish Literature of the Renaissance in English (3)**

RUSSIAN—See *Slavic Languages and Literature*

SANSKRIT—See *Asian Languages and Literature*

SCANDINAVIAN LANGUAGES AND LITERATURE

Courses for Undergraduates

DANISH

- 101-102, 103 **Elementary Danish (5-5,5)**

A,W,Sp
Fundamentals of oral and written Danish.

- 220 **Introduction to Danish Literature (3) A**
Selected short stories by contemporary authors. Prerequisite, 103 or equivalent.

- 221 **Introduction to Danish Literature (3) W**
Selected prose fiction. Prerequisite, 220 or equivalent.

- 222 **Introduction to Danish Literature (3) Sp**
Kaj Munk and his dramas. Prerequisite, 221 or equivalent.

- 223, 224, 225 **Danish Conversation and Composition (2,2,2) A,W,Sp**
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 300, 301, 302 **Modern Danish Literature (3,3,3) A,W,Sp**

- 450 **History of Danish Literature (3)**
ARESTAD
A one-volume history serves as text. Representative literary works from the earliest times to the present are read to supplement the historical account and to show the evolution of the thought and form of the various genres. Prerequisite, 222 or equivalent.

- 490 **Supervised Reading (*, max. 5) AWSp**
ARESTAD
Students with an adequate reading knowledge of Danish pursue in this course a program of study in a selected area of Danish language, literature, or related fields. Conferences with the instructor; reports. Prerequisite, permission.

ICELANDIC

- 101, 102 **Modern Icelandic (3,3) A,W**
Fundamentals of oral and written Modern Icelandic.

NORWEGIAN

- 101-102, 103 **Elementary Norwegian (5-5,5)**

A,W,Sp,SpA
BY
Fundamentals of oral and written Norwegian.

- 220 **Introduction to Norwegian Literature (3) AW**
SEHMSDORF
Ibsen's *A Doll's House* and one other play. Prerequisite, 103 or equivalent.

- 221 **Introduction to Norwegian Literature (3) WSp**
ARESTAD, SEHMSDORF
Hamsun's *Victoria* and one other novel. Prerequisite, 220 or equivalent.

- 222 **Introduction to Norwegian Literature (3) ASp**
SEHMSDORF
Hamsun's *Pan* and selected short stories. Prerequisite, 221 or equivalent.

- 223, 224, 225 **Norwegian Conversation and Composition (2,2,2) A,W,Sp**
BY
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 300 **Modern Norwegian Literature (3) A**
ARESTAD, SEHMSDORF
Reading representative works of Ibsen and Bjørnson. Prerequisite, 222 or equivalent.

- 301 **Modern Norwegian Literature (3) W**
ARESTAD, SEHMSDORF
Reading selected novels of Kielland, Hamsun, Undset. Prerequisite, 222 or equivalent.

- 302 **Modern Norwegian Literature (3) Sp**
ARESTAD, SEHMSDORF
Reading representative poetry of Wergeland, Welhaven, Vogt, Bull, and Øverland. Prerequisite, 222 or equivalent.

- 303, 304, 305 **Advanced Norwegian Conversation and Composition (2,2,2) A,W,Sp**
BY
Prerequisite, 225 or equivalent.

- 450 **History of Norwegian Literature (3) Sp**
ARESTAD
A one-volume history serves as text. Representative literary works from the earliest times to the present are read to supplement the literary historical account and to show the evolution of the thought and form of the various genres. Prerequisite, 222 or equivalent.

- 490 **Supervised Reading (*, max. 10) AWSp**
ARESTAD, SEHMSDORF
Students with an adequate reading knowledge of Norwegian pursue in this course a program of study in a selected area of Norwegian language, literature, or related fields. Conferences with the instructor; reports. Prerequisite, 302 or permission.

SWEDISH

- 101-102, 103 **Elementary Swedish (5-5,5)**

A,W,Sp,SpA
HALL
Fundamentals of oral and written Swedish.

- 220 **Introduction to Swedish Literature (3) AW**
JARVI
Fröding and his poetry. Prerequisite, 103 or equivalent.

- 221 **Introduction to Swedish Literature (3) WSp**
JARVI
Hjalmar Söderberg and his short stories. Prerequisite, 220 or equivalent.

- 222 **Introduction to Swedish Literature (3) ASp**

JARVI
Malmberg and his major works. Prerequisite, 221 or equivalent.

- 223, 224, 225 **Swedish Conversation and Composition (2,2,2) A,W,Sp**
HILDEMAN
Prerequisites, 103 for 223; 223 for 224; 224 for 225.

- 300 **Modern Swedish Literature (2) A**
JOHNSON
An introduction to Lagerkvist's major works. Prerequisite, 222 or equivalent.

- 301 **Modern Swedish Literature (2) W**
HILDEMAN
Lyric poetry. Prerequisite, 222 or equivalent.

- 302 **Modern Swedish Literature (2) Sp**
JOHNSON
Bellman and his time. Prerequisite, 222 or equivalent.

- 303, 304, 305 **Advanced Conversational Swedish (2,2,2) A,W,Sp**
CARLSON
Prerequisite, 225 or equivalent.

- 306, 307, 308 **Advanced Swedish Composition (1,1,1) A,W,Sp**
CARLSON
Prerequisite, 225 or equivalent.

- 350 **Contemporary Swedish Literature (3) A**
JOHNSON
An introduction to developments in Swedish literature in the 1950's and 1960's through the study of representative poetry, prose, and dramas. Prerequisite, 222 or equivalent.

- 351 **Swedish Romanticism (3) W**
HILDEMAN
The study of representative works by such romantics as Tegnér, Geijer, Atterbom, Stagnelius, and Almqvist. Prerequisite, 222 or equivalent.

- 352 **Strindberg and His Works (3) Sp**
JOHNSON
The study of representative short stories, dramas, autobiographical works, poems, and one novel. Prerequisite, 222 or equivalent.

- 450 **History of Swedish Literature (3) Sp**
HILDEMAN, JOHNSON
A one-volume history serves as text. Representative literary works from the earliest times to the present are read to supplement the literary historical account and to show the evolution of the thought and form of the various genres. Prerequisite, 222 or equivalent.

- 490 **Supervised Reading (*, max. 12) AWSp**
HILDEMAN, JOHNSON
Students with an adequate reading knowledge of Swedish pursue in this course a program of study in a selected area of Swedish language, literature, or related fields. Conferences with the instructor; reports. Prerequisite, 302 or permission.

SCANDINAVIAN COURSES IN ENGLISH

- 100 **Modern Scandinavian Culture (2) AWSp**
ARESTAD, HILDEMAN, SEHMSDORF
The background for Scandinavian democracy of the present day, with special emphasis on the large peoples' movements of the nineteenth century and the role of literature and

the arts in this development. Reading and discussion of a play by Ibsen and one by Strindberg.

230 Scandinavian Mythology (2) Sp SEHMSDORF, WAHLGREN

An introduction to the study of the mythology of the Germanic, and especially Scandinavian peoples. Emphasis on the source material, particularly the *Poetic Edda* and *Prose Edda*, and heroic legend, also historical and archeological material.

250 Scandinavian Drama in English Translation (2) Sp JARVI

Introduction to Scandinavian drama with major emphasis on representative plays by Holberg, Almqvist, Björnson, Lagerkvist, Bergman, Grieg, Abell, and Forssell, with some attention to Ibsen and Strindberg.

309 The Scandinavian Novel in English (2) Sp VALFELLS

Representative Old Icelandic sagas.

310 The Scandinavian Novel in English (2) JOHNSON

The emigrant novel: Rölvaag, Bojer, Moberg.

311 The Scandinavian Novel in English (2) W ARESTAD

Representative novels and short stories of Jacobsen, Hamsun, Dinesen, Duun, and Lagerkvist.

380 History of Scandinavia to 1814 (3) W HILDEMAN, WAHLGREN

A survey of Scandinavian history from the Viking period to 1814 with primary emphasis on the development of Denmark, Finland, Iceland, Norway, and Sweden and the role of the Scandinavians in world history. Offered jointly with the Department of History as Modern European History (HSTEU) 380.

381 History of Scandinavia Since 1814 (3) Sp HILDEMAN, WAHLGREN

A survey of Scandinavian history from 1814 to the present with major emphasis on the political, social, cultural, and economic development of the Scandinavian countries. Offered jointly with the Department of History as Modern European History (HSTEU) 381.

455 Introduction to Scandinavian Linguistics (3) Sp VALFELLS

Descriptive analysis of the phonological, morphological, and syntactical structures of the modern Scandinavian languages. Prerequisite, equivalent of two college years of a Scandinavian language.

460, 461 History of the Scandinavian Languages (3,3) W,Sp VALFELLS

A survey of the development of the languages from primitive Scandinavian to contemporary Danish, Faroese, Icelandic, Norwegian, and Swedish. Prerequisite, two years of a Scandinavian language or permission.

480 Ibsen and His Major Plays in English (2) A ARESTAD, JOHNSON

481 Strindberg and His Major Plays in English (2) W JOHNSON

482 Lagerkvist and His Contemporaries in English (2) Sp JOHNSON

A study of representative Scandinavian plays of our time. (Formerly 382.)

483 Strindberg and the Swedish Drama (5) S JOHNSON, JARVI

Study and discussion of representative Strindberg plays and of post-Strindberg plays by dramatists from Lagerkvist to Forssell in English translation.

Courses for Graduates Only

500, 501, 502 Old Icelandic (3,3,3) A,W,Sp JOHNSON, VALFELLS

503, 504 Advanced Old Icelandic (2,2) W,Sp VALFELLS

The study of the *Poetic Edda*. Prerequisite, 502 or equivalent.

506 Ibsen's Early Plays (3) A ARESTAD

507 Ibsen's Later Plays (3) W ARESTAD

508 Nineteenth-Century Danish-Norwegian Novel (3) A ARESTAD

(Offered alternate years; offered 1970-71.)

509 Twentieth-Century Danish-Norwegian Novel (3) W ARESTAD

(Offered alternate years; offered 1970-71.)

510, 511, 512 Strindberg (3,3,3) A,W,Sp JOHNSON

515 Modern Danish and Norwegian Poetry (3) Sp ARESTAD

(Offered alternate years; offered 1970-71.)

516 Modern Danish and Norwegian Drama (3) Sp ARESTAD

517 Nineteenth-Century Swedish Novel (3) W JOHNSON

Seminar in the novel from Almqvist to Strindberg. (Offered alternate years; offered 1970-71.)

518 Twentieth-Century Swedish Novel (3) Sp JOHNSON

A seminar on the novel from Strindberg to the present. (Offered alternate years; offered 1970-71.)

519 Recent Swedish Drama (3) A JOHNSON

A seminar in the drama from Lagerkvist to the present. (Offered alternate years; offered 1970-71.)

520 Modern Swedish Poetry (3) W HILDEMAN

A seminar in the poetry from Tegnér to Rydberg. (Offered alternate years; offered 1970-71.) (Formerly 517.)

521 Recent Swedish Poetry (3) Sp HILDEMAN

Seminar in recent and contemporary poetry from Lagerkvist to the present. (Offered alternate years; offered 1970-71.)

530, 531 Medieval Scandinavian Literature (3,3) W,Sp HILDEMAN, WAHLGREN

The study of the main genres in the vernacular, with primary emphasis on the ballads.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

SERBO-CROATIAN—See *Slavic Languages and Literature*

SLAVIC LANGUAGES AND LITERATURE

Courses for Undergraduates

BULGARIAN

401-402, 403 Elementary Bulgarian (5-5,5) A,W,Sp AUGEROT

401-402: Introduction to Bulgarian phonology and grammar in terms of the modern spoken language. Writing conventions of literary Bulgarian. 403: Reading in modern authors to increase student's command of grammar and vocabulary. Prerequisite, Russian 203 or 210 or 250, or permission. (403 formerly 411.)

CZECH

401-402, 403 Elementary Czech (5-5,5) A,W,Sp KOVTURN

401-402: Introduction to the essentials of spoken and written Czech. 403: Modern Czech prose, leading to a command of the language as a research tool and providing an adequate basis for further study. Prerequisite, Russian 203 or 210 or 250, or permission. (403 formerly 411.)

404, 405, 406 Advanced Czech (5,5,5) A,W,Sp KOVTURN

Continuation of Czech 401-402, 403 to provide an introduction to Czech literature through selected readings from the main works of Czech authors of the nineteenth and twentieth centuries. The courses also reinforce and extend the student's basic knowledge of Czech grammar and vocabulary through daily discussions in the language. Prerequisites, 403 for 404; 404 for 405; 405 for 406. (Formerly 451, 452, 453.)

HUNGARIAN

401-402, 403 Elementary Hungarian (5-5,5) A,W,Sp

Introduction to spoken Hungarian pronunciation, basic grammar, conversation. Limited reading and writing in 401-402. More extensive reading and writing in 403. (Formerly 301, 302, 303.)

POLISH

401-402, 403 Elementary Polish (5-5,5) A,W,Sp MIKULSKI

401-402: Acquaints the student with the principal morphological and syntactic features of the Polish language through the medium of a basic vocabulary. 403: Designed to enlarge the student's general vocabulary by the reading of short texts selected from Polish authors of the nineteenth and twentieth centuries. Prerequisite, Russian 203 or 210 or 250, or permission. (403 formerly 411.)

404, 405, 406 Advanced Polish
(5,5,5) A,W,Sp
MIKULSKI

Continuation of 401-402, 403 to provide introduction to Polish literature through selected readings of the main works from nineteenth and twentieth centuries. The course also reinforces the student's basic knowledge of vocabulary, grammatical patterns, and conversation. (Formerly 451, 452, 453.)

ROMANIAN

401-402, 403 Elementary Romanian (5-5,5)
A,W,Sp
AUGEROT

401-402: A comprehensive introduction to both spoken and literary Romanian. 403: Designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short fictional material in modern Romanian. Offered jointly with the Department of Romance Languages and Literature as Romanian 401-402, 403; (formerly 411-412, 413.)

RUSSIAN

101-102 First-year Russian (5-5) A,W
DIXON

Introduction to Russian. Extensive oral practice to afford assimilation of basic structural features. Introduction to reading and composition. One hour weekly; lectures on pronunciation, grammar, and writing; opportunities for student questions (conducted in English). Four hours weekly: practice sessions conducted entirely in Russian. (See also 110.) For continuation, see 103. (Formerly 100-105.)

103 First-Year Russian (5) ASp
DIXON, TRACY

Continuation of 101-102. Prerequisite, -102 or 110, or permission. (Formerly 200.)

110 Accelerated Russian (10) A
COATS

Covers material of 101-102 in one quarter. Two hours weekly: lectures on pronunciation, grammar, and writing (conducted in English). Eight hours weekly: practice sessions conducted entirely in Russian. For continuation, see 115.

115 Accelerated Russian (10) W
COATS

Continuation of 110. Covers material of 103, 201 in one quarter. For continuation, see 210. Prerequisite, 110 or -102, or permission. (Formerly 210.)

130 Accelerated Russian for Social Scientists (10) A
HANEY

Meets four hours per day. Designed to provide students with basic knowledge of both written and spoken Russian. Grammar lectures in English. Readings and conversational practice sessions in Russian. Prerequisite, permission. (Formerly 110.)

150 Intensive First-Year Russian (15) S
HAGGLUND

Covers material of 101-102, 103 in one quarter. Recommended for students who want to acquire rapidly a considerable proficiency. For continuation, see 201 or 250, 202, 203.

201 Second-Year Russian (5) AW
TRACY

Sequel to 103. For continuation, see 202, 203. Prerequisite, 150 or 103, or permission. (Formerly 205.)

202, 203 Second-Year Russian (5,5) W,Sp
TRACY

Continuation of 201. Prerequisite, 201 or 115, or permission. (Formerly 300, 305.)

210 Accelerated Russian (10) Sp
COATS

Continuation of 115. Covers material of 202, 203 in one quarter. Prerequisite, 201 or 115, or permission. (Formerly 310.)

230 Accelerated Russian for Social Scientists (10) W
HANEY

Meets three hours per day. Readings and lectures in Russian in history, economics, geography, political science, and anthropology. Prerequisite, 130 or permission. (Formerly 210.)

240 Accelerated Scientific Russian (10) S

Introduction to written Russian as a research tool for science students only. Readings in chemistry and physics. Not counted for Russian major language credit.

250 Intensive Second-Year Russian (15) S
HANEY

Continuation of 150. For Summer Quarter students who wish to complete a second 15 credits of Russian. Prerequisite, 150, 103, or permission.

301, 302, 303 Intermediate Russian (5,5,5)
A,W,Sp
HOLDSWORTH

Oral and writing practice based on Russian prose readings. Intensive review and supplementation of structural knowledge. One hour weekly conducted in English, four hours weekly in Russian. Prerequisite, 203 or 210, or permission. (Formerly 311, 312, 313.)

305 Intermediate Conversational Russian (3) AWSp
ELIENKOFF

Participation in the program of the Russian House, supervised by a member of the Department in weekly conferences. Prerequisite, 203 or 210, or equivalent. (Formerly 315.)

330 Accelerated Russian for Social Scientists (10) Sp
HANEY

Meets two hours per day. Intensive reading and discussion of social science literature in the student's special field of interest. Prerequisite, 230 or permission. (Formerly 310.)

350 Intensive Third-Year Russian (15) S
HOLDSWORTH

Oral and writing practice based on Russian prose readings. Intensive review and supplementation of structural knowledge of Russian. Prerequisites, 210, 250, or 203.

380 Russian Language in Leningrad Program (10) S

University credits may be earned by students participating in University-sponsored Russian Language Program at Leningrad University. Prerequisite, 305 or equivalent.

401, 402, 403 Advanced Russian (5,5,5)
A,W,Sp

BURTON, GRIBANOVSKY, VINCOW
Class conversation and composition based on reading. Prerequisites, 303 for 401; 401 for 402; 402 for 403. (Formerly 411, 412, 413.)

450 Intensive Fourth-Year Russian (15) S
GRIBANOVSKY

Intensive practice in conversation, composition, and reading at an advanced level. Equiv-

alent to 401, 402, 403. Prerequisite, 303, 350, or permission.

451, 452, 453 Structure of Russian (3,3,3) A,W,Sp
AUGEROT, COATS

Descriptive analysis of the phonology and morphology of contemporary standard Russian. Prerequisites, 403 or equivalent for 451; 451 for 452; 452 for 453, or permission.

461, 462, 463 Introduction to Russian Literature (3,3,3) A,W,Sp
GRIBANOVSKY

Discussion and analysis of Russian prose, poetry, and drama in Russian. Prerequisite, 403 or permission of instructor.

464 The Russian Symbolist Movement (3) Sp
A study of Russian poetry and prose of the "Symbolist" period (1895-1910.) (Offered alternate years; not offered 1970-71.)

465 Modern Russian Poetry (Acmeism and Futurism) (3) A

A study of Russian poetry in its renaissance, from 1890 to 1925. Prerequisite, 403 or equivalent. (Offered alternate years; not offered 1970-71.)

468 Contemporary Russian Literary Criticism (3) Sp
SWAYZE

Recent trends in the Russian study of literature.

470 Russian Versification (3) Sp

Russian versification and poetic language with a brief survey of bibliography pertaining to Russian literary studies. Prerequisite, 465 or permission.

499 Undergraduate Research (3-5, max. 15) AWSp
HANEY
For Slavic majors only. Prerequisite, permission.

SERBO-CROATIAN

401-402, 403 Elementary Serbo-Croatian (5-5,5) A,W,Sp
RUDICINA

401-402: A comprehensive introduction to both spoken and written literary Serbo-Croatian. 403: Designed to increase the student's vocabulary and enhance his knowledge of grammar through the reading of short stories in the modern literary idiom. Prerequisite, Russian 203 or 210 or 250, or permission. (403 formerly 411.)

404, 405, 406 Advanced Serbo-Croatian (5,5,5) A,W,Sp
RUDICINA

Continuation of Serbo-Croatian 401-402, 403 to provide instruction and practice designed to reinforce the basic grasp of the language, and to enlarge both vocabulary and command of grammatical patterns. Prerequisite, 403. (Formerly 451, 452, 453.)

SLAVIC

421, 422 Studies in Slavic Literature (3,3) W,Sp
KOVTURN, RUDICINA

Studies of specific topics in Slavic literature (exclusive of Russian) to be selected by the instructor. Prerequisite, permission.

LITERATURE COURSES IN ENGLISH

Russian 320 Russian Literature in English (5) A

Introduction, from 1782 to the present. Representative prose and poetical works of the fore-

ARTS AND SCIENCES

most Russian and Soviet writers are discussed and analyzed.

Russian 421 Contemporary Russian Literature in English (5) W SWAYZE

A survey of Russian literature from 1917 to the present.

Russian 422 Russian Plays in English (5) Sp KONICK

From 1782 to 1948.

Russian 426 The Russian Novel in English (4) A KONICK

Gogol, Goncharov, Turgenev, Leskov, Saltykov-Shchedrin.

Russian 427 The Russian Novel in English (4) W KONICK

Tolstoy

Russian 428 The Russian Novel in English (4) Sp KONICK

Dostoevsky

Slavic 321, 322, 323 Slavic Literature in English (3,3,3) KOVTON

A survey of East European literatures. Treated in detail are Polish, Czech, Serbian, Croatian, Bulgarian, and Ukrainian literatures. Prerequisite, upper-division standing.

Courses for Graduates Only

RUSSIAN

550 Advanced Russian Morphophonology (3) A MICKLESEN

Includes a detailed discussion and evaluation of attempts to incorporate both Russian phonology and Russian morphology in modern scientific grammars. Prerequisite, 453.

551 Advanced Russian Syntax (3) W MICKLESEN

Detailed structural analysis of sentence types in the Russian literary language, with emphasis on grammatical categories and word classes.

555 History of the Russian Language (4) W COATS

An outline of grammatical and lexical developments of the Russian literary language from the earliest documents to the present. Prerequisite, Slavic 550. (Formerly 455.)

556 Readings in the History of the Russian Language (3) Sp COATS

Readings and grammatical interpretation of selected texts from various periods of development of the Russian language. Prerequisite, Russian 555.

561 Gogol (4) W

Close analysis of Gogol's novels, plays, and stories in Russian.

562 Tolstoy (5) W KONICK

Analysis of the works of Leo Tolstoy. Prerequisite, graduate standing.

565 Russian Eighteenth-Century Literature (5) W HANEY

Discussion of representative works of poetry, prose, fiction, and criticism in the formative

period in history of Russian letters. Prerequisite, 320 or permission.

566 Pushkin (4) A KONICK

Analysis of the works of Alexander Pushkin.

567 Dostoevsky (4) W RUDICINA

Analysis of the works of Feodor Dostoevsky. (Offered alternate years; offered 1970-71.)

568 Nineteenth-Century Russian Poetry Since Pushkin (3) Sp HAGGLUND

Discussion of the masters of nineteenth-century Russian lyric poetry since Pushkin.

569 Seminar in Contemporary Russian Literature (4) Sp SWAYZE

Examination of selected works of poetry, prose, and criticism representative of Russian literature from 1917 to the present. Prerequisite, permission.

570 Seminar in Russian Prose (3, max. 9) A HANAY

Examination and discussion of Russian masterpieces.

571 Stylistics of Modern Russian Poetry (3) HANAY

An examination of the linguistic aspects of poetic style in selected works of modern Russian poetry. Prerequisites, 451, 452, and 6 credits in Russian literature courses, or permission.

572 Seminar in Russian Poetry (3, max. 9) Sp HANAY

Topics in Russian poetry to be selected by the instructor. Prerequisite, graduate standing.

575 Kievan Literature (3) A HANAY

Analysis of representative works of prose and poetry of Kievan Rus' from the beginning to the end of the thirteenth century. Prerequisite, graduate standing. (Offered alternate years; not offered 1970-71.)

576 Muscovite Literature (3) W HANAY

Analysis of representative works of prose and poetry of the Muscovite period from the end of the thirteenth century to the reign of Peter I. Prerequisite, graduate standing. (Offered alternate years; not offered 1970-71.)

577 Russian Folk Literature (3) Sp HANAY

Analysis of representative works of the various genres of folk literature including the *byliny*, *skazki*, historical and lyrical songs and the spiritual *stikh*. Prerequisite, graduate standing. (Offered alternate years; not offered 1970-71.)

588-589-590 Russian Literature, 1750 to the Present (5-5-5) A,W,Sp HAGGLUND, KONICK

Survey of Russian Literature for first-year graduate students. Prerequisite, graduate standing.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

SLAVIC

550 Historical Survey of Common Slavic (5) A MICKLESEN

Slavic languages and their geographical and dialectal distribution; Slavic civilization

throughout prehistoric and early historic periods; principal phonological and morphological features of Slavic as a subgroup of the Indo-European family of languages. Prerequisite, Russian 453 or permission. (Formerly 450.)

552 History of the East Slavic Languages (3) A MICKLESEN

Designed to acquaint majors in Slavic Linguistics with the details of the historical development of the phonological and morphological structure of the East Slavic languages. Prerequisite, 550.

553 History of the West Slavic Languages (3) W MICKLESEN

Designed to acquaint majors in Slavic Linguistics with the details of the historical development of the phonological and morphological structure of the West Slavic languages. Prerequisites, 550, 552.

554 The History of the South Slavic Languages (3) Sp MICKLESEN

This course is designed to acquaint majors in Slavic linguistics with the details of the historical development of the phonological and morphological structure of the South Slavic languages. Prerequisites, 550, 552, 553.

555 Old Church Slavonic (3) W AUGEROT

Rise and development of earliest Slavic literary language and a descriptive study of its orthography, phonology, morphology, and syntax.

556 Readings in Old Church Slavonic (3) Sp AUGEROT

Reading and grammatical interpretation of a selected group of texts.

557 Seminar in Slavic Linguistics (3) Sp MICKLESEN

Seminar designed to permit the investigation and discussion of special topics in Slavic linguistics. (May be repeated for credit.) Prerequisites, 554 and Russian 551.

SOCIAL SCIENCES

150 Afro-American History (5) FRANKLIN

An examination of the Negro and his role in history both in Africa and the Americas.

SOCIOLOGY

105 Sociology of Black Americans (5) GOODMAN

Evaluates the sociocultural context of the black man's environment and consequences of his interaction with that environment.

110 Survey of Sociology (5) AWSp

Human interaction patterns shaped by ecology, social structure, and culture. Communication, family processes, social differentiation, and formal organization as integrative mechanisms. Deviance, adaptation, social change.

223 Social Statistics (5) AWSp

Methods and sources for quantitative investigation. Prerequisite, 110.

- 240 Group Behavior (5) AWSp**
BURGESS, EMERSON
Socialization of the individual; social processes; and interactions of persons in groups. Prerequisites, 110 and Psychology 100.
- 270 Social Disorganization and Deviant Behavior (5) AWSp**
AKERS, SCHMITT
Analysis of the processes of social and personal disorganization and reorganization in relation to poverty, crime, suicide, family disorganization, mental disorders, and similar social problems. Prerequisite, 110.
- 330 Human Ecology (5) A**
CAMPBELL, MC CANN
Factors and forces which determine the distribution of people and institutions. Prerequisite, 110. (Formerly 230.)
- 331 Population Analysis (5) AW**
CAMPBELL, HAGGERTY
Population growth and distribution, population composition, population theory, urbanization. Determinants and consequences of fertility and mortality trends and migration in economically developed and underdeveloped areas. Prerequisite, 110.
- 352 The Family (5) AWSp**
The family as a social institution; personality development within the family; marriage adjustment; changing family patterns; disorganization and reorganization. Prerequisite, 110.
- 362 Race Relations (5) AWSp**
BARTH, LIEBERSON, VAN DEN BERGHE
Interracial contacts and conflicts. Prerequisite, 110.
- 365 Urban Community (5) A**
COHEN
Comparative and analytic study of organization and activities of urban groups. Prerequisite, 110.
- 371 Criminology (5) AWSp**
AKERS, SCHRAG
Factors associated with crime and delinquency. Criminological theories. Survey of correctional facilities and programs. Visits to agencies and institutions. Prerequisite, 110.
- 389 Reading in Selected Fields (2-5, max. 15) AWSp**
Open only to qualified undergraduate students by permission.
- 410 History of Sociological Thought (5) W**
Contributions of individual theorists (from Comte to the present) to a coherent body of testable hypotheses; emphasis on cumulative development of concepts and principles, emergence of sociology as a science, probable future developments. Prerequisite, 110.
- 411, 412, 413 Systematic Sociology (3,3,3) A,W,Sp**
A,W,Sp
DODD
This sequence pursues acquaintance (411), competence (412), and creative use (413) with systematizing sociological methodology. Standard and frontier methods of logic, statistics, polling, modeling, cybernetics, values theory, etc., are studied in class projects, student theses, and in "Scient-scales." Students write papers for professional journals. Prerequisite, permission.
- 414 Sociological Theory (5) A**
COSTNER, SCHRAG
Modern scientific theory applied to social behavior; sociology as a natural science. Prerequisite, 20 credits in social science.
- 415 Theory of Social Organization (5) W**
WAGER
State and usages of theory in social organization; importance of linkage between theory and methodology; major features of social organization demonstrated by intensive examination of representative theories of social organization with particular focus on complex forms. Prerequisite, 110.
- 420 Methods of Sociological Research (5) A**
FARIS
A general survey of the principal methods of research used in sociology, and of special issues and problems in methodology. Prerequisite, 223 or equivalent.
- 421 Methodology: Case Studies and Interviewing (3)**
Prerequisites, 223 and 420.
- 422 General Methodological Strategies (3) Sp**
WAGER
An introduction to the varied strategies of research in sociology. These strategies include laboratory and field experimentation, statistical studies, surveys, field observations, historical and comparative studies, mathematical modeling, and computer simulation. Prerequisite, 223.
- 423 Advanced Social Statistics (5) A**
COSTNER
Application of statistical methods to the analysis of sociological data. Prerequisite, 223.
- 425 Graphic Techniques in the Social Sciences (5)**
SCHMID
Theory and practice of presenting statistical data in graphic form. Construction of bar, line, pictorial, and other types of charts and graphs, and areal distribution maps, etc., used for research and publicity purposes in sociology, geography, economics, education, and community planning. Prerequisite, 223 or approved equivalent.
- 426 Methodology: Quantitative Techniques in Sociology (3)**
COSTNER, HAGGERTY
Measures of relationships among variables and among attributes; calculation techniques; application to typical sociological problems; interpretation. Prerequisites, 223 and 423, or equivalents.
- 427 Statistical Classification and Measurement (3) Sp**
COSTNER, HAGGERTY
Application of statistical principles and methods to problems of classification and measurement in social research. Prerequisite, 423 or equivalent.
- 428-429 Principles of Study Design (3-3) W,Sp**
COSTNER
Application of statistical principles and methods to problems of sampling and experimentation in social research. Prerequisite, 423 or equivalent.
- 430 Human Ecology (5) ASp**
CAMPBELL
Factors and forces which determine the distribution of people and institutions. Not open to students who have taken 330. Senior majors and graduate students only. Prerequisite, 110.
- 431 Population Analysis (5) Sp**
MC CANN, SCHMID
Population growth and distribution, population composition, population theory, urbanization. Determinants and consequences of fertility and mortality trends and migration in ecologically developed and underdeveloped areas. Not open to students who have taken 331. Senior majors and graduate students only. Prerequisite, 110.
- 440 Primary Interaction and Personal Behavior (5) W**
FARIS
Social sources of cooperative motives; social basis of the self; nature of primary groups; institutional roles; exceptional and unconventional roles; methodology. Prerequisite, 240 or equivalent.
- 442 Public Opinion (3) Sp**
DODD
The nature of public opinion; formation and measurement of public opinion; the operation of public opinion polls. Prerequisite, 240 or equivalent.
- 443 Mass Communication (5)**
LARSEN
Control, structure, and functioning of mass media of communications as a force in social life; methods of research. Prerequisite, 240 or equivalent.
- 445 Social Movements (3)**
MIYAMOTO
Social movements as collective enterprises to establish new social orders; types, formation, and organization of movements. Prerequisite, 240 or equivalent.
- 447 Socialization (5) A**
BURGESS
How social systems control the behavior of their constituent groups, and persons, through the socialization process, sanctions, power, allocation of status and rewards. Prerequisite, 110.
- 448 Sociometric Analysis and Group Structure (5) W**
LEIK
Analysis of the theory and techniques used in the description and experimental investigation of group structure and process. Study of formation, organization, cohesion, and disorganization of social groups through sociometric techniques. Prerequisites, 223, 240, and senior standing.
- 450 Contemporary American Institutions (5)**
WAGER
Origins and developments of major social institutions. Sociology of economic structure, political organization, religion, education, recreation, and other institutionalized patterns. Prerequisite, 110.
- 451 Social Change and Trends (5) Sp**
Basic trends in American life; frames of reference for analysis of social change; forces causing social change. Prerequisite, 15 credits in social science.
- 452 Health and Social Behavior (5) W**
SHARP
Theoretical and methodological aspects of health, disease, and illness as deviant behavior in relation to social (organizational and occu-

pational), ecological, demographic, and cultural determinants of health and health care. Prerequisite, 110.

453 Social Factors in the Family (3)

Review and analysis of empirical research in courtship and marriage, marital adjustment, and specific areas of marriage and family life. Prerequisites, 223 and 352.

455 Housing in the American Community (3)

COHEN

Sociological considerations in housing design; housing trends in relation to major components of the population; housing and residential areas in the community context.

458 Institutional Forms and Processes (5) Sp

FARIS

The process of institutionalization and the general nature of institutions; relationship of institutions to persons; institutions and social control; social change and institutional disorganization. Prerequisites, 110, and upper-division standing.

459 Comparative Social Systems: Africa (3)

VAN DEN BERGHE

A comparative approach to the social structure of literate and nonliterate societies with special emphasis on problems of social evolution, integration, and conflict. Africa south of the Sahara will be stressed. Prerequisite, senior standing in the social sciences.

460 Social Differentiation (5) Sp

BARTH, VAN DEN BERGHE

Analysis of societal organization based on sex, age, residence, occupation, community, class, caste, and race. Prerequisite, 110.

463 American Negro Community (3) A

BARTH

Internal structure of class and caste patterns; resultant personality and institutional development. Prerequisite, 110.

465 Complex Organizations (3) A

GROSS

An examination of the structure of complex organizations. Particular attention will be given to developing generalizations applicable to industrial organizations, businesses, hospitals, prisons, labor unions, governments, universities, armies, and similar formally instituted organizations. The major focus will be on empirical research, with some attention to methodological problems in studying such organizations. Prerequisites, 15 credits in sociology.

466 Industrial Sociology (5)

Changing focus of field; contrasting types of industrial organizations; industrial organizations as social systems; problems of social systems; the individual in the organization; union-management relations and organizational dynamics. Prerequisite, 110.

467 Industry and the Community (3)

Nature of the economy. Theories of industry-community relations. Varieties and types of relations between industry and community. Process of power. Impact of technological change. Levels of worker participation in the community. Integration of industry and other communal institutions. Prerequisite, 110.

468 Sociology of Occupations and Professions (5)

BLUMSTEIN

Frameworks for study of occupations and professions; occupational structure and mobil-

ity in American society and relation to adult socialization and career development; occupational and professional associations and society. Prerequisites, 240 and 15 credits in social sciences.

472 Juvenile Delinquency (5)

AKERS, COSTNER, HIRSCHI

Factors in delinquency, juvenile courts, detention, probation. Programs of treatment and prevention. Volunteer services. Prerequisite, 371 or equivalent.

473 Corrections (5)

Social control of crime. Police, courts, institutions, and correctional agencies for adult offenders. Individual and group therapies. Captive communities. Prerequisite, 371 or equivalent.

474 Probation and Parole (3)

Probation and parole systems. Roles of judges, parole board members, and professional personnel. Criteria for parole selection. Attitudes toward probationers and parolees. Prerequisite, 473 or equivalent.

475 Problems in the Administration of Correctional Programs (3)

Correctional objectives, and relative effectiveness of alternative procedures aimed at their attainment. Participation in research designed to evaluate correctional policies. Observation of administrative methods. Prerequisites, 371 and 473, or equivalents.

481, 482, 483 Issues in Analytic Sociology (3, max. 9; 3, max. 9; 3, max. 9)

Examination of current issues in sociological analysis. The specific content of the course will vary according to recent developments in sociology and according to the interests of the instructor. Any of the sequence may be repeated with permission of the instructor. Prerequisite, permission.

496H, 497H, 498H Senior Seminar (3,3,3) A,W,Sp

Exploration of fields of sociological specialization; professional organization of sociologists; relation to other disciplines. For sociology majors only, primarily for honors students. Prerequisites, senior standing and permission.

499 Undergraduate Research (2-5, max. 15) A,W,Sp

Open only to qualified undergraduate students by permission of the instructor.

501, 502, 503 Research Frontiers in Sociology (3,3,3) A,W,Sp

LARSEN

Review and analysis of research strategic requirements and opportunities in and between major fields of sociology. Formulation of M.A. thesis prospectus. Required of all entering graduate students and restricted to this group. Must be taken in sequence.

521, 522, 523 Seminar in Methods of Sociological Research (3,3,3) W,Sp

Prerequisites, 223 and 420, or equivalents.

528 Seminar in Selected Statistical Problems in Social Research (3)

COSTNER

Prerequisite, 426.

530 Advanced Human Ecology (3)

SCHMID

Prerequisites, 330 or 430, and 15 credits in social sciences.

531 Demography (3)

SCHMID

Research problems in population and vital statistics. Prerequisites, 331 or 431 and 15 credits in social sciences, or permission.

532 Research Methods in Human Ecology (3)

LIEBERSON

Analysis of community structure, segregation, and other spatial phenomena. Measures of migration, intercity relations, and diversity. General problems of measuring ecological associations. Prerequisite, 330 or 430.

533 Research Methods in Demography (3) W

LIEBERSON, CAMPBELL

Measures of population composition, fertility, and mortality. Life table analysis, standardization procedures, population projects and estimates. Prerequisites, 331 or 431.

539 Selected Topics in Demography and Ecology (3, max. 9) Sp

LIEBERSON

Specialized problems in demography or ecology are covered; for example, migration, fertility, mortality, language, race and ethnic relations, metropolitan community. See quarterly announcement for specific problem to be covered. Prerequisite, permission of instructor.

540, 541 Seminar in Social Interaction (3,3)

BURGESS, MIYAMOTO, SCHMITT

Evaluation of studies in social interaction. Analyzes types of interaction, interaction models, and such major variables as roles, self-conception, and the influence of norms. Prerequisite, 440.

542 Seminar on Small Group Research (3)

EMERSON, LEIK, SCHMITT

Theories, methodology, and studies in the area of small group research. Covers such topics as interaction channels, group cohesion, group locomotion, and consensus in groups. Prerequisite, permission for nonmajors.

543 Communications Seminar (3)

LARSEN

Sociological research in mass communication. Emphasis on the role of groups in providing norms and networks in the flow of information and influence from the mass media. Prerequisite, 443 or equivalent.

544 Seminar on Social Power (3)

EMERSON

An examination of basic principles concerning power, influence, and authority in small groups, organizations, and communities. Prerequisites, 240, 415, and 460.

550, 551, 552 Marriage and the Family (3,3,3)

Analysis of marriage and family patterns and problems, with initial emphasis on research findings and methods. Individual research on selected projects. Prerequisites, 352 and 453, or equivalents.

562 Seminar in Comparative Race Relations (3)

VAN DEN BERGHE

A cross-cultural approach to race and ethnic relations, including case studies from Africa and Latin America. Prerequisite, graduate standing in social sciences.

566, 567 Seminar in Complex Organizations (3,3) W,Sp

GROSS

Research training in industrial sociology. Readings and field projects. Prerequisite, 465 or equivalent.

569 Social and Cultural Change: Africa (3)
OTTENBERG, VAN DEN BERGHE, WINANS

Urbanization, stratification, technology, education, social and religious movements, and cultural pluralism in contemporary Africa. Offered jointly with the Department of Anthropology as Anthropology 569. Prerequisite, graduate standing in a social science department.

571 Correctional Communities (3) Sp
SCHRAG

Prisons and juvenile reformatories as communities. Prerequisites, 371 and 473.

572 Analysis of Criminal Careers (3)

Personal and social factors in criminal maturation and reformation. Prerequisites, 371 and 473, or equivalents.

573 Crime Prevention (3)

Critical consideration of programs for delinquency prevention. Prerequisites, 371 and 472.

574 Seminar in Methods of Criminological Research (3) W
SCHRAG

Provides training in the technical analysis of published research in criminology; designs and processes studies in parole prediction, prediction of prison adjustment, and prediction of treatment effect.

581, 582, 583 Special Topics in Sociology (3,3,3) A,W,Sp

Examination of current substantive topics in sociology. The specific content of the seminar will vary according to recent developments in sociology and according to the interests of the instructor. May be repeated for credit with the permission of the instructor.

591, 592, 593 Practicum in Sociological Research (2,2,2)

Direct research experience under the tutelage of a faculty member on a current faculty research project. The practicum is intended to complement lecture courses in methodology by permitting the student to participate in actual projects beginning at the planning stage. Required of all second-year graduate fellows, open to all second-year students in sociology.

599 Reading in Selected Fields (1-6, max. 24) AWSp

Open only to qualified graduate students by permission.

600 Independent Study or Research (2-5) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

SPANISH—See Romance Languages and Literature

SPEECH

Courses for Undergraduates

GENERAL

102 Speech, Man, and Society (5) AWSp

An introduction to the study of speech communication, the semantic and physical bases of speech, speech in the life of the individual and society, the impeding and facilitating of communication.

103 Basic Principles of Oral Communication (5) AWSp

Training in the fundamentals of good speech, especially orderly thinking, emotional adjustment, use of language, and manner of presentation. Emphasis on interpersonal communication, oral composition, and informal speaking to a group. Frequent conferences with instructor. (Formerly Speech 100.)

203 Principles of Oral Communication (3) AWSp

A course in the fundamentals of speaking designed to meet the speech needs of elementary and secondary teachers and intended mainly for teacher candidates. Required for the Provisional Teaching Certificate. Speech 103 may be substituted, but credit may not be received for both Speech 103 and 203. (Formerly Speech 101.)

400 Theoretical Backgrounds in Speech (3) W
BURKS

Speech as a form of individual and social behavior. The study of speech seen in historical perspective.

499 Undergraduate Research (1-5, max. 15) AWSp

Prerequisite, permission.

Courses for Graduates Only

500 Departmental Seminar (0) AWSp

Reports of research by graduate students and staff members.

501 Introduction to Graduate Study in Speech (3) A
CROWELL

590 Seminar in Theory of Speech (2, max. 6) A

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

RHETORIC AND PUBLIC ADDRESS

Courses for Undergraduates

220 Introduction to Public Speaking (5) AWSp

BOSMAJIAN

A beginning course in persuasive speaking, emphasizing choice and organization of material, sound reasoning, audience analysis, oral style, and delivery. Frequent speeches before the class, followed by conferences with instructor. Not open to students who earned credit for Speech 120 prior to Autumn Quarter, 1961. Special section for honors students offered Autumn Quarter only.

222 Speech in a Free Society (3) W
BOSMAJIAN

Examination of problems and arguments related to freedom of speech; early English writers on freedom of expression; background of freedom of speech in the United States; contemporary freedom of speech issues.

230 Essentials of Argument (5) AWSp

DOUGLAS, MORTENSEN

Argument as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking.

235 Parliamentary Procedure (3) A
BOSMAJIAN

Principles and practice: a study of the historical bases and contemporary uses of parliamentary procedure; methods and practice in organizing and conducting public meetings.

260 Radio-TV Speech (3) AWSp
BIRD, HOGAN

The development and practice of speech techniques in radio and television broadcasting. Three lecture and discussion periods and two one-hour laboratory periods each week.

320 Public Speaking (5) A
BURKS

Practice in preparation and presentation of a variety of types of public speeches based on study of their structure and form; emphasis on organization and delivery. Prerequisite, Speech 103 or 220, or permission.

327 Extempore Speaking (3) Sp

Not open to speech majors or students who have taken Speech 220 or 320.

329 Rhetoric of Social and Political Movements (5) Sp
BOSMAJIAN

Inquiry into the rhetoric of social and political movements; emphasis on investigation of persuasive discourse; also an examination of the nonverbal symbols of persuasion. (Formerly Speech 429.)

335 Methods of Debate (3) W
DOUGLAS

Introduction to debate as a method of advocacy with study and practice of its more important forms. Concurrent registration in Speech 339 not permitted. Prerequisite, Speech 220 or 230, or permission.

339 Forensic Studies (1-3, max. 9) AWSp
DOUGLAS

Discussion of selected public questions before audiences on and off campus. No more than 3 credits may be earned in one year, and these should normally be distributed through at least two consecutive quarters. The student should confer with the director before completing registration. Prerequisite, permission.

361 Advanced Radio-TV Speech (3) W
BIRD, HOGAN

Analysis of audience situations, group discussions, and audience participation programs. Prerequisite, Speech 260 or permission.

373 Principles of Group Discussion (5) AWSp
CROWELL

Discussion as an everyday community activity, with emphasis on the informal cooperative problem-solving methods of committee, conference, and round-table groups. Prerequisite, Speech 103 or 230, or permission. (Formerly Speech 332.)

421 Advanced Speech Composition (5) W
BASKERVILLE, BURKS

Preparation and delivery of longer public speeches. Emphasis on style, thought organization, and proof. Analysis of model speeches. Prerequisite, Speech 220 or permission. (Formerly Speech 420.)

425, 426 American Public Address (5,5) A,Sp
BASKERVILLE

Historical and critical study of principal speakers and speeches and of their relation-

ship to American political, social, and intellectual life. A lecture, discussion, and reading course. 425: Revolutionary period to late nineteenth century; 426: late nineteenth century to the present.

428 British Public Address (5) W CROWELL

Historical and critical study of principal speakers and speeches and of their relationship to British political and social life. Rhetorical analysis of speeches.

473 Problems of Discussion Leadership (3) Sp CROWELL

A critical analysis of leadership in committee and conference, with emphasis on the development of speech effectiveness in the cooperative achievement of goals. Prerequisite, Speech 373. (Formerly Speech 432.)

Courses for Graduates Only

521 Studies in Greek and Roman Rhetoric (5) A BURKS

Critical analysis of writings on rhetoric by Plato, Aristotle, Cicero, Quintilian, and others. (Formerly Speech 423.)

522 Studies in Medieval and Renaissance Rhetoric (5) W

A critical analysis of selected persons, works, and topics related to the development of rhetorical theory during the Middle Ages and the Renaissance. Prerequisite, Speech 521. (Offered alternate years; not offered 1970-71.)

523 Studies in Modern Rhetoric (5) Sp NILSEN

Critical analysis of writings on rhetoric by Cox, Wilson, Bacon, Campbell, Blair, Whately, and others. Not open to students who received credit for Speech 522 prior to Spring Quarter, 1957. (Offered alternate years; not offered 1971-72.)

524 Studies in Contemporary Rhetoric (3) Sp NILSEN

Critical analysis of recent developments in and contributions to rhetorical thought. (Offered alternate years; not offered 1970-71.)

525 Rhetorical Criticism (3 or 5) W BASKERVILLE

The history and method of rhetorical criticism. Application of critical standards to notable British and American speeches. Prerequisites, Speech 425, 426, or 428.

592 Seminar in Rhetoric and Public Address (2, max. 6) W

593 Seminar in Argument and Discussion (2, max. 6) Sp

ORAL INTERPRETATION OF LITERATURE

Courses for Undergraduates

140 Oral Interpretation (5) AWSp WEYBRIGHT

Development and use of fundamental techniques for analysis and reading aloud of prose and poetry.

240 Critical Approaches to Oral Interpretation (3) W

A course relating oral interpretation performance and literary criticism. Critical study and performance of contemporary verse, prose,

and drama. Prerequisite, Speech 140 or permission.

345 Ensemble Oral Interpretation (3) Sp WEYBRIGHT

The focus of this course is upon the study of the potentials for ensemble oral interpretation in the three major genres of imaginative works of literature. It includes study in the theory and techniques of Chamber Theatre and Readers Theatre. Prerequisite, Speech 140 or permission. (Offered alternate years; not offered 1970-71.)

347 Oral Interpretation of Nonfiction Prose (3) Sp

A study of stylistic, literary, and rhetorical strategies in nonfiction prose texts from the point of view of the oral interpreter. Materials will be selected from histories, biographies, autobiographies, speeches, essays, travel literature, letters, journals, and diaries. Prerequisite, Speech 140 or permission. (Offered alternate years; not offered 1971-72.)

349 Readers Theatre (2, max. 10) AWSp POST

Presentation of literature before audiences on and off campus. Prerequisites, Speech 140 and permission.

440 Oral Interpretation of Poetry (3) W

Problems of interpretation pertaining to oral presentation of various types of poetry. Prerequisite, Speech 140.

442 Oral Interpretation of Fiction (3) A Study of fiction for purposes of developing understanding and appreciation of the literature, and ability to communicate its meanings to an audience. Prerequisite, Speech 140. (Formerly Speech 340.)

444 Oral Interpretation of Modern Dramatic Literature (3) Sp

Study of dramatic literature from Ibsen to the present, for purposes of developing understanding, appreciation, and ability to communicate its meaning. Prerequisite, Speech 140.

Courses for Graduates Only

540 Studies in Oral Interpretation (3) A Critical analysis of writings by Sheridan, Walker, Rush, Delsarte, Bell, Curry, Emerson, and others. Prerequisite, Speech 440. (Offered alternate years; not offered 1970-71.)

543 Studies in Theories of Performance and Criticism (3) W

Analysis of performance theories as expressed in the writings of oral interpreters and literary critics.

594 Seminar in Oral Interpretation (2, max. 6) Sp

SPEECH-COMMUNICATION SCIENCE

Courses for Undergraduates

270 Introduction to Speech-Communication Science (5) A MORTENSEN, STEPHENSON

Basic research principles in Speech-Communication Science; survey of substantive research findings. Prerequisite, Speech 103.

471 Persuasion (3) Sp MORTENSEN, STEPHENSON

Analysis of the ways in which beliefs, values, attitudes, and behavior are deliberately in-

fluenced through communication. (Formerly Speech 421.)

472 Speech-Communication and Interpersonal Influence (5) W MORTENSEN, STEPHENSON

Source, message, channel, and receiver variables as determinants of communication effects. Examination of major theoretic positions underlying current speech-communication literature in interpersonal influence. (Formerly Speech 402.)

474 Experimental Methods in Speech-Communication (3) Sp MORTENSEN, STEPHENSON

Application of behavioral research principles to problems in quantification, design, and analysis of data in speech-communication research. Prerequisite, introductory statistics or equivalent, or permission. (Formerly Speech 404.)

476 Speech-Communication: Behavioral Models and Theories (3) A MORTENSEN, STEPHENSON

Examination of selected theories and communication models from the behavioral sciences. Emphasis on application of theory to problems of hypothesis testing in empirical research in speech behavior. Prerequisite, permission. (Formerly Speech 406.)

Courses for Graduates Only

570 Experimental Problems in Public Address (3-5) W

Analysis of theoretical considerations in audience and listening behavior; application of measurement techniques. (Formerly Speech 530.)

597 Seminar in Interpersonal Communications (2, max. 6) Sp

Examination of experimental literature on selected topics. Subjects to change from year to year, including conflict resolution, information processing, communication networks, feedback systems, audience composition research, communication effects. (Formerly Speech 596.)

SPEECH EDUCATION

Courses for Undergraduates

355 Speech in the Elementary Classroom (3) Sp FEEZEL

Designed for prospective or current public school teachers in the primary or elementary grades. Recognizes oral communication as both a means of teaching and learning and as an essential object of instruction in any discipline. Special attention to instructional communication theory, language development, student-centered curriculum, speech activities. Prerequisites, junior standing and Education 288. (Formerly Speech 359.)

356 Speech in the Secondary Classroom (3) W FEEZEL

Designed for prospective or current teachers in the secondary schools. Recognizes oral communication as both a means of teaching and learning and as an essential object of instruction in any discipline. Special attention to instructional communication theory, student-centered curriculum, speech activities, oral questioning process. Not open to speech majors. Prerequisites, junior standing and Education 288. (Formerly Speech 359.)

457 Debate and Discussion Problems in High School and College (2½) S
DOUGLAS

Evaluation of debate and discussion in high school and college and consideration of methods of directing; specific consideration of debate questions in current use; bibliographies, analyses, and briefs.

Courses for Graduates Only

550 Studies in Speech Education (3) A
Philosophical, curricular, and methodological problems of speech instruction. (Offered alternate years; not offered 1971-72.)

595 Seminar in the Teaching of Speech (2, max. 6) A
(Offered alternate years; not offered 1970-71.)

SPEECH AND HEARING SCIENCES

Courses for Undergraduates

100 Voice and Articulation: Theory and Applications (2) AWSp
Elementary voice and articulation theory and applications to problems of diction, voice quality, power, and variety. Additional lab hour each week will be arranged. Special laboratory sections open to students with significant dialect problems. (Formerly Speech 110, later Speech and Hearing Sciences 100.)

101 Applied Phonetics (2) AWSp
Basic phonetic theory and applications to problems of reading, language and speech teaching and to understanding of personal articulatory problems. Additional laboratory hour each week will be arranged. (Formerly Speech 111, later Speech and Hearing Sciences 101.)

300 Speech Science (5) AWSp
TIFFANY, BENNETT
Study of the basic physiological and acoustical attributes of speech production and reception as these phenomena occur against the background of language structure. (Formerly Speech 310, later Speech and Hearing Sciences 300.)

301 Anatomy of the Speech Mechanism (5) ASp
PALMER
Structure and function of the organs concerned with phonation and articulation. (Formerly Speech 311, later Speech and Hearing Sciences 301.)

302 General Phonetics (5) AWSp
BENNETT
Phonetic and phonemic analysis of the sound system of the English language with special application to the problems of speech improvement and speech correction. (Formerly Speech 312, later Speech and Hearing Sciences 302.)

303 Speech and Language Development (3) Sp
Study of the normal acquisition of speech and language in children. (Formerly Speech 476, later Speech and Hearing Sciences 303.)

414 Articulatory Phonetics (3) A
BENNETT
Study of the physiological parameters of speech production. Prerequisites, Speech 300, or 301 and 302, or permission. (Formerly Speech and Hearing Sciences 414.)

415 Acoustic Phonetics (3) W
TIFFANY
Study of the acoustical parameters of the speech signal, with special emphasis on spectrographic analysis of speech. Prerequisites, Speech 300, or 301 and 302, or permission. (Formerly Speech and Hearing Sciences 415.)

416 Perceptual Phonetics (3) Sp
TIFFANY, BENNETT
Study of the perceptual and linguistic parameters of speech reception. Prerequisites, Speech 300, or 301 and 302, or permission. (Formerly Speech and Hearing Sciences 416.)

420 Instrumentation for Speech and Hearing Science (3) A
WALTON
General problems in design and application of electronic equipment used in the speech and hearing sciences. Laboratory problems and demonstrations. (Formerly Speech 418, later Speech and Hearing Sciences 420.)

Courses for Graduates Only

502 Advanced Anatomy of Speech and Hearing Structures (3) AWSp
PALMER
Directed individual dissection and study of selected anatomic structures of the speech or hearing mechanisms. (Formerly Speech 511, later Speech and Hearing Sciences 502.)

503 Experimental Phonetics (3) Sp
TIFFANY
Application of experimental methods to research in voice and phonetics; critical review of research literature. (Formerly Speech 510, later Speech and Hearing Sciences 503.)

504, 505 Research Methods in Speech and Hearing Science (3,3) A,W
PRATHER
504: Introduction to empirical methods in the speech and hearing sciences. 505: Applications of basic statistical procedures to investigation of specific problems in the communication sciences. Prerequisite for 504, Psychology 301 or equivalent. (504 formerly Speech 502, later Speech and Hearing Sciences 500; 505 formerly Speech 503, later Speech and Hearing Sciences 501.)

519 Seminar in Speech Science (2, max. 6) Sp
(Formerly Speech 591, later Speech and Hearing Sciences 519.)

520 Advanced Instrumentation for Speech and Hearing Science (3) W
WALTON
Design and use of electronic and electroacoustic devices in the speech and hearing sciences. Laboratory construction and calibration of equipment. Prerequisite, Speech 420. (Formerly Speech 518, later Speech and Hearing Sciences 520.)

526 Physiological Acoustics (3) W
YANTIS
Study of pertinent literature and experimental techniques incident to the scientific study of the normal and abnormal auditory system. (Formerly Speech 581, later Speech and Hearing Sciences 521.)

527 Psychoacoustics (3) Sp
YANTIS
Review of instrumentation, research techniques, and significant literature pertinent to normal auditory sensitivity, pitch, loudness, and other attributes of auditory sensation. (Formerly Speech 582, later Speech and Hearing Sciences 522.)

SPEECH PATHOLOGY

Courses for Undergraduates

150 Directed Observation—Speech and Hearing Therapy (1) AWSp
HELMICK
For premajors desiring general orientation in speech and hearing rehabilitation. (Formerly Speech 170, later Speech and Hearing Sciences 150.)

330 Speech Disorders (5) A
CARRELL
Nature and etiology of disorders of speech, with emphasis on developmental and functional disorders. Prerequisite, Speech 301. (Formerly Speech 370, later Speech and Hearing Sciences 330.)

331 Speech Disorders (5) W
CARRELL
Dysphasia, dysarthria, dysphonia, and dysglossia. Prerequisite, Speech 330, except by permission. (Formerly Speech 371, later Speech and Hearing Sciences 331.)

332 Diagnosis of Speech Disorders (3) Sp
Prerequisite, Speech 331. (Formerly Speech 373, later Speech and Hearing Sciences 332.)

348 Survey of Communication Disorders (3) A
For students not intending to major in speech pathology or audiology. (Formerly Speech 379, later Speech and Hearing Sciences 349.)

350 Methods of Clinical Management (3) ASp
MINER
Techniques and procedures for planning effective management of speech disorders. Prerequisite, Speech 331, which may be taken concurrently. (Formerly Speech 372, later Speech and Hearing Sciences 350.)

351 Practicum in Speech Pathology (1-5, max. 15) AWSp
MINER
Total undergraduate credits in 351 and 391 together cannot exceed 20 credits. Prerequisites, Speech 332, 350, and permission. (Formerly Speech 374, later Speech and Hearing Sciences 351.)

430 Stuttering (3) Sp
PRINS
Nature, etiology, and treatment of stuttering. Prerequisite, Speech 330 or permission. (Formerly Speech 475, later Speech and Hearing Sciences 430.)

449 Special Studies in Speech Pathology and Audiology (1-5, max. 15)
Intensive study of selected special problems in speech pathology and audiology. Prerequisite, permission. (Formerly Speech 497, later Speech and Hearing Sciences 449.)

450 Stuttering Therapy (2) A
PRINS
Prerequisite, Speech 430 or permission. (Formerly Speech 477, later Speech and Hearing Sciences 450.)

451 Interview Techniques for Speech and Hearing Rehabilitation (3)
(Formerly Speech 478, later Speech and Hearing Sciences 451.)

452 Physical Medicine and Rehabilitation Information in Speech Pathology (3) A
Orientation information for speech pathology students on rehabilitation principles and tech-

niques. Offered jointly with the Department of Physical Medicine and Rehabilitation as Physical Medicine and Rehabilitation 479. (Formerly Speech 479J, later Speech and Hearing Sciences 452.)

Courses for Graduates Only

530, 531, 532, 533 Organic Disorders of Speech (3,3,3,3) W,W,Sp,A
Etymology, diagnosis, and therapy. 530: Morphogenic disorders, especially cleft palate and dental malocclusions. 531: Dysarthria, especially cerebral palsy. 532: Dysphasia. 533: Pathologic disorders of voice. Prerequisite for each course, 331 or permission; Psychology 421 prerequisite for 531. (Formerly Speech 570, 571, 572, 573, later Speech and Hearing Sciences 530, 531, 532, 533.)

534 Communication Disorders in Mental Retardation and Neurological Impairment (3) A
KUNZE
Theory, diagnosis, and therapy of the communication problems of mentally retarded and neurologically impaired children. (Formerly Speech 576, later Speech and Hearing Sciences 534.)

535 Psychological Factors in Communication Disorders (2) W
Prerequisite, Psychology 305 or permission. (Formerly Speech 578, later Speech and Hearing Sciences 535.)

536 Advanced Diagnostic Procedures in Speech Pathology (4) A
PALMER
A study of approaches to differential diagnosis in speech and language disorders, as well as experience in the integration of information gained from various diagnostic procedures. Two hours of laboratory required per week. Prerequisite, Speech 332, or permission. (Formerly Speech and Hearing Sciences 536.)

551 Advanced Practicum in Speech Pathology (1-5, max. 10) AWSp
MINER
Prerequisites, 351 or equivalent, and permission. (Formerly Speech 574, later Speech and Hearing Sciences 551.)

569 Seminar in Speech Pathology (2, max. 6) W
(Formerly Speech 597, later Speech and Hearing Sciences 569.)

AUDIOLOGY

Courses for Undergraduates

370 Introduction to Audiology (5) A
Description of normal audition; elementary structure and function of the hearing mechanism; types of deficient hearing and their effects on speech. (Formerly Speech 380, later Speech and Hearing Sciences 370.)

371 Basic Audiometry (3) W
Introduction to the theory and practice of the assessment of hearing function. Prerequisite, Speech 370 or permission. (Formerly Speech 387, later Speech and Hearing Sciences 371.)

390 Introduction to Aural Rehabilitation (5) W
WILSON
Psychological and educational implications of hearing loss; principles and methods of

speech reading, auditory training, and speech conservation. Prerequisite, Speech 370. (Formerly Speech 381, later Speech and Hearing Sciences 390.)

391 Practicum in Audiology (1-5, max. 15) AWSp
WILSON
Total undergraduate credits in 351 and 391 together cannot exceed 20 credits. Prerequisites, Speech 350, 390, and permission. (Formerly Speech 384, later Speech and Hearing Sciences 391.)

470 Medical Background for Audiology (2) Sp
Diseases and injuries of the ear resulting in reduced audition. Prerequisite, Speech 370 or permission. (Formerly Speech 485, later Speech and Hearing Sciences 470.)

475 Speech Audiometry (3) Sp
THOMPSON
Evaluation of auditory function using speech as a stimulus. Implications in differential diagnosis and aural rehabilitation. Prerequisite, Speech 371. (Formerly Speech 487, later Speech and Hearing Sciences 471.)

490 The Teaching of Speech to the Deaf (6)
LOWENBRAUN
Study of principles and techniques used in developing the formation of English sounds by the analytical method; introduction of speech by the whole-word method; major emphasis on development of speech in the preschool and school-age deaf child. Offered jointly with the College of Education as Special Education (EDSPE) 430. Prerequisite, permission. (Formerly Speech 409FJ, later Speech and Hearing Sciences 490.)

491 The Teaching of Language to the Deaf (6)
LOWENBRAUN
Study of principles and techniques of teaching language to the preschool and school-age deaf child. Leading systems of teaching language to the deaf will be reviewed and a step-by-step development of at least one language system will be covered. Offered jointly with the College of Education as Special Education (EDSPE) 431. Prerequisite, permission. (Formerly Speech 409GJ, later Speech and Hearing Sciences 491.)

492 Advanced Aural Rehabilitation (5) Sp
WILSON
Survey and study of the pertinent research literature in speech reading, auditory training, and speech conservation for the auditorially handicapped. Prerequisite, Speech 390 or permission. (Formerly Speech 482, later Speech and Hearing Sciences 492.)

493 Hearing Aid Amplification (3) A
Study of acoustic amplification and pertinent audiologic techniques. Prerequisite, Speech 471 or permission. (Formerly Speech 488, later Speech and Hearing Sciences 493.)

Courses for Graduates Only

570 Advanced Audiology (5) A
YANTIS
Methods, techniques, and instruments used in the measurement of auditory function. Review of research literature. Prerequisite, 471 or permission. (Formerly Speech 580, later Speech and Hearing Sciences 570.)

571, 572, 573 Advanced Audiometry (3,3,3) A,W,Sp
Special diagnostic and predictive techniques for assessment of auditory function. 571: Techniques of objective audiometry and evaluation of nonorganic hearing problems. 572: Functional evaluation of the cochlear end organ. 573: Functional evaluation of the retrocochlear and central auditory systems. Prerequisite for each course, 570. (Formerly Speech 587, 588, 589, later Speech and Hearing Sciences 571, 572, 573.)

591 Advanced Practicum in Audiology (1-5, max. 10) AWSp
WILSON
Prerequisites, 391 or equivalent, 570, and permission. (Formerly Speech 584, later Speech and Hearing Sciences 591.)

599 Seminar in Audiology (2, max. 6) Sp
(Formerly Speech 598, later Speech and Hearing Sciences 599.)

SWEDISH—See *Scandinavian Languages and Literature*

TAMIL—See *Asian Languages and Literature*

THAI—See *Asian Languages and Literature*

TIBETAN—See *Asian Languages and Literature*

VIETNAMESE—See *Asian Languages and Literature*

ZOOLOGY

Courses for Undergraduates

111-112 General Zoology (5-5) AWS,WSpS
BALL, CLONEY, EDWARDS, FARNER, GRIFFITHS, OSTERUD
Introduction to general principles of zoology and to major groups of animals. 111: cell structure and function; mitosis; principles of embryology; invertebrate phyla through echinoderms. -112: annelids, mollusks, arthropods and chordates; gametogenesis and genetics; speciation and evolution; ecology. Intended primarily for majors and preprofessional students. Prerequisites, Chemistry 150 for 111-; 111- for -112.

114 Evolution (2) S
General survey of evolution of animals, including man. For nonmajors.

118 Survey of Physiology (5) A
MARTIN
Elementary human physiology. For nonmajors. Credit will not be given for 118 if credit previously has been given for Zoology 208.

119 Elementary Physiology Laboratory (1) A
MARTIN
Specifically for physical education majors. May be taken by others only with permission. Prerequisite, 118 concurrently. (Formerly 118L.)

208 Elementary Human Physiology (5) Sp
GRIFFITHS
Each organ system is described and its function illustrated in the laboratory. Prerequisites, two quarters of college chemistry, two quarters college biological sciences completed or in progress, or permission. Credit will not be

given for 208 if credit has previously been given for Zoology 118.

301 Introductory Physiology (3) A
EDWARDS, WHITELEY

Fundamentals of physiology: biochemistry of cell constituents, environment of the cell, bioenergetics, intermediary metabolism, membranes, control mechanisms. Prerequisites, chemistry through organic, one year of college physics, 10 credits in biological sciences.

330 Natural History of Marine Invertebrates (5) Sp
KOHN, PAINE

A field and laboratory course emphasizing the habits, habitats, adaptations, and interrelationships of marine animals.

331 Natural History of Freshwater Invertebrates (5) S

A laboratory and field course dealing with the occurrence, distribution, and ecological relationships of common freshwater invertebrates. Prerequisite, 15 credits in biological sciences or permission.

362 Natural History of Vertebrates (5) Sp
PAULSON

A field and laboratory course on the classification, ecology, and behavior of fishes, amphibians, reptiles, birds, and mammals. Prerequisite, permission.

402 History of Zoology (3) A
Prerequisite, 20 credits in zoology or permission.

403 Comparative Vertebrate Histology (5) Sp
CLONEY

Microscopic anatomy of the tissues and organs of vertebrates. Prerequisite, -112 or Biology 212.

409 Ethology (3) W
ORIAN

Perception, nervous integration, movement, motivation, instinct, learning, and social behavior in animals, with emphasis upon their evolution and selective significance. Prerequisite, permission.

410 Ethology Laboratory (1-4) Sp
ORIAN

Experiments with orientation, motivation, learning, and social behavior in animals, including special student research problems. Prerequisite, permission. (Formerly 409L.)

423 Protozoology (5) Sp
OSTERUD

Introduction to protozoa exclusive of parasites, with emphasis on morphology (including fine structure and function), ecology, taxonomy, and life histories. Prerequisite, 20 credits in biological sciences or permission; Biology 401 recommended.

428 General Physiology of Excitable Tissues (5) W

Simple and complex ionic equilibria, electrical properties of membranes; active and passive membrane responses. Impulse generation and conduction; electrical and chemical synapses; structure of muscle, and mechanical, thermal, chemical, and electrical aspects of contraction. Prerequisite, 301.

432 Marine Invertebrate Zoology (8) S

Morphology and phylogeny of marine invertebrates. (Offered at Friday Harbor Laboratories.) Not open to students who have had 433, 434. Prerequisite, -112 or Biology 212.

433, 434 Invertebrate Zoology (5,5) W,Sp

KOHN, ILLG, KOZLOFF
Morphology and phylogeny of invertebrates exclusive of terrestrial arthropods. Not open to students who have had 432. Prerequisite, -112 or Biology 212.

435 Parasitology (5) A
OSTERUD

A general course covering the principles of parasitism and the major groups of animal parasites. Prerequisite, 20 credits in biological sciences or permission.

438 Comparative Endocrinology (3) W
GORBMAN

Hormonal integration of living processes at all levels in animals: cells, organs, organisms, populations. Prerequisites, one year of zoology and permission; histology and organic chemistry recommended.

439 Comparative Endocrinology Laboratory (2) W
GORBMAN

Appropriate experiments to accompany and enlarge on material presented in 438. Prerequisites, 438 and permission.

444 Entomology (5) Sp

Structure, classification, and economic relationships of insects. Prerequisite, 15 credits in biological sciences or permission.

453-454 Comparative Anatomy of Chordates (5-5) A,W
SNYDER

Phylogeny of the chordates; structure, function, and evolution of vertebrate organ systems. Prerequisite, -112 or Biology 212.

456 Developmental Biology of Animals (5) ASp

BALL, CAHN, FERNALD
Introduction to properties and experimental analysis of developing systems, and a descriptive and comparative study of development with emphasis on chordates. The Autumn Quarter course emphasizes descriptive and comparative analysis. The Spring Quarter course emphasizes experimental aspects and the use of live material in the laboratory. Prerequisite, Biology 212 or Zoology -112, prior completion of Zoology 301 recommended for the Spring Quarter course.

457 Methods and Problems in Development (3) Sp
BALL, CAHN

Lecture course in experimental embryology focusing on modern approaches to developmental problems and emphasizing their analysis at a biochemical level. Selected topics will be covered in two lectures each week. Readings from primary sources will be assigned in conjunction with lecture material, to be discussed in a discussion section once weekly. Prerequisites, 456 and permission.

458 Vertebrate Physiology (5) W
FARNER, JOHANSEN, MARTIN

Emphasis on the physiology of nonmammalian vertebrates' major functions and organ systems viewed extensively from ecologic and evolutionary aspects. Special attention will be given to respiration, circulation, excretion, locomotion, energy metabolism, seasonal adaptation. Prerequisite, 301.

459 Laboratory in Development (2) Sp
BALL, CAHN

An analysis of developmental problems using

several experimental approaches. Exercises will include tissue culture and transplantation experiments, and use of biochemical approaches to characterize embryonic development. Prerequisites, concurrent registration in 457 and permission.

464 Natural History of Birds (5) Sp
RICHARDSON

A lecture, laboratory, and field course. (Alternates with 465.) Prerequisites, -112 or Biology 212, and permission.

465 Natural History of Mammals (5) Sp
RICHARDSON

A lecture, laboratory, and field course. (Offered alternate years.) Prerequisites, -112 or Biology 212, and permission.

468 Comparative Physiology (5) Sp
EDWARDS, MARTIN, OLSEN

Osmotic and ionic regulation, respiration, circulation, and excretion, with special emphasis on the variety of means with which animals solve common problems. Prerequisite, 301. (Offered alternate years; offered 1970-71.)

470 Concepts and Issues (5) A
RAY

Zoological concepts, their current and potential applications to cultural dilemmas and frontiers. Prerequisite, advanced standing.

475 Zoogeography (3) W
RICHARDSON

Studies of the present distribution of terrestrial vertebrates and how it has come about, especially in relation to environment, evolution, and dispersal. Prerequisites, -112 or equivalent, and one additional course involving some study of vertebrate classification, or permission.

490 Undergraduate Seminar (3, max. 6)

Supervised reading and group discussion on selected concepts of zoology. Prerequisites, 20 credits in zoology and permission.

491 Topics in Zoological Research (1, max. 3) A

Undergraduate seminar on research problems currently under investigation by department faculty members. Includes discussions and laboratory demonstrations of aims, techniques, and results of zoological research. Prerequisites, upper-division standing and permission.

498 Special Problems in Zoology (1-5, max. 15) AWSp

Prerequisites, 30 credits in zoology and permission.

Courses for Graduates Only

506 Topics in Experimental Embryology (2, max. 6) A

Seminars and discussions of aspects of growth of special current interest. Prerequisite, permission.

517 Comparative Developmental Physiology (6) Sp
WHITELEY

The topics of oögenesis, fertilization, and differentiation of invertebrates will be considered from the point of view of biosyntheses, permeability, and metabolic changes, acquisition of specific biochemical properties and physical mechanisms of developmental processes. The laboratory will deal comparatively with a variety of marine invertebrates.

(Offered at Friday Harbor Laboratories.)
Prerequisite, permission.

520, 521, 522 Seminar (1,1,1) A,W,Sp

528 Advanced Topics in Physiology (1-3, max. 15) Sp

FARNER, JOHANSEN, MARTIN, OLSEN

Advanced considerations in physiology with emphasis on recent development. Prerequisite, at least one 400-level course in physiology.

533 Advanced Invertebrate Zoology (6) S

The rich and varied invertebrate fauna of the San Juan Archipelago is studied, emphasizing systematics and ecology, with opportunity for developing individual research problems. (Offered at Friday Harbor Laboratories.) Prerequisite, 10 credits in invertebrate zoology or equivalent.

534 Topics in Advanced Invertebrate Zoology (3, max. 15)

ILLG, KOHN

Advanced considerations in morphology, ecology, phylogeny of invertebrates; emphasizing current developments. Prerequisite, permission.

536 Comparative Invertebrate Embryology (6) S

Morphological and experimental studies of development of selected types of marine invertebrates. (Offered at Friday Harbor Laboratories.) Prerequisites, Zoology 433, 434, and 456.

538 Advanced Invertebrate Physiology (6) S

Physiological bases of ecology, evolution, and tolerance to stress, as illustrated by many diverse forms. (Offered at Friday Harbor Laboratories.) Prerequisites, chemistry through organic and 10 credits in invertebrate zoology, or equivalent.

554 Advanced Vertebrate Morphology (3) A

SNYDER

Current problems and trends in vertebrate anatomy emphasizing functional relationships. Prerequisites, Zoology 454, 456, and permission.

568 Chemical Integration (2, max. 6) AWSp

GORBMAN

Graduate seminar dealing with current problems in endocrinology and neuroendocrinology. Prerequisite, permission.

572 Topics in Ecology (2 or 3) W

EDMONDSON, PAINE, KOHN, ORIAN

Graduate seminar on modern problems in ecology. Prerequisites, Biology 472 or equivalent, and permission.

574 Ecology of Marine Communities (3) A

PAINE

A lecture course emphasizing the ecological structure and functioning of marine communities. Topics include population interactions and dynamics, distributional patterns, bioenergetics, stability, and species diversity. Prerequisites, Biology 472 or equivalent, and permission.

576 Environmental Marine Physiology (6) Sp

JOHANSEN

A course emphasizing the relationship of vertebrate and invertebrate physiology to physical factors in the marine environment. Instruction will be given in principles and applications of modern instrumentation for quantitative

study of animal-environment interactions. (Offered at Friday Harbor Laboratories.) Prerequisites, invertebrate and/or vertebrate zoology, one year of college physics, organic chemistry. Physiology desirable.

578 Advanced Ecology (5) A

ORIAN, PAINE

Properties of populations; population regulation; community productivity and structure, niche theory. Prerequisites, Biology 472 or equivalent, and permission.

581 Systematic Zoology (5) W

ILLG

History, principles, and procedures of zoological taxonomy; review of biological bases of phylogeny; history and principles of zoological nomenclature. Prerequisite, permission.

583 Advanced Techniques in Microscopy (5) A

CLONEY

Theory and use of light microscope, modern techniques of specimen preparation for morphological studies, photomicrography. Prerequisite, permission.

600 Independent Study or Research (*)

AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

SCHOOL AND GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

ACCOUNTING

Courses for Undergraduates

210 Fundamentals of Accounting (3)

AWSpS

Nature and social setting of accounting; uses of accounting information; introduction to basic accounting concepts, and some accounting techniques. Prerequisite, sophomore standing.

220 Fundamentals of Accounting (3)

AWSpS

Basic concepts; principles and procedures for recording business transactions; development of accounting reports. Prerequisite, 210.

230 Basic Accounting Analysis (3) AWSpS

Preparation and use of accounting information as part of the managerial processes of control, planning, and decision making. Concentrates on the use of information by those managing the business and making decisions. Prerequisite, 220.

301 Intermediate Accounting I (3) AWSpS

Concepts and principles underlying accounting. Theory and problems of financial accounting. Prerequisite, 230.

302 Intermediate Accounting II (3) AWSpS

Continuation of 301. Prerequisite, 301.

303 Advanced Accounting (3) AWSpS

Theory and problems in accounting for ownership equities in corporations and partnerships. Financial statement analysis and internal measurement of business performance. Prerequisite, 302.

311 Cost Accounting (3) AWSpS

Theory of cost accounting; accumulation and allocation of costs; managerial control through cost data. Prerequisite, 301.

371 Auditing or Industrial Internship (2) ASp

One quarter's internship with a certified public accounting firm, industrial organization, or government agency. Prerequisite, prior departmental approval.

375 Topics in Financial Reporting (4)

AWSpS

A critical examination of the uses and limitations of general purpose financial statements which have been prepared in accordance with generally accepted accounting principles. Prerequisite, 230; not open to accounting majors.

411 Auditing Standards and Principles (3) AWSpS

Establishes a framework for professional auditing; examines the problems and opportunities, the approaches and methodology in performing the attest function and in expanding the attest function in the future. Prerequisites, 303, 311.

421 Federal Income Tax (5) AWSpS

Comprehensive development of individual and corporation income tax. Prerequisite, 303 or permission.

430 Introduction to Information Systems (3) AW

Provides an understanding of the concepts of information systems sufficient to analyze business information systems; provides sufficient knowledge about electronic data processing for the student to determine how information can be automated. Prerequisites, 230 and Quantitative Methods 200.

440 Accounting Systems (3) ASp

Discusses the concepts and methodology of systems analysis and design; integrates concepts of decision theory, systems theory, traditional information systems (i.e. accounting systems) and electronic data processing techniques. Prerequisite, 430.

450 Special Tax Problems (3) AWSp

Special problems in income tax, including partnerships, estates and trusts, corporate reorganization, gift and estate taxes, basic tax research. Prerequisite, 421.

460 Advanced Cost Accounting (3) AWSp

Advanced analysis of cost and management accounting problems including standard costs; special application of advanced cost accounting techniques for management planning and control. Prerequisite, 311.

470 Case Studies in Auditing (5) WSp

Application of standards and principles to case studies in auditing, including practice case. Prerequisite, 411.

475 Administrative Controls (3) Sp

The use of the budgetary, statistical, and accounting information in planning operations and achieving planned objectives through control. Prerequisites, 230 and Quantitative Methods 201. Not open to accounting majors.

480 Fund Accounting (3) ASp

Fund and budgetary accounting as applied to governments and to institutions, such as hospitals and colleges. Prerequisite, 302.

485 Consolidated Financial Statements (3) AWSpS

Accounting for parent-subsidiary and branch relationships; mergers; foreign exchange. Prerequisite, 303.

490 Advanced Problems (3) WSp

Intensive study of accounting principles, procedures, and presentations, principally through consideration of C.P.A. problems. Prerequisites, 311, 411, 421, 480, 485.

495 Advanced Accounting Theory (3) Sp

Theory of accounting related to income measurement, assets, and equities. Prerequisites, 303 and senior standing.

499 Undergraduate Research (3, max. 9) AWSpS

Prerequisite, permission.

Courses for Graduates Only

500 Managerial Accounting (5) ASp

Covers concepts and procedures for determination and presentation of information for managerial and financial decisions. Income determination, cost analysis, and analytic reports. Interpretation, use, and limitations of accounting statements. Prerequisite, permission.

510 Concepts in Accounting Measurements (3) AW

An intensive study of accounting principles underlying financial statements, the measurement of income, the valuation of assets, and accounting for corporate stock equities. Emphasis is placed on the uses and limitations of accounting data, including analysis and interpretation of financial statements. Prerequisite, 500 or permission.

511 Concepts in Accounting Measurements (3) WSp

Covers identification and measure of attributes of resources of the firm relevant to management decisions. Flows as they relate to time, volume of activity, units of product, segments of the firm, and functional responsibility. Problems of cost and revenue forecasting for planning and control. Prerequisite, 500 or permission.

520 Seminar in Financial Accounting (3) ASp

A critical examination of alternative approach to the study and the development of accounting theory. Evaluation of selected classic contributions to accounting theory. Extensive readings and discussion of recent attempts in English-speaking countries to formulate meaningful and useful conceptual bases for accounting. Prerequisite, permission.

521 Seminar in Financial Accounting (3) W

Application of accounting theories to unresolved problems in financial accounting. Topics covered vary with the changing importance of current accounting concepts and problems. Stress is placed on developing research and writing skills along with analytic abilities. Prerequisites, 520 and permission.

522 Seminar in Cost Accounting (3) Sp

Critical examination of theories of managerial accounting. Differentiation of objectives of managerial and financial accounting; joint costs; absorption, direct, standard, and distribution costing; techniques of analysis of data, including differential cost analysis. Prerequisite, permission.

540 Seminar in International Accounting (3) A or Sp

Emergence of the international accounting problem and organizations associated with the study of the issues involved; national differences in accounting thought and practice; international standards of accounting and auditing and financial reporting. Prerequisite, permission.

570 Seminar in Auditing (3) W

Examination of the changing business environment of the auditor and the impact of these changes on auditing philosophy, objective, and methodology. The seminar focuses on the auditing of integrated information systems, the use of computers as an audit tool, and the expansion of the reporting function. Prerequisite, permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

Independent study in business administration; critical evaluation of business analysis and research methods. Effective communication of ideas is emphasized. Methods and content of independent research studies being completed by the students are subjected to critical evaluation. Prerequisites, instructor's approval of preliminary research topic outline for 571-; 571- for -572; 571-572 open only to M.B.A. nonthesis students.

592 Seminar in Administrative Controls (3) AWSpS

Examination of the uses of quantitative information for planning and control in organizations. Emphasis is placed on the role of accounting and budgets in control and on the interactions between information, decision problems, and organization. Prerequisites, 500 (or equivalent), and Administrative Theory and Organizational Behavior 550.

599 Doctoral Seminar in Accounting (3) Sp

Study and research in advanced topics of accounting. The seminar is generally concerned with unpublished areas of research, and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

ADMINISTRATIVE THEORY AND ORGANIZATIONAL BEHAVIOR

Courses for Undergraduates

301 Behavioral Science and Administration (4)

MITCHELL

An introduction to some of the fundamental research and theories of behavioral science that are particularly relevant to the study of management. Materials are presented to aid the student of management and administration in understanding the behavior of individuals and work groups.

440 Organization Theory (3) AWSpS

BUCK, BUTLER, FENN, HENNING, GARRISON, KAST, KNOWLES, KNUDSON, LE BRETON, PEERY, ROSENZWEIG, SAXBERG, SCOTT, WOODWORTH

A study of concepts of power, authority, and influence; communications, delegation and decentralization, decision and planning theory; formal organization structures, group decision making, philosophy and values in business organizations, and considerations of organization as a social issue. Prerequisite, 90 credits.

441 Advanced Organization Theory (3) Sp

GARRISON, HENNING, SAXBERG, SCOTT

Deals with current research, measuring organizational effectiveness, planning, leadership patterns, current problems, developments in related disciplines. Prerequisite, 440.

460 Human Relations in Business and Industry (4) AWSpS

BARNOWE, BELL, BUCK, FENN, FRENCH, GARRISON, KAST, KNOWLES, KNUDSON, ROSENZWEIG, SAXBERG

Develops understanding of organizational behavior, with a clinical focus on basic processes and methods involved in diagnosing human situations and in taking action; includes specific personal, social, and organizational aspects; case discussion and analysis of concepts and conceptual schemes. Prerequisite, 90 credits.

461 Two-Person Behavior in Organizational Contexts (5)

BARNOWE, BELL, FENN, FRENCH, GARRISON, KNOWLES

Clinical examination of those behavioral skills and processes that are most basic in the development of effective individual behavior in business and other organizational contexts. Emphasis on clinical practice in developing: (1) self-awareness; (2) skills and processes in face-to-face communication and interaction; and, (3) structuring effective interpersonal relationships in organizational contexts. Prerequisites, 460 or permission, and senior standing.

463 Administrative Behavior (4) W

BARNOWE, BELL, FENN, FRENCH, GARRISON, KNOWLES, SAXBERG

Practice and theory in formal organizations studied through selected readings and actual cases. Emphasizes the superior-subordinate relationship at all levels. Considers the administrator's frame of reference, communication in organizations, motivation, informal organization, situational and environmental aspects, and administrative controls. Prerequisite, either Administrative Theory and Organizational Behavior 460 or Personnel 301 or 310.

499 Undergraduate Research (3, max. 9) AWSpS

Prerequisite, permission.

Courses for Graduates Only

500 Human Relations—Organizational Behavior (3) AW

FENN, FRENCH, GARRISON, KNOWLES, KNUDSON, MITCHELL, SCOTT, SUTHERMEISTER, WOODWORTH

Analytically examines basic clinical processes related to diagnosing organizational behavior and taking action, and such aspects as individual and group behavior, basic human relations skills, behavioral processes, and the effects of organizational systems and processes on human organization. Prerequisite, permission.

550 Organization and Management (3) AWSpS

BUCK, FRENCH, GARRISON, HENNING, KAST, KNOWLES, KNUDSON, LE BRETON, ROSENZWEIG, SAXBERG, SCOTT, SUMMER, WOODWORTH

Studies concepts of power, authority and influence, objectives and goals, decision making and planning, communication, delegation and decentralization, leadership and motivation, and considerations of values, social issues, and future trends in organization. Research and theories in other fields, such as behavioral science and economics, will be related to business organization and management theory. Prerequisite, permission.

565 Seminar in Comparative Administrative Theory (3) AWSpS

KAST, LE BRETON, SAXBERG, SCOTT

An evaluation of the various approaches to the study of administration. A theoretical and historical point of view taken. Each approach to the study is analyzed independently, and also related to a general theory. Prerequisite, permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

575 Human Aspects of Administration (3) AWSpS

BARNOWE, FENN, KAST, KNOWLES, KNUDSON, SUTERMEISTER

Examines administration process with a primary focus on organizational behavior. Develops the basic contributions of social science and other sources in the formulation of administrative-organizational conceptual schemes. Critically evaluates administrative theory in relation to administrative practice. Prerequisite, permission.

576 Human Aspects of Administration (3)

BARNOWE, BELL, BUCK, FENN, GARRISON, HENNING, KNOWLES, KNUDSON, LUND, SAXBERG, SCOTT

Develops in depth some of the basic contributions to administrative theory and practice made by past and current research, thought, and experience. Typically examines several major research studies, drawing on findings from psychology, sociology, social and cultural anthropology, business administration, government, and other sources. Prerequisite, permission.

580 Planning and Decision Theory (3) AWSpS

BELL, EBERT, KAST, LE BRETON, ROSENZWEIG, SCOTT

Development of a theory of planning, including foundation for theory, process of planning, role of participants in planning, the auxiliary functions, and integration into a general theory. Development of a theory of decision making, with emphasis on behavioral aspects. Consideration of information-decision systems and the role of model building. Prerequisite, permission.

587 Seminar in Advanced Organization Theory (3)

GARRISON, HENNING, KAST, LE BRETON, SAXBERG, SCOTT

Investigates the development of a theory of organization with subtheories on structures, processes, goal determination, problem solving, innovation, and change. Appraises various approaches to the study of organizations

such as the sociological, normative, descriptive, analytical, and systems approach. Studies in detail the most important conceptual and analytical models of organization such as bureaucratic, information-communication, coalition, economic, and behavioral. Appraises the research methodologies in field studies, laboratory investigations, model building, and simulation. Discusses the future trends in organization theory. Prerequisite, permission.

599 Doctoral Seminar in Administrative Theory and Organizational Behavior (3) SCOTT

Study and research in advanced topics of administrative theory and organizational behavior. The seminar is generally concerned with unpublished areas of research and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

BUSINESS COMMUNICATIONS

Courses for Undergraduates

301 Basic Written Business Communications (4) AWSpS

HARDER, MURPHY, PECK

A broad analytical approach to written communications as a management tool. Analysis of the psychology, semantics, planning, and principles of effective business writing. Practical application through messages that inform and persuade, grant and refuse; plus short business reports and applications for positions. Prerequisite, 75 credits.

410 Business Reports and Other Specialized Communications (5) AWSpS PECK

Emphasis on writing major types of reports used in business, especially memoranda and one formal report. Specialized Communications include adjustments, credit and collections, and sales. Prerequisite, 75 credits.

BUSINESS ECONOMICS

300 Managerial Economics (3) AWSpS ALBERTS, PAGE

Analysis of economic factors affecting decisions made by business firms. Demand and cost analysis, and alternative policies from the firm's point of view. Prerequisites, Economics 201 and Quantitative Methods 201.

301 Money, National Income, and Prices (4) AWSpS

HENNING, PIGOTT, SCOTT

Measurement and analysis of business activity in the commodity and money markets; static and dynamic models of income and interest rate determination; problems and policies in the stabilization of business conditions. Prerequisites, Economics 200 and 201.

439 Business Forecasting (4) ASp BOURQUE, SCOTT

Analysis of basic variations affecting general business conditions as a background for busi-

ness and investment decisions; appraisal of proposals for controlling cycles and of forecasting techniques. Prerequisites, 301 and Quantitative Methods 201.

499 Undergraduate Research (3, max. 6)

Research in selected areas of business economics. Prerequisites, 300 and 301, and permission.

Courses for Graduates Only

500 Business Economics I (4) AS

PAGE, SCOTT

Factors underlying the determination of cost and prices for the industry and the firm; demand analysis. Prerequisite, permission.

501 Business Economics II (3) AWSp HESS, JOHNSON

Analysis of real and monetary factors affecting the national and international economic environment, supply and demand for money, interest rates, stabilization problems and policies. Prerequisite, 500.

512 Advanced Managerial Economics (3) W PAGE

Focus is on application of basic firm theory as developed in 500. Principles of optimum resource allocation, empirical estimation of cost and demand schedules. Prerequisite, 500 and Quantitative Methods 500, or permission.

513 Macro-Analysis For Business (3) W FROST

National income and output analysis; examination of dynamic income-expenditure models; economic growth and industry change. Prerequisite, 501 or permission.

520 Seminar in Monetary and Fiscal Policy (3) A JOHNSON

Exploration of the recent and current literature in the area of monetary and income theory and an examination of monetary and fiscal policy problems in the area of domestic finance. Prerequisites, 500, 501, and Finance 420, or permission.

524 Seminar in Forecasting (3) Sp BOURQUE

Econometrics; input-output analysis and NBER forecasting techniques; empirical testing and applications. Prerequisites, 513 and Quantitative Methods 500, or permission.

526 Industry Structure and Performance (3) Sp NARVER

A course in market structure, conduct, and performance; mergers and diversification; price and nonprice patterns of firm behavior. Prerequisite, 512 or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

588 Seminar in Applied Microeconomic Analysis (3) W SCOTT

A seminar in applied microeconomic analysis: emphasis on individual selected topics and presentation of papers with application to economic problems of industries and firms, such as the estimation of aggregate production functions for industries, consumer preference patterns, firm forecasting and intrafirm pricing policies. Prerequisite, 512 or permission.

599 Doctoral Seminar in Business Economics (3)

Study and research in advanced topics of business economics. The seminar is generally concerned with unpublished areas of research, and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

BUSINESS, GOVERNMENT, AND SOCIETY

Courses for Undergraduates

**101 Business: An Introductory Analysis (5) AWSp
WHEELER**

The nature and role of American business in modern society; its growth, structure, organization, and relationship to environment. Business firms: their objectives, functions, and management. Problems of organization, decision making, controls, investment in business, and related aspects. Career opportunities in business.

**200 Introduction to Law (5) AWSpS
JAMIESON, GRAHAM, HERMANN**

Legal institutions and processes; law as a system of social thought and behavior, and a frame of order within which rival claims are resolved and compromised; legal reasoning; law as a process of protecting and facilitating voluntary arrangements in a business society.

**307 Business Law for Engineers (3) AWSp
SECREST**

Introduction to the law of contracts. Special emphasis on problems which are of concern to the practicing engineer or architect; construction and materials purchase contracts, labor and mechanics liens, the community property concept. Open to students in the Colleges of Architecture and Urban Planning, Engineering, and Forest Resources. Not open for credit to Business Administration students. Prerequisite, inquire at Loew 353.

**310 Legal Aspects of Business and Public Policy (5) W
HERMANN, GRAHAM**

Legal questions involved in government and economic institutions, including government regulation of competition, of business-labor relations, and of government ownership; government assistance to business as well as business influences on government; regulations and the alternative of public control in selected case studies in such areas as pollution control and public utilities. Prerequisite, 200 or permission.

**361 Business History (3) SpS
STRONG**

Exploration and analysis of the development of the American business system, business enterprise and its management within the context of environmental forces shaping the growth of the nation.

**403 Commercial Law (5) AWSp
CARR, HAY**

Principles of the law of property, sales, negotiable instruments, and security transactions. Prerequisite, 200.

**444 Business and Society (4) AWSpS
HART, LANGNESS, MONSEN, ROBINSON, STRONG**

Major concepts in the behavioral sciences with respect to the influence of cultural norms and goals upon business activity, and the interdependence of business and other elements of the social order. Lectures and discussion.

**445 Comparative Enterprise Systems (5) Sp
GOLDBERG**

Investigation of functions, modes of operation, and methods of coordinating business enterprises in various economic systems, ranging from the competitive to the highly centralized.

**499 Undergraduate Research (3, max. 9)
Selected problems in social, legal, and economic institutions. Prerequisite, permission.**

Courses for Graduates Only

**510 Business and Public Policy (3) AWSpS
GOLDBERG, GRAHAM, HERMANN, JAMISON, MARCUS**

Legal institutions and processes in the business environment; contract, property, and the corporation; business, labor, and governmental participation in development of public policies affecting business. Prerequisite, permission.

**552 Legal Aspects of Business Regulation (3) ASP
MARCUS**

Examination, from the administrative point of view, of advanced legal problems bearing upon top management's basic operating policy. Prerequisite, permission.

**553 Advanced Problems in Business and Public Policy (3) S
MARCUS**

Advanced contemporary problems in business and public policy; wage and price controls; collective bargaining and strikes in essential industries; racial integration; "undesirable" and "excessive" advertising; industrial impact on the physical environment. Prerequisites, 510 and permission.

**562 Responsibilities of Business Leadership (3) AWSpS
GOLDBERG**

Relationships between business and consumers, government, labor, and agriculture as affected by changing social forces. Problems of business ethics. Prerequisite, permission.

**565 Industrialization and Social Structure (3) W
STRONG**

Continuity and change in the structure of societies undergoing industrialization, with special attention to theories of the American experience, and to the status and power of business. Prerequisite, permission.

**570 Seminar in Business Research (3) W
Broad research skills are developed with exploration of research methods and methodology and design of overall strategies of research. In addition, attention is devoted to methods of appraising research quality. Interdisciplinary contributions applicable to business research are studied with emphasis on**

currently emerging philosophies of scientific method. Highly recommended for students anticipating the writing of research reports and dissertations. Prerequisite, permission.

**571-572 Research Reports (3-3) AWSpS, AWSpS
See Accounting for description.**

**575 Theories of Capitalism (3) WS
MONSEN, ROBINSON**

Focuses upon the various theories of capitalism developed over the past several centuries and their relevance for our contemporary society. Prerequisite, permission.

**590 Business History (3) WS
MONSEN, ROBINSON, STRONG, WHEELER**
Development of the American business system—with special emphasis upon the dynamic forces, both internal and external, shaping the form and character of macro- and micro-business. Prerequisite, permission.

**597 Behavioral Science of the Business System (3) AWSpS
HART, MONSEN, ROBINSON, STRONG**

Analysis of the business system in the light of the concepts and methods of the behavioral disciplines. Attention centers on the business scholar's need to develop an integrative approach to social science. Prerequisite, permission.

**598 Analysis of Business Behavior (3) ASP
MONSEN**

Analysis of the behavior of the modern firm and its environment in the light of traditional and contemporary theory. Emphasis is placed upon empirical investigation of firm behavior. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

BUSINESS POLICY

Courses for Undergraduates

**470 Business Policy (4) AWSpS
BROWN, GARRISON, KNUDSON, LE BRETON, MEIER, NEWELL, PIELL, ROSENZWEIG, SCHRIEBER, SUMMER**

Case study of policy-making and administration from a general management point of view. Emphasis is on problem analysis, the decision-making process, administration and control, and continuous reappraisal of policies and objectives. This course integrates and builds upon the work of the core curriculum. Prerequisites, Finance 350, Marketing 301, Operations Management 301, and Personnel and Industrial Relations 301 or Administrative Theory and Organizational Behavior 460.

**471 Problems of the Independent Businessman (4)
SCHRIEBER, VESPER**

The role of small business in the economy. Case studies of problems faced by owner-managers of small business enterprises. The managerial role in establishing and operating new businesses. Case studies of problems involved in translating new product or service ideas into economic enterprises. Emphasis on the decision-making process in choosing a

BUSINESS ADMINISTRATION

strategy and implementing it. Prerequisite, senior standing.

480 Business Simulation (5) WSp

GARRISON, NEWELL, PIEHL, SCHRIEBER

Critical analysis of integrated business policy formulation in a complex and dynamic industrial environment by means of simulation (business gaming). Prerequisite, senior standing.

499 Undergraduate Research (3, max. 9)

AWSp

Prerequisite, permission.

Courses for Graduates Only

571-572 Research Reports (3-3) AWSpS,

AWSpS

See Accounting for description.

593, 594 Policy Determination and

Administration (3,3) AWSpS, AWSpS

BROWN, KNUDSON, LE BRETON, MEIER, PIEHL, ROSENZWEIG, SCHRIEBER, VESPER

Analysis of policy problems faced by chief administrative officers of business firms. Determining of objectives; development of policies to achieve objectives; organization of executive personnel to implement policies; coordination of the organization; appraisal and adjustments to changes in environment. The course is intended to give a clearer insight not only into how business decisions are reached, but into the motivation of businessmen in deciding what to do under varying circumstances. Case study seminars with simulation (business gaming) included in 594. (It is recommended that these courses be scheduled toward the end of the student's course work.) Prerequisites, Master of Business Administration candidacy and permission for 593; 593 for 594.

FINANCE

Courses for Undergraduates

350 Business Finance (4) AWSpS

HALEY

Sources, uses, cost, and control of funds in business enterprises. Internal management of working capital and income sources and cost of long-term funds; capital budgeting; financing of the growth and expansion of business enterprises; government regulation of the financial process. Prerequisite, Business Economics 300.

420 Financial Markets (4) AWSp

FROST, HENNING, PIGOTT

Analysis of the structure and functions of the money and capital markets; the saving-investment process and financial intermediaries; supply and demand for loanable funds and the level and structure of interest rates, role of Federal Reserve and Treasury in money market developments. Prerequisite, Business Economics 301.

423 Banking and the Financial System

(4) AW

HALEY

Role of banks and nonbank financial institutions in the financial system; asset choices of banks and nonbank financial institutions; problems in the management of financial institutions with emphasis on commercial banks. Prerequisites, 350, 420.

427 International Finance (4) Sp

HENNING

Asset choice and institutional operations in

international finance; foreign exchange problems; the impact of international financial problems and operations on business; short-term and long-term international financing. Prerequisite, Business Economics 301.

450 Problems in Corporation Finance

(4) AWSp

HALEY, HIGGINS

Case problems in corporate financial management. Includes cases on management of current assets, obtaining short-term loans, raising long-term capital, capital budgeting, and dividend policy. The management point of view is stressed. Prerequisites, 350 and Accounting 375.

453 Financial Theory and Analysis (4) ASp

SCHALL

Determination of liquidity needs subject to firm constraints and longer term capital budgeting problems involving cost of capital and capital rationing considerations; analytical approach. Prerequisites, 350 and Quantitative Methods 201.

460 Investments (4) AWSpS

ALBERTS, D'AMBROSIO

Introduction to the nature, problems, and process of evaluating particular securities and portfolio construction and administration. Special attention is directed to the risk and rate of return aspects of particular securities, securities portfolios, and total wealth. Prerequisite, 350.

461 Investment Analysis (4) AWSp

D'AMBROSIO

A sequence course to 460 in which traditional investment analysis of securities is explored in more detail, and special emphasis is directed to more recent developments, especially portfolio analysis. Prerequisites, 460 and Accounting 375.

499 Undergraduate Research (3, max. 6)

AWSp

Research in selected areas of business finance, money and banking, or investments. Prerequisites, 350 and permission.

Courses for Graduates Only

502 Financial Management (3) AWSpS

HIGGINS, SCHALL

A course in the financial management of the firm including capital budgets; working capital analysis, and dividend policy. Prerequisites, Business Economics 500 and 501, or permission.

521 Seminar in Financial Markets (3) WSp

SCOTT

Analysis of managerial and environmental financial problems of banks and nonbank financial institutions; theory of flow of funds and financial intermediation. Prerequisites, 420, and Business Economics 500, 501.

527 Seminar in International Finance

and Investments (3) AW

HENNING

Study of selected problems in financing, international trade, investment, and foreign business operations; international aspects of money markets; problems of evaluation of foreign investments. Prerequisite, 502 or permission.

550 Business Financial Policy (3) AWSp

ALBERTS

Systematic coverage of the theory of financial management. Application of quantitative anal-

ysis to the financial problems of the firm. Examination of empirical studies on the financing of the modern corporation. Prerequisite, 502 or permission.

552 Seminar in Corporation Finance (3) W

HALEY, SCHALL

A study of the financing of the corporation, including recent theoretical and institutional developments. Extensive reading and discussion in designated areas covering problems relating to financial management and to the social and economic implications of the financial process. Prerequisite, 550 or permission.

560 Seminar in Investments (3) ASp

D'AMBROSIO

Discussion and analysis of concepts, processes, and problems of investment media valuation, portfolio valuation, and portfolio construction and administration for individuals and institutions. Prerequisites, 460 and 502, or permission.

571-572 Research Reports (3-3)

AWSpS, AWSpS

See Accounting for description.

599 Doctoral Seminar in Finance (3)

Study and research in advanced topics of finance. The seminar is generally concerned with unpublished areas of research and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research

(*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

INTERNATIONAL BUSINESS*

Courses for Undergraduates

310 Principles of International Business (5) AWSpS

KOLDE, NIEDERREITER, TRUITT

Broad study of the major forms of international business: export and import trade, overseas investment, production and marketing operations; organization and management of multinational companies; licensing, financing, and other services. Theoretical principles, government policies, business practices. Prerequisite, junior standing or permission.

320 International Business Environment (5) A

NIEDERREITER

Study of international environment and its impact on business behavior: cultural, economic, and institutional factors; conditions in underdeveloped countries; communist enterprise; national policies and international relations. Prerequisite, 310 or permission.

370 Foreign Area Analysis (5) W

NIEDERREITER, RUSTIA, TRUITT

Objectives and methodology; business operations in the European Economic Community,

*Related courses in other areas include: Accounting 540; Business, Government, and Society 445; Finance 427 and 527.

other internationally integrated markets and trade blocs, and specific countries; student projects provide specialization and practical experience. Prerequisite, 310 or permission.

420 International Trade (5) W

KOLDE, RUSTIA, TRUITT

Organization and administration of international trade: market research and product development; cost-price analysis; finance, credit, and transportation; export-import institutions and practices; tariffs and trade legislation. Prerequisite, 310 or permission.

470 Multinational Operations Management (5) Sp

NIEDERREITER, RALSTON, TRUITT

Case studies in foreign operations management: planning international objectives and strategies; developing multinational company structures and executives; adapting administrative practices and operating policies to international diversities. Prerequisite, 310 or permission.

499 Undergraduate Research (3, max. 9) AWSpS

Prerequisite, permission.

Courses for Graduates Only

515 Concepts and Policies (3) ASp

KOLDE, NIEDERREITER, TRUITT

Theoretical and managerial concepts, institutions, and environment of international business; organization and administration of foreign operations; conflicts between domestic and international policies and practices. Prerequisite, permission.

520 Business Enterprise in Developing Areas (3) WS

KOLDE, TRUITT

The conditions, requirements, and problems which confront business enterprise in the developing countries of Africa, Asia, Latin America, and Oceania form the theme and the structure for this seminar. Prerequisite, permission.

521 Business Enterprise in Integrated Markets (3) ASp

KOLDE, NIEDERREITER

A study in depth of the European Economic Community and other internationally integrated areas; their impact upon business operations and world trade is emphasized. Prerequisite, permission.

544 Multinational Corporate Systems (3) W

KOLDE

Theoretical concepts; structural and sociological systems; intra-company international trade; transfer of corporate skills; transfer pricing; managerial communication; integrations of the different national subsystems; normative deductions. Prerequisite, 515 or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

595 Business Studies Abroad (*, max. 9)

Research and study of foreign business problems in the country or countries where the firms are located. Limited to students who have the approval of a major adviser who has agreed to direct their work in accordance with a definite program of studies. Prerequisite, permission.

599 Doctoral Seminar in International Business (3)

KOLDE

Study and research in advanced topics of international business. The seminar is generally concerned with unpublished areas of research and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

MARKETING

Courses for Undergraduates

300 Marketing Concepts (4) AWSpS

BRODY, ETCHESON, WHEATLEY

Analysis of tools, factors, and concepts used by management in planning, establishing policies, and solving marketing problems. Topics cover marketing concepts, consumer demand and behavior, location analysis, marketing functions, institutions, channels, prices, and public policy. (Not open to Business Administration students for credit, nor to those who have taken Marketing 301.)

301 Marketing Concepts (4) AWSpS

Analysis of tools, factors, and concepts used by management in planning, establishing policies, and solving marketing problems. Topics cover marketing concepts, consumer demand and behavior, location analysis, marketing, functions, institutions, channels, prices, and public policy. Prerequisite, Economics 201.

341 Product and Price Policies (4) W

R. LITTLE, NARVER

Examines important aspects of product planning and development, product line decisions, packaging, brand policies, guarantees, and services. Price theory is considered but emphasis is placed on special pricing policies and problems and legal constraints on pricing activity. Prerequisites, 301 and Business Economics 300.

350 Marketing Management (4) AWSpS

R. LITTLE, WAGNER

Analysis of marketing management areas. Major areas covered are: market evaluation, product planning, promotion, channels and dealer relations, pricing and government controls, physical distribution, organization and planning and control of marketing activities. Prerequisite, 301.

361 Marketing Channels and Institutions (4) ASp

R. LITTLE

Analysis of marketing institutions and their functions, marketing channel structure, and channel alternatives available to management. Special attention is given to the role and perspective of the channel manager in directing marketing channel systems. Prerequisite, 301 or equivalent. (Not open to students who have taken 381.)

381 Retailing (4) AWSp

R. LITTLE, MILLER, WAGNER, WHEATLEY

Profit planning and business control; buying, stock control, pricing, promotion; store loca-

tion, layout, organization, policies, systems; coordination of store activities. Prerequisite, 301. (Not open to students who have taken 361.)

401 Sales Management (4) AWSpS

BRODY, GRATHWOHL, WHEATLEY

Sales and distribution planning; sales organization and training; management of the sales force; methods of sales, cost, and performance analysis. Prerequisite, 301.

411 Advertising (4) AWSpS

SPENCE, WAGNER, WHEATLEY

The management of the advertising function and its integration with other forms of promotion. Topics covered are planning the program; determining the most effective approach; evaluation of media and budget; advertising research; advertising institutions; economic and social aspects. Prerequisite, 301.

415 Consumer Behavior (4) AWSpS

DENMAN, OSHIKAWA, SPENCE

Theory and practice pertinent to marketing decisions of individuals and business firms; utilization of theories from behavioral sciences in marketing research; theories of fashion, characteristics of goods, shopping behavior, product differentiation, market segmentation, and opinion leadership; application of concepts to management of advertising, personal selling, pricing, and channels of distribution. Prerequisite, 301; Quantitative Methods 201 recommended.

421 Marketing Research (4) AWSpS

BRODY, DENMAN, WAGNER

The marketing research process; preliminary steps and research design, questionnaires, secondary and primary data, sampling, processing and interpreting data, evaluation and effective presentation of findings. A class research project provides practical application of methods studied. Prerequisite, 301.

430 Quantitative Methods in Marketing (4) AWSpS

MOINPOUR

Application of quantitative methods to marketing decision problems, such as product testing, advertising effectiveness, routing of salesmen, distribution systems, pricing, and marketing models. Methods include analysis of variance, multiple regression, Bayesian statistics, linear programming, and others as appropriate. Prerequisites, 301 and Quantitative Methods 201 or equivalent.

481 Retail Field Work (2, max. 8) WS

MILLER

Open to scholarship students only. Prerequisite, permission.

491 Marketing Problems (4) AWSpS

GRATHWOHL, MILLER, WHEATLEY

Analysis of managerial marketing problems of the manufacturer, wholesaler, and retailer. Prerequisites, 301 and senior standing.

499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

Courses for Graduates Only

500 Marketing Management (4) WS

ETCHESON, GORDON, WHEATLEY

Analysis of markets and institutions, and the role of marketing in the economy. Considerations necessary for sound marketing manage-

ment decisions in pricing, demand creation, physical distribution, channel selection, and product development; marketing structures and policies under various competitive relationships; public policy and legislative restraints. Prerequisite, permission.

510 Market Structure and Channel Strategy (3) A

R. LITTLE

Principles, structure, and channel implications of both wholesale and retail distribution; factors affecting channels; selected product channels; physical distribution factors; marketing cost analysis and control. Prerequisites, 500 or equivalent, and permission.

515 Price Practices and Policies (3) W

ETCHESON, NARVER

The nature of pricing decisions; price theory and practice; primary and secondary factors affecting price policy; pricing methods and strategies; pricing practices in selected industries. Prerequisite, 500 or equivalent.

520 Seminar on Promotion in Marketing (3) ASpS

ETCHESON, WAGNER

Examination of topics of importance in the promotion of the firm's goods and services in its markets. Prerequisite, M.B.A. Core requirements in Marketing or permission.

521 Seminar on Experimentation in Marketing (3) W

R. LITTLE, MOINPOUR, WHEATLEY

The theory and application of experimental designs in marketing emphasis is placed on the underlying logic of experimentation and the analysis and interpretation of experimental data dealing with a variety of marketing problems. Prerequisites, M.B.A. Core requirements in Quantitative Methods and Marketing or equivalent.

522 Advanced Marketing Concepts (3) Sp

ETCHESON, GORDON, WHEATLEY

The interdisciplinary exchange of ideas related to marketing is studied. The marketing theories and evolving concepts of marketing and management are critically appraised. Prerequisites, 520 or 521, and permission.

525 Seminar in Consumer Behavior (3) W

Analysis of current research in consumer behavior. Topics will include consumer decision-making processes, models of buyer behavior, and contributions from the behavioral sciences. Prerequisite, M.B.A. Core requirements or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

599 Doctoral Seminar in Marketing (3)

Study and research in advanced topics of marketing. The seminar is generally concerned with unpublished areas of research and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

OPERATIONS MANAGEMENT

Courses for Undergraduates

301 Principles of Operations Management (3)

EBERT, JOHNSON, MEIER, NEWELL, SCHRIEBER, VERGIN

Fundamentals of operations management and the techniques used in the analysis and control of operating systems. Background of management decision making and systems analysis, concepts of alternate systems of operations, selection of resources, scheduling and control of the flow of transactions in systems, maintenance of efficiency, statistical analysis of systems behavior, use of computers and quantitative models in analysis and control of operations. Prerequisites, Quantitative Methods 200, 201, or permission.

441 Systems Theory and Design (3)

JOHNSON, SCHRIEBER

Theory and analysis of systems design, including the tools and techniques which are particularly useful in systems design, e.g., computers, network analysis, and simulation. Prerequisite, 301 or permission.

442 Operations Analysis (3)

NEWELL, SCHRIEBER, VERGIN

Theory and analysis of operations; including capital equipment selection and replacement, design of control systems using statistical control models, and applications of improvement curve theory to systems planning and control. Prerequisite, 301 or permission.

443 Scheduling and Inventory Control (3)

MEIER, NEWELL, SCHRIEBER, VERGIN

Theory of scheduling and inventory control. Analysis of alternative scheduling and inventory systems with emphasis on the use of mathematical models and simulation. Prerequisite, 301 or permission.

460 Administration of Operations (4)

JOHNSON, MEIER, NEWELL, SCHRIEBER

Administration and analysis of operations in a variety of institutional settings. Particular attention is given to analysis and decision making at the management level through the use of cases. Prerequisites, 301 and senior standing, or permission.

499 Undergraduate Research (3, max. 9) AWSp

Prerequisite, permission.

Courses for Graduates Only

500 Operations Management (3) SpS

EBERT, JOHNSON, MEIER, NEWELL, SCHRIEBER, VERGIN

A study of the management of operations in business and public enterprises. Basic concepts, philosophy, and techniques of analysis for management decision making; analysis of structure and dynamic behavior of management systems; use of computers and quantitative models in planning and control of operations; selection of resources; choosing among alternative systems of operations. Prerequisite, Quantitative Methods 500 or permission.

520 Seminar in Operations Management (3) ASp

JOHNSON, NEWELL, SCHRIEBER

Research, readings, and reports on current problems using a topical approach with em-

phasis on such areas as productivity, product research and development, reliability, plant location, equipment policies, computers, and automation. Prerequisite, 500 or equivalent.

521 Studies in Operations Management (3) W

JOHNSON, MEIER, NEWELL, SCHRIEBER

Policy formulation and administration of operating sectors of enterprises by analysis of case studies; emphasizing applications of quantitative models to operating problems, systems analysis, and integration of functions of operations management with the major goals of the organization. Prerequisite, 500 or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

582 Analytical Models in Operations Management (3)

MEIER, VERGIN

Application of quantitative methods to operations management problems. Content to vary. Topics to include design of production facilities, inventory control, production scheduling, maintenance scheduling, quality control, with one or two areas covered in depth each quarter. Prerequisites, 500 and Quantitative Methods 510, or equivalent.

585 Operations Systems Analysis (3, max. 6)

JOHNSON, MEIER, NEWELL, VERGIN

Analysis of the structure and dynamic behavior of management systems. The dynamics of operations management decision making from the systems point of view, considering the impact of the interaction of the separate elements of an enterprise. The computer as an integral part of decision processes. Study, in different quarters, of such topics as industrial dynamics (theory and analysis of the feedback structure of organizations and computer systems, heuristic decision methods, and management information systems.). Prerequisite, permission.

599 Doctoral Seminar in Operations Management (3)

Study and research in advanced topics of operations management. The seminar is generally concerned with unpublished areas of research and is conducted by visiting professors and departmental faculty. May be repeated for credit. For doctoral students only. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

PERSONNEL AND INDUSTRIAL RELATIONS

Courses for Undergraduates

301 Industrial Relations (3) AWSpS

FENN, FRENCH, PETERSON, SUTERMEISTER, WOODWORTH

The recruitment, selection, utilization, and development of human resources, with special emphasis on union management relations and relevant behavioral science research. Not

open for credit to students who have taken 310.

310 Personnel Management (5) AWSpS
FENN, FRENCH, PETERSON
SUTERMEISTER, WOODWORTH

Philosophy and procedures in obtaining and maintaining an efficient work force, with emphasis on the methods of initiating and carrying out an effective personnel program. Not open to Business Administration students for credit or to those who have taken 301.

445 Personnel Methods and Theory I (3)
SUTERMEISTER, WOODWORTH

Job analysis, job evaluation, and wage surveys, wage and salary administration; performance standards, performance evaluation; employee services and fringe benefits.

446 Personnel Methods and Theory II (3)
BUCK, FENN, PETERSON

Recruitment, selection, interviewing, testing, placement, training, research, and statistics.

450 Industrial Relations Administration (5) AWSp
FRENCH, PETERSON, WOODWORTH

Cases, lectures, and collective bargaining simulation are used to develop administrative skill in dealing with unions. Subjects covered are: nature of unions, institutional forces conditioning collective bargaining practices, and administrative practices dealing with unions.

499 Undergraduate Research (3, max. 9) AWSp
Prerequisite, permission.

Courses for Graduates Only

520 Seminar in Personnel and Industrial Relations (3)
SUTERMEISTER, PETERSON

Problems and policies in personnel and industrial relations are analyzed in the following areas: personnel philosophy, ethics, role of personnel department, breadth of personnel department's responsibilities, implementation of personnel program, collective bargaining, and contribution of personnel department to the organization. Prerequisite, permission. (Offered twice yearly.)

530 Personnel Systems and the Behavioral Sciences (3)
FRENCH, WOODWORTH

Depth analysis of the utility, reliability, and validity of current and proposed personnel devices and systems in staffing, directing, appraisal, compensation, training and development, and collective bargaining. Prerequisite, permission. (Offered twice yearly.)

541 Management-Employee Relations Systems in the White Collar and Professional Sectors (3)
PETERSON, WOODWORTH

Focuses on current and emerging forms of management and employee relations systems. Primary emphasis is given to new forms of white-collar unionization, bargaining and quasi-bargaining situations between professionals and management, and emerging forms of third party participation in these relationships. Prerequisite, permission.

571-572 Research Reports (3-3) AWSpS, AWSpS
See Accounting for description.

599 Doctoral Seminar in Personnel and Industrial Relations (3) Sp

Study and research in advanced topics of personnel management and industrial relations. The seminar is generally concerned with unpublished areas of research, and is conducted by visiting professors and departmental faculty. For doctoral students only. May be repeated for credit. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

QUANTITATIVE METHODS

Courses for Undergraduates

200 Computer Programming (1) AWSpS
DIEHR

An introduction to computer programming using the BASIC language; applications to business problems. Limited study of computer hardware and software.

201 Statistical Analysis (4) AWSpS
DAELLENBACH, TAMURA

A survey of statistical techniques useful in guiding business decisions; introduction to probability, decision making, linear programming, correlation, and regression. Prerequisites, Elements of Calculus (Mathematics 157) and 200.

350 Quantitative Analysis for Business (4) AW
PAGE

Introduction to mathematical tools utilized for analysis of business problems; appreciation of the uses of these tools in business situations; calculus; linear algebra. Prerequisites, School of Business Administration mathematics requirement and 200.

360 Probability and Statistical Inference for Business (4) AWSp
TAMURA

Fundamental concepts necessary to the proper application of advanced analytical statistical techniques in business. Probability, moments, statistical distributions, and inference. Prerequisite, 350.

404 Computer Programming for Business (4) WSp
DIEHR

In-depth coverage of FORTRAN IV with programming assignments. Machine and assembly languages. Overview of ALGOL, PL/I, COBOL. Basic data processing techniques. Operating systems. Prerequisite, 200.

424 Simulation Techniques (4) Sp
MEIER

Construction and operation of simulation models, including the use of specialized simulation languages in conjunction with digital computers. Prerequisites, 200, 201.

444 Comparative Programming Languages (4) Sp
DIEHR

A comparison of programming languages. History of development of high-level languages. Formal syntax and semantics. Languages covered include general-purpose and special-purpose languages. Prerequisite, 404.

450 Operations Research Techniques I (4) AW
DAELLENBACH

Quantifying business problems and obtaining solutions through the application of the tools of operations research. Emphasis is placed on the techniques of mathematical programming. Prerequisite, 350 or permission.

451 Operations Research Techniques II (4) Sp
DAELLENBACH

Additional techniques of operations research useful in business analysis: queuing theory, simulation and game theory. Prerequisites, 360 or permission, and 450.

460 Multivariate Analysis for Business (4) W
TAMURA

Functional analysis techniques for business research. Variance and covariance; simple and multiple regression; problems of serial correlation, interdependence, and identification in parameter estimation. Prerequisite, 360 or permission; 470 recommended.

470 Analysis of Variance (4) A
CHIU

Inference in comparison and analysis of variance. Statistical linear models. Prerequisite, 360 or permission.

480 Survey Sampling (4) Sp
TAMURA

Concepts and techniques useful in survey research in business. Practical experience in their application through a class project. Prerequisite, 360 or permission; 470 recommended.

490 Special Problems in Quantitative Analysis (4) W
RAO

Specialized quantitative techniques useful for solving business problems in a world of uncertainty. Emphasis on applications. Prerequisites, 450 and 460.

499 Undergraduate Research (3, max. 9) AWSpS

Research in selected problems in business statistics, operations research, decision theory, and computer applications. Prerequisite, permission.

Courses for Graduates Only

500 Business Statistics (3) AW
CHIU, TAMURA

A treatment of statistical methods useful in the decision-making process. Includes descriptive statistics, probability and inference, correlation and regression. Prerequisite, School of Business Administration mathematics requirement.

510 Quantitative Methods (3) AWSp
MEIER, DIEHR

A survey of operations research techniques useful in guiding business decisions with emphasis on linear programming and statistical decision processes. Prerequisite, 500 or permission.

516 Statistical Decision Processes for Business (3) W
CHIU

Application of utility theory, probability theory, and game theory to decision making under conditions of risk and uncertainty, using both Bayesian and non-Bayesian approaches. Prerequisite, 510 or 360.

520 Seminar in Business Statistics (3) Sp

RAO

A seminar in the application of selected statistical techniques. Areas: statistical decision processes; nonparametric statistics; advanced application of statistical techniques in administrative control; advanced multivariate analysis; theories and techniques of time series analysis and index number construction. Prerequisites, 360 and permission.

544 Seminar in Business Use of Computers (3)

DIEHR

Intensive inquiry into the economic feasibility and desirability of using computers in business. Selected topics will be chosen to evaluate the advantages, disadvantages, and relative costs of using computers in major areas of business analysis. Prerequisites, 404 or equivalent, and permission.

550 Seminar in Operations Research Techniques (3, max. 6) AWSp

DAELLENBACH, DIEHR

An intensive study into operations research techniques relevant to business analysis: simulation, mathematical programming, random processes. Prerequisite, 450 or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

599 Doctoral Seminar in Quantitative Methods (3)

Study and research in advanced topics of quantitative methods. The seminar is generally concerned with unpublished areas of research, and is conducted by visiting professors and departmental faculty. For doctoral students only. May be repeated for credit. Prerequisite, permission.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

RISK AND INSURANCE

Courses for Undergraduates

310 Fundamentals of Risk and Insurance (5) A

WICKMAN

Introduction to principles of insurance. Economic and social contributions of insurance. Evaluation of loss exposures faced in business and personal situations. Planning to use insurance intelligently in dealing with loss exposures. Analysis of alternative methods. Prerequisite, junior standing.

420 Analysis of Insurer Operations (4) W

WICKMAN

Study of basic operations common to all types of insurance companies. Emphasis on analysis and decision making as applied to different insurance company operating problems. Prerequisite, junior standing.

480 Risk Control (4) Sp

WICKMAN

Control of non-market risks as a managerial function. Evaluation of alternative courses of action. Influence of competitive pressures and

regulation of the insurance industry. Prerequisite, junior standing.

499 Undergraduate Research (3, max. 6) AWSpS

WICKMAN

Individual investigation of risk and insurance problems. Open only to qualified students. Prerequisite, permission.

TRANSPORTATION

Courses for Undergraduates

310 Principles of Transportation (5) AWSpS

BREWER, W. I. LITTLE

Survey of the economic organization and functioning of the transportation industries. Impact on industrial location, prices, and markets. The nature of public policy in transportation.

372 Physical Distribution Management (3) ASp

BREWER, W. I. LITTLE

Management's responsibility for the movement of raw materials and finished products, including traffic management, plant location, materials handling, distribution warehousing, inventory control, and production scheduling.

440 Transportation Pricing (3) W

BREWER, W. I. LITTLE

Conceptual framework and theoretical aspects of pricing services. Exercise of managerial discretion in price determination. Comparative evaluation of pricing among different modes. Problems in pricing. Prerequisite, 310.

471 Public Policy in Transportation (3) A

BREWER, W. I. LITTLE

Appraisal from the public point of view. Content and effect on decision making by carrier and shipper firms. Procedures of administrative agencies regulating transportation firms.

481 Cases in Transportation Carrier Management (3) W

BREWER, W. I. LITTLE

Carrier problems including financing, equipment purchase and utilization, labor relations, policy determination, purchasing controls, public relations, and rate negotiations. Prerequisite, 310.

491 Cases in Physical Distribution Management (3) Sp

BREWER, W. I. LITTLE

Transportation problems and decisions from the buyer's viewpoint. Cases deal with analysis and selection of mode, both public and private. Costs and service considerations in assembly and distribution. Plant and warehouse location. Evaluation of market potential in view of transportation problems.

499 Undergraduate Research (3, max. 9) AWSpS

Prerequisite, permission.

Courses for Graduates Only

505 Transportation Systems and Institutions (3) A

BREWER, W. I. LITTLE

Economic, social, and political aspects of the transportation industry from the standpoint of the transportation firm, the user, and the regulatory agencies. Modern physical distribution systems. The economic impact of location on transportation industries. Theoretical and pragmatic considerations in pricing transportation services. Environmental aspects of domestic and international transportation and

physical distribution systems. The socio-economic impact of advancing technology in transportation. Prerequisite, permission.

520, 521 Trends and Contemporary Problems in Transportation Management, National Policy, and Regulation (3,3) WSp

BREWER, W. I. LITTLE

The impact of changing patterns and programs in transportation on the economy and individual firms. Primary and secondary source data and the interpretation of this information in researching transportation problems and arriving at solutions. Each quarter different aspects are emphasized. Prerequisite, 505 or permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

600 Independent Study or Research (*, max. 10) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

URBAN DEVELOPMENT

Courses for Undergraduates

310 Urban Development Economics (4) AWSp

LESSINGER, SEYFRIED

An undergraduate course concerned with urban land use analysis and determination, location and interdependence of cities, the urban economy, land tenure, and other institutional factors.

320 Law of Urban Development (3) WSp

HERMANN

Legal aspects of modern land utilization including the urban plan, zoning, and private and public ownership—with preliminary discussion of the nature of property and a brief survey of real property law.

395 Urban Development and Private Investment (4) ASp

SEYFRIED, WHEELER

An undergraduate course emphasizing the role of the private sector in urban development; valuation and investment theory; techniques of investment analysis, and capital allocation.

405 Urban Development and Location of Firms (4) W

SEYFRIED, WHEELER

Spatial equilibrium and the optimum location of business firms and households; decision criteria for location of commercial and industrial firms, and for residences; rent and location theory.

496 Research in Urban Development (3) AWSp

LESSINGER, SEYFRIED

Research methodologies and techniques are stressed. A supervised research paper is required. Prerequisites, 310, 395, and permission.

Courses for Graduates Only

520 Urban Development Economics (3) AWSp

LESSINGER, SEYFRIED, WHEELER

The economics of spatial systems, urban land value, rent and location theory, the urban market for land use—residential, commercial, industrial, public; problems of urban development and investment. Prerequisite, permission.

521 Investment in Urban Development (3) W
LESSINGER, SEYFRIED, WHEELER

Investment characteristics of urban development, investment theory and analysis; investment procedures and techniques for types of urban real property. Prerequisite, permission.

525 Urban Development and the Location of Firms (3) W

LESSINGER, SEYFRIED

Graduate seminar in spatial equilibrium of the firm and households decision criteria for optimum location with constraints; public policy and allocation of urban land uses. Prerequisites, 520, 521, and permission.

571-572 Research Reports (3-3) AWSpS, AWSpS

See Accounting for description.

595 Urban Development Problems (3) Sp
LESSINGER, SEYFRIED

A seminar for advanced graduate students concerned with contemporary problems of urban development, including problem identification and measurement, research methodology, and techniques; historical and cultural aspects, social indicators. Prerequisites, 520, 521, and permission.

600 Independent Study or Research (*, max. 10) AWSpS**700 Thesis (*) AWSpS****702 Degree Final (3) AWSpS****800 Doctoral Dissertation (*)**

CONTINUING EDUCATION

SECRETARIAL STUDIES

The Secretarial Studies program offers courses that are designed to meet the needs of students who are preparing for positions as secretaries and administrative assistants and those who wish to develop competency in typewriting, shorthand, and office machines. These courses also are required in partial fulfillment of the Business Education major and minor.

111 Secretarial Studies (2) AWSpS
BROWN, FRERICHS, WILSON

Intermediate typewriting; improvement of speed and accuracy; emphasis on business letters, tabulated material, and manuscripts; application of rules for correct copy. Prerequisite, one semester of typewriting or equivalent.

112 Secretarial Studies (2) AWSpS
BROWN, FRERICHS

Advanced typewriting; emphasis on the development of production skills in the solution of business and professional typewriting problems. Prerequisite, 111.

115 Office Machines (3) AWSpS
WILSON

Instruction in the operation of full-bank and ten-key adding machines; rotary, printing, key-driven, and electronic display calculators

118 Forkner Shorthand (3) AS
BROWN

Theory of Forkner shorthand, a system that combines the alphabet and symbols. Development of transcription skills. Students who present one or more units of Forkner shorthand as entrance credit may not receive credit. Students with one or more high school units in shorthand should consult Secretarial Studies

instructors for proper course placement. Prerequisite, one semester of typewriting.

119 Forkner Shorthand (3) AW
BROWN

Development of dictation and transcription skills. Students with one or more high school units in Forkner shorthand should consult Secretarial Studies instructors for proper course placement. Prerequisites, 118 or equivalent and 111 (111 may be taken concurrently).

120 Gregg Shorthand (3) AS
FRERICHS

Theory of Gregg shorthand, a symbol system. Students who present one or more units of Gregg shorthand as entrance credit may not receive credit for this course. Students with one or more high school units in shorthand should consult Secretarial Studies instructors for proper course placement. Prerequisite, one semester of typewriting.

121 Gregg Shorthand (3) AW
FRERICHS

Development of dictation and transcription skills. Students with one or more high school units in Gregg shorthand should consult Secretarial Studies instructors for proper course placement. Prerequisites, 120 or equivalent and 111 (111 may be taken concurrently).

122 Advanced Shorthand (3) Sp
BROWN

Development of dictation and transcription skills. Prerequisites, 119 or 121 or equivalent, and 111.

310 Advanced Secretarial Studies (5) A
BROWN

Advanced shorthand dictation and transcription; office procedures. Prerequisites, 112 and 122 or permission.

311 Advanced Secretarial Studies (5) W
BROWN

Continuation of 310. Prerequisite, 310.

320 Secretarial Practice (5) Sp
FRERICHS

Advanced office procedures and administration; automation in the office; machine transcription, reproduction processes; records management. Prerequisite, 112.

SCHOOL OF DENTISTRY

COMMUNITY DENTISTRY

100 Orientation (1) W
LEWIS

Dentistry as a health profession: its scope, responsibilities, and contacts with other vocations; qualities and traits which lead to high attainment and social usefulness in the profession; purposes, correlation, and development of the various phases of dental education, meaning and value of the scientific method, the critical point of view in the field, and the Code of Ethics of the American Dental Association.

131 Dental Materials (4) A

Physical and chemical properties of dental materials.

200 Dental History (1) W

Origin and progress in dentistry: beginnings of the scientific study of the teeth and related

parts; integration of the developments of the profession in all its phases—professional, technical, and scientific.

300, 301 Dental Medicine (1,0) Sp,Sp

Systemic conditions and diseases, with special reference to their oral manifestations or implications. Consideration of some aspects of dermatology and syphilology, diabetes, the blood dyscrasias, endocrine gland and nutritional disturbances, and other conditions.

401 Applied Dental Science (2) W
GEHRIG

Correlation of preclinical basic medical science and other preclinical study with clinical procedures and requirements. New findings and practices are submitted so that senior students may utilize such information.

403 Jurisprudence (1) A
WILSON

Legal problems and obligations incident to the practice of dentistry: state dental laws, contracts, malpractice, and dentists as expert witnesses.

431-432-433 Dental Ethics and Office Management (2-1-1) A,W,Sp
KLEIN, O'CONNOR

Office location, arrangement, furnishings, equipment, and personnel; patient and financial records, taxes, patient-dentist relationships; credit, collections, and fees; banking and accounting; Code of Ethics of The American Dental Association and its application.

CONJOINT COURSES IN DENTISTRY

361 Clinical Orientation (0) A

A course for third-year students prior to the beginning of Autumn Quarter. It is designed to familiarize the student with clinical equipment and procedures and initiates the transition of thought from technical and laboratory methods to clinical application of them. It includes student exercises on each other in prophylaxis, rubber dam applications, and local anesthetic injections in preparation for treatment of patients.

532, 533, 534 Basic Science (3,4,4)
STERN

A seminar-lecture discussion course dealing with the structure, physiology, chemistry, and microbiology of the dental and periodontal tissues. Correlations with the needs of the clinical specialties are made wherever possible.

DENTAL HYGIENE

300 Dental Procedures (3) A
VONESH

Lectures and demonstrations in dental procedures, dental specialties; emphasis on the role of auxiliary personnel.

331 Dental Anatomy (4) A
HODSON

Morphology of permanent and primary teeth; sketching and carving of essential units.

332 Dental Materials (2) W
COOLEY, HALPIN

Survey of the physical and chemical properties of dental materials, with laboratory experience in their manipulation.

333 Oral Radiographic Technique (3) A VORIS

Physical and clinical aspects of X-ray procedures, with orientation to anatomy of the oral cavity and completion of acceptable full mouth surveys on patients.

334 Oral Histology (3) A TAMARIN

Development and microscopic anatomy of structures of the oral cavity.

335 Oral Prophylaxis (2) W VONESH

Objectives and principles of oral hygiene; instrumentation and procedure of oral prophylaxis, topical fluoride application, oral inspection, and dental health instruction.

349 Clinical Oral Prophylaxis (4) Sp VORIS

Clinical experience in the performance of oral prophylaxis, topical application of fluoride, and dental health instruction for patients.

401 Office Procedure and Ethics (2) Sp POLSTER

Dental office and clinic procedure; dental and dental hygiene ethics, professional interrelationships.

402 Community Dental Health (3) W WELLS

Application of educational principles to dental health teaching; instruction in planning for community dental health programs including actual dental survey experience; evaluation of dental health teaching materials.

403, 404 Principles of Dental Hygiene Practice (1,1) W,Sp WELLS

Presentation and analysis of dental health problems, with emphasis on advanced dental health instruction; experience in presentation of dental health material to groups.

405, 406 Oral Pathology (1,1) A MORGAN

Study of diseases and abnormalities of the hard and soft tissues of the oral cavity. Prerequisite, 405 for 406.

446 Field Practice (2) WSp REHM

Advanced dental hygiene practice, including work in the University Child Health Center, in a public health department, hospitals, clinics, and schools.

447 Dental Hygiene Practice (4) A ANDERSON

Clinical procedures in all phases of dental hygiene; varied clinical experiences under close supervision.

448 Dental Hygiene Practice (4) W POLSTER

Continued clinical procedure with expansion to include dental hygiene services to patients requiring special considerations.

449 Dental Hygiene Practice (4) Sp POLSTER

Supervised opportunity to attain experience, knowledge, and skill so that each student may develop operative dental hygiene techniques commensurate with her ability.

491 Seminar in Dental Hygiene (2) AWSp VORIS

Study of professional education, accreditation, legislation, organization, and literature. Re-

sponsibilities of the dental hygienist to the community.

492 Readings in Current Literature in Dental Hygiene and Preventive Dentistry (2) AWSp FALES

Discussion of reported readings and survey of background material, with emphasis on dental research and its application to dental health education.

493 Problems in Dental Hygiene (2-4) AWSp FALES

Problems for study directed toward increased understanding in the selected field of practice. Presentation of background, objectives, program, and evaluation.

494 Principles of Teaching in Dental Hygiene (2) AWSp FALES

Application of principles of learning to teaching methods and techniques effective in dental hygiene, with opportunity for course planning, demonstration, and practice teaching. Prerequisite, certificate in dental hygiene.

OTHER COURSES REQUIRED FOR DENTAL HYGIENE STUDENTS

Conjoint (Medical) 316, 317-318 Introductory Anatomy and Physiology (2,5-5) A,W,S LANDAU

Human physiology with anatomical demonstration. An elementary course integrating anatomy, histology, physiology, and biochemistry of the human body. Offered by the Departments of Biological Structure, and Physiology and Biophysics. For nursing and dental hygiene students; others by permission only.

Home Economics 319 Family Nutrition (4) A MONSON

Chemistry and metabolism of the nutrients essential for the maintenance of health. Normal nutritional needs of individuals at various age levels. Nutritional value of foods. Simple dietary modifications as appropriate to medical or dental fields.

Microbiology 301 General Microbiology (5) S NESTER

A one-quarter lecture and laboratory course designed to acquaint students in the physical and biological sciences with microorganisms and their activities. Emphasis is on understanding of basic biological concepts elucidated through investigations of microorganisms. Topics include microbial cell structure and functions, metabolism, and microbial genetics, as well as relationship of these aspects of cell activity to disease, immunity, and other important applied areas. Laboratory exercises cover a variety of microbiological techniques and experiments are designed to illustrate the major concepts discussed in lecture. Prerequisite, two quarters of chemistry (a biological science course is desirable but not required).

Pathology 310 General Pathology (2) A WEIGENSTEIN

Study of causes, processes, and effects of important diseases. Lectures, demonstrations, and discussions. A reasonable knowledge of anatomy, histology, and physiology is required. For students of dental hygiene, physical therapy, and medical technology; others by permission.

Pedodontics 200 Preventive Dentistry (1, max. 2) WSp LAW, SCHUMACHER

Etiology and control of dental caries. Physiology and composition of saliva, ecology of the mouth, chemical composition of teeth, degradation of carbohydrates, systemic factors in the caries process, enzyme inhibitors, fluorides, and caries susceptibility tests. Dental students only may receive 2 credits.

Periodontics 407, 408 Principles of Periodontology (1,1) A,W HALL

Classification, etiology, and principles of treatment of periodontal diseases and the relationship of these to dental hygiene practice. Prerequisite, 407 for 408.

Pharmacy 362 Fundamentals of Pharmacotherapeutics (3) Sp J. PLEIN

Principles of pharmacy; mathematics of pharmacy; pharmacological and therapeutic action of drugs. For nonmajors.

Psychiatry 450 Principles of Personality Development (2) A KAUFMAN

Discussion of the principles of personality development and the problems most commonly met. Consideration will be given to the physiologic, psychologic, and cultural factors from infancy through adolescence. For nonmedical students. Prerequisite, senior or graduate standing.

ENDODONTICS

201 Introduction to Endodontics (2) Sp NATKIN

A lecture course dealing with the anatomic, microanatomic, microbiologic, and pathologic problems encountered with the pulpless tooth and its sequelae.

232 Endodontic Technic (2) Sp STEINER

A lecture-laboratory course in root canal therapy in terms of present-day concepts, with emphasis on a definite, simplified technic. Treatment of extracted teeth as practice for clinical cases.

304 Endodontics (1) A STEINER

A lecture course in which is presented the differential diagnosis of facial pain, problems in pulp anesthesia, periapical surgery, and systemic antibiotic therapy.

349 Clinical Endodontics (0-1-1) AWSp

The student is required to complete the endodontic treatment on an anterior, bicuspid, and molar tooth.

449 Advanced Clinical Endodontics (0-0-2) AWSp

In addition to filling several root canals, the student performs periapical surgery and at least three minor operations such as bleaching.

Courses for Graduates Only

546, 547, 548 Clinical Endodontics (3,4,4) STEINER

The clinical diagnosis and treatment of the pulpless tooth.

549, 550, 551 Clinical Endodontics (3,4,4) NATKIN

The clinical diagnosis and treatment of the pulpless tooth. Prerequisites, 546, 547, 548.

576, 577, 578 Endodontic Seminar (2,2,2)

NATKIN

A continuous weekly seminar devoted to review of endodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment.

579, 580, 581 Endodontic Seminar (2,2,2)

NATKIN

A continuous weekly seminar devoted to review of endodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment. Prerequisites, 576, 577, 578.

582, 583, 584 Treatment Planning Seminar (2,2,2)

STEINER

A weekly seminar to discuss controversial treatment problems and difficult diagnostic cases.

585, 586, 587 Treatment Planning Seminar (2,2,2)

STEINER

A continuation of the weekly seminar to discuss controversial treatment problems and difficult diagnostic cases. Prerequisites, 582, 583, 584.

591, 592, 593 Clinical Practice Teaching (1,1,1)

STEINER, NATKIN

A closely supervised experience in teaching clinical endodontics to the undergraduate dental student. Prerequisites, 546, 547, 548, 576, 577, 578.

597, 598 Endodontics Teaching Seminar (2,2) W,W

GUILD

Weekly seminars devoted to an examination of general problems of teaching and learning and specific problems of endodontics teaching. Prerequisite, 597 for 598.

600 Independent Study or Research (*)

An investigative program in one of the basic sciences under the direction of the departmental faculty. Prerequisite, permission.

700 Thesis (*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have clinical application.

FIXED PARTIAL DENTURES**132, 133, 134 Oral Anatomy (4,2,2) A,W,Sp**

CANFIELD, MORRISON

Detailed study of the human dentition from the standpoint of function, and of morphology of the component parts in detail, with attention to systematized nomenclature. This course also provides the first opportunity for study of the relationships between tooth form and position and the functional pattern of individual patients (Formerly Operative Dentistry 132, 133, 134.)

231, 232, 233 Fixed Partial Dentures Technic (4,4,4) A,W,Sp

WARNICK

This course will cover the basic aspects of the theory and practice of tooth preparation, crown and bridge indication, design and tissue relationships. Selected cases will be carried through on a dental model.

300, 301, 302 Fixed Partial Dentures (1,1,1) A,W,Sp

WARNICK

Lectures on various clinical phases of typical crown and fixed partial denture construction.

346 Clinical Crowns and Fixed Partial Dentures (3-1-1) AWSp

MORRISON

Construction of crowns and fixed partial dentures for clinical cases; instruction under close supervision, with cases assigned according to the student's knowledge and abilities.

446 Advanced Clinical Crowns and Fixed Partial Dentures (3-4-1) AWSp

Continuation and advancement of clinical experience, including clinical ceramics, with treatment of more difficult clinical cases under close supervision.

Courses for Graduates Only**546 Oral Rehabilitation (4) W**

YUDELIS

A clinical course dealing with complex restorative cases. Major emphasis is directed toward tissue response to stresses resulting from the demands of the restoration. (Formerly 561.)

547 Oral Rehabilitation (4) Sp

YUDELIS

Continuation of 546 with the additional consideration of esthetics in complex restorative cases. (Formerly 562.)

548, 549, 550, 551 Oral Rehabilitation (4,4,4,4) S,W,A,Sp

YUDELIS

Continuation of 546, 547.

600 Independent Study or Research (*) Sp

YUDELIS

An investigative program in one of the clinical sciences, under the direction of one of the departmental faculty.

700 Thesis (*)

YUDELIS

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

GRADUATE AND CERTIFICATE DENTAL STUDENTS ONLY

These courses include subject material applicable to all phases of dentistry and may be applied toward the major requirement for the degree of Master of Science in Dentistry.

DENTISTRY**Courses for Undergraduates****400 Hospital Orientation (0-0-1) AWSp**

HOOLEY

A demonstration course for fourth-year dental students emphasizing hospital procedures and the dentist's use of the patient's medical record.

401 Treatment Planning Seminar (1-1-1) AWSp

A seminar devoted to the discussion of treatment plans for patients of fourth-year students. The specific plans for treatment along with a case "work-up" are presented by the

students, discussed by the class members present, and reviewed by the attending faculty.

402 Special Studies in Dentistry (2 or 4, max. 8) AWSp

A series of courses offered by the various departments, from which students may elect study in areas of special interest to them. These courses include subject matter applicable to all phases of dentistry, and may be applied toward the major requirement for the degree of Master of Science in Dentistry.

Courses for Graduates Only**510 Applied Osteology and Myology of the Head and Neck (2)**

MOFFETT

Detailed study as a background for the study of the growth and development of the head and for cephalometric roentgenogram interpretation. (Department of Orthodontics)

511 Roentgenographic Cephalometry (2)

MOORE

Basic principles, history, and techniques of roentgenographic cephalometry. (Department of Orthodontics)

512, 513 Growth and Development (2,2)

KELLER, MC NEILL

Review of the various methods of studying human growth, and special emphasis upon growth of the head, and study of the development of the dentition from birth through maturity; analysis of the factors that produce normal occlusion and malocclusion. Prerequisite, 512 for 513. (Department of Orthodontics)

514 Genetics and Its Applications to Dental Problems (2)

MOFFETT

Review of methodology in twin studies, population genetics, and karyotypic analysis, using examples in dental research. Survey of literature on inherited dental traits.

515 Morphogenesis of Skeletal Tissue (3) Sp,S

Review of development of connective tissue, cartilage, bone and joints, including the differentiation, growth, remodeling, aging, and degenerative changes.

518 Scientific Methodology in Dental Research (2)

(1) Review of the scientific method. (2) Evaluation of dental literature. (3) Discussion of proposed master's degree research projects. (4) Procedure in scientific writing. (5) Formulation and discussion of hypothetical research projects related to orthodontics.

563 Minor Tooth Movement (2)

RIEDEL

A lecture-clinic course dealing with minor tooth movement necessary to successful periodontal therapy. Prerequisite, permission.

580 Gnathodynamics (2)

A seminar devoted to a comprehensive review of the temporomandibular joint and its associated structures. Thorough review of the anatomy and growth processes of the head and oral mechanism, with special emphasis upon the functional aspect of the human denture. Study of the instruments designed to imitate jaw movement and their effectiveness, together with the pathologies of the temporomandibular joint. (Departments of Orthodontics and Prosthodontics)

581 Restorative Treatment Planning (4) W YUODELIS

A seminar devoted to the coordinated application of knowledge gained from both graduate and undergraduate courses to the diagnosis and treatment of comprehensive dental cases with special emphasis given to the relationship of periodontics to restorative dentistry. Prerequisite, graduate dental student or permission.

587 Masticatory Functional Analysis and Occlusal Adjustment (2) W YUODELIS

The course is designed to enable the orthodontic graduate student to mount dental casts on an adjustable articulator, allowing for the reproduction of various mandibular border movements related to the functional occlusion of the teeth. For orthodontic graduate students only.

588 Masticatory Functional Analysis and Occlusal Adjustment (2) W YUODELIS

Nine weekly three-hour lecture/seminar and clinical sessions in the study of the physiology of occlusion. Pertinent literature is reviewed and discussed from the multidisciplinary viewpoints. The clinical sessions include training in masticatory functional analysis and the treatment of occlusally related diseases. Open to graduate dental students only.

589 Masticatory Functional Analysis and Occlusal Adjustment (2) Sp YUODELIS

Continuation of 588. Prerequisite, 587 or 588.

590 Masticatory Functional Analysis and Occlusal Adjustment (2) W YUODELIS

Continuation of 589. Prerequisites, 589 and permission.

For other graduate course offerings see individual departmental listings.

OPERATIVE DENTISTRY

131 Elementary Operative Dentistry Technic (4) Sp NOLAN

Fundamental principles of cavity preparation; training in digital skill.

231, 232, 233 Operative Dentistry Technic (4,4,5) A,W,Sp G. SMITH

Advanced application of the principles and requirements of operative procedures; exercises on manikins to further manual dexterity; consideration of instrumentation and of manipulation of restorative materials.

300, 301, 302 Operative Dentistry (1,1,1) A,W,Sp HAMILTON

Lectures on the clinical application of knowledge acquired in lower-division technic courses; introduction to professional conduct and clinical demeanor.

346 Clinical Operative Dentistry (3-2-3) A,W,Sp STIBBS

Clinical procedures in all phases of operative dentistry; varied clinical experience under close supervision.

400, 401, 402 Advanced Operative Dentistry (1,1,1) A,W,Sp DIEPENHEIM, ELLSPERMAN, SMITH, STIBBS

Lectures on refinements in technical procedures, treatment of atypical cases, and problems in diagnosis and treatment planning.

446 Advanced Clinical Operative Dentistry (3-3-1) A,W,Sp STIBBS

Supervised opportunity to attain optimum experience and self-reliance so that each student may develop as an operator to the best of his ability.

Courses for Graduates Only

500 Research Methodology in Operative Dentistry (3) HODSON

Theory and practice in the design of research projects; the procedures involved in completing a thesis, and the evaluation and recording of printed material. (Formerly 563.)

520 Basic Principles of Operative Dentistry (4) STIBBS

Principles of cavity design for operative dentistry. Laboratory practice in the fundamentals of cavity preparation. Indications and contraindications of outline form for the various types of clinical restorations. (Formerly -592.)

521 Teaching and Administration of Technic Courses in Operative Dentistry (4) STIBBS

Study of course content, organization and presentation, laboratory procedures, teaching aids, and textbook selection. Consideration is given to professional responsibility for promotion and maintenance of high standards of dental health care. (Alternates with 522; offered in odd-numbered years.)

522 Teaching and Administration of Clinic Courses in Operative Dentistry (4) STIBBS

Selection of standards of performance and evaluation of teaching methods to promote student achievement. Discussion of public relations, legal, ethical, and executive responsibilities involved in administering an undergraduate dental operator. (Alternates with 521; offered in even-numbered years.)

523 Teaching Observation (1, max. 6)

Lectures in undergraduate dental courses. Prerequisite, permission of department chairman. (Formerly 590.-)

524 Teaching Practice (4, max. 12)

Supervised teaching in a variety of undergraduate dental courses. Prerequisite, permission of department chairman. (Formerly -591.-)

530 Dental Caries Seminar (2) STIBBS

Detailed review of recent research and literature of dental caries with emphasis on its microbiologic, biomechanical, microscopic, and clinical nature, and current concepts of its etiology, prevention, and treatment. (Formerly 565.)

550 Clinical Operations (1-4, max. 20) STIBBS

Clinical procedures in all phases of operative dentistry; varied clinical experience under supervision.

571 Resin and Other Interim Restorations (2) DIEPENHEIM

Composition and use of silicates, organic, and composite restorative materials. Application of temporary restorations, emergency treatment, and vital pulp therapy relative to operative dentistry. (Formerly 561.)

572 Dental Amalgam Restorations (3) DIEPENHEIM

Indications and contraindications, physical properties, rationale and techniques of manipulation, cavity preparation and tissue response. (Formerly 567.)

573 Cast Gold Restorations (3) B. SMITH

Indications and contraindications, physical properties, and dental procedures for the different types of single restorations from inlays to full crowns, with or without fired porcelain veneers. (Formerly 568.)

574 Fired Porcelain Restorations (3) B. SMITH

Indications, contraindications, and procedures for porcelain veneer crowns, inlays, facings, and porcelain fused to metal. (Formerly 569.)

575 Gold Foil Restorations (4) STIBBS

Indications and contraindications for the various types of restorations. Rationale and techniques of manipulation. Modification of cavity preparation forms with emphasis on W. I. Ferrier designs. Reactions of hard and soft tissues to restorative procedures and environmental changes. (Alternates with 576.) (Formerly 562.)

576 Pure Gold Restorations (4) STIBBS

Physical properties, indications, and contraindications for the various forms of pure gold for dental restorations. History and significance of pure gold as a restorative material. (Alternates with 575.) (Formerly 560.)

590 Special Studies (*)

Clinics, study club, refresher courses, society meetings. Prerequisite, permission of department chairman. (Formerly 570.)

600 Independent Study or Research (*) Prerequisite, permission.

700 Thesis (*)

ORAL BIOLOGY

200 Dental Caries (1) W

A series of lectures outlining the morphological, biochemical, and microbiological aspects of dental caries.

331 Oral Pathology (5) W

The principles of pathologic processes as related to diseases of the mouth and adjacent structures.

431 Oral Histology and Embryology (4) W

Histology of enamel, dentin, dental pulp, cementum, periodontal membrane, alveolar bone, oral mucous membrane, maxillary sinus and temporomandibular articulation. (Formerly Oral Biology 131.)

Courses for Graduates Only

500 Dental Caries (2-3) W

A series of lectures outlining the morphological, biochemical, and microbiological aspects of dental caries with the additional require-

ment of participation in a seminar for purposes of review of the current literature and discussion of research in this field. Prerequisite, permission.

510 Clinical Oral Pathology (1-3, max. 10) W

Presentation of interesting oral lesions from the Dental School and the University Hospital and the correlation of the clinical findings with the underlying morphologic and biochemical changes in the tissues. The relation of these oral lesions to systemic disease will be stressed. Prerequisite, permission.

515 Surgical Oral Pathology (2-4, max. 16) AWSpS

The objectives of this course are to train students to interpret microscopic slides of lesions from the oral cavity and related areas, and to correlate these with the clinical findings. Each student will be responsible for the grossing of specimens and the preparation of histology reports. Prerequisite, permission.

520 Seminar in Oral Pathology (1-3, max. 9) AWSp

Conferences, seminars and round table discussions of advanced topics and recent literature in oral pathology. Prerequisite, permission.

531 Oral Pathology (5) W

The purposes of this course are to train the student so that he may recognize and intelligently interpret clinical manifestations of diseases of the oral cavity, and to stimulate an intellectual curiosity regarding the basic pathological mechanisms responsible for these conditions. Prerequisite, permission.

540 Oral Biology Seminar (1-3, max. 10) AWSp

Presentation of and discussion of current research problems by members of the staff, investigators from other departments in the University, visiting scientists, and trainees. Prerequisite, permission.

550 Research Techniques in Oral Biology (2-4, max. 15) Sp

Introduction to morphologic and biochemical techniques employed in molecular pathology and biochemical cytology. Prerequisite, permission.

560 Biomineralization (2) A

A series of lectures outlining the current state of knowledge concerning the formation and metabolism of mineralized tissues of the human body, with particular emphasis on the hard tissues of the tooth and alveolus. Prerequisite, permission. Offered alternate years. Offered 1971-72.

565 Comparative Odontology (2) A

The course will present a broad view of the dentition in terms of its evolution and the relationship of morphology to function. Prerequisite, permission. Offered alternate years. Offered 1971-72.

570 Oral Facial Development (2-3) Sp

The course will trace the embryological development of the tissues and organs of the human face and oral regions. Contributions of embryonic primordia to adult structures will be studied. Mechanisms resulting in abnormal development will receive special emphasis. Prerequisite, permission. Offered alternate years. Offered 1970-71.

581 Biological Structure and Functions of Exocrine Glands (1-3) A

The development and structure of the salivary glands will be traced in a number of mammalian species. Morphologic details will be related to function. The effect of environment on morphology will also be shown. Prerequisite, permission. Offered alternate years. Offered 1970-71.

582 Physiology of Exocrine Glands (3) W

The autonomic innervation of salivary glands, the action of drugs, changes in blood flow and metabolism during activity as well as the processes involved in the transport of water and electrolytes through the glands will be explored in depth. Prerequisite, permission. Offered alternate years. Offered 1970-71.

583 Biochemistry of Exocrine Glands (2) Sp

The course will survey the protein products synthesized and secreted by exocrine pancreas and salivary glands. Structure-function relationships of the digestive enzymes and other proteins secreted by these glands will be examined. The biochemical events of biosynthesis, transport, and secretion will be explored and the relationship of pancreatic and salivary heteroenzymes will be discussed. Prerequisite, permission. Offered alternate years. Offered 1970-71.

600 Independent Study or Research (*) AWSpS

Nonthesis research. The Department offers research training in light microscopy, electron microscopy, radioautography, histo- and cytochemistry, and a variety of preparative and analytical biochemical techniques which include cell fractionation, paper and column chromatography, zone electrophoresis, biological tracer techniques, and appropriate chemical and enzymic determinations. Prerequisite, permission.

700 Thesis (*)

ORAL DIAGNOSIS AND TREATMENT PLANNING

216, 217 Oral Roentgenology (1,1) W,Sp

JACOBSON

Biophysical, clinical, and interpretative aspects of dental X-ray procedures, with practical application in the completion of acceptable full-mouth surveys on patients.

300, 301 Oral Diagnosis and Treatment Planning (1,1) A,W

DEGERING

Fundamental procedures in oral diagnosis; preparation for advanced instruction.

346 Clinical Oral Diagnosis and Treatment Planning (0-1) WSp

Opportunity for examining, performing X-ray survey, and planning treatment for less involved patients. Students also participate in rendering diagnosis and emergency treatment.

400, 401, 402 Advanced Oral Diagnosis and Treatment Planning (1,1,1) A,W,Sp

JACOBSON

Instruction in advanced X-ray interpretation. Diagnosis and treatment of typical cases to be encountered in general practice. Recognition and treatment of the more common manifestations of oral disease.

446 Advanced Clinical Oral Diagnosis and Treatment Planning (0-1) AW

Advanced instruction in diagnosis and in the

examination and handling of patients. Students are in block assignment and perform radiographic surveys, oral diagnosis, and treatment plans for prospective patients.

Courses for Graduates Only

500 Extraoral Radiology (1)

JACOBSON

The purpose of this course is to familiarize the student with the various techniques necessary to produce diagnostic radiographic films of the jaws and their contiguous parts. This is done by means of seminar and clinical performance on patients. Offered when demand is sufficient.

ORAL SURGERY

200 Regional Anesthesia (1) Sp

FUNK

A review of the head and neck anatomy, the pharmacology of the anesthetic agents and their vasoconstrictors, and the physiology involved in local anesthetic administration are presented. Patient evaluation is stressed, with indications and contraindications for the use of local anesthesia and sedative premedication. The armamentarium, sterilization of equipment, and sterile technique are included. Methods of anesthetizing the branches of the trigeminal nerve for dental manipulations are described in detail. The complications and emergencies attending local anesthetic administrations are emphasized. Limited group demonstrations and practical experience are included during the course.

300, 301, 302 Exodontia (1,1,1) A,W,Sp

GORDON

The definition, history, and scope of Oral Surgery are presented. Surgical principles, history taking, and patient evaluation including the performance of an adequate, thorough oral examination are emphasized. The principles of asepsis, adequate armamentarium, and surgical technique for the extraction of all normally erupted teeth with the recovery of fractured roots resulting from such extractions are presented. Surgical techniques for the extraction of teeth associated with the low antrum; the extraction of complicated teeth; classification, diagnosis, and removal of impacted teeth; soft and hard tissue surgery; pre- and postoperative management of the patient; types, prevention, and control of hemorrhage; surgical complications; fundamentals of diagnosis, treatment and prevention of shock are included. The fundamentals of office emergency treatment are introduced.

303 Medical Emergencies (1) W

STAFF

Office emergencies are discussed in detail. A scheme for evaluation and stepwise treatment of any office emergency is outlined. Specific initial therapy prior to the arrival of the physician for each office emergency (angina pectoris, myocardial infarction, cardiac arrhythmia, epileptic attack, cerebrovascular accident, allergic reaction, anaphylactic shock, and others) is discussed. The taking of an adequate medical history and premedication for prevention of the emergency are strongly emphasized.

331 Oral Surgery Laboratory (1) Sp

GORDON

An introduction to the theoretical and technical aspects of exodontia and associated

minor oral surgery is offered. A correlation of the lecture material with clinical experience is presented with special emphasis on the medical conditions influencing dental surgery. Various operations, such as: biopsy; incision and drainage; hyperplastic tissue trim; buried root recovery; simple and surgical extractions; alveolotomy; perforated antrum care; and finally, maxillary and mandibular immediate denture surgery are performed on mounted models. Practical clinical procedures, such as blood pressure determination; venipuncture; intramuscular injection of drugs; oxygen administration; artificial respiration; and cricothyroidotomy are practiced during the course. TV demonstrations of procedures are performed prior to the laboratory sessions.

346 Clinical Exodontia (0-1-1) AWSp

Extractions and other minor oral surgery under local anesthesia are accomplished in the Oral Surgery Clinic. The junior student is responsible for the patient's medical history, the oral examination, radiographic and clinical diagnosis, treatment planning, administration of the local anesthetic agent, assisting the senior student in the treatment and postoperative care of the patient under the supervision of the staff. Opportunities are provided for practical application for the principles of sterilization of instruments and supplies, as well as the demonstration of intravenous and intramuscular injections and prescription writing. Demonstrations of emergency oxygen equipment and the treatment of emergencies in the dental office are practiced.

400, 401, 402 Oral Surgery (1,1,1) A,W,Sp

FUNK, GEHRIG

Surgical bacteriology, the physiology of inflammation, and the anatomy of the progress of spread of oral infections through the facial spaces and planes of the head and neck are reviewed. The therapeutic and surgical management of oral infections are presented, including the rational use of anti-infective agents. Major oral surgery problems, such as the care of facial and intraoral lacerations, and the diagnosis and treatment of facial trauma are included. Management of fractures of the maxilla, mandible, and zygomatic bones is described in detail. Initial emergency treatment of facial trauma patients (management of air-way, hemorrhage, and shock) are emphasized. Bone and allopastic grafting, disturbances of temporomandibular articulation, the affections of the 5th and 7th nerves, the diagnosis and treatment of cysts, major salivary gland pathology, developmental deformities of the maxilla and mandible (prognathia, retrognathia, apertognathia), and the principles of plastic procedures are included. Legal aspects of oral surgery are also presented.

403 Maxillofacial Surgery (1) W

GEHRIG

Review of benign and malignant oral neoplasms with particular emphasis on the clinical findings, differential diagnosis, and treatment of each. White lesions, swellings, ulcerations, radiolucencies and radiopacities of the jaws, and associated structures are discussed. The dentist's role in the diagnosis, tumor board, biopsy, and postoperative management of the patient with an oral malignancy is emphasized. Students attend meetings of the University Hospital Head and Neck Tumor Clinic during their block rotations on Hospital Dental Service.

404 General Anesthesia (1) Sp

STAFF

Introduction to the use of general anesthesia for oral surgery; agents employed and the physiology of general anesthesia, including the stages of anesthesia; methods of administration; premedication of the patient; armamentarium; complications and accidents; agents designed primarily for administration to children. Lectures and clinical demonstrations.

446 Clinical Oral Surgery (0-0-2) AWSp

The senior student is responsible for mastering the medical evaluation, the oral examination, the x-ray and clinical diagnosis, treatment plan, administration of premedication, operation, and postoperative management of clinic patients. The student learns to manage problems of multiple dental extractions with flap design and alveolotomy, surgical extractions, hyperplastic tissue removal, exostoses, small cysts, uncomplicated biopsies, buried roots, intraoral incision and drainage of abscesses with their complete management, and the removal of some unerupted or impacted teeth. Clinical experience with intravenous and intramuscular drug administration is provided.

Courses for Graduates Only

500, 501, 502 Oral Surgery Seminar (2,2,2)

A,W,Sp

FUNK, GEHRIG, GORDON

A weekly seminar is devoted to the discussion of oral surgery and related problems from basic science, medical, diagnostic, therapeutic, operative, and postoperative aspects. Subjects such as hemorrhagic diathesis, antibiotic therapy, facial trauma, neurologic disorders, developmental deformities, soft tissue surgery, maxillary sinus pathology, pharmacology of general anesthetics, bone physiology, and tracheotomy are discussed. Prepared presentations are given by the graduate students. Guest lecturers are invited to discuss their specialties in the fields such as ophthalmology, otolaryngology, neurosurgery, and general surgery, as they are related to oral surgery. Several seminars are held jointly with other departments (Prosthodontics and Orthodontics). Each graduate student attends ninety seminars over the three-year period.

530, 531, 532 Clinical Pathology Conference

(1,1,1) A,W,Sp

FUNK, GEHRIG, GORDON

Patients with interesting or unusual oral pathology are presented by undergraduate students and discussed by a graduate student. Questions and comments are supplied by the staff. This conference presents a practical proving ground for the oral pathology knowledge of both the undergraduate and graduate students.

540, 541, 542 Advanced Oral Surgery Clinic

(3,3,3) A,W,Sp

FUNK, GEHRIG, GORDON

The patient evaluation, clinical diagnosis, treatment plan, operation and management of oral surgery cases that can be operated under premedication and local anesthesia on an outpatient basis are accomplished. Problems such as biopsy, benign tumor, cyst, vermilionectomy, peripheral neurectomy, vestibular extension, removal of hyperplastic tissue, exostosis, torus, foreign body, supernumerary impacted teeth, and other procedures are included.

550 Anatomical Approaches to Head and Neck Surgery (2) W

FUNK, GEHRIG, GORDON

A study and laboratory dissection of the anatomical structures as they are found in major oral surgery procedures. Prerequisite, permission.

600 Independent Study or Research (*) AWSp

An investigative program in one of the basic or clinical sciences under the direction of the departmental faculty. Prerequisite, permission.

700 Thesis (*) Sp

A research project is carried out under the direction of a staff member from the Oral Surgery Department or the department in which the research is primarily centered. This project and a thesis are submitted as partial requirements for the degree of Master of Science in Dentistry. The research problem may be in either the basic or clinical sciences, or may represent a combined project in both areas.

ORTHODONTICS

300 Orthodontics (1) ASp

KELLER

Discussions and illustrations of the periodontal membrane, bone, and adjacent tissues as related to the forces of occlusion, of a balanced occlusion, and of the growth and development of the individual, with special emphasis on the head. Review of the major growth studies in the literature and their applications to dentistry and to orthodontics.

301-302 Orthodontics (0-1)

This course is designed to provide a clinical background in orthodontics diagnosis and treatment planning. The student will be required to participate in graduate-level seminars from 7:30 to 8:30 a.m. and clinical examination and treatment planning from 8:30 to 11:30 a.m. Prerequisites, 300 for 301; 301 for 302.

400, 401 Advanced Orthodontics (1,1) A,W

DECKER, KELLER, MC NEIL, R. EDEL

Brief historical review of the etiology of malocclusion; classification and analysis of cases; growth anomalies as well as deformities and their evaluation; the temporomandibular joint; the mandibular position as related to orthodontic case analysis; treatment planning; types of appliances and their uses; retention; the ultimate outcome of orthodontic treatment. Prerequisite, 300.

Courses for Graduates Only

500, 501, 502, 503, 504, 505, 506 Orthodontics Seminar (2,4,5,4,3,3,2)

Methods of diagnosis, analysis, and treatment planning of malocclusion; analysis of methods and theoretical principles used in the treatment of malocclusion. The student presents a detailed case analysis and plan of treatment for each clinical patient he is supervising. Each course is prerequisite to the following course.

546, 547, 548, 549, 550, 551, 552 Clinical Orthodontics (4,4,5,5,5,5,6)

Technics of construction and manipulation of the edgewise arch mechanism; application of the technics in the treatment of malocclusion. Treatment of patients begins in the second quarter. Each course is prerequisite to the following course.

600 Independent Study or Research (*)
Prerequisite, permission.

700 Thesis (*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

PEDODONTICS

200, 201 Preventive Dentistry (1,1) A,W

LAW, MOORE

Etiology and control of dental caries. Physiology and composition of saliva, ecology of the mouth, chemical composition of teeth, degradation of carbohydrates, systemic factors in the caries process, enzyme inhibitors, fluorides, and caries susceptibility tests. Study of the growth and development of the oral mechanism and of the human head is begun in the second quarter; the forces of occlusion are analyzed and a comparison made between the various animal dentitions. The Broadbent-Bolton cephalometer is discussed, with particular emphasis on its research implications.

216 Pedodontics (2) Sp

DAVIS, PETERSON

Operative technics applicable to primary and mixed dentitions; cavity preparations in primary teeth, construction of a functional space maintainer, and restoration of a fractured incisor.

300, 301 Pedodontics (1,1) A,W

DAVIS, PETERSON

Emotional development of the child and its implications in pedodontic procedures. Space maintenance, the interception of incipient malocclusion, and clinical management of oral habits.

346 Clinical Pedodontics (1-1-1) AWSp

Diagnosis and examination of the child patient. Restorative procedures in primary and mixed dentitions, with special emphasis on application of the rubber dam.

400 Pedodontics and Public Health Dentistry (1) Sp

DAVIS, LAW, PETERSON

The child in the dental health program. Organization of dental health programs on local, state, and national levels. The role of the dentist in community public health planning. Public health legislation and its implications to the dental profession.

446 Advanced Clinical Pedodontics (1-1-1) AWSp

Diagnosis and treatment planning, with emphasis upon preventive dentistry. Complete operative procedures, including vital pulp therapy, construction of space maintainers, bite planes, and restoration of fractured anterior teeth.

Courses for Graduates Only

500, 501, 502, 503, 504

Pedodontics Seminar (2,2,2,2,2)

LAW

Seminar on problems of tooth formation, development, calcification, and eruption in the child. Management of clinical problems of tooth development; operative procedures, pulp therapy, treatment planning, and the consideration of emotional factors in pedodontic practice.

546, 547, 548, 549, 550

Clinical Pedodontics (*,*,*,*,*)

A,W,Sp,S,A

DAVIS, PETERSON, ROGERS

Advanced clinical practice. Assignment of selected cases, with student responsibility for complete examination, diagnosis, and treatment planning including completion of the case. The use of appliances to effect limited tooth movement in cases of space closure and the application of the Broadbent-Bolton cephalometer in diagnosis and treatment.

600 Independent Study or Research (*)

Prerequisite, permission.

700 Thesis (*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

PERIODONTICS

200 Introduction to Periodontics (1) W

HALL

A survey of periodontology with emphasis on the clinical and histopathologic features of periodontal diseases.

231 Periodontic Technic (1) Sp

HEINS

A clinical and seminar experience in relating both the normal and the abnormal periodontium to dental practice.

300 Periodontics (2) A

OGILVIE

Introduction to periodontal therapy as it is currently practiced. The indications for, and applications of the various treatment procedures. A lecture-demonstration course.

301 Periodontics (1) W

OGILVIE

Continuation of 300. Additional aspects of therapy are discussed. Emphasis is placed upon the prevention of disease, the integration of periodontics within the dental practice, the use of auxiliary personnel to the full in periodontal treatment, and the long-term maintenance of treatment results. A lecture-discussion course.

346 Clinical Periodontics (0-0-3) AWSp

Treatment of periodontal disease. Emphasis upon diagnosis, treatment planning, and non-surgical treatment procedures.

407, 408 Principles of Periodontology (1, 1)

AW

HALL

Classification, etiology, and principles of treatment of periodontal diseases and the relationship of these to dental hygiene practice. Prerequisite, 407 for 408. (Formerly Dental Hygiene 407, 408.)

446 Advanced Clinical Periodontics (1-1-1) AWSp

Treatment of patients with more complex periodontal involvement. The development of skill in treatment planning and execution by the individual student. Concrete experiences in surgical periodontics.

450 Honors Course in Periodontics (1-1-1) AWSp

HALL, HEINS

Intensive clinic-seminar experience in periodontics for selected fourth-year students. Taken instead of 446.

Courses for Graduates Only

546, 547, 548 Clinical Periodontics (3,4,4)

SCHLUGER

Clinical experience in diagnosis and treatment of periodontal disease.

549, 550, 551 Clinical Periodontics (3,4,4)

SCHLUGER

Clinical experience in diagnosis and treatment of periodontal disease. Prerequisites, 546, 547, 548.

560 Morphology of the Periodontium (1)

Study of the structure of the periodontium. This course is designed to correlate closely with 599. Prerequisite, permission.

561, 562, 563 Periodontal Case Management (1-1-1)

A didactic presentation of clinical periodontics to provide a comprehensive view of the field and a grasp of modern therapeutics.

576, 577, 578 Periodontics Seminar (2,2,2)

OGILVIE, STERN

A continuous weekly seminar devoted to review of periodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment.

579, 580, 581 Periodontics Seminar (2,2,2)

SCHLUGER

A continuation of the weekly seminars devoted to review of periodontic and related literature and to discussion of teaching methods and philosophy of teaching and treatment. Prerequisites, 576, 577, 578.

582, 583, 584 Treatment Planning Seminar (2,2,2)

SCHLUGER

A weekly seminar involved with the presentation, discussion, and tentative solution of moderate to complex problems in diagnosis and treatment.

585, 586, 587 Treatment Planning Seminar (2,2,2)

SCHLUGER

A weekly seminar utilizing the case review method and dealing with the surgical treatment of moderate to advanced periodontal disease. Prerequisites, 582, 583, 584.

591, 592, 593 Clinical Practice Teaching (1,1,1)

HALL

A supervised experience in teaching clinical periodontics to undergraduate dental students. Prerequisites, 546, 547, 548, 576, 577, 578.

599 Pathology of the Periodontium and Contiguous Structures (3) Sp

PAGE

A seminar which covers in depth the tissue alterations noted in periodontal disease and the concepts of the nature of the underlying lesion. Prerequisites, Pathology 445 and 500, or permission.

600 Independent Study or Research (*)

SCHLUGER

An investigative program in one of the basic sciences under the direction of the departmental faculty. Prerequisite, permission.

700 Thesis (*)

SCHLUGER

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree

EDUCATION

of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have clinical application

PROSTHODONTICS

131 Complete Denture Technic (8) Sp LORD

A lecture-laboratory course dealing with basic principles of complete denture fabrication; construction of selected dentures for technic manikins.

231, 232 Removable Partial Denture Technic (2,6) A,W DORAN

A lecture-laboratory course dealing with basic principles of removable partial denture fabrication; construction of selected removable partial dentures for technic manikins.

300, 301, 302 Complete Denture Prosthodontics (1,1,1) A,W,Sp BOLENDER, LORD

A lecture course devoted to the diagnosis and clinical management of the completely edentulous patient.

303, 304 Removable Partial Denture Prosthodontics (1,1) W,Sp BOLENDER, LORD

A lecture-participation course devoted to the diagnosis and treatment of the partially edentulous patient requiring the fabrication of a removable partial denture.

346 Junior Clinical Prosthodontics (4-2-2) AWSp

Diagnosis and treatment of completely edentulous and partially edentulous patients.

400 Advanced Complete Denture Prosthodontics (1) A BOLENDER

A lecture course devoted to the diagnosis and clinical management of patients requiring immediate dentures.

401 Advanced Removable Partial Denture Prosthodontics (1) W BOLENDER

A lecture course devoted to the management of patients presenting special problems requiring the making of removable appliances.

446 Advanced Clinical Prosthodontics (2-2-1) AWSp

Diagnosis and management of completely edentulous and partially edentulous patients. Fabrication of conventional and immediate complete dentures and removable partial dentures.

Courses for Graduates Only

560 Complete Dentures (4) A SWOOPE, BOLENDER

A comprehensive seminar-clinical course devoted to the diagnosis and treatment of the completely edentulous patient. Emphasis is placed on management of patients who present difficulties in treatment.

561 Immediate Dentures (4) W SWOOPE, BOLENDER

A seminar-clinical course concentrating on those factors which are peculiar to the fabrication of immediate dentures. Emphasis is placed on the management of transition from natural to artificial dentition. This course will provide an opportunity for the application of the principles covered in 560.

562 Removable Partial Dentures (4) Sp SWOOPE, BOLENDER

A seminar-clinical course devoted to the diagnosis and treatment of the partially edentulous patient requiring the fabrication of a removable partial denture. The study of supporting tissues and their physiologic responses is included.

563 Obturators and Speech Appliances (2) AWSpS BEDER

A seminar-laboratory course devoted to the diagnosis and treatment of the patient with congenital or acquired defects of the palate and contiguous tissue. Various types of appliances are described and constructed.

564 Definitive and Adjunctive Maxillofacial Appliances (2) AWSpS BEDER

A seminar-laboratory course devoted to the theories and principles in the fabrication of somatoprotheses; appliances for resected or traumatized mandible; vehicle and protective devices in irradiation therapy; stents, alloplastic protheses; splints and other special protheses. Various materials and types of appliances are utilized.

565, 566, 567 Clinical Practice Teaching (1,1,1) A,W,Sp BOLENDER

Supervised experience in teaching clinical prosthodontics to the undergraduate dental student.

568 Obturators and Speech Appliances (2) AWSpS BEDER

Clinical application of 563. Patients requiring the fabrication of obturators and speech appliances are treated.

569 Definitive and Adjunctive Maxillofacial Appliances (2) AWSpS BEDER

Clinical application of 564. Patients requiring the fabrication of a variety of special appliances are treated.

570, 571, 572, 573, 574, 575, 576, 577 Prosthodontics Seminar (2,2,2,2,2,2,2) BOLENDER, SWOOPE

A continuous weekly seminar devoted to the review of prosthodontic and related literature.

578 Prosthodontic Technique Practice Teaching (1) WSp BOLENDER

Designed to provide practical experience under supervision, in the teaching of technical procedures in undergraduate dental laboratory courses. The primary course involved will be Prosthodontics 131 (Complete Dentures). The graduate student will assume an active role as instructor, being supervised by full-time faculty.

580 Prosthodontic Dental Materials (2) WSp SWOOPE

A study of common materials utilized in the fabrication of dental appliances. Emphasis is placed on resin systems and various precious- and base-metal alloys.

600 Independent Study or Research (*) Prerequisite, permission.

700 Thesis (*)

An investigative program carried out under the direction of a member of the Department staff by a student working toward the degree

of Master of Science in Dentistry. The problem may be in one of the basic sciences or may have a clinical application.

COLLEGE OF EDUCATION

EDUCATION

Specific areas in the College of Education are designated by area letters. These letters must precede course numbers on the student's Official Program. Designation letters and their definitions are:

EDADM—Educational Administration

EDC&I—Curriculum and Instruction

EDHED—Higher Education

EDHPS—History, Philosophy, and Sociology of Education

EDPSY—Educational Psychology

EDSPE—Special Education

EDUC—Independent study, research, and field study (student teaching)

EDUCATIONAL ADMINISTRATION

EDADM

430 Public School Administration (3)

Extensive use of case studies in the development of skills in organizational analysis. Emphasis is given to the concept of influence, the means of influence, and the nature of influence. (Formerly Education 430.)

EDADM

526 Seminar in School Supervision (3) ANDERSON

Theory of the process of supervising school personnel, including an analysis of the techniques of supervision, theory of leadership and group process, interpersonal relations, and evaluation of teacher effectiveness. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 526.)

EDADM

527, 528, 529 Educational Administration and Supervision (3,3,3) ANDERSON, ANDREWS, BOLTON, OSTRANDER, STRAYER

Theories, issues, and practices of administering public schools. Includes legal, extra-legal, political, and organizational framework; management and financial practices; instructional, social, and supervisory problems. Prerequisites, graduate standing and one year of teaching experience. (Formerly Education 527, 528, 529.)

EDADM

530 Seminar in Educational Decision Making (3) BOLTON

Analysis of nature of decisions in educational setting. Consideration of theory of decisions, social and psychological constraints, and application in simulated situations. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 530.)

EDADM

531 Seminar in Administration: Finance (3) STRAYER

Current problems in school finance, including costs, ability to support schools, and financial implications of educational principles. The

economics of public education. Problems of state and local school support. Financing capital outlay, research, and public relations. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 531.)

EDADM

532 Seminar in Human Relations in Educational Administration (3)

ANDERSON, BOLTON

Analysis of factors involved in human relations problems related to operation of public schools. Motivation, perception, communication, role analysis, and dynamics of groups will be studied through use of cases and simulated situations. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 532.)

EDADM

533 Seminar in Administration: School Buildings (3)

SCHNEIDER

Planning procedures; school building surveys; preparation of educational specifications; relationships with architects; types of school buildings and special areas; special problems related to heating, ventilation, acoustics, illumination, and use of site; maintenance and modernization; financing the school plant program. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 533.)

EDADM

534 Seminar in Educational Planning and Organization (3)

STRAYER

Application of principles utilized in planning and organizing public schools. Formation of policy and procedures; formal and informal organization; power, authority, and responsibility; utilization of people, time, and space. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 534.)

EDADM

535 Research Seminar: Educational Administration and Supervision (3, max. 6)

ANDERSON, ANDREWS, BOLTON, OSTRANDER, STRAYER

Critical analysis of current research results and methods will be used as background to evaluate student's independent research in seminar discussion. May be repeated by permission. Prerequisites, 9 quarter credits in Educational Administration and research topic approved by instructor. (Formerly Education 535.)

EDADM

536 Internship in Educational Administration (1-6, max. 6)

ANDERSON, ANDREWS, BOLTON, OSTRANDER, STRAYER

Recommended for all candidates preparing for administrative positions except those having sufficient experience as administrators. Half-time work in a school district or districts for one, two, or three quarters, depending upon the student's previous experience. Supervision by staff members of the College of Education and the superintendent of schools or school principal in the selected school district. Prerequisite, completion of all other requirements for administrator's credential. (Formerly Education 536.)

EDADM

537 Special Problems in Educational Administration and Supervision (3, max. 9)

ANDERSON, ANDREWS, OSTRANDER, STRAYER

Readings, lectures, and discussions of topics of special and current interest to school administrators or supervisors. Reports on new developments in research. Topics will vary each year. Prerequisites, master's degree and permission. (Formerly Education 537.)

EDADM

538 School-Community Relations (3)

ANDREWS, OSTRANDER

Examines the dynamics of the interface between the public schools and the community. Special attention is given to the findings of research in relation to school-community power, types, and organizational influences. Prerequisites, EDADM 528, master's degree in Educational Administration or equivalent, or consent of instructor.

EDADM

539 The Law and Education (2½)

ANDREWS, OSTRANDER

A course designed for educators and administrators to alert them to some of the commonly encountered areas which involve legal problems. Prerequisite, master's degree in Educational Administration or equivalent. (Offered summer quarter only.) (Formerly Education 539.)

EDADM

563 Seminar in School Personnel Administration (3)

BOLTON

Major emphasis will be on the analysis of factors to be considered in the selection and evaluation of teachers, including determination of relevant criteria, acquisition and analysis of data, planning and decision processes. Less emphasis will be given to other school personnel topics. Prerequisite, master's degree in Educational Administration or equivalent. (Formerly Education 563.)

CURRICULUM AND INSTRUCTION

EDC&I

130, 131 French for the Elementary School (3,3)

Training in basic French grammar, pronunciation, and intonation with practical techniques for using French in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those with little or no background in French. Offered jointly with the Department of Romance Languages and Literature as French 126, 127. Prerequisite, 130 for 131. (Formerly Education 126J, 127J.)

EDC&I

132 Spanish for the Elementary School (5)

Training in basic Spanish grammar, pronunciation, and intonation with practical techniques for using Spanish in the elementary classroom; organization of study units, songs, dialogues, and dramatizations. Open to those who have little or no background in Spanish. Offered jointly with the Department of Romance Languages and Literature as Spanish 128. (Formerly Education 128J.)

EDC&I

200 Industrial Education: Sketching and Technical Drawing (3)

BAILY

Freehand sketching; orthographic projection; pictorial representation; dimensioning; letter-

ing; working drawing and blueprint reading. (Offered alternate years; offered 1970-71.) (Formerly Education 180.)

EDC&I

201 Industrial Education: Sketching and Technical Drawing (3)

BAILY

Developmental drawing; sheet metal layout drawing; revolutions, mechanical perspective—angular; mechanical perspective—parallel. Prerequisite, EDC&I 200 or permission. (Offered alternate years; offered 1971-72.) (Formerly Education 181.)

EDC&I

202 Industrial Education: General Shop (5)

BAILY

Introduction to industrial education; the common tools, materials, processes, and products of industry. (Formerly Education 182.)

EDC&I

203 General Shop for Occupational Therapists (5)

BAILY

Introduction to the common tools, materials, and processes used in occupational therapy. Freehand sketching, both pictorial and orthographic; working drawings and print reading. (Formerly Education 182.)

EDC&I

204 Industrial Education: Fundamentals of Woodwork (3)

BAILY

Hand-tool processes; elementary machine operations; methods of assembling and fastening; simple wood finishing. (Formerly Education 280.)

EDC&I

206 Industrial Education: General Metalwork (3)

BAILY

Tools, materials, and processes used in sheet metal, forging, casting, bench metal, ornamental iron work, welding, machining, and finishing of metal. (Formerly Education 281.)

EDC&I

300 Industrial Education: Home Planning (4)

BAILY

Consumer knowledge and information in the problems involved in purchasing, planning, financing, and building a home are emphasized. Students draw plans and write specifications for a complete set of house plans. Prerequisite, EDC&I 200 or equivalent. (Offered alternate years; offered 1971-72.) (Formerly Education 386.)

EDC&I

302 Industrial Education for Elementary Teachers (5)

BAILY

Planning and preparing a representative unit in some area of the elementary school program, with particular emphasis upon those parts which involve construction activity. Development of basic skills in the use of common hand tools. Related information about industrial technology and its place in our society is included. (Formerly Education 389.)

EDC&I

303 Industrial Education: Basic Woodworking for Occupational Therapists (5)

BAILY

Hand-tool processes, elementary machine operations, safety practices, problem-solving and

planning, methods of assembling and fastening, simple wood finishing. (Formerly Education 382.)

EDC&I

304-305 Industrial Education: Woodworking Technology (3-2)

BAILY

Design, construction, and finishing of projects in wood, involving machine operations. Prerequisites, EDC&I 204 for EDC&I 304; EDC&I 304- for EDC&I 305. (Formerly Education 383-384.)

EDC&I

307 Industrial Education: Tools and Materials (2)

BAILY

Sources, specifications, and costs of shop materials and equipment. Care, repair, and sharpening of hand and machine tools. (Offered alternate years; offered 1970-71.) (Formerly Education 380.)

EDC&I

308 Special Problems in Industrial Education (1-5, max. 5)

BAILY

The student works on an individual basis, conferring with the staff as needs arise, on one or more problems of special interest to him in industrial education. An outline and an organized plan of procedure are to be presented to the staff. (Formerly Education 387.)

EDC&I

315 The Teaching of Business Education: Typewriting, Shorthand, and Transcription (2)

BRIGGS

Prerequisites, EDPSY 304 and Secretarial Studies 112. (Formerly Education 325.)

EDC&I

316 The Teaching of Business Education: Bookkeeping and General Business (2)

BRIGGS

Prerequisites, EDPSY 304 and 9 credits in accounting. (Formerly Education 324.)

EDC&I

321 Health in the Elementary School (2)

GAINES, MILLS, REEVES

Health procedures and techniques for meeting health needs and problems of elementary school children, including screening, observation, emergency care, etc. (Formerly Education 338.)

EDC&I

322 Physical Education in the Elementary School (1½ Men)

PEEK

Instruction and participation in elementary gymnastics, fitness, and development of lower organization relations and directed reading in the elementary physical education program. The units will vary in length and time and will not require participation in all the allotted hours. Individual schedules will be arranged in Pavilion 224 after conference. Credit will be given only upon satisfactory completion of EDC&I 323. (Formerly Education 378.)

EDC&I

323 Physical Education in the Elementary School (1½ Men)

PEEK

Instruction and participation in planning and presenting team sports activities with directed reading in the elementary school physical education program. The schedules will vary in length and time and will not require participation in all the allotted hours. Individual schedules will be arranged in Pavilion 224 after conference. Credit will be given only upon completion of EDC&I 322. (Formerly Education 378.)

ucation program. The schedules will vary in length and time and will not require participation in all the allotted hours. Individual schedules will be arranged in Pavilion 224 after conference. Credit will be given only upon completion of EDC&I 322. (Formerly Education 378.)

EDC&I

324 Physical Education in the Elementary School (3) Women

Special methods and procedures for planning and conducting the physical education program in the elementary schools (grades 1-6). Consideration of the physical activities that are appropriate for children and contribute to their motor efficiency and physical fitness. Prerequisite, EDPSY 304. (Formerly Education 378.)

EDC&I

325 The Teaching of Physical Education for Men (2)

PEEK

A study of principal techniques and curricular programs in the planning and presentation of secondary physical education instructional units. Prerequisites, EDPSY 304, Physical Education 363. (Formerly Education 339.)

EDC&I

327 The Teaching of Home Economics (5)

MCADAMS

(Credits count: 2 as education and 3 as home economics.) Prerequisites, EDPSY 304, 25 credits in home economics. (Formerly Education 332.)

EDC&I

328 Methods of Teaching for Institution Administration Students (3)

MCADAMS

Prerequisites, junior standing and 25 credits in home economics, including Home Economics 307. (Formerly Education 333.)

EDC&I

329 Teaching Foreign Language in the Secondary School (2)

A basic course in the methods of teaching foreign languages in the secondary school. Prerequisite, EDPSY 304. (Formerly Education 370S.)

EDC&I

330, 331, 332 The Teaching of French (3,3,3)

NOSTRAND

Elementary, junior high, and senior high emphases. Prerequisites, EDPSY 304 and demonstration of language proficiency; (EDC&I 330 formerly Education 329E; EDC&I 331 formerly Education 329X; EDC&I 332 formerly Education 329S).

EDC&I

333, 334, 335 The Teaching of Spanish: Secondary Emphasis, Elementary and Junior High School, Elementary Emphasis (3, 3, 3)

FRIEDRICH

Prerequisite to student teaching. Elementary emphasis, junior high, and secondary emphases. Prerequisites, EDPSY 304, EDC&I 329, and demonstration of language proficiency. (Formerly Education 343E, X, S.)

EDC&I

336 The Teaching of German in Secondary Schools (3)

RABURA

Prerequisites, EDPSY 304, EDC&I 329, German 303, or permission. (Formerly Education 330.)

EDC&I

337 The Teaching of German in Elementary Schools (3)

FISCHER

Objectives and methods of the FLES (Foreign Languages in Elementary Schools) program in German. Prerequisites, EDPSY 304, EDC&I 329, German 303, or permission. (Formerly Education 334.)

EDC&I

338 The Teaching of Russian (2)

HANEY

Special methods in the teaching of Russian to acquaint prospective teachers with materials, methods, and problems. Prerequisites, EDPSY 304, EDC&I 329, and permission. (Formerly Education 341.)

EDC&I

339 The Teaching of Scandinavian (Norwegian, Swedish) (2)

ARESTAD, JOHNSON

Special methods in the teaching of Norwegian and Swedish to acquaint prospective teachers with materials, methods, and problems. Prerequisites, EDPSY 304, EDC&I 329, and permission. (Formerly Education 344.)

EDC&I

340 Elementary Art Education (2)

JOHNSON

A study of the stages of development in the art of the young child as expressed through his creative and mental growth. (Formerly Education 319.)

EDC&I

341 The Teaching of Art in the Secondary School (3)

JOHNSON

For majors in secondary art education planning to teach on the junior or senior high school level. Prerequisite, EDPSY 304. (Formerly Education 320.)

EDC&I

342 Art in the Elementary School (3)

KOENIG, SOLBERG

For students majoring in elementary education. A study of art in the development of children. Experiences in working with various materials used in school art programs. Prerequisites, EDPSY 304 and Art 100. (Formerly Education 376.)

EDC&I

343 Music in the Elementary School (3)

SWANSON, CUNHA

For students majoring in elementary education (not open to music specialists). A study of music in the development of children with attention to musical activity and the growth of related concepts and skills. Prerequisites, EDPSY 304 and Music 119. (Formerly Education 377.)

EDC&I

344 The Teaching of Secondary School Music (3)

NORMANN

Offered jointly with the School of Music as Music 384; 2 credits count as education and 1 as music. Prerequisite, EDPSY 304. (Formerly Education 346J.)

EDC&I

345 Fundamentals of Kindergarten-Primary Teaching (3)

MAC DONALD

A course in methods, materials, and professional practices relevant to teaching young children. Recommended for students planning

to teach in the kindergarten and primary grades. Prerequisite, EDC&I 360. (Formerly Education 318.)

EDC&I
347 Modern Theories and Practices in Early Childhood Education (3)

An introduction to modern theories and practices in early childhood education presented via classroom lectures and observations in selected schools and agencies. (Formerly Education 366.)

EDC&I
348 Language Arts and Social Studies in Early Childhood Education (3)

A basic course stressing language arts and social studies as related to the development of the young child. The course familiarizes students with effective teaching procedures and learning resources designed to help children learn language competencies and social awareness within the framework of social studies content. (Formerly Education 367.)

EDC&I
349 Mathematics and Science in Early Childhood Education (3)

A basic course in science and mathematics instruction emphasizing knowledge and skills in teaching scientific and mathematical processes and concepts to young learners. (Formerly Education 368.)

EDC&I
350 Program Planning in Early Childhood Education (3)

The theoretical and practical aspects of planning, selecting, preparing, presenting, and supervising curricular materials and activities in the prekindergarten are presented. (Course taken concurrently with student teaching, 7 credits.) (Formerly Education 369.)

EDC&I
355 Language Arts in the Elementary School (3)

KITTELL, MONSON

A basic course in planning and teaching elementary language arts: listening and speaking, handwriting, spelling, creative and practical writing. Prerequisite, EDPSY 304. (Formerly Education 375H.)

EDC&I
356 The Teaching of English (3)

SMITH

Designed to draw together the student's previous background in English literature, language, and composition, the course focuses on the techniques and materials for teaching English in junior and senior high schools. Prerequisite, EDPSY 304. (Formerly Education 326.)

EDC&I
357 The Teaching of Speech (3) A

NELSON

A special methods course in the teaching of speech at the secondary level. Prerequisites for majors in speech, EDPSY 304, at least 20 credits in speech; for nonmajors, permission. (Formerly Education 342.)

EDC&I
358 The Teaching of Journalism (3)

For teachers in high schools and junior colleges, or for education students taking first or second areas in journalism. Prerequisites, EDPSY 304, Communications 321 and 325, or permission. (Formerly Education 375J.)

EDC&I
360 Reading in the Elementary School (3)

MONSON, SEBESTA

*A basic course in methods, techniques, and materials used in the teaching of reading from the readiness period in the kindergarten-primary area through the study-techniques of the intermediate grades. Prerequisite, EDPSY 304. (Formerly Education 374E.)

EDC&I
362 Reading in the Secondary School (3)

FEA

A basic course in the methods, techniques, and materials used in the teaching of reading from the intermediate grades through the study-techniques of high school. Prerequisite, EDPSY 304. (Formerly Education 374S.)

EDC&I
365 Social Studies in the Elementary School (3)

FOSTER, HUNKINS, JAROLIMEK

A basic course in the planning and teaching of social studies in the elementary school. Prerequisites, EDPSY 304 and Geography 100. (Formerly Education 375M.)

EDC&I
366 The Teaching of Social Studies in Secondary Schools (3)

Application of educational principles and methods to the teaching of social studies on the junior and senior high school levels. Prerequisite, EDPSY 304. (Formerly Education 331.)

EDC&I
370 Science in the Elementary School (3)

OLSTAD

A basic course in the teaching of science in the elementary school with special emphasis on the nature of science as a process of inquiry. Prerequisites, EDPSY 304 and 5 credits in an approved course in science. (Formerly Education 375S.)

EDC&I
371 Teaching Science in the Secondary School (3)

OLSTAD

A basic course in the teaching of science in the secondary school with special emphasis on the nature of science as a process of inquiry. Prerequisite, EDPSY 304. (Formerly Education 370.)

EDC&I
372 The Teaching of Biology (2)

OLSEN

Prerequisites, EDPSY 304, EDC&I 371, and 25 credits in biology. (Formerly Education 321.)

EDC&I
373 The Teaching of Chemistry (3)

RITTER

Prerequisites, EDPSY 304, EDC&I 371, and at least 20 credits in college chemistry. (Formerly Education 322.)

EDC&I
375 Mathematics in the Elementary School (3)

VOPNI

An examination of the learning and teaching of elementary mathematics (grades K-6), in light of recent theoretical and pedagogical developments. Prerequisites, EDPSY 304 and Mathematics 170. (Formerly Education 379.)

EDC&I
376 The Teaching of Junior High School Mathematics (3)

KINGSTON

Emphasis is upon a critical understanding of junior high school subject matter; supplementary topics include teaching aids and classroom procedures. Not open to students having credit for EDC&I 377. Prerequisites, EDPSY 304, EDC&I 378, Mathematics 101, or equivalent. (Formerly Education 337.)

EDC&I
377 The Teaching of Secondary School Mathematics (3)

DUBISCH

Emphasis is upon a critical understanding of subject matter; supplementary topics include teaching aids and classroom problems. (Credits count: 2 as education and 1 as mathematics.) Prerequisites, EDPSY 304, EDC&I 378, Mathematics 412, or equivalent. (Formerly Education 336.)

EDC&I
378 Teaching Mathematics in the Secondary School (2)

A basic course in the teaching of mathematics in the secondary school for preservice teachers. (Formerly Education 370.)

EDC&I
400 Selection and Organization of Occupational and Industrial Education Subject Matter (3)

BAILY

Problems, techniques, and procedures in the selection and organization of teaching content for industrial education; preparation of instructional units and evaluative devices for industrial education teachers. (Formerly Education 388.)

EDC&I
401 The Teaching of Occupational and Industrial Education (3)

BAILY

To acquaint prospective industrial education teachers with teaching aids, classroom procedures, and problems in the teaching of industrial education courses. Prerequisite, EDC&I 400 or permission. (Formerly Education 327.)

EDC&I
402 Instructional Analysis for Industrial Education Teachers (3)

BAILY

A study of the techniques and procedures used in analyzing instructional areas into their basic elements, and an arrangement of the elements into a teaching plan and sequence for industrial arts and vocational industrial education course. (Formerly Education 487.)

EDC&I
403 Planning the Industrial Educational Facilities (3)

BAILY

A study of the fundamental concepts and principles in planning industrial education areas to produce safe, efficient, and effective teaching-learning situations. An analysis of the problems encountered in the selecting, purchasing, locating, and installing of equipment, tools, materials, and services. (Formerly Education 482.)

EDC&I
404 Principles and Objectives of Vocational Education (3)

BAILY

Survey of vocational education, aims, objectives, and types of programs. Relationship to

EDUCATION

general and practical arts education. (Formerly Education 445.)

EDC&I

405 Supervision of Vocational Education Programs (3)

BAILY

Principles, problems, techniques, and methods of supervision; planning and organizing a supervisory program, equipment and instructional materials; relationship of supervisors to administrators and teachers; evaluation of programs. Prerequisite, permission of the instructor. (Formerly Education 444.)

EDC&I

406 Organization and Administration of Vocational Education Programs (3)

BAILY

Administrative problems involved in organizing and operating vocational schools and classes. This class is designed for superintendents, principals, vocational directors, supervisors, or other persons with direct responsibility for the administration or supervision of vocational programs. (Formerly Education 446.)

EDC&I

407 Organization and Administration of Industrial Education (3)

BAILY

Types of programs of vocational-industrial education and industrial arts; organization and administration of these programs, the relationships between them, and their place in public school programs. (Formerly Education 483.)

EDC&I

408 Current Problems in Vocational and Industrial Arts Education (3)

BAILY

A study of the current events and problems in industrial education and their application in the field. (Formerly Education 489.)

EDC&I

409 Improvement of Teaching: Industrial Education (3)

BAILY

An analysis of the types of teaching instructional materials and evaluation devices used in industrial education, with emphasis upon the improvement of existing methods and techniques. (Formerly Education 475I.)

EDC&I

410 Field Experience in Industrial Practices (2-10, max. 10)

BAILY

Study of the problems of industry such as employment practices, job requirements, materials handling and processing, plant organization and management that would assist industrial arts teachers interpret industrial practices. Prerequisites, teaching experience in industrial education and permission of instructor. (Formerly Education 484.)

EDC&I

411 Principles and Problems in Distributive Education (3)

Concerned with improvement of instruction, maintenance of high standards in work stations, and special techniques used by experienced coordinators in the solution of common problems. (Offered summer quarter only.) (Formerly Education 476I.)

EDC&I

412 Selection and Organization of Distributive Education Subject Matter (3)

Problems, techniques, and procedures in the selection and organization of teaching con-

tent for distributive education. Prerequisite, permission. (Formerly Education 476G.)

EDC&I

413 Coordination of Distributive Education Programs (3)

Stresses fundamentals, records and reports, the use of advisory committees, course titles, qualifications, coordinating activities, course content, and work training stations. (Formerly Education 476K.)

EDC&I

414 Distributive Education: Post-Secondary Level (3)

BAILY

History and development of midmanagement distributive education programs, organization, and framework. Eight principal elements covering all aspects of the program, including type of students served, qualifications of the instructors, curriculum, research, and coordination aspects. (Formerly Education 476.)

EDC&I

415 Materials and Methods of Teaching Typewriting (3)

BRIGGS

Procedures and materials for developing skills in beginning and advanced typewriting. Demonstration and participation in drill techniques; testing and grading; evaluation of recent research findings in the development of speed and accuracy; classroom organization. (Formerly Education 476D.)

EDC&I

416 Materials and Methods of Teaching Office and Clerical Practice (3)

BRIGGS

Objectives and content of office practice and general clerical practice courses; plans for organizing classes and methods of teaching specific machines and subject matter; laboratory study of new inventions in office machines. (Formerly Education 476E.)

EDC&I

417 Materials and Methods of Teaching Gregg Shorthand and Transcription (3)

BRIGGS

Recent research and experimentation in teaching shorthand and transcription are emphasized. Psychology of skill development; comparison of the various methods of teaching shorthand; evaluation of teaching materials; consideration of standards, objectives, and teaching techniques. An advanced course for experienced teachers. (Offered summer quarter only.) (Formerly Education 476L.)

EDC&I

418 Principles and Problems of Business Education (3)

BRIGGS

Objectives, history, trends, and issues of business education; federal participation in vocational education; economic, occupational, and population trends and their implications in business education; leaders in business education; research and problems. (Offered summer quarter only.) (Formerly Education 476M.)

EDC&I

419 Materials and Methods of Teaching Bookkeeping and General Business Subjects (3)

BRIGGS

Techniques of teaching bookkeeping and general business subjects; relationship to the cur-

riculum; standards to be achieved; content and organization of the subject matter; tests and teaching materials; new trends in the field; motivational devices; visual aids. (Formerly Education 476N.)

EDC&I

420 Principles of Safety Education (3)

BAILY

Designed primarily for teachers and administrators interested in developing a school safety program in elementary, junior, and senior high schools. Special emphasis is placed on the need for a safe school environment and the role of the teacher in promoting safety. (Formerly Education 415.)

EDC&I

421 Principles of Safety Education: Driver Education, Introductory (3)

BAILY

An introductory course to develop and improve knowledges, attitudes, and skills related to the teaching of the driving tasks in the secondary school. (Extension credit only.) (Formerly Education X415A.)

EDC&I

422 Principles of Safety Education: Driver Education, Advanced (3)

BAILY

To build and develop new and broader competencies in traffic safety, including research, engineering, school transportation, traffic law and enforcement, current teaching methods, scheduling, and administration. Prerequisites, EDC&I 421 and permission. (Extension credit only.) (Formerly Education X415B)

EDC&I

423 Workshop in Instructional Improvement: Industrial Education (2-6)

Individual or group study projects on the improvement of instruction in Industrial Education.

EDC&I

425 Programs in Elementary Physical Education (Men and Women) (2½)

HORNE

Progress and problems in modern programs. Offered jointly with the Department of Physical and Health Education for Women as Physical Education (Women) 478. (Offered summer quarter only.) (Formerly Education 478J.)

EDC&I

426 Field Training in Health Education (5)

MILLS, REEVES

Four and one-half weeks of full-time supervised work experience in the health education division of a local official health agency. Offered jointly with the Department of Preventive Medicine as Preventive Medicine 460. Prerequisite, permission. (Formerly Education 460J.)

EDC&I

427 Improvement of Teaching: Home Economics (3, max. 6)

GRANBERG, MC ADAMS

Identification of goals, concepts, and generalizations in home economics units at the secondary level with emphasis on teaching techniques, evaluation, and use of resources. Offered jointly with the School of Home Economics as Home Economics 462. Prerequisite, teaching experience in home economics or permission. (Formerly Education 475FJ.)

EDC&I**428 Organization and Supervision of Post-Secondary Distributive Education (3)**

Development of supervisory personnel for community colleges and technical vocational schools to initiate, operate, and administer post-secondary midmanagement programs.

EDC&I**435 The Teaching of Foreign Literature (3, max. 6)**

KELLER

The methodology of teaching a foreign literature, with demonstrations by the instructor and practice by students; preparation of lectures; study of discussion techniques. Offered jointly with the Department of Romance Languages and Literature as Romance Linguistics 475. Prerequisites, senior standing and permission. (Formerly Education 475DJ, 475EJ.)

EDC&I**438 Improvement of Teaching: Latin (3)**

Examination and evaluation of the various methods of teaching Latin; audio-visual aids, testing materials, textbooks; relation of Latin to other languages; Latin derivatives in English vocabulary. Offered jointly with the Department of Classics as Latin 475. (Formerly Education 475LJ.)

EDC&I**439 Caesar for High School Teachers (3)**

READ

Interpretation of Caesar's works in the light of their historical, political, literary, and geographical background, with special reference to the problems of high school teaching. Offered jointly with the Department of Classics as Latin 476. (Offered summer quarter only.) (Formerly Education 475XJ.)

EDC&I**441 Improvement of Teaching: Art Appreciation in the Schools (3)**

A survey of the history of art to promote an appreciation of the nation's cultural heritage; designed for teachers at all levels of instruction and subject matter areas. (1) Development of content in sequential or unit plan studies to incorporate art history in general studies curricula. (2) Development of methods and preparation of materials for classroom presentation. Illustrated lectures. Prerequisite, teaching experience. (Formerly Education 475R.)

EDC&I**443 Improvement of Teaching: Elementary School Music (3)**

Advanced studies in the teaching of music in the elementary school. Prerequisite, teaching experience. (Formerly Education 475K.)

EDC&I**445 Theory and Practice of Kindergarten and Primary Teaching (3)**

MAC DONALD

A systematic treatment of the content, teaching processes, and learning resources appropriate to kindergarten and primary education with particular emphasis on current research and developments. Prerequisite, teaching experience. (Formerly Education 420.)

EDC&I**455 The Language Arts: Instructional Problems and Practices in the Elementary School (3)**

KITTELL, SEBESTA

A study of important and recent research in elementary school language arts and a con-

sideration of its practical implications for teaching. Prerequisite, teaching experience. (Formerly Education 475H.)

EDC&I**456 Workshop in Instructional Improvement: Language Arts (5)**

Individual or group study projects on the improvement of instruction in language arts.

EDC&I**458 Journalism Teaching in the Secondary School (2½)**

SAMUELSON

Advanced course in teaching high school journalism. For experienced publications advisers. No credit if EDC&I 358 or Journalism 375J has been taken. (Offered summer quarter only.) (Formerly Education 475J.)

EDC&I**460 The Teaching of Reading (3)**

FEA, SEBESTA

The teaching of reading in the elementary and intermediate grades of the elementary school, including comprehension and decoding, reading in the content fields, and motivation of voluntary reading. Students will work intensively in one area of special interest. Prerequisite, teaching experience. (Formerly Education 477.)

EDC&I**461 Supplementary Materials for the Teaching of Reading (3)**

Designed to provide acquaintance with and basis for evaluation of materials used in the teaching of reading. Basal readers, material from the content areas, recreational reading materials, and supplementary practice materials will be examined. Prerequisite, teaching experience.

EDC&I**465 Social Studies Education: Elementary School Programs and Practices (3)**

JAROLIMEK

Stresses curriculum patterns, instructional procedures, resource materials, and the selection of content in social studies. For elementary and junior high school teachers. Prerequisite, teaching experience. (Formerly Education 475M.)

EDC&I**466 Social Studies Education: Secondary School Programs and Practices (3)**

Stresses curriculum patterns, instructional procedures, resource materials, and a selection of content in social studies for junior and senior high school teachers. Prerequisite, teaching experience. (Formerly Education 475Y.)

EDC&I**467 Geography in the Social Studies Curriculum (3)**

BACON

A discussion of the concepts and content of geography essential to effective social studies curricula. Offered jointly with the Department of Geography as Geography 467. (Offered summer quarter only.) (Formerly Education 475GJ.)

EDC&I**468 Workshop in Instructional Improvement: Social Studies (2-6)**

Individual or group study projects on the improvement of instruction in social studies.

EDC&I**470 Science Education: Elementary School Programs and Practices (3)**

OLSTAD

Designed for classroom teachers with reference to the teaching and learning of science from kindergarten through grade six. Emphasis is placed on objectives, methods, and materials as related to the concepts and processes of science. Prerequisite, teaching experience. (Formerly Education 475S.)

EDC&I**471 Science Education: Secondary School Programs and Practices (3)**

OLSTAD

Survey of the status and potential role of science in education; trends and their implications for the teaching of both biological and physical sciences in the junior and senior high schools; representative curricula and related teaching procedures; the psychology of concept formation and problem-solving; and organization of science programs. Prerequisite, teaching experience. (Formerly Education 475T.)

EDC&I**473 Workshop in Instructional Improvement: Science (2-6)**

Individual or group study projects on the improvement of instruction in science.

EDC&I**475 Improvement of Teaching: Elementary School Mathematics (3)**

VOPNI

Designed for elementary teachers (grades K-6). Emphasis is placed on the contributions of research to the improvement of the teaching of mathematics in the elementary school. Prerequisite, teaching experience. (Formerly Education 475B.)

EDC&I**476 Improvement of Teaching: Junior High School Mathematics (5)**

An exploration of some modern mathematical concepts for the purpose of improving the teaching of junior high school mathematics. Prerequisite, Mathematics 101 or equivalent. (Formerly Education 475P.)

EDC&I**477 Improvement of Teaching: Secondary School Mathematics (5)**

An exploration of some modern mathematical concepts for the purpose of improving the teaching of secondary school mathematics. Prerequisite, teaching experience. (Formerly Education 475A.)

EDC&I**478 Special Topics in Mathematics for Teachers (2-5, max. 15)**

Algebra and geometry for junior high school teachers of mathematics. Offered jointly with the Department of Mathematics as Mathematics 497. (Formerly Education 497J.)

EDC&I**479 Workshop in Instructional Improvement: Mathematics (2-6)**

Individual or group study projects on the improvement of instruction in mathematics.

EDC&I**480 Introduction to Learning Resources in Teaching (3)**

TORKELSON

Factors influencing the selection and use of audio-visual resources in instruction. (Formerly Education 455.)

EDC&I

481 Practicum in Learning Resources (3)
Design and production of visual and auditory materials for teaching. Prerequisite, EDC&I 480 or equivalent. (Formerly Education 456.)

EDC&I

482 Still Photography in Education (3)
Theory and practice in producing still photographs and slides for teaching purposes; camera and darkroom techniques. Producing photographic materials to meet specific learning problems. Prerequisite, EDC&I 480 or permission. (Formerly Education 457.)

EDC&I

483 Educational Film Production (3)
Basic motion-picture techniques, emphasizing cinematography and editing. (Formerly Education 458A.)

EDC&I

484 Educational Film Production (3)
Advanced film techniques, including instructional film design, narration writing, sound editing, and rerecording. Prerequisite, EDC&I 483. (Formerly Education 458B.)

EDC&I

485 Workshop in Instructional Improvement: Learning Resources (2-6)
Individual or group study projects on the improvement of instruction in learning resources.

EDC&I

488 Television in the Schools (3)
DILWORTH
Television programs to supplement classroom work; the development of the American system of broadcasting; the development and significance of educational television, and the contribution schools can make to broadcasting. Offered jointly with the School of Communications as Communications 459. Open to nonmajors; not open to graduate students in communications. (Offered summer quarter only.) (Formerly Education 459J.)

EDC&I

489 Television Production Workshop for Teachers (2½)
RYAN
Working in University studios under laboratory conditions involving production and on-camera methods, teachers learn to present instructional subject matter through television. For those especially who expect to work with television as instructors or as supervisors of school-oriented television activities. Open to nonmajors; not open to graduate students in Communications or to students with credit for Communications 361. Offered jointly with the School of Communications as Communications 463. (Offered summer quarter only.) (Formerly Education 463J.)

EDC&I

490 Elementary School Curriculum (3)
HUNKINS, JAROLIMEK, KITTELL
Description and analysis of current curriculum practices with particular emphasis upon the interrelationships and dimensions of content, organization, methods, evaluation, trends, and issues. Prerequisite, teaching experience. (Formerly Education 461.)

EDC&I

491 Junior High School Curriculum (3)
An historical, philosophical, and functional analysis of junior high school education with particular emphasis upon curriculum and

teaching procedures. (Formerly Education 462.)

EDC&I

492 Secondary School Curriculum (3)
ANDERSON
A systematic description and analysis of current curriculum practices with particular emphasis upon the factors and forces affecting secondary school curriculum. (Formerly Education 465.)

EDC&I

493 Principles and Procedures of Curriculum Development (3)
HUNKINS
Intensive study of the basic principles and procedures utilized in the development of curricula. Prerequisite, teaching experience. (Formerly Education 467.)

EDC&I

494 Workshop in Curriculum Development (1-15, max. 15)
HUNKINS
Individual or group work on curriculum development projects in elementary and secondary schools. Prerequisite, EDC&I 493. (Formerly Education 466.)

EDC&I

495 Improvement of Teaching (3)
To help teachers (1) understand the physical, psychological, emotional, and social needs of children, (2) adapt instruction to the needs of children, (3) select the approaches and instructional resources which will provide the soundest learning experiences, and (4) in the appraisal of themselves and their work. (Offered only by special arrangement with school districts.) (Formerly Education 475.)

EDC&I

496 Workshop in Instructional Improvement (2-6, max. 6)
Individual or group study projects on the improvement of instruction. (Formerly Education 474.)

EDC&I

510 Seminar in Industrial Arts and Vocational Technical Education (3)
BAILY
Intensive study of current events, problems and research studies in industrial arts education, vocational and technical education. Prerequisite, permission of instructor. (Formerly Education 579.)

EDC&I

511 History of Industrial Education (3)
BAILY
A study of the leaders, agencies, movements, experiments, and publications that have contributed to the development of industrial education, with special attention to the economic, social, and philosophical factors which have motivated and influenced this development in America. (Formerly Education 486.)

EDC&I

515 Seminar in Business Education (3)
BRIGGS
Analysis of selected problems in Business Education; current research in Business Education; evaluation of work experience programs; developments in vocational Business Education. Prerequisites, EDC&I 415, 418, 419. (Formerly Education 569.)

EDC&I

530, 531 Romance Language Teachers Seminar (3,3)
SIMPSON
The teaching of foreign languages. Conducted as a workshop. Offered jointly with the Department of Romance Languages and Literature as Romance Linguistics 572, 573. (Formerly Education 572J, 573J.)

EDC&I

560 Seminar in Reading (3)
KITTELL, MONSON, SEBESTA
Designed to focus primarily on those aspects of the reading process that are of concern in a developmental reading program. Emphasis is on research dealing with factors influencing reading ability, problems in skill development, effectiveness of various methods and approaches for teaching reading, reading in content fields, and recreational reading. Course work includes group and individual analysis of studies with attention to research design and measurement. Prerequisite, permission of instructor. (Formerly Education 575E,S)

EDC&I

561 Seminar in Language Arts (3)
KITTELL, MONSON, SEBESTA
Study of recent research in language structure with special attention to research pertaining to the teaching of language skills: ausing, speech, and written composition. Course work includes group and individual analysis of language arts studies with attention to research design and measurement. Prerequisite, permission of instructor. (Formerly Education 575E,S)

EDC&I

562 Seminar in Reading and Language Arts: Secondary Emphasis (3)
FEA, KITTELL, SEBESTA
Study of recent research in listening, oral language, reading, and written language, emphasizing psychological and interrelated aspects. Prerequisite, permission of instructor. (Formerly Education 575S.)

EDC&I

563 Current Issues in Language Arts Education (1, max. 6)
KITTELL
Discussion of problems and issues of current interest and importance in language arts education.

EDC&I

565 Seminar in Social Studies Education: Elementary Emphasis (3)
JAROLIMEK
Intensive study of the social studies curriculum, with particular emphasis on current literature and research. Prerequisite, EDC&I 465 or equivalent. (Formerly Education 578E.)

EDC&I

566 Seminar in Social Studies Education: Secondary Emphasis (3)
JAROLIMEK
Intensive study of the social studies curriculum, with particular emphasis on current literature and research. Prerequisite, EDC&I 465 or equivalent. (Formerly Education 578S.)

EDC&I

567 Current Issues in Social Studies Education (1, max. 6)
JAROLIMEK
Discussion of problems and issues of current interest and importance in social studies education.

EDC&I**570 Seminar in Science Education: Elementary Emphasis (3)**

OLSTAD

Investigation of curriculum and instruction in science at elementary school levels, with particular emphasis on current literature and research. Prerequisite, EDC&I 470 or equivalent. (Formerly Education 576E.)

EDC&I**571 Seminar in Science Education: Secondary Emphasis (3)**

OLSTAD

Investigation of curriculum and instruction in science at secondary school levels, with particular emphasis on current literature and research. Prerequisite, EDC&I 471 or equivalent. (Formerly Education 576S.)

EDC&I**572 Current Issues in Science Education (1, max. 6)**

OLSTAD

Discussion of topics and problems of current interest and importance in science education.

EDC&I**575 Seminar in Mathematics Education: Elementary Emphasis (3)**

VOPNI

Investigation of curriculum and instruction in mathematics at the elementary school level; review of research and preparation of proposals. Prerequisite, EDC&I 475 or equivalent. (Formerly Education 577E.)

EDC&I**576 Seminar in Mathematics Education: Secondary Emphasis (3)**

VOPNI

Investigation of curriculum and instruction in mathematics at the secondary school level; review of research and preparation of proposals. Prerequisite, EDC&I 476 or 477, or equivalent. (Formerly Education 577S.)

EDC&I**577 Current Issues in Mathematics Education (1, max. 6)**

VOPNI

Discussion of problems and issues of current interest and importance in mathematics education.

EDC&I**580 Seminar in Learning Resources (3)**

Advanced analysis of learning resources, instructional communications, and technology. Prerequisite, EDC&I 480 or permission of instructor. (Formerly Education 520.)

EDC&I**581 Management of Learning Resources Programs (3)**

A study of factors affecting management of educational programs involving production, storage, distribution, and use of visual and auditory materials and equipment. Prerequisite, EDC&I 480 or permission. (Formerly Education 519.)

EDC&I**582 Learning Resources Systems of Instruction (3)**

A study of the "systems" approach to instruction and the orchestration of relevant components, techniques; and arrangements; e.g., logistics, instructional space and facilities, computer-assisted instruction. (Formerly Education 521.)

EDC&I**583 Learning Resources and Learning Domains (5)**

Research and relevant literature concerning visual and auditory stimuli as these relate to learning domains (affective, perceptual-motor, cognitive). (Formerly Education 522.)

EDC&I**589 Doctoral Seminar in Learning Resources (3)**

For doctoral majors in learning resources, concentrating on contemporary research in the field, and on candidate's individual project and postdoctoral research plans. (Formerly Education 523.)

EDC&I**590 Seminar in Elementary Education (3)**

KITTELL

An exploration of the philosophy, history, purposes, curriculum, methods, school organization, and evaluation in elementary education, with emphasis on individual research. Prerequisites, elementary school teaching experience, EDPSY 401, and EDC&I 490. (Formerly Education 525.)

EDC&I**592 Seminar in Secondary Education (3)**

Research and study of secondary education. Primary focus will be on factors involving change in secondary school curriculum and organization. Prerequisite, EDC&I 491 or 492. (Formerly Education 568.)

EDC&I**593 Seminar in Curriculum: Theory and Practice (3)**

HUNKINS

An investigation of the area of curriculum theory and practice. Consideration is given to the development of models to explain the relationships between various curricular variables. These theoretical models are related to curricular practices and innovations. Prerequisites, EDC&I 493 and experience. (Formerly Education 560.)

EDC&I**594 Seminar in Curriculum: Theory and Practice (3)**

HUNKINS

Further investigation of the area of curriculum theory and practice. Theoretical models considered and developed in EDC&I 593 are further refined and new models are discussed. Curricular practice and innovation is considered from additional theoretical frameworks. Prerequisites, EDC&I 493, 593, and experience. (Formerly Education 561.)

EDC&I**595 Seminar in Analysis of Teaching (3)**

CLEGG

An exploration of the dimensions of teaching, including psychological, sociological, and philosophical factors. Particular emphasis is given to research related to the variables involved in teaching. Prerequisites, teaching experience and EDPSY 401. (Formerly Education 570.)

EDC&I**596 Seminar in Strategies of Instruction (3)**

CLEGG

An exploration of the various media and types of organization relevant to the implementation of strategies based on theoretical models. Prerequisite, EDC&I 595. (Formerly Education 571.)

EDC&I**598 Internship in Curriculum (3-9, max. 9)**

HUNKINS

Recommended for all doctoral candidates preparing for positions as curriculum directors in public school systems. Half-time work in a school district or districts in close proximity to the University of Washington for one, two, or three quarters, depending upon the student's previous experience. Supervision by staff members of the College of Education and the appropriate school staff member in charge of curriculum in the selected school district. Prerequisite, EDC&I 493. (Formerly Education 562.)

HIGHER EDUCATION**EDHED****417 Adult Education (3)**

SCHILL

A survey and analysis of the aims and objectives of professional adult education in America. (Formerly Education 417.)

EDHED**450 Introduction to the Study of Higher Education (3)**

COPE

An introduction to contemporary United States higher education, with special emphasis on emerging trends, roles of the several kinds of institutions, the composition and character of student bodies and faculty, and the broader coordination of colleges and universities. (Formerly Education 450.)

EDHED**550 Development and Organization of Higher Education (3)**

WILLIAMS

An examination of the structures of the American higher education enterprise, including an analysis of attempts at taxonomy, of studies of the relationships between ends and means, and of attempts to change the college and university. (Formerly Education 550.)

EDHED**551 College Problems (3)**

WILLIAMS

Identification of a number of contemporary problems of American higher education, and an analysis of the methods by which solutions may be sought. Prerequisites, prospective candidacy in higher education, and EDHED 550. (Formerly Education 551.)

EDHED**552 Improvement of College Teaching (3)**

REITAN

An analysis of various instructional modes, media, and instruments, with emphasis on current research findings and methodology. (Formerly Education 552.)

EDHED**553 Seminar in the Administration of Community Colleges (3)**

LARSEN

For students preparing for administrative positions in community colleges. Principles and practices in organization and administration of community colleges. Prerequisite, EDHED 555. (Formerly Education 553.)

EDHED**554 Seminar in the Administration of Colleges and Universities (3)**

A study of the internal administration and organization of four-year colleges and universities with emphasis on both practice and theory. Instruction largely by the case or problem method. Prerequisite, EDHED 450. (Formerly Education 554.)

EDHED

555 The Community College (3)

LARSEN

A study of the history, development, role, objective, and organization of the community college and of the problems and issues confronting the two-year college. (Formerly Education 555.)

EDHED

556 Internship in Higher Education (3-10, max. 10)

REITAN

Field study and experience in college teaching and administration, planned by the College of Education in cooperation with selected colleges. Prerequisite, permission of instructor. (Formerly Education 556.)

EDHED

557 Occupational Programs in Higher Education (3)

SCHILL

Analysis of occupational preparation programs in institutions of higher education, industry, and business and governmental agencies, with emphasis on methods of determining content, processes for evaluation, and research. (Formerly Education 557.)

EDHED

558 History of American Higher Education (3)

WILLIAMS

An examination of the historical development of the American higher educational enterprise. (Formerly Education 558.)

EDHED

559 Seminar in Higher Education (3, max. 6)

Intensive study of selected problems and proposals for research in higher education. Prerequisites, prospective candidacy in higher education, and permission of instructors. (Formerly Education 559.)

HISTORY, PHILOSOPHY, AND SOCIOLOGY

EDHPS

410 Educational Sociology (3)

An examination of roles played by small and large groups, as they affect the school as a social system. Current sociological theory is modified or extended to explain school events and interrelationships. Field experience included. (Formerly Education 410.)

EDHPS

412 Foundations of Freedom and Education (3)

MORRIS

Emphasis on the principles, processes, and content of constitutional law in an effort to provide new insights and new tools with which school administrators and teachers may examine questions involving political and civil rights in the United States, especially as these affect the conduct of education. (Formerly Education 412.)

EDHPS

479 Crucial Issues of Education (3)

A course designed to consider in some detail certain of the most significant and critical problems of educational policy. (Formerly Education 479.)

EDHPS

480 History of Educational Thought (3)

BURGESS

Survey of educational theory and practice in Western culture. (Formerly Education 480.)

EDHPS

488 Philosophy of Education (3)

TOSTBERG

Consideration of the major philosophic questions that underlie educational theory. (Formerly Education 488.)

EDHPS

492 History of European Education Through the Reformation (3)

Development of European education in cultural context: Greece, Rome, Middle Ages, Renaissance, and Reformation. (Formerly Education 492.)

EDHPS

493 History of European Education Since the Reformation (3)

Development of European education in cultural context: Pedagogical reformers, national systems, and recent trends. (Formerly Education 493.)

EDHPS

494 History of American Education to 1865 (3)

BURGESS

Development of American education in cultural context: colonial period, influence of Enlightenment, and common school movement. (Formerly Education 494.)

EDHPS

495 History of American Education Since 1865 (3)

BURGESS

Development of American education in cultural context: progressive education, recent criticism, continuing issues and trends.

EDHPS

496 Comparative Education (3)

International efforts in education, primarily the role of the United States in overseas programs. Analysis of the relation of school and society in foreign areas, stressing social change and conflict. (Formerly Education 496.)

EDHPS

498 Educational History and Utopian Thought (3)

BURGESS

Selected studies of education as a key to the good society. (Formerly Education 498.)

EDHPS

510 Seminar in Educational Sociology (3)

Application of sociological principles to school problems; individual problems and investigations. For teachers, administrators, and those using educational sociology as a field for advanced degrees. (Formerly Education 510.)

EDHPS

580 Seminar: Research in History of Education (3, max. 6)

BURGESS

Study of the literature, bibliography, sources, and critiques of history of education. Research methods analyzed and demonstrated in seminar papers. Prerequisites, graduate standing and permission of instructor. (Formerly Education 580.)

EDHPS

582 Seminar in Philosophy of Education: Modes of Inquiry (3, max. 6)

TOSTBERG

Study of the various ways in which philosophers of education have conducted their inquiries and presented their findings. Prerequisites, EDHPS 488 and permission of instructor. (Formerly Education 582.)

EDHPS

583 Seminar: Research in Educational Sociology (3)

Theory, concept, and method of sociological inquiry as applied to problems in education. Prerequisite, permission of instructor. (Formerly Education 586.)

EDHPS

586 Seminar in Educational Classics (3)

Analysis in depth and in the context of the relevant history of several major works in educational thought from Plato to Dewey. Prerequisite, permission of instructor.

EDHPS

587 Contemporary Philosophies of Education (3)

TOSTBERG

Intensive study of the writings of selected contemporary philosophers of education. Prerequisite, graduate standing. (Formerly Education 587.)

EDHPS

588 Analysis of Educational Concepts (3)

TOSTBERG

Study of the application of linguistic analysis to the discourse of education. Prerequisites, EDHPS 587 and permission of instructor. (Formerly Education 588.)

EDHPS

589 Special Topics in History, Philosophy, and Sociology of Education (3, max. 12)

For advanced degree candidates majoring in history, philosophy, and sociology of education. Prerequisite, permission of instructor. (Formerly Education 589.)

EDUCATIONAL PSYCHOLOGY

EDPSY

304 Educational Psychology (5)

CALDWELL, HAUCK, MC CARTIN

The basic undergraduate course in psychology is concerned with the study of human learning in the educational setting. Learning, motivation, technology, the cognitive process, human development and socialization, the affective processes and attitudes change, and classroom management are examined. Emphasis is placed on the development of competence in manipulation of events known to influence effective classroom learning. EDUC 289 should be taken concurrently. Prerequisite, EDUC 288. (Formerly Education 304.)

EDPSY

308 Evaluation in Education (3)

CLARK, PECKHAM, SAX, WODTKE

Fundamentals of measurement, construction of achievement tests, selection and administration of standardized tests and scales, and evaluation and application of test results. (Formerly Education 308.)

EDPSY

365 Sensory-Motor and Language Development in Young Children (3)

EVANS, WODTKE

A study of sensory-motor, language, and general cognitive development in young children. Trends and processes of behavioral development are examined with particular emphasis upon problems and techniques in the assessment of behavior related to school learning. Current theories and practices are reviewed and laboratory experiences provided. This course reflects a pluralistic multiple approach to child study. Prerequisite, EDPSY 304; EDPSY 308 recommended but not required. (Formerly Education 365.)

EDPSY

- 401 Advanced Educational Psychology-Learning (3)**
CALDWELL, FEA, MEACHAM

Consideration of the major topics in the psychology of learning as applied to the teacher-learner environment. Prerequisite, EDPSY 304 or equivalent. (Formerly Education 401.)

EDPSY

- 402 Advanced Child Development (3)**
EVANS, WODTKE

An advanced course in the psychology of human growth and development with a focal concern for the educational implications of developmental psychology. Prerequisites, EDPSY 304 and 401. (Formerly Education 402.)

EDPSY

- 407 Teaching the Gifted Child (3)**
FREEHILL, HAUCK

The role of the teacher and the school in the identification and development of the special abilities and talents of gifted children. Prerequisite, teaching experience. (Formerly Education 407.)

EDPSY

- 408 Mental Hygiene for Teachers and Administrators (3)**
LAWRENCE, SALYER

Principles of mental health; normal personality development and functioning; relation of school environment to mental health of students, teachers, and administrators. Background in educational psychology is recommended, but is not a prerequisite. (Formerly Education 408.)

EDPSY

- 413 Adolescence and Youth (3)**
EVANS, HAUCK, MC CARTIN, WODTKE

This course provides an overview of the adolescent period for individuals who plan to work with students in the junior and senior high schools and in the early college years. It will focus upon crucial aspects of the students' intellectual, social, physical, and emotional developmental processes and patterns. It will consider the impact of culture upon the adolescent group. Prerequisite, EDPSY 304 or equivalent. (Formerly Education 413.)

EDPSY

- 421 Remedial Education (3)**
Experience in and study of analysis of difficulties in school subjects with special reference to language arts and mathematics. Experience in language arts and mathematics. Experience in and study of appropriate remedial instruction. Analysis and instruction will be that that is both feasible and practical for the teacher working with individuals or with a group. (Formerly EDSPE 421.)

EDPSY

- 422 Reading Disability Clinic (3-5)**
Supervised practicum in diagnosing and teaching children with reading disabilities. Prerequisite, EDPSY 425, which was formerly EDSPE 425. (Formerly EDSPE 422.)

EDPSY

- 425 Reading Disability; Remedial Techniques (3)**

Discussion and evaluation of methods for minimizing reading retardation. Descriptions of in-class and clinical procedures supple-

mented by classroom observations. Prerequisite, EDC&I 360 or equivalent. (Formerly EDSPE 425.)

EDPSY

- 447 Principles of Guidance (3)**
ISLAND, LAWRENCE

A study of guidance programs in elementary and secondary schools. Attention will be given to the roles of specialists with emphasis upon the role of the classroom teacher in school guidance programs. This course is designed for teachers, administrators, and prospective teachers. Prospective counseling specialists should see EDPSY 551, 552, 553. (Formerly Education 447.)

EDPSY

- 449 Laboratory in Educational Psychology (2-6, max. 6)**

Special studies for counselors, teachers, administrators, and others concerned with student personnel and psychological services in schools and colleges. The course focuses on special topics which have either local or contemporary significance. (Not offered every year; check current *Time Schedule*.) (Formerly Education 449.)

EDPSY

- 490 Basic Educational Statistics (3)**
KLOCKERS, PECKHAM

Frequency distributions, measures of central tendency and variability, linear correlation, probability, binomial and random sampling, normal distributions, Chi square, significance of means and correlations, zero order regression and prediction. (Formerly Education 490.)

EDPSY

- 491 Computer Utilization in Education (3) W**
PECKHAM

An introduction to programming languages, computer utilization in the solution of research problems, data reduction to forms amenable to computer processing, appropriate framing of problems for solution by computers, utilization of program packages. Prerequisite, EDPSY 490.

EDPSY

- 501 Seminar in Concepts and Problem Solving (3)**
FEA

The psychology of children's thinking. Course will emphasize study of research results in concept development and problem solving with application to classroom learning situations. Prerequisite, permission of instructor. (Formerly Education 501A.)

EDPSY

- 502 Seminar in Critical and Creative Thinking (3)**
FEA

The psychology of children's thinking. Course will emphasize study of research results in critical thinking and creative thinking with application to classroom learning situations. Prerequisite, permission of instructor. (Formerly Education 501B.)

EDPSY

- 503 Psychology of Reading (3) W**
FEA

Reading and perception, word recognition, concept development and meaning in reading: psychology of reading interests and skills. (Formerly Education 504A.)

EDPSY

- 504 Verbal Instruction (3)**
FEA

A study of the psychological implications of verbal behavior as applied to classroom instruction and learning. Prerequisite, permission of instructor. (Formerly Education 504B.)

EDPSY

- 505 Educational Issues in Human Learning (3)**
FREEHILL

A study of contemporary problems in learning with emphasis on historical antecedents to modern views, methodological problems in the solution of the issues, relevant studies and phenomenological observation, implications and application of conclusions. Prerequisite, at least 20 quarter credits of previous work in educational psychology and/or psychology. (Formerly Education 502A.)

EDPSY

- 506 Instructional Theory (3)**
An examination of the contribution of psychology to teaching and an evaluation of selected elements in instructional strategies. Prerequisite, EDPSY 505. (Offered alternate years; check current *Time Schedule*.) (Formerly Education 502B.)

EDPSY

- 507 Reading Disability: Etiology and Diagnosis—Practicum (5)**
THALBERG

Theory and basic concepts underlying appraisal techniques and causality. Lectures and clinical practicum in administering, scoring, and evaluating each technique, and in interpreting and communicating results. Prerequisite, EDC&I 360 or equivalent. (Formerly EDSPE 505.)

EDPSY

- 508 Clinical Supervision—Practicum (3-6, max. 6)**
THALBERG

Practicum in supervising diagnostic activities and remedial reading therapy. (Formerly EDSPE 507.) Prerequisites, EDPSY 422 and 425. (Formerly EDSPE 422 and EDSPE 425.)

EDPSY

- 510 Seminar in Educational Psychology (3)**
Seminar on advanced topics in educational psychology. A critical appraisal of current research. Prerequisites, advanced degree candidacy in educational psychology and permission. (Formerly Education 510.)

EDPSY

- 540 Individual Testing (5)**
BROWN, MEACHAM, OLCH

A study of intelligence testing with supervised experience. The emphasis is on the Stanford Binet and the Wechsler Intelligence Scale for Children. Prerequisites, EDPSY 308, 541, and permission of instructor. (Formerly Education 540.)

EDPSY

- 541 Group Tests in Counseling (5)**
BASHEY, FORSTER

Emphasis on the utilization of objective measures in counseling. Prerequisite, EDPSY 490 or equivalent. (Formerly Education 541.)

EDPSY

- 542 Career Development (3)**
SALYER

Emphasis on educational and vocational information in counseling. Overview of theories of vocational choice. (Formerly Education 542.)

EDUCATION

EDPSY

544 Counseling (5)

BRAMMER, LEE, ISLAND

Emphasis on the theory and practice of student counseling. (Formerly Education 544.)

EDPSY

545 Practicum in Counseling (3-6, max. 6)

BRAMMER, ISLAND, LEE, MEACHAM

Supervised practice in counseling school and college students. Prerequisites, EDPSY 541, 544, and permission of instructor. (Formerly Education 545.)

EDPSY

546 Internship in Student Personnel Services (2-12, max. 12)

BRAMMER, BROWN, FORSTER, ISLAND, LEE

Supervised practice in student personnel activities for advanced students. Prerequisite, permission of instructor. (Formerly Education 546.)

EDPSY

547 Organization and Administration of Student Personnel Programs (3)

Basic considerations in planning, organizing, and operating school student personnel programs; analysis of issues and problems encountered in formulating policy; supervising and evaluating services. Prerequisites, EDPSY 551, 552, or equivalent. (Formerly Education 547.)

EDPSY

548 Educational Implications of Personality Theory (5)

FREEHILL, OLCH

A study of personality development and personality theories with continuous attention to the meaning of these in educational practice, testing, and counseling. Prerequisites, 15 credits of psychology and educational psychology. (Formerly Education 548.)

EDPSY

549 Seminar in Student Personnel Work (3, max. 9)

Individual problems and issues of student personnel programs at school and college levels. Prerequisite, permission. (Formerly Education 549.)

EDPSY

551 Student Personnel Services in the Elementary School (3)

BROWN

A study of philosophy and practice appropriate to elementary school service. (Formerly Education 543E.)

EDPSY

552 Student Personnel Services in the Secondary School (3)

ISLAND

A study of philosophy and practice appropriate to secondary school service. (Formerly Education 543S.)

EDPSY

553 Student Personnel Services in Higher Education (3)

BRAMMER

A survey and critical study of the philosophy and practice of student personnel work in American colleges and universities. (Formerly Education 543H.)

EDPSY

555 Seminar in Rehabilitation Counseling (1-2, max. 6)

BASHEY, FORSTER

Oriented toward the role of a rehabilitation counselor as a professional worker. The his-

tory, background, scope, and trends of vocational rehabilitation services will be studied. Field trips will be utilized extensively to acquaint the student with resources serving the disabled in the immediate community.

EDC&I

561 Group Process Laboratory (3)

BRAMMER

Experience in small group process following the "T" group model. Collateral discussions of process and independent study. Prerequisite, permission.

EDPSY

564 Practicum in School Psychology (3)

BROWN

A practicum course in appraisal and counseling emphasizing diagnosis and counseling with behavior and learning disabilities and bringing to bear techniques acquired in prior courses (EDPSY 540, 545, 565). (Formerly Education 564.)

EDPSY

565 Personality Appraisal (5)

FREEHILL, MEACHAM

Study of personality evaluation with a supervised laboratory emphasizing work with children and their families. Prerequisites, EDPSY 540, 548, and permission of instructor. (Formerly Education 565.)

EDPSY

591 Methods of Educational Research (3)

CLARK, SAX, PECKHAM

An introduction to educational research. Primary focus upon hypothesis development, experimental design, use of controls, data analysis and interpretation. Prerequisites, EDPSY 308, 490. (Formerly Education 591.)

EDPSY

592 Advanced Educational Measurements (3)

KLOCKARS, SAX

Theory of tests and measurement; an examination of assumptions involved in classical test theory, errors of measurement, factors affecting reliability and validity, and problems of weighting. Prerequisites, EDPSY 308, 490. (Formerly Education 592.)

EDPSY

593 Experimental Design and Analysis (5)

KLOCKARS

Experimental design with specific emphasis on the analysis of variance and covariance. Prerequisites, EDPSY 490 or equivalent, and EDPSY 591. (Formerly Education 593.)

EDPSY

594 Advanced Correlational Techniques (5)

KLOCKARS

Multivariate analysis, including regression and multiple correlation; partial, phi, tetrachoric, biserial, and point-biserial correlation; the discriminant function; factor analysis; intraclass correlation; trend analysis. Prerequisites, EDPSY 490 or equivalent, and EDPSY 591. (Formerly Education 594.)

SPECIAL EDUCATION

EDSPE

403 Education of the Emotionally Disturbed (3)

FARGO

Classroom instruction and measurement of emotionally disturbed children; modification of classroom behavior. Prerequisite, EDSPE 404. (Formerly Education 403.)

EDSPE

404 Exceptional Children (3)

Atypical children studied from the point of view of the classroom teacher. Prerequisite, EDPSY 304. (Formerly Education 404.)

EDSPE

405 Educating the Mentally Retarded (3)

AFFLECK

A basic course for students preparing to teach the educable mentally retarded; organization of programs, curriculum planning, and instructional procedures and materials. Prerequisite, EDSPE 404, or equivalent. (Formerly Education 405.)

EDSPE

406 Teaching Reading to the Slow Learner (3)

BEAMAN, MONTGOMERY

Curriculum adjustment and procedures for developing reading skills for the pupil of below-average ability. Prerequisite, EDC&I 360 or 460, or equivalent. (Formerly Education 406.)

EDSPE

409 Mental Retardation (3)

RYCKMAN

An introductory course on the subject of mental retardation and the problems it presents to parents, the mentally retarded, the community, the schools, and society. Prerequisite, EDSPE 404, or equivalent. (Formerly Education 409.)

EDSPE

411 Learning Disabilities (3)

RYCKMAN

An analysis of learning and behavior; program development and classroom management of children with learning disabilities. Prerequisite, EDSPE 404. (Formerly Education 411.)

EDSPE

414 Education in the Inner City

FARGO

Survey of social and psychological factors related to the culturally and economically disadvantaged pupil and his education. Prerequisite, EDSPE 404. (Formerly Education 414.)

EDSPE

416 Evaluation of Instructional Materials for Exceptional Children (3)

BEAMAN, MONTGOMERY

An introduction to techniques of determining the quality of instructional materials in terms of (a) the systems of specific subject matter organization and (b) specified instructional outcomes.

EDSPE

418 Vocational Development of Handicapped Children and Youth (3)

AULD

Curricular aspects of vocational training relevant to each age level in the education of handicapped children. Application of programmed instructional techniques to breaking down of the occupational task. Emphasis on familiarizing school personnel with interdisciplinary services and community resources available to assist them in facilitating the maximal vocational development of handicapped children and youth.

EDSPE

430 The Teaching of Speech to the Deaf (6)

BECKMEYER, LOWENBRAUN

Study of principles and techniques used in developing the formation of English sound by

the analytical method; introduction of speech by the whole word method; major emphasis on development of speech in the preschool and school age deaf child. (Offered jointly with Speech 490. (Formerly Education 409FJ.)

EDSPE

431 The Teaching of Language to the Deaf (6)

LOWENBRAUN

Study of principles and techniques of teaching language to the preschool and school-age deaf child. Leading systems of teaching language to the deaf will be reviewed and a step-by-step development of at least one language system will be covered. (Offered jointly with Speech 491. (Formerly Education 409GJ.)

EDSPE

432 Elementary School Methods for the Deaf (6)

LOWENBRAUN

This course covers the principles and methods of teaching the following subjects to deaf children at the primary and intermediate levels: (1) reading, (2) arithmetic, (3) social studies, (4) science. Will also cover use of visual aids in classes for the deaf. (Formerly Education 409H.)

EDSPE

433 History, Education, and Guidance of the Deaf (3)

BECKMEYER

Consideration of education of deaf from social, economic, and educational point of view; history of deaf education. (Formerly Education 409I.)

EDSPE

506 Internship in Special Education (2-10, max. 10) AWSp

Supervised experiences in special education for advanced students. Ordinarily reserved for post-master's students. Prerequisite, permission of chairman of Special Education. (Formerly Education 506.)

EDSPE

508 Administration of Special Education (3)

HARING

Research and trends in administrative organization, programs, personnel assignments, and instructional groupings for the education of exceptional children as these relate to the total school program, pupil personnel services, community agency services, and state and federal legislation. Prerequisite, background in special education and public school administration.

EDSPE

509 Seminar in Mental Retardation (3)

AFFLECK

An interdisciplinary approach to the advanced study of selected research topics in mental retardation. Designed for teachers, psychologists, social workers, and related professional personnel. Prerequisite, 409 or equivalent. (Formerly Education 509.)

EDSPE

511 Individual Assessment and Modification Strategies in Special Education (3)

LOVITT

Exploration of variables affecting the academic and behavioral performance of exceptional children. Assessment and establishment of instructional programs and procedures. (Formerly Education 511.)

EDSPE

513 Clinical Appraisal of Exceptional Children (3)

MONTGOMERY

Diagnostic instruments used in the clinical appraisal of exceptional children. Theoretical considerations will be used to buttress practical experiences in appraisal related to intervention. Prerequisite, EDPSY 404.

EDSPE

515 Problems and Issues in Special Education (3, max. 9)

AFFLECK

An intensive examination of the issues pertinent to all of special education, such as legislation, interdisciplinary function, and the role of special education in general education and placement practices. Prerequisite, permission of instructor.

EDSPE

517 Practicum in Research Design and Analysis in Special Education (3)

LOWENBRAUN

Critical analysis of current research practices in special education will serve as background to a student carrying out a small independent research project. Projects will be evaluated in seminar discussion. Prerequisites, EDPSY 490 and EDPSY 591 or equivalent, and permission.

EDSPE

518 Seminar in Special Education Research (1-3)

LOVITT

Designed for doctoral students in special education during their year of residency. Each candidate will select a dissertation problem and submit a proposal. Topics such as the procurement of subjects, the reporting and communication of research findings, and the evaluation of research will be stressed. The seminar will lead to the evolution of a viable dissertation proposal.

INDEPENDENT STUDY, RESEARCH, AND STUDENT TEACHING

EDUC

288 Introduction to Teaching (1)

BOROUGH, FOSTER

Designed to provide an over-all introduction to preparation for teaching on the elementary and secondary school levels. School and classroom visits are arranged. (Formerly Education 288.)

EDUC

289 Introduction to Classroom Procedures: Laboratory (3)

BOROUGH, FOSTER

Opportunity is provided for participation in classroom organization and management. Assignment is for 10 hours a week in a specific school situation, level as requested. Prerequisite, EDUC 288. (Formerly Education 289.)

EDUC

371, 372 Student Teaching: Early Childhood, Kindergarten, and Primary Grades (5-15); Student Teaching: Elementary School (Grades 1 through 6) (5-15)

BOROUGH, FOSTER

All student teaching is done in the public schools, and a full day from 8 a.m. to 4 p.m. must be left free for an assignment. Assignments are made by the Director of Student Teaching the first day of each quarter. Prerequisites, completion of the required professional education sequence and of required portion of the elementary education minor, 2.00

grade-point average in professional education, 120 minimum credits, and permission; 15 credits required for certification. (EDUC 371 formerly Education 371K; EDUC 372 formerly Education 371E.)

EDUC

374, 375 Student Teaching: Junior High School (5-15); Student Teaching: Senior High School (5-15)

BOROUGH, FOSTER

All student teaching is done in the public schools, and a full day from 8 a.m. to 4 p.m. must be left free for an assignment. Assignments are made by the Director of Student Teaching the first day of the quarter. Prerequisites, completion of the required professional education sequence, as required, 120 minimum credits, 2.00 grade-point average in professional education and permission; 15 credits required for certification. (EDUC 374 formerly Education 371X; EDUC 375 formerly Education 371S.)

EDUC

471, 472, 474, 475 Practicum in Teaching: Early Childhood, Kindergarten, and Primary Grades (4-16); Practicum in Teaching: Elementary School (4-16); Practicum in Teaching: Junior High School (4-16); Practicum in Teaching: Senior High School (4-16)

BOROUGH, FOSTER

This series of courses provides professional experience in the public schools beyond initial certification requirements for those desiring additional or specialized training. Assignments are approved by the Director of Student Teaching the first day of the quarter. Prerequisites, teaching experience and permission of Director of Student Teaching. (EDUC 471 formerly Education 471K; EDUC 472 formerly Education 471E; EDUC 474 formerly Education 471X and EDUC 473; EDUC 473 formerly Education 471S and EDUC 474.)

EDUC

499 Undergraduate Research (2-5)

For undergraduates. Registration must be accompanied by a study prospectus on a special form provided by the Office of the Dean, endorsed, by the faculty adviser most appropriate for the project proposed, and the instructor, and must be filed in the Office of Graduate Studies. Students developing studies under this rubric should be advised that a report or paper setting forth the results of their investigations should be regarded as a basic part of the program. (Formerly Education 499.)

EDUC

500 Field Study (3 or 6, max. 6)

Individual study of an educational problem in the field, under the direction of a faculty member. Prerequisites, approved plan of study, and permission of the instructor must be filed in the Office of Graduate Studies in Education. (Formerly Education 500.)

EDUC

524 Seminar in Teacher Education (3)

FOSTER

The seminar will focus on recent trends, issues, and proposals for future development in teacher education and certification. Prerequisite, permission of instructor.

EDUC

599 Independent Studies in Education (*)

Independent studies or readings of specialized aspects of education. Registration must be ac-

accompanied by a study prospectus endorsed by the appropriate faculty adviser, for the work proposed, and with permission of the instructor, must be filed with the Office of Graduate Studies in Education. Prerequisite, permission of the instructor. (Formerly Education 599.)

EDUC

600 Independent Study or Research (*)

EDUC

700 Thesis (*)

EDUC

702 Degree Final (3)

800 Doctoral Dissertation (*)

COLLEGE OF ENGINEERING

AERONAUTICS AND ASTRONAUTICS

Courses for Undergraduates

200 Introduction to Aeronautics
and Astronautics (2) AWSp
BOLLARD

Introduction to the field of aerospace engineering; discussion of basic concepts and typical problems.

300, 301, 302 Aerodynamics I, II, III
(3,3,3) A,W,Sp
GANZER

The atmosphere and the fluid medium. Dimensional analysis and force coefficients. Kinematics and dynamics of flow fields; incompressible flow about bodies. Thin airfoil theory; finite wing theory. Compressible fluids; one-dimensional compressible flow; two-dimensional supersonic flow. Viscous flows; boundary layers. Prerequisites, Physics 123 and Mathematics 238 for 300; 300 and Mechanical Engineering 320 for 301; 301 for 302.

320, 321, 322 Junior Laboratory I, II, III
(2,2,2) A,W,Sp
OATES

The design and conduct of experimental inquiry with consequent introduction to experimental equipment and techniques relative to the general field of mechanics with emphasis in the applied fields of aeronautics and astronautics. Student registers for the entire three quarter sequence.

330, 331, 332 Structural Analysis I, II, III
(3,3,3) A,W,Sp
DILL

Development of the equations of elasticity, viscoelasticity, and plasticity. Plane stress, plane strain; torsion, bending, and stability of rods and beams; virtual work, potential energy, Castigliano's theorem; statically indeterminate structures; bending of plates and shells. Prerequisites, Engineering Mechanics CEEM 292 for 330; 330 for 331; 331 for 332.

370 Introduction to Applied Analysis
(3) Sp
PEARSON

Advanced calculus, from applications point of view. Matrix methods. Dimensional analysis and theory of modeling. Review of vectors; surface and volume integral identities. Fourier series. Prerequisite, Mathematics 238.

400, 401, 402 Gas Dynamics I, II, III
(3,3,3) A,W,Sp

AHLSTROM

Review of thermodynamics. Introduction to kinetic theory and statistical mechanics. One-dimensional gas dynamics, one-dimensional wave motion, waves in supersonic flow, flow in ducts and wind tunnels. Measurements in fluid dynamics. Inviscid equations of motion, incompressible potential flows, vortex flows, small perturbation flows, bodies of revolution, similarity laws. Transonic flow, hypersonic flow, method of characteristics. Equations with viscosity and heat conductivity. Boundary layer flows. Prerequisite, 302.

410, 411, 412 Aircraft Design I, II, III
(3,3,3) A,W,Sp
GANZER

Preliminary design of a modern airplane to satisfy a given set of requirements. Estimation of size, selection of configuration, weight and balance, and performance. Satisfaction of stability, control, and handling qualities requirements. FAA load requirements, loads analysis, structural design of components. Prerequisites, 302 for 410; 410 for 411; 332 and 411 for 412.

420, 421, 422 Senior Projects Laboratory
I, II, III (3,3,3) A,W,Sp
Prerequisite, 322.

430 Matrix Structural Analysis (3) A
MARTIN

Introduction to matrix methods of structural analysis. Prerequisite, 331.

431 Plates and Shells (3) W
MARTIN

Introduction to the theory of plates and shells. Prerequisites, 331, 332.

432 Special Topics in Structural Analysis
(3) Sp
MARTIN

Problems and introduction to theory associated with plastic behavior, viscoelastic materials, filament wound and laminated structures, fatigue, creep, and impact. Prerequisite, 331.

440, 441, 442 Flight Mechanics I, II, III
(3,3,3) A,W,Sp
GANZER

Calculation of aerodynamic coefficients and stability derivatives. Prediction of performance, stability, and control characteristics of a specified aircraft. Vehicle equations of motion near a flat earth; the performance problem within the atmosphere; an introduction into the dynamic stability of vehicles subject to aerodynamic forces. Wind tunnel tests of an aircraft model to determine performance and stability parameters; comparison of wind tunnel and derived aerodynamic characteristics. Determination in flight of performance, stability, and control characteristics; and comparison with predicted and wind tunnel results. Prerequisites, 302 for 440; 440 for 441; 441 for 442.

450, 451, 452 Space Mechanics I, II, III
(3, 3, 3) A,W,Sp
VAGNERS

Review of kinematics. Review of particle dynamics. Dynamics of a system of particles. Stability of motion. Rigid-body motion. Universal law of gravitation. The two-body problem. Orbit transfer problems. Linearized orbit investigations. Effect of air drag on orbits. Variation of parameters for continuous

orbit perturbation. Planetary potentials. Change of orbit elements due to oblateness. Elementary three-particle problem. Rigid-body motion of space vehicles. Elements of orbit determination. Prerequisite, Mathematics 238.

460, 461, 462 Propulsion I, II, III (3,3,3)
A,W,Sp

EASTMAN

Performance and operating characteristics of engines and propeller combinations. Study of jet and rocket engines with regard to flow through inlets, compressors, burners, turbines, and nozzles. Various means for creating thrust; thrust contribution to lift; V/STOL configurations; completely integrated thrust and lift; shaft and jet driven helicopter rotors. Prerequisite, Mechanical Engineering 320.

470 Analytical Problems in Aeronautics
(3) A
PEARSON

Numerical methods for algebraic and differential equations. Transforms. Introduction to perturbations, eigenvalues, nonlinearities. Probability and statistics. Variational idea. Prerequisite, Mathematics 238.

480 Systems Dynamics (3) W

BOLLARD

Equations of motion and solutions for selected problems; natural frequencies and mode shapes; response of simple systems to applied loads. Prerequisite, senior standing.

481 Elementary Aeroelasticity (3) Sp
BOLLARD

Discussion of aeroelastic problems in aircraft design; elementary development of static and dynamic aeroelastic problems. Prerequisite, 480.

499 Special Projects (2-5, max. 10) AWSp

An investigation on a special project by the student under the supervision of a staff member. Prerequisite, senior standing.

Courses for Graduates Only

501, 502, 503 Physical Gas Dynamics I, II, III
(3,3,3) W,Sp,A
STREET

Review of thermodynamics; thermodynamic properties derived from classical statistical mechanics, reacting gas mixtures. Equilibrium flow; nonequilibrium flow. Kinetic theory; radiation gas dynamics.

504, 505, 506 Fluid Mechanics I, II, III
(3,3,3) A, W, Sp
AHLSTROM

Review of thermodynamics; vectors and dyads. Derivation of the Navier-Stokes equations, stream functions and potential functions, integrals of the equations of motion. Boundary conditions and discontinuity surfaces in fluids. Derivation of the Boltzmann equation, derivation of continuum equations from the Boltzmann equation. Dimensional analysis, sound waves, surface waves. Ideal incompressible flows, compressible flows. Laminar and turbulent viscous flows, transonic flow, hypersonic flow, combustion, super fluids. Prerequisite, 567 (may be taken concurrently with 504).

507, 508, 509 Aerodynamics of Viscous
Fluids I, II, III (3,3,3) A,W,Sp
STREET

Equations of motion of a viscous compressible fluid; forces on a solid; viscous waves; boundary layer equations; incompressible lam-

inar flows. Plane Couette flow; one-dimensional shock layer; laminar boundary layers in compressible flow; change of variables in the compressible flow equations; the flat plate with and without heat transfer; integral relations. Bodies of revolution in laminar flow; stagnation point heat transfer; extension to dissociating boundary layers. Prerequisite, 506.

510 Wave Propagation in Fluids and Solids (3) Sp
FYFE

Time dependent fluid flow problems; wave and shock propagation in gases and solids; the interaction of different wave forms and boundaries.

511 Unsteady Aerodynamics (3) W

Oscillating airfoils at subsonic and supersonic speeds; consideration of wings and bodies in unsteady flow. Offered only when warranted by sufficient enrollment.

512 Magneto-Fluid Dynamics (3) Sp

Review of electrodynamics and Maxwell's equations; orbit theory of charged particles, statistical mechanics of ionized gases; continuum magneto-fluid dynamics, the two-fluid model and the one-fluid model; wave propagation in a plasma. Prerequisite, 504. Offered only when warranted by sufficient enrollment.

516, 517 Stability and Control I, II (3,3) W,Sp
GANZER

Aerodynamics of control; the general problem of dynamic stability; the influence of aerodynamic parameters on flying characteristics. Response of airplane to actuation of control; automatic stability and control.

519 Special Topics in Stability and Control (3, max. 6) A
JOPPA

Study of recent work in stability and control of aircraft, with special attention to handling qualities. Prerequisites, 516, 517.

523 Seminar in Aerodynamics (1-3, max. 12) AWSp

Study of recent advances in aerodynamics. Topics vary from year to year. Open only to students having the M.S. degree or its equivalent.

524, 525, 526 Aerodynamics of Aircraft Gas Turbine Engines I, II, III (3,3,3) W,Sp,A
OATES

Aircraft gas turbine cycle analysis, component matching, overall engine performance. Aerodynamics of turbines and compressors, through-flow theories, actuator disc theory, three-dimensional effects. Advanced aerodynamics-secondary flows, boundary layers and separation, turbulence in supersonic inlets, engine compatibility. Offered even-numbered years.

527, 528, 529 Space Propulsion and Energy Conversion I, II, III (3, 3, 3) W,Sp,A
DECHER, OATES

Physics, nucleonics, and heat transfers of nuclear heated rockets, gaseous rockets, etc. Electrothermal, electromagnetic, and electrostatic thrusters. Analysis of space power generation cycles, Brayton cycle, condensing cycles, MHD generation, thermoelectric generation, and solar collectors. Offered odd-numbered years.

530, 531, 532 Mechanics of Solids I, II, III (3,3,3) A,W,Sp
DILL

Linear theory of elasticity, viscoelasticity, and plasticity. Variational and extremum theorems. Three-dimensional problems. Plane stress. Plane strain.

535, 536, 537 Analysis of Shells I, II, III (3,3,3) A,W,Sp

Nonlinear equations of thin shells. Solution of the linearized equations for shells of revolution and other shapes. Buckling of shells. Post-buckling deformation of shells. Offered only when warranted by sufficient enrollment.

540, 541, 542 Finite Element Analysis I, II, III (3,3,3) W,Sp,A
MARTIN

The finite element concept; historical background; relation to classical theory; finite element models; general finite element theory. Finite elements in structural mechanics; structural idealization; constraints; linear and nonlinear problems. Finite element theory for inelastic bodies; problems in structural dynamics and wave propagation; finite element applications to other fields.

545, 546 Bioastronautics I, II (3,3) W,Sp
BOLLARD

Systematic study in how the principles of engineering science apply to specific biosystems; to acquaint the student with the principles of structure and function of the human organism. Prerequisite, 545 for 546. Offered only when warranted by sufficient enrollment.

550, 551 Aerospace Systems I, II (3,3) W,Sp
BOLLARD

The study of aerospace system analysis employing transform methods. The effect of subsystem behavior such as the flexibility of flight vehicle structure, aerodynamic forces. Offered only when warranted by sufficient enrollment.

553 Vibrations of Aerospace Systems (3) W
NATURAL frequencies and modes of vibrations of linear systems; forced vibrations and motion dependent forces; Lagrange's equations and Hamilton's principle; matrix methods for discrete and continuous systems.

555 Special Topics in Aerospace Systems (3, max. 6) AWSp
BOLLARD

556 Aeroelasticity (3) Sp
Concept of functional diagrams and aeroelastic operators; quasi-static lifting-surface deformations and stability; control surface effectiveness; nonstationary lifting-surface deformations and stability; general dynamics of aerodynamic, structural, and control system interactions. Prerequisites, 481, 553. Offered only when warranted by sufficient enrollment.

557 Nonlinear Problems in Aerospace Systems (3) A

The application to aeronautics of nonlinear ordinary differential equations and the topology of their integral curves in the phase plane; dynamical interpretation of singular points; existence of periodic solutions; questions of stability; nonlinear resonance; frequency demultiplication; relaxation oscillations. Offered only when warranted by sufficient enrollment.

562, 563, 564 Methods of Partial Differential Equations I, II, III (3,3,3) A,W,Sp
KEVORKIAN

First order partial differential equations: characteristics, conservation laws, shocks, appli-

cations to geometrical optics and Hamilton-Jacobi theory. Elliptic equations: fundamental solution, Green's function, conformal mapping, boundary-value problems. Parabolic equations. Hyperbolic equations: characteristics, shocks, examples from fluid dynamics, approximate methods. Prerequisite, 569. Offered odd-numbered years.

565, 566 Approximate Analysis I, II (3,3) A,W
PEARSON

Approximation theory, curve-fitting. Numerical differentiation and integration. Linear and nonlinear algebraic equation systems. Ordinary differential equation methods. Asymptotic expansions. Perturbation methods. Matrix iterative techniques. Numerical methods for elliptic, parabolic, hyperbolic partial differential equations. Variational methods. Eigenvalue problems. Nonlinearities. Applications to problems in fluid flow, stress analysis, acoustics, electromagnetism.

567, 568 Analysis in Engineering (3,3) A,W
Mathematical methods for solving problems arising in engineering. 567: Vector analysis, matrices, tensors, complex variables. 568: Calculus of variations, Sturm-Liouville problems, series solutions and special functions for ordinary differential equations, orthogonal functions.

569 Partial Differential Equations (3) Sp
Properties of diffusion, wave, and Laplace-type equations. Initial and boundary value problems. Series expansions, transform methods. Singularities, Green's functions. Classification of second order equations; theory and applications of method of characteristics. Numerical techniques. Prerequisite, 568 or Mathematics 428.

571, 572, 573 Principles of Dynamics I, II, III (3,3,3) A,W,Sp
VAGNERS

Review of rigid body dynamics; calculus of variations. Lagrangian mechanics. The canonical equations of Hamilton; canonical transformations. Hamilton-Jacobi theorem; Hamiltonian perturbation theory. Periodic and quasi-periodic motion. Stability of dynamical systems; resonance in dynamical systems. Motion near a given motion. Applications to particle and rigid body space mechanics. Prerequisite, knowledge of material of 451; 452 is recommended for 572, 573, and may be taken concurrently.

575 Thermo- and Electrodynamics of Continua (3) W
DILL

The application of the principles of the phenomenological theory of irreversible thermodynamics and of the electrodynamics of continuous media to fluids and solids. Prerequisite, 567.

576, 577, 578 Perturbation Theory I, II, III (3, 3, 3) A, W, Sp
KEVORKIAN

Basic concepts of asymptotic expansions: evaluation of integrals. Singular perturbations: limit process expansions, matching, uniformly valid approximations. Theory for nonlinear oscillations: multiple variable expansions, adiabatic invariance, canonical perturbation theory. Offered even-numbered years.

580, 581, 582 General Theory of Continuous Media I, II, III (3,3,3) A,W,Sp
DILL

General formulation of the classical field theories: fundamental concepts of motion, stress,

ENGINEERING

energy, entropy, and electromagnetism for a continuum; conservation of mass; balance of momentum; balance of energy, including thermodynamics of irreversible deformations; balance of electromagnetism. General nature of constitutive equations for a continuum. Examples of kinematic, energetic, mechanical, thermomechanical, electromagnetic, and electromechanical constitutive equations. Prerequisites, 567 and intermediate standing.

583 Special Topics in Solid Mechanics (3) AWSp

DILL

Study of recent advances in the mechanics of solids. May be repeated for credit by permission.

587, 588, 589 Techniques of Applied Analysis I, II, III (3,3,3) A,W,Sp PEARSON

Review of complex variable. Series expansions, contour integration, generating functions, conformal mapping. Differential equations in the complex plane. Special functions. Asymptotic methods (saddle point, stationary phase, WKB, and others). Fourier and related transforms. Radiation conditions, signal propagation, singular inversions. Green's functions. Applications to problems in engineering and physics. Integral equations. Wiener-Hopf and other special techniques. Prerequisites, 567, 568, 569 or equivalent. Offered even-numbered years.

599 Special Projects (2-5, max. 15) AWSp

An investigation on a special project by the student under the supervision of a staff member.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

CHEMICAL ENGINEERING

Courses for Undergraduates

200 Introduction to Chemical Engineering (3) W

The engineering design process: conception, analysis, detailed process and equipment design, operation; familiarization with the techniques of design. Prerequisite, sophomore standing or permission.

210 Material and Energy Balances (4) ASp

Chemical and physical process calculations: steady and unsteady state material and energy balances with specific examples in vapor-liquid contact operations and multi-phase extraction, and introductory thermochemistry. Prerequisite, 200 or permission.

325 Thermodynamics (4) A

Basic principles of thermodynamics and the behavior of pure substances with applications in compression and expansion operations, fluid flow, power cycles, and refrigeration. Prerequisite, 210, which may be taken concurrently.

326 Thermodynamics and Kinetics (4) W
Phase equilibria and chemical equilibria in multicomponent systems; theories of solution; chemical reaction analysis. Prerequisites, 325 and Chemistry 456, which may be taken concurrently.

330 Transport Process Principles I (4) W
Diffusive transport of momentum, heat and mass; general aspects of fluid flow; the Navier-Stokes equations; one-dimensional flow with engineering applications. Prerequisite, 326.

340 Transport Process Principles II (4) Sp
A continuation of 330. Prerequisite, 330.

435 Heat and Mass Transfer (4) A
Applications of the principles of heat and mass transfer to problems of engineering significance. Methods for evaluating heat and mass transfer coefficients; use of coefficients in equipment design. Particular attention is given to problems in physical separations and to alternative means of accomplishing desired mass exchange. Prerequisite, 340.

436 Chemical Engineering Laboratory I (4) A

Lectures on statistical analysis of data, instrumentation, and report writing; laboratory experiments on transport phenomena and the analog computer. Emphasis on experimental methods and report writing. Prerequisite, 340.

437 Chemical Engineering Laboratory II (2) W

A continuation of 436. Laboratory investigation of chemical engineering principles applied to equipment design with emphasis on heat transfer and mass transfer operations. Prerequisite, 436.

438 Chemical Engineering Laboratory III (1-3) Sp

Special projects in the design, construction, and operation of chemical engineering equipment. Prerequisite, 437.

440 Fluid Mechanics (3) A

A concise survey of fluid mechanics. Qualitative aspects of non-Newtonian behavior; basic physical and mathematical ideas of parallel flow, creeping motion, potential motion, turbulence, and boundary layers. Prerequisite, 340.

450 Heat Transfer (3) W

Application of steady-state and transient conduction theory, including numerical methods; elements of heat transfer by radiation; basic concepts and applications of convective heat transfer theory. Prerequisite, 435.

460 Mass Transfer (3) W

Diffusion equations; interphase mass transfer; models and analogy expressions; simultaneous heat and mass transfer; mass transfer design principles. Prerequisite, 435.

465 Reactor Design (3) W

Application of principles of chemical kinetics to the design of commercial-scale chemical reactors; characterization of batch and flow reactors, in homogeneous and heterogeneous systems. Prerequisite, 435.

470 Chemistry of Wood (3) A

Chemical and physical properties of cellulose, lignin, hemicellulose, and extractives; wood as a raw material for the chemical industry. Prerequisite, Chemistry 102 or 232, or permission. (Formerly 451.)

471 Pulp and Paper Technology (3) W

Morphology of wood fibers, manufacture of mechanical and chemical pulps, stock preparation, paper machine operation, coated papers, paper-plastic combinations, converting operations. Prerequisite, Chemistry 102 or 232, or permission.

472 Pulp and Paper Laboratory (2) Sp

Laboratory experiments in the pulping of wood, fiber technology, and the physical and chemical characterization of paper and pulp. Prerequisite, 471.

480 Process Dynamics and Control (3) A
Analysis of the dynamics of simple chemical process units and systems; applications to stability, control, and instrumentation of such processes. Prerequisite, senior standing.

481 Process Optimization (3) Sp

Concepts and techniques of optimizing chemical engineering processes and systems, including classical and direct methods of experimental search, linear and nonlinear programming, and dynamic programming. Prerequisite, 435.

485 Process Design Principles II (3) W

Applied economics in chemical engineering design and operations; market survey and plant location; introduction to plant and process design. Prerequisite, 435.

486 Process Design (5) Sp

Comprehensive design of a specific process, including economic feasibility studies, utilization of market survey and plant location studies, process equipment design and optimization, and overall plant integration and layout. Prerequisite, 485.

499 Undergraduate Research (1-6, max. 12) AWSp

Independent research projects in chemical engineering. Prerequisite, permission.

Courses for Graduates Only

520, 521, 522 Seminar (0,0,1) A,W,Sp

523 Seminar in Chemical Engineering (0-3, max. 12) AWSp

Reports by students and staff on topics of current interest in chemical engineering. Prerequisite, one year of graduate study or permission.

525 Chemical Engineering Thermodynamics (3) A

Review of principles of thermodynamics; statistical foundations. Applications to problems in multiphase and multicomponent systems. Irreversible thermodynamics. Prerequisite, undergraduate thermodynamics.

526 Topics in Thermodynamics (3) W

Classical and molecular thermodynamics of phase equilibria, solution theory, thermodynamic stability, and critical phenomena. Prerequisite, 525 or permission.

530 Momentum, Heat, and Mass Transfer I (3) A

Derivation of the differential equations for mass, heat, and momentum transport from both continuum and molecular viewpoints of matter. Irreversibility and dissipation. Formulation of flux relations and determination of transport coefficients. Prerequisite, 340 or permission.

531, 532 Momentum, Heat, and Mass Transfer II, III (3,3) W, Sp

A continuation of the material presented in 530 with particular emphasis on molecular mechanisms for transport in dense gases and liquids. Prerequisite, 530 or permission.

540 Topics in Fluid Mechanics (3) A SLEICHER

An introduction to fundamental concepts and methods of analysis in fluid mechanics. Stress

rate-of-strain relationships, general deductions from the equations of motion, parallel flow, vorticity and circulation, creeping motion, irrotational motion, introduction to stability and turbulence, boundary layer theory. Prerequisites, 530 and Aeronautics and Astronautics 567, or permission.

543, 544 Fluid Turbulence (3,3) A,W

SLEICHER

Statistical and phenomenological theories of turbulence. Introductory concepts, velocity correlations, the energy spectrum, the decay of turbulence, scalar fields, turbulent transport, shear turbulence, wall turbulence, phenomenological theories of energy transport, instrumentation, recent literature. Prerequisite, 6 credits in graduate fluid mechanics.

550 Topics in Heat Transfer (1-3, max. 6) Sp

DAVID

Methods and developments in heat transfer theory of interest in chemical engineering with emphasis on convection (including condensation, boiling, and two-phase flow) and radiation. Prerequisite, permission. (Formerly 551.)

555 Interfacial Phenomena (3)

BERG

Capillary statics and dynamics; classical and statistical thermodynamics of interfaces; adsorption. Prerequisites, 525, 540.

560 Topics in Mass Transfer (1-3, max. 6) W

HEIDEGGER

Consideration of special topics in the general area of mass transfer. Discussions and readings of the current literature. Subject matter changes from year to year. Prerequisite, one year of graduate study in chemical engineering or permission. (Formerly 561.)

565 Kinetics and Catalysis (3) Sp

JOHANSON

Homogeneous and heterogeneous systems with emphasis on chemical engineering principles applied to industrial reactor design. Prerequisite, 525.

566 Topics in Reaction Kinetics (1-3, max. 6) W

JOHANSON

Considerations of particular problems in chemical reactions, combustion, elevated temperature systems, reactor design. Prerequisite, 565 or permission.

570 Chemistry of High Polymers (3, max. 6) Sp

Fundamentals of high polymer chemistry, including kinetics of addition and condensation polymerization, the determination of average molecular weights and chain length distributions, solution properties and the relationship between molecular structure and plastic film and fiber properties of various polymers. Prerequisite, an undergraduate sequence in organic chemistry.

571 Cellulose and Lignin (3)

Chemistry and technology of cellulose, lignin, and related substances. Origin and status in plant tissue, isolation procedures, physical characteristics, and chemical reactions. Chemical processing in pulp, paper, rayon, and plastics industries. Prerequisite, an undergraduate sequence in organic chemistry.

575 Topics in Analysis in Chemical Engineering (1-4, max. 7) A

GARLID

Discussion of topics in applied mathematics of importance in chemical engineering prob-

lems, including both classical contributions and topics of current interest. Subject matter varies from year to year. Prerequisite, one year of graduate study in chemical engineering or permission.

580 Topics in Chemical Engineering Design (3)

GARLID

Mathematics of process dynamics and control including differential equations, perturbation techniques, transform methods. Basic methods of control system design. Effects of control loop imperfections such as hysteresis, measurement lag, and dead time. Prerequisite, one year of graduate study in chemical engineering or permission.

582 Advanced Topics in Mass Transfer (3)

583 Advanced Topics in Chemical Engineering (1-3)

584 Advanced Topics in Chemical Engineering Science (1-3)

585 Topics in Chemical Engineering Plant Design (1-3)

588 Nuclear Fuel Management (3) W

BABB

Applications of chemical engineering principles to processing of nuclear reactor materials and irradiated fuels. Fuel cycles; properties of irradiated fuel; theory of molecular separations processes; analysis of steady state and transient characteristics of chemical processing operations. Offered jointly with the Department of Nuclear Engineering as Nuclear Engineering 588. Prerequisites, 530, Nuclear Engineering 484, or permission.

599 Current Topics in Chemical Engineering (1-3, max. 12)

Readings or lectures and discussions of topics of current interest in the field of chemical engineering. Subject matter changes from year to year. Prerequisite, permission.

600 Independent Study or Research (*)

AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

CIVIL ENGINEERING

Specific areas in Civil Engineering are designated by area letters. These letters must precede course numbers on the student's Official Program. Designation letters and their definitions are:

CIVE—Civil Engineering Core Courses

CEEM—Engineering Mechanics

CEHY—Hydraulic Engineering

CEST—Structural Engineering

CETC—Transportation, Construction, and Materials Engineering.

CEWA—Water and Air Resources (Sanitary Engineering)

CORE COURSES

Courses for Undergraduates

CIVE

310 Forest Highway Location and Design (5) Sp

SAWHILL

Reconnaissance, preliminary, and location surveys for forest highways. Earthwork compu-

tations, with and without use of electronic computers. Testing of road constructional materials and subgrade soils. Design of roadway elements. Not to be taken for credit by civil engineering majors. Prerequisites, General Engineering 121 and Mathematics 125. (Formerly Civil Engineering 310.)

CIVE

316 Geometronics (4) ASp

COLCORD

Introduction to geodetic and photogrammetric concepts and their application to engineering surveys. Errors. Measurement of position with modern techniques including use of tachometric, optical, and electronic instruments. Reduction to plane coordinates and analysis of measurements. Prerequisites, Mathematics 224, General Engineering 115, Mechanical Engineering 215. (Formerly Civil Engineering 316.)

CIVE

320 Transportation Engineering I (4) WS

EXKE, COLCORD, SAWHILL

Introduction to the planning, financing, and administration of a transportation system. Mathematical theory and practice in the design of alignment and grade of the traveled way, as well as its physical components; roadbed, drainage, pavement, and other design elements. Relationship of design elements to vehicle and human characteristics, and design commonality of roadway, railway, runway, and waterway. Prerequisite, CIVE 316. (Formerly Civil Engineering 320.)

CIVE

341 Hydraulics (3) W

CHENOWETH

Liquid properties, hydrostatics; continuity, energy, and momentum; flow in open and closed conduits, flow measurements; hydraulic machinery and models. Not to be taken for credit by civil engineering majors. Prerequisites, Mathematics 124 and Physics 121. (Formerly Civil Engineering 341.)

CIVE

345 Hydraulic Engineering (4) AWSp

RICHEY

Extension and application of fluid mechanics principles to hydraulic engineering problems. Diffusion and mixing processes, surface-water and groundwater hydrology, open channel flow, pipeline systems, turbomachinery. Prerequisite, CEEM 342. (Formerly Civil Engineering 345.)

CIVE

350 Environmental Engineering (4) WSp

CARLSON

Introduction to the basic concepts of environmental engineering and evaluation of man's interaction with his ecology. Introduction to several major environmental engineering problem areas, including the characteristics and control of air and water pollution, the collection and disposal of solid wastes, and the planning of urban water supply and sewerage and drainage systems. Prerequisite, CIVE 345 (may be taken concurrently). (Formerly Civil Engineering 350.)

CIVE

363 Constructional Materials (4) AWS

MILLER, TERREL

General treatment of physical and mechanical properties and engineering behavior of metallic and nonmetallic materials. Steel, aluminum, concrete, wood, asphalt, soils, and bi-

tuminous mixtures. Laboratory testing, instrumentation, and investigation into microbehavior. Correlation with microstructure and various aspects of materials science. Prerequisites, Materials Engineering 250, CEEM 292, CIVE 393 (to be taken concurrently.) (Formerly Civil Engineering 363.)

CIVE

366 Soils Engineering (4) ASp

HENNES, MEESE

Mechanical properties of soils. Theoretical mechanics and engineering practice in the evaluation of lateral earth pressures, bearing capacity, and settlement of foundations. Underground exploration techniques and foundation construction methods. Prerequisite, CIVE 363. (Formerly Civil Engineering 366.)

CIVE

380 Analysis of Elastic Structures (4) WSp

NICHOLLS

Analysis of stresses and deflections in elastic structures, including beams, trusses, rigid frames and suspension structures. Prerequisite, CIVE 393. (Formerly Civil Engineering 380.)

CIVE

381 Concepts of Structural Design (4) ASp

CLANTON

Planning, design, and construction aspects of structural projects. Criteria for structural adequacy and efficiency. Examination of the design process. Further topics concerned with the analysis of stresses and deflections in structures. Prerequisites, CIVE 363, CIVE 380, CIVE 390 (may be taken concurrently). (Formerly Civil Engineering 381.)

CIVE

390 Environmental Systems Planning (4) ASp

HORWOOD, MAR

Concepts of systems engineering and their application to environmental problems of concern to civil engineers. Interaction with socioeconomic forces underlying the demand for public works and environmental control mechanisms. Case histories and examples selected from the areas of land use and urban planning, water resources, transportation systems, structural projects, air resources, and water pollution. Prerequisites, CIVE 320, CIVE 345, CIVE 350, CIVE 380.

CIVE

393 Mechanics of Materials II (4) AW

HARTZ

A continuation of the study of mechanics of solids. Additional topics in beam bending and columns, including elastic, viscoelastic, and plastic behavior. Virtual work and strain energy methods will be introduced. Prerequisite, CEEM 292.

Courses for Graduates Only

CIVE

520 Seminar (1, max. 6) AWSp

Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520A.)

CIVE

700 Thesis (*) AWSpS

CIVE

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

ENGINEERING MECHANICS

Courses for Undergraduates

CEEM

291 Dynamics (3) AWSpS

HARTZ, EVANS

A general treatment of the dynamics of particles and rigid bodies using vector analysis. Kinematics, kinetics, momentum and energy principles for particles and rigid bodies. Euler's equations of motion. Prerequisites, General Engineering 112, Mathematics 126, Physics 121. (To be taken concurrently with CEEM 295.) (Formerly Civil Engineering 291.)

CEEM

292 Mechanics of Materials I (3) AWSpS

HARTZ, COON

An introduction to the mechanics of solids. Strain and deformation, stress, stress-strain relationships; torsion, stresses due to bending. Prerequisites, General Engineering 112, Physics 121, Mathematics 126 (may be taken concurrently). (To be taken concurrently with CEEM 296.) (Formerly Civil Engineering 292.)

CEEM

295 Dynamics Tutorial (0) AWSpS

EVANS, HARTZ

(To be taken concurrently with CEEM 291.)

CEEM

296 Mechanics of Materials I Tutorial (0) AWSpS

COON, HARTZ

(To be taken concurrently with CEEM 292.)

CEEM

342 Fluid Mechanics I (4) AWSpS

NECE

Elementary mechanics of incompressible fluids. Hydrostatics. Continuity, energy, and momentum equations. Introduction to potential flow. Resistance phenomena for laminar and turbulent flows. Dynamic similitude. Prerequisites, CEEM 291, Mathematics 224. (Formerly Civil Engineering 342.)

CEEM

470 Advanced Mechanics of Materials I (3) A

SERGEV

Torsion of noncircular and hollow members, open and closed sections. Membrane stresses in shells. Introduction to the theory of elasticity, Airy's stress function. Beam columns. Thick-walled cylinders. Prerequisites, CIVE 382 or permission. (Formerly Civil Engineering 570.)

CEEM

494 Introduction to the Mechanics of Continuous Media (3) WSp

COON, EVANS, HARTZ

A rigorous development of the basic equations of motion of elastic solids and Newtonian fluids through the use of vectors and Cartesian tensors, mechanical behavior of materials, problems in linear elasticity and fluid statics and dynamics. Prerequisites, CEEM 291, CEEM 292, CEEM 342 or Aeronautics and Astronautics 300, or permission. (Formerly Civil Engineering 494.)

CEEM

498 Special Topics—Engineering Mechanics (1-5) AWSpS

Special topics in civil engineering offered as course with lecture and/or laboratory. Prerequisite, permission of Department Chairman. A maximum of 6 credits may be ap-

plied toward an undergraduate degree. (Formerly Civil Engineering 498.)

CEEM

499 Special Projects—Engineering Mechanics (1-5) AWSpS

Individual undergraduate research projects. Prerequisite, permission of Department Chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 499.)

Courses for Graduates Only

CEEM

520 Seminar (1, max. 6) AWSp

Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520.)

CEEM

571 Advanced Mechanics of Materials II (3) W

SERGEV

Beams on elastic foundations. Bending of circular and rectangular plates. Introduction to bending theory of shells. Prerequisite, CEEM 470 or permission. (Formerly Civil Engineering 571.)

CEEM

572 Advanced Mechanics of Materials III (3) Sp

SERGEV

Theory of elastic stability. Columns. Buckling of frameworks. Lateral and torsional buckling of beams. Stability of plates and shells. Prerequisite, CEEM 571 or permission. (Formerly Civil Engineering 572.)

CEEM

573 Structural Mechanics I (3) A

HARTZ

Matrix methods in structural mechanics. Review of basic structural theory. Principle of virtual work. Development of basic matrix force (flexibility) and displacement (stiffness) methods of structural analysis. Prerequisite, graduate standing or permission. (Formerly Civil Engineering 573.)

CEEM

574 Structural Mechanics II (3) W

HARTZ

Dynamic response of structures using mode superposition and matrix methods. Lumped and distributed parameter systems. Application to earthquake, moving and blast loads. Approximate and numerical methods. Prerequisite, CEEM 573 or permission. (Formerly Civil Engineering 574.)

CEEM

575 Structural Mechanics III (3) Sp

HARTZ

Variational and energy methods in structural and solid mechanics. Application of calculus of variations and minimal principles of mechanics to nonlinear structural analysis, elastic stability, theory of elasticity, plates and shells, and vibrations. Prerequisite, CEEM 574 or permission. (Formerly Civil Engineering 575.)

CEEM

576 Theory of Plates and Shells (3) A

SERGEV

General methods and advanced topics in the bending of thin plates. General theory for the deformation of thin shells. Boundary conditions. Approximate theories. Translational shells and shells of revolution. Prerequisite, CEEM 571 or permission. (Formerly Civil Engineering 576.)

CEEM

577 Finite Element Methods in Structural Mechanics (3) Sp
HARTZ

Extension of the matrix methods of structural analysis to the solution of elasticity, plate and shell problems by use of finite element approximations. Discussion of convergence and bounding and extension to investigation of stability and finite deformations. Prerequisite, CEEM 573 or permission. (Formerly Civil Engineering 577.)

CEEM

590 Structures Under Wind (3) A
HARTZ

Fundamental principles governing the static or dynamic response of suspended structures, transmission lines, tall stacks, and other flexible structures subject to deflection, overturning, or oscillation as a result of wind action. Prerequisite, graduate standing in engineering. (Formerly Civil Engineering 599.)

CEEM

591 Theory of Elasticity I (3) Sp
COON, EVANS, HARTZ

Elementary formulation of linear elasticity using indicial notation. Use of Airy stress function for solution of plane elasticity problems in rectangular and polar coordinates. Saint Venant's theory of torsion. Elementary treatment of thermal stress problems. Energy methods. Prerequisite, graduate standing in engineering. (Formerly Civil Engineering 590.)

CEEM

592 Theory of Elasticity II (3) A
EVANS

Rigorous formulations of classical theory making use of Cartesian tensor analysis. Stress functions. Use of potential theory to obtain solutions in terms of Papkovitch functions. Prerequisite, Aeronautics and Astronautics 530 or Mechanical Engineering 551, or permission. (Formerly Civil Engineering 592.)

CEEM

593 Theory of Elasticity III (3) W
EVANS

Further topics in elasticity theory, including the Muskhelishvili method for plane elastostatics, integral transforms, contact problems, and finite elastic deformations. Prerequisites, CEEM 592, Aeronautics and Astronautics 580. (Formerly Civil Engineering 593.)

CEEM

594 Wave Propagation in Solids (3) Sp
EVANS, HARTZ

Dynamic formulation of the theory of elasticity; elastic waves in two- and three-dimensional solids; elastic waves in rods, beams, and plates; plastic and viscoelastic wave propagation in solids. Prerequisites, CEEM 574 or equivalent and CEEM 592, or permission. (Formerly Civil Engineering 594.)

CEEM

599 Special Topics—Engineering Mechanics (2-5, max. 15) AWSpS

Prerequisite, permission of instructor and Department Chairman. (Formerly Civil Engineering 599M.)

CEEM

600 Independent Study or Research—Engineering Mechanics (*) AWSpS

HYDRAULIC ENGINEERING

Courses for Undergraduates

CEHY

441 Intermediate Fluid Mechanics (3) A
RICHEY

Potential flow, boundary layer mechanics, generalized similarity problems, introduction to mixing processes. Application to fluid mechanics problems in environmental engineering. Prerequisite, CIVE 345 or permission. (Formerly Civil Engineering 441.)

CEHY

445 Hydraulic Machinery (3) A
CHENOWETH

Application of hydraulic principles to the design and function of hydraulic machinery, with emphasis on centrifugal pumps. Hydraulic transients in penstocks and force mains, including use of digital computer in analyzing such conditions. Prerequisite, CIVE 345. (Formerly Civil Engineering 445.)

CEHY

446 Hydraulic Engineering (3) AW
RICHEY

Application of fluid mechanics principles to problems in hydraulic engineering occurring in the study of surface and ground water hydrology, hydraulics, and stability of dams, economic studies, etc. Prerequisites, CIVE 345 and CEWA 451 (to be taken concurrently). (Formerly Civil Engineering 446.)

CEHY

447 Physical Hydrology (3) W
CAMPBELL, RICHEV

The interaction of precipitation, evaporation the soil-vegetation complex and groundwater in producing runoff. Sedimentation and channel stability. Prerequisite, senior or graduate standing. (Formerly Civil Engineering 447.)

CEHY

448 Open-Channel Engineering (3) Sp
STRAUSSER

The transportation of water by gravity flow. Analysis and design of canals, transitions, energy dissipators, and similar structures. Analysis of surface profiles and effect of non-linear alignment on flow. Design-oriented problems in open-channel hydraulics. Prerequisite, CEHY 345. (Formerly Civil Engineering 448.)

CEHY

498 Special Topics: Hydraulics (1-5) AWSpS
Special topics in civil engineering offered as a course with lecture and/or laboratory. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 498H.)

CEHY

499 Special Projects: Hydraulics (1-5) AWSpS

Individual undergraduate research projects. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 499H.)

Courses for Graduates Only

CEHY

520 Seminar (1, max. 6) AWSp
Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520H.)

CEHY

542 Hydrodynamics I (3) AW
NECE, HUNT

Fundamentals of fluid potential motion. Two- and three-dimensional flow examples, including free surface flows. Conformal mapping, other solution techniques. Prerequisites, CEEM 342 or equivalent. (Formerly Civil Engineering 542.)

CEHY

543 Hydrodynamics II (3) Sp
NECE, HUNT

Fundamentals of the flow of a real fluid. Viscous flows; the Navier-Stokes equations, and some exact solutions. Boundary layer theory. Introduction to turbulence and diffusion. Prerequisite, CEHY 542. (Formerly Civil Engineering 543.)

CEHY

544 Coastal Hydraulics (3) Sp
RICHEY

The mechanics of waves, their prediction and interaction with coastlines, estuaries, and engineering installations. Prerequisite, major in engineering or physical sciences. (Formerly Civil Engineering 544.)

CEHY

545 Incompressible Flow Through Porous Media (3) Sp
HUNT

Application of conformal mapping techniques to both confined and free-surface flow through porous media. Groundwater flow provides the basic motivation for the course, but the mathematical methods are developed with a large degree of generality to give the student an insight into their application to other areas of two-dimensional potential theory. Prerequisites, graduate standing and Mathematics 224, or equivalent. (Formerly Civil Engineering 545.)

CEHY

547 Advanced Hydrology (3) Sp
CAMPBELL, RICHEV

Statistical hydrology and economic implications. Correlations, frequency distributions, stochastic treatments. Prerequisite, graduate standing.

CEHY

549 Experimental Hydrodynamics (3) W
NECE, RICHEV

Experimental studies of steady and unsteady flow phenomena. Model tests as used in hydraulic design. Instrumentation and experimental techniques. Prerequisites, CEHY 441 or permission. (Formerly Civil Engineering 549.)

CEHY

599 Special Topics: Hydraulics (2-5, max. 15) AWSpS

Prerequisites, permission of instructor and department chairman.

CEHY

600 Independent Study or Research—Hydraulics (*) AWSpS

STRUCTURAL ENGINEERING
Courses for Undergraduates

CEST

477 Structural Design through Model Studies (3) W
ALBRECHT

Theory of models, dimensional analysis, direct model analysis; studies employing specific materials, techniques of testing and measurement. Offered jointly with the College of Architecture and Urban Planning as Architecture 521. Prerequisite, permission.

CEST

481 Bridge Design (3) Sp

CLANTON

The design of highway bridges. Characteristics of various types. Prerequisite, CEST 483. (Formerly Civil Engineering 481.)

CEST

482 Advanced Reinforced and Prestressed Concrete (3) W

BIRKELAND, MATTOCK, MITTET

Analysis, design, and construction of reinforced and prestressed concrete structures. Prerequisite, CIVE 382. (Formerly Civil Engineering 482.)

CEST

483 Structural Design I (3) AW

CLANTON, NICHOLLS, VASARHELYI

Introduction to the design of steel, wood, and concrete members and connections. Prerequisite, CIVE 382. (Formerly Civil Engineering 483.)

CEST

484 Structural Design II (3) WSp

CLANTON, NICHOLLS, VASARHELYI

Design of structural systems of buildings including roofs, floors, walls, columns, and foundations. Prerequisite, CEST 483. (Formerly Civil Engineering 484.)

CEST

485 Applied Structural Analysis (3) AW

CLANTON

Matrix formulation of the analysis of statically indeterminate structures using both force and displacement methods. Prerequisite, CIVE 382. (Formerly Civil Engineering 485.)

CEST

498 Special Topics: Structural Engineering (1-5) AWSpS

Special topics in civil engineering offered as a course with lecture and/or laboratory. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 498S.)

CEST

499 Special Projects: Structural Engineering (1-5) AWSpS

Individual undergraduate research projects. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 499S.)

Courses for Graduates Only

CEST

520 Seminar (1, max. 6) AWSp

Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520S.)

CEST

579 Introduction to Structural Design Optimization (3) Sp

NICHOLLS

Introduction to the general methods of approach used in optimization. Linear programming theory and its application to linear algebraic problems. Application of linear programming to optimization of design of trusses and frames. Application of linear programming to nonlinear systems using the approach of sectionally linearized constraints. Prerequisite, graduate standing or permission. (Formerly Civil Engineering 579.)

CEST

580 Strain Measurements (3) A

VASARHELYI

Experimental determination of strain under static and dynamic loads; mechanical, optical, and electrical strain gauges; transducers for displacement, velocity and acceleration; photoelasticity, strain rosette, brittle coating and other methods; problems of instrumentation, and analysis of data. Prerequisite, graduate standing or permission. (Formerly Civil Engineering 580.)

CEST

581 Advanced Structures I (3) A

VASARHELYI

Review of the theory of flexure of members of non-uniform section. Analysis of rigid frames. Slope deflection, moment distribution, stiffness matrix. Formulation for computer analysis. Prerequisite, graduate standing in civil engineering or permission. (Formerly Civil Engineering 581.)

CEST

582 Advanced Structures II (3) W

VASARHELYI

Analysis of trussed structures. Deflections and secondary stresses. Influence lines. Strain energy theorems, flexibility matrix, specialized computer programs. Prerequisite, CEST 581 or permission. (Formerly Civil Engineering 582.)

CEST

583 Advanced Structures III (3) Sp

VASARHELYI

Curved members and arches. Approximate and rigorous methods. Strain energy methods, elastic center. Influence lines. Model methods of structural analysis with demonstrations. Prerequisite, CEST 582 or permission. (Formerly Civil Engineering 583.)

CEST

584 Plastic Design of Steel Structures (3) W

VASARHELYI

Plastic (inelastic) behavior of structural steels. Applications to the design of structural members and systems. Upper- and lower-bound theorems, minimum weight design. Limitations and economy of the procedure. Prerequisite, CEST 581 or permission. (Formerly Civil Engineering 584.)

CEST

586 Structural Materials and Design (3) W

MITTET

A critical review and discussion of the mechanical properties of structural steel, structural aluminum alloy, and reinforced concrete which affect structural design. Fatigue and impact in metal structures. Failure of structures and structural members. Prerequisite, graduate standing in civil engineering. (Formerly Civil Engineering 586.)

CEST

587 Advanced Design of Steel Structures (3) Sp

VASARHELYI

Broad review of the factors influencing the function of a structure, such as material properties and fabrication methods. Welded, riveted and bolted connections. Particular problems of welded structures. Design projects. Prerequisite, CEST 586 or permission. (Formerly Civil Engineering 587.)

CEST

588 Behavior of Concrete Members (3) A

MATTOCK

Behavior of structural concrete members subject to long- or short-term loading by axial

force, bending, shear, and torsion. Prerequisite, CEST 484. (Formerly Civil Engineering 588.)

CEST

589 Behavior of Concrete Structures (3) W

MATTOCK

Behavior under load of concrete structures; continuous beams, frames, and slabs. Effect of creep and shrinkage on the behavior of structures. Prerequisite, CEST 588. (Formerly Civil Engineering 589.)

CEST

599 Special Topics: Structures (2-5, max. 15) AWSpS

Prerequisites, permission of instructor and department chairman. (Formerly Civil Engineering 599S.)

CEST

600 Independent Study or Research—Structural Engineering (*) AWSpS

TRANSPORTATION, CONSTRUCTION, AND MATERIALS ENGINEERING

Courses for Undergraduates

CETC

401 Highway and Traffic Engineering Functions (3) A

SAWHILL

Historical development of highway transportation in the United States and significant legislation in its development, including federal, state, and local programs. An overall view of traffic engineering in relation to planning, design, operations, administration, safety, and research. Prerequisite, graduate or senior standing. (For students in traffic safety education. Not approved for students with credit for CETC 410.)

CETC

405 Critical Path Methods of Project Scheduling (3) AWSp

HORWOOD

Precedence analysis of project activities. The Critical Path Method (CPM) and time-cost algorithms. Program Evaluation and Review Techniques (PERT). Project exercises and computer applications. Prerequisite, Mathematics 105. (Formerly Civil Engineering 405.)

CETC

410 Traffic Engineering—Fundamentals (2) A

SAWHILL

General review of scope and functions of traffic engineering including its relation to urban planning, municipal engineering, motor vehicle registration, safety, and administration. Prerequisite, senior standing in engineering, or urban planning, or permission. (Formerly Civil Engineering 410.)

CETC

413 Highway Capacity and Traffic Flow Theory (3) W

SAWHILL

Modern practices in the estimation of street and highway capacity; mathematical models; application of queuing theory to traffic events. Prerequisite, CETC 410.

CETC

415 Photogrammetry (3) A

COLCORD, VERESS

Geometrical characteristics of photographs. Planning and control considerations for mapping in terrestrial, aerial, and underwater environment. Theory of stereoscopy and parallax measurement. Photogrammetric instrumentation. Evaluation of accuracies and error sources. (Formerly Civil Engineering 415.)

CETC**417 Cadastral Surveys (3) W**
COLCORD

Boundaries; the system of public lands; adverse and riparian rights; subdivision design and site planning. Professional ethics. (Formerly Civil Engineering 417.)

CETC**419 Celestial Methods in Geodesy (3) Sp**
COLCORD

Concepts of time and the celestial sphere. Determination of time, latitude, longitude, and azimuth for geodetic and control surveys. Sources of error. Introduction to satellite observations and methods. (Formerly Civil Engineering 419.)

CETC**421 Transportation Engineering II (3) WSp**
EKSE, HENNES

Physical elements of transportation facilities: roadbed, drainage, pavement, railways, runways, waterways, and other design components of transportation systems. Prerequisites, CIVE 320, CIVE 345, and CIVE 364. (Formerly Civil Engineering 421.)

CETC**424 Pavement Design (3) Sp**
SHERIF, TERREL

Current rational pavement design procedures. Viscoelastic behavior of flexible pavements. Layered systems. Elastic slab theory, considering such factors as temperature and warping stresses. Other elements of highway design. Prerequisite, CETC 421. (Formerly Civil Engineering 424.)

CETC**425 Introduction to Urban Transportation (3) Sp**
HORWOOD

Identification of the framework, central concepts, constraints, and issues of the urban transportation planning problem. Offered jointly with the Department of Urban Planning as Urban Planning 425. (Formerly Civil Engineering 425J.)

CETC**430 Map Projections (3) Sp**
VERESS

Classification of projections, theory of distortion. Projection from ellipsoid to sphere. Theory of conformal projections (Lambert, Mercator, stereographic). Equal area projections. Polyconic and other projections. Offered jointly with the Department of Geography as Geography 430. Prerequisite, permission. (Formerly Civil Engineering 430J.)

CETC**467 Soil Mechanics II (3) A**
MEESE

Fundamental principles of soil mechanics, with emphasis on problems involving plastic equilibrium and seepage forces. Prerequisite, CIVE 366. (Formerly Civil Engineering 467.)

CETC**498 Special Topics: Transportation, Construction, and Materials Engineering (1-5) AWSpS**

Special topics in civil engineering offered as course with lecture and/or laboratory. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 498T.)

CETC**499 Special Projects: Transportation, Construction, and Materials Engineering (1-5) AWSpS**

Individual undergraduate research projects. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 499T.)

Courses for Graduates Only**CETC****500 Transportation Safety—Introduction Seminar (1) A**
SAWHILL

A general review of all aspects of transportation safety, reflecting federal, state, and local safety programs; motor vehicle and driver administration, enforcement, courts, traffic engineering, insurance, and public support. Prerequisite, graduate standing or permission.

CETC**504 Transportation Finance, Policy, and Programming (2) W**
HENNES, HORWOOD

The planning, development, and financing of public transport facilities at different levels of government. Problems and issues in the integrating of transport systems. (Formerly Civil Engineering 504.)

CETC**505 Economic Analysis of Public Works (2) A**
HENNES, HORWOOD

The use of benefit cost ratio, rate of return, and maximization of benefits as criteria in project justification, cost allocation, and selection among engineering alternatives in the design and construction of public works. (Formerly Civil Engineering 505.)

CETC**510 Traffic Engineering—Analysis (3) A**
SAWHILL

Measurement and evaluation of characteristics of vehicular volume, speed, travel time, delays, and travel desires. Analysis of roadway and intersection capacity. Parking studies and computer analysis of traffic engineering studies. Prerequisite, CETC 410 or permission. (Formerly Civil Engineering 510.)

CETC**511 Traffic Engineering—Administration and Safety (2) W**
SAWHILL

Comprehensive review of Uniform Vehicle Code and Manuals on Uniform Vehicle Control Devices. Warrants and uses of signs, signals, markings, and channelization. Traffic engineering administration, federal, state, county, and municipal. Prerequisite, CETC 410 or permission. (Formerly Civil Engineering 511.)

CETC**512 Traffic Engineering—Planning (2) Sp**
SAWHILL

Application of origin and destination studies, traffic assignment and trip generation models to limited and comprehensive traffic studies. Traffic engineering functions in arterial street systems planning. Downtown traffic planning and traffic facilities location. On- and off-street parking and characteristics of terminal facilities. Prerequisite, CETC 410 or permission. (Formerly Civil Engineering 512.)

CETC**513 Traffic Engineering—Design (3) Sp**
SAWHILL

Factors and elements in the geometric design of arterials, freeways, intersections, interchanges, and parking facilities. Special design studies and reports. Prerequisite, CETC 410 or CETC 512 or permission. (Formerly Civil Engineering 513.)

CETC**515 Stereo-Photogrammetry (3) W**
VERESS

Theory of orientation; mathematical concept of relative and absolute orientation for vertical and convergent photography. Error propagation and corrections. Accuracy element of orientation. Critical surfaces. Standard residual Y-parallaxes. Prerequisites, CETC 415, CETC 530. (Formerly Civil Engineering 515.)

CETC**516 Analytical Photogrammetry (3) W**
VERESS

Basic principle of analytical photogrammetry. Stereo comparators and the analytical plotter. Reduction of plate coordinates. Perspective. Colinearity, coplanarity, space coordinate systems, transformations. Space intersection and resection and their adjustments. Solutions using high speed electronic computers. Prerequisites, CETC 415 and CETC 530. (Formerly Civil Engineering 516.)

CETC**518 Aerial Triangulation (3) Sp**
VERESS

Radial aero-triangulation; instrumental aerial triangulation by independent pairs, aero-polygon, aero-leveling, and independent geodetic control methods. Semi-analytical aero-triangulation. Mathematical strip and block adjustment. Analytical aero-triangulation methods. Prerequisites, CETC 515 and CETC 516. (Formerly Civil Engineering 518.)

Courses for Graduates Only**CETC****520 Seminar (1, max. 6) AWSp**

Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520T.)

CETC**522 Transportation Systems (3) A**
EKSE, HENNES

Interregional highways, state trunk lines and local roads; their functions and appropriate standards of design. The characteristics of road, rail, water, and air transport in relation to selection and design of the facility. Pipeline and conveyor transportation. Prerequisite, CETC 421. (Formerly Civil Engineering 522.)

CETC**523 Transportation Terminals (3) W**
EKSE, HENNES

Coordination of transportation facilities. Port and harbor installations. Airports. Rail belt lines and terminals. Prerequisite, CETC 421. (Formerly Civil Engineering 523.)

CETC**524 Rapid Transit (3) Sp**
EKSE, HENNES

Engineering problems in the mass movement of people in metropolitan areas. Demand in relation to level of service. Equipment. Route selection. Running time. Station spacing. Prerequisite, graduate standing in engineering or permission. (Formerly Civil Engineering 524.)

CETC

525 Transportation and Land Use Planning Models (3) A SCHNEIDER

Theory underlying land use and transportation planning models. Past attempts to model urban development. Modeling of alternatives. Forecasting technological innovation, assessing land use implications. Offered jointly with the Department of Urban Planning as Urban Planning 525. Prerequisite, CETC 425 or permission.

CETC

526 Transportation Studies, Model Calibration, and Network Flow (3) Sp SAWHILL

Review of the organization of regional transportation studies, including the functions of engineers, planners, and others. Examination of transportation and land-use models as applied to transportation studies and analysis of current models. Application of technology of traffic assignment to transportation networks, with problems of tree building, network flow, restrictions and system optimization by computer. Prerequisite, graduate standing or permission.

CETC

527 Information Systems for Planning and Research (3) A HORWOOD

Computer programming technology and data systems designed for large scale data inputs. Machine editing, data manipulation, and retrieval. Laboratory problems adapted to specialized interests of students. No previous computer programming experience required. Offered jointly with the Department of Geography as Geography 527 and the Department of Urban Planning as Urban Planning 527. (Formerly Civil Engineering 527J.)

CETC

528 Automated Mapping and Graphing (3) W HORWOOD

Problem-oriented computer languages for statistical and areal analysis. Laboratory problems adapted to specialized interests of students. Offered jointly with the Department of Geography as Geography 528 and the Department of Urban Planning as Urban Planning 528. Prerequisite, basic statistics, CETC 527, or permission. (Formerly Civil Engineering 528J.)

CETC

529 Computer Applications to Urban and Regional Analysis (3) Sp HORWOOD

Simulation models and automated systems for the study of land use and related economic and demographic data. Machine methods of planning analysis and feedback review. Laboratory projects. Offered jointly with the Department of Geography as Geography 529 and the Department of Urban Planning as Urban Planning 529. Prerequisite, CETC 528 or permission. (Formerly Civil Engineering 529J.)

CETC

530 Adjustment Computations (4) A COLCORD, VERESS

Two- and multi-dimensional distributions and concept of errors, variances, co-variances, weight and error propagation. Least square adjustment by variation of parameters and condition methods. Solution of normal equations and adjustments of hybrid systems using matrix notation inversion by high speed

computers. Prerequisite, permission. (Formerly Civil Engineering 530.)

CETC

531 Geodesy (3) A COLCORD

Introduction to gravimetric and geometric geodesy. Potential attraction, gravity observation and reduction. Properties of the ellipsoid and geoid and computations of geodetic position and distances. Prerequisite, permission. (Formerly Civil Engineering 531.)

CETC

535 Airport Systems Planning (3) W SHINN

Investigation of physical, sociopolitical, and economic features of air transportation system planning. Emerging technologies. Intermodal relationships. The decision-making environment for resource allocation, land-use planning, programming, and organization. Scenarios of anticipated conflict resolution problems. Offered jointly with Urban Planning as Urban Planning 535. Prerequisites, CETC 425, Urban Planning 400, or permission.

CETC

537 Electronic Surveying I (3) W COLCORD, HARRISON

Fundamentals of electronics. Receivers, antennae, radar equation, lasers, circular, hyperbolic and other methods. Radar, linescan radar, radio and laser altimeters. Theory of geodimeter, tellurometer, electrotape, and other electronic surveying equipment. Prerequisite, Electrical Engineering 303 or permission. (Formerly Civil Engineering 537.)

CETC

538 Electronic Surveying II (3) Sp VERESS

Relation of doublepath propagation to phase measuring technique. Curvature of ray path. Propagation velocity. Distance reduction. Long-line measurement. Control point extension. Trilateration adjustment. Hydrographic surveying applications. Prerequisites, CETC 530 and CETC 537. (Formerly Civil Engineering 538.)

CETC

565 Remote Sensing of Environment (3) W COLCORD

Use of aerial photographs and other sensors for terrain evaluation and environment studies. Factors in system design and target signature evaluation. Prerequisite, permission. (Formerly Civil Engineering 565.)

CETC

566 Engineering Properties of Clay (3) A SHERIF

Shearing strength, consolidation characteristics, structural concepts, and related properties of clay. Prerequisite, CIVE 366. (Formerly Civil Engineering 566.)

CETC

567 Stresses in Earth Masses (3) W SHERIF

Stress function. Stress-strain analysis within elastic range with emphasis on soil/water systems. Groundwater hydrodynamics. Stress distribution under various loadings. Relaxation methods. Prerequisites, CETC 467 and Mathematics 324, or permission. (Formerly Civil Engineering 567.)

CETC

568 Seepage and Slope Stability (2) W HENNES, MEESE

Control of landslides; effect of seepage and

porewater pressure on the stability of earth masses. Prerequisite, CETC 467. (Formerly Civil Engineering 568.)

CETC

569 Applied Soil Mechanics (3) Sp HENNES, MEESE

Soil mechanics in engineering practice; the application of theory to the analysis of footings, piling, retaining walls, tunnels, and other substructures. Prerequisites, CIVE 366 and graduate standing. (Formerly Civil Engineering 569.)

CETC

599 Special Topics: Transportation, Construction, and Materials Engineering (2-5, max. 15) AWSpS

Prerequisites, permission of instructor and department chairman. (Formerly Civil Engineering 599T.)

CETC

600 Independent Study or Research—Transportation, Construction, and Materials Engineering (*) AWSpS

WATER AND AIR RESOURCES

Courses for Undergraduates

CEWA

450 Man and Pollution of His Environment (3) Sp CHRISTMAN

Description of growing problems of air, water, and land pollution that the engineer must define and solve if the quality of man's environment is to be maintained. The quantity and quality of present production of wastes; their known environmental effects; practical methods of control; prospects for the future. The essential team approach to these engineering problems is stressed, noting the interrelationship of physical, chemical, and biological causes and effects. Prerequisite, junior standing. (Offered jointly with Arts and Sciences as 405.)

CEWA

451 Sanitary Engineering II (5) AW BOGAN, CARLSON, SYLVESTER

Design criteria for water supply and waste collection systems. Political, social, and economic considerations in the development of these systems. Design of ground water and surface water supply systems; design of domestic sewage and storm water collection systems. Prerequisites, CIVE 350 and CEHY 446 (to be taken concurrently). (Formerly Civil Engineering 451.)

CEWA

452 Systems Engineering Fundamentals (3) Sp MAR

The methodology and philosophy necessary to employ the system approach to management of natural resources, design of public works systems, or any other complex systems are surveyed. Scientific methods for the tasks of problem definition, goal setting, system synthesis, system analysis, and choice among alternate systems. Prerequisites, Mathematics 224 and senior standing. (Formerly Civil Engineering 452.)

CEWA

455 Water Biology (4) A WELCH

Principles of aquatic ecology with emphasis on aspects related to water quality problems

and methods of measuring associated biological changes. Topics include nutrient cycles, autotrophic and heterotrophic metabolism, environmental factors that affect planktonic and benthic plants, and effects of various types of wastewaters on benthic and nektonic animals. Prerequisite, senior or graduate standing.

CEWA

456 The Chemistry of Natural Water Systems (3) A

CHRISTMAN

Principles of chemical equilibrium relevant to natural water systems; the nature and effect of chemical interactions of domestic and industrial waste effluents on natural water systems; chemical principles involved in the treatment of water and waste waters. Prerequisite, one year of general chemistry or equivalent. (Formerly Civil Engineering 456.)

CEWA

457 Instrumentation for Water and Air Analysis (3) W

CHRISTMAN

Theory and application of instrumentation used in water and air quality measurement, research, and monitoring. Lecture and laboratory. Prerequisite, CIVE 350 or equivalent. (Formerly Civil Engineering 457.)

CEWA

458 The Chemistry of Air Pollution (3) A

CHARLSON

Lecture and laboratory sessions focussed on (a) the significance and testing of inorganic and organic atmospheric contaminants, (b) familiarization with sampling and analytical instrumentation. Prerequisites, Chemistry 160 or equivalent. (Formerly Civil Engineering 458.)

CEWA

459 Air Microbiology (3) W

ROSSANO

The collection, distribution, and survival of the atmospheric microbial content will be discussed in lecture and studied in the laboratory. Pertinent aspects of medical and agricultural air microflora will be considered. Prerequisite, CEWA 455 or equivalent, or Microbiology 400, or permission. (Formerly Civil Engineering 459.)

CEWA

461 Air Resources Engineering I (3) ASp

ROSSANO

Relation between air pollution sources, atmospheric variables, and effect on receptors. Detection, analysis, and control of air pollution. Prerequisite, CIVE 350 or permission. (Formerly Civil Engineering 461.)

CEWA

498 Special Topics: Water and Air Resources (1-5) AWSpS

Special topics in civil engineering offered as course with lecture and/or laboratory. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 498W.)

CEWA

499 Special Projects: Water and Air Resources (1-5) AWSpS

Individual undergraduate research projects. Prerequisite, permission of department chairman. A maximum of 6 credits may be applied toward an undergraduate degree. (Formerly Civil Engineering 499W.)

Courses for Graduates Only

CEWA

520 Seminar (1, max. 6) AWSp

Prerequisite, permission of thesis supervisor. (Formerly Civil Engineering 520W.)

CEWA

525 Seminar in Atmospheric Problems Associated with Air Pollution (2) W

BADGLEY, CHARLSON

Seminar for both engineers and atmospheric scientists in the atmospheric problems related to air pollution. A wide variety of topics will be covered in both faculty lectures and student participation jointly with Atmospheric Sciences. Prerequisites, Atmospheric Sciences 301 or Geophysics 403 and CEWA 461.

CEWA

550 Sanitary Engineering Unit Operations I (3) W

CARLSON

Physical and biological operations involved in treatment of water. Biological population control, solid-liquid separation, material and energy balances, design of biological operations. Prerequisite, CEWA 455 or permission. (Formerly Civil Engineering 550.)

CEWA

551 Sanitary Engineering Unit Operations II (3) W

BOGAN

Design of chemical operations employed in the treatment of water and wastes including solids separations, chemical coagulation, ion exchange, and gas transfer. Theoretical development of design parameters and evaluation of functional performances, reaction rates, mass balances, and power requirements. Prerequisite, CEWA 456 or permission. (Formerly Civil Engineering 551.)

CEWA

552 Treatment Process and Systems Design (3) Sp

BOGAN, CARLSON

Functional design of processes and systems for treatment of water and waste water to meet specific situations. Comprehensive design of specific process including selection and design of equipment and control elements, plant layout and site development, and cost studies. Introduction to use of systems analysis methods and mathematical description of process performance. Prerequisites, CEWA 550 and CEWA 551. (Formerly Civil Engineering 552.)

CEWA

553 Advanced Water Biology (4)

WELCH

Application of ecological concepts for analysis and interpretation of bioenvironmental problems and data from inland and coastal waters. Students participate in presentation and discussion of current research on selected topics. Prerequisites, CEWA 455, CEWA 456, or permission. (Formerly Civil Engineering 553.)

CEWA

554 Advanced Process Chemistry for Sanitary Engineers (3) W

CHRISTMAN

Properties of colloidal systems, natural, and synthetic organic materials encountered in water and waste water treatment, and laboratory methods for their analysis. Prerequisite, CEWA 456 or permission. (Formerly Civil Engineering 554.)

CEWA

555 Topics in Analysis and Design of Sanitary Systems (3) A

BOGAN

Mathematics of treatment processes and systems of interest to the sanitary engineer. Use of analog and digital computers for simulating multi-use river systems, treatment processes and operations, and water distribution networks. Computer programming for design optimization and system control. Prerequisite, one year graduate study or permission. (Formerly Civil Engineering 555.)

CEWA

556 Bioengineering Aspects of Waste Treatment (3) Sp

CARLSON

Sanitary engineering problems relating to biological and biochemical systems influencing man's environment. Biological treatment of industrial wastes and advanced waste treatment processes. Prerequisite, CEWA 550 or permission. (Formerly Civil Engineering 556.)

CEWA

557 Water and Waste-Water Treatment (3) Sp

MAR, SYLVESTER

Objectives of water and waste-water treatment; associated physical, chemical, and biological phenomena; design of common treatment systems. Prerequisite, CEWA 451 or permission. (Formerly Civil Engineering 557.)

CEWA

558 Water Quality Management (3) W

MAR, SYLVESTER

Water quality control objectives, methods and philosophies; effect of various uses on water quality; receiving water characteristics; dispersion and behavior of pollutants; treatment required for various water usages. Prerequisites, CEWA 455, CEWA 456, or permission. (Formerly Civil Engineering 558.)

CEWA

559 Water Resource Management (3) A

MAR, SYLVESTER

Engineering, social, and economic factors involved in water resource development and management; water policies, programs and administration. Use relationships and conflicts. Considerations for regional water resource systems. (Formerly Civil Engineering 559.)

CEWA

560 Topics in Environmental Health for Engineers (3) A

ROSSANO

Survey of environmental health practices and problems with emphasis on the role of sanitary engineering. (Formerly Civil Engineering 560.)

CEWA

562 Air Resources Engineering II (3) W

ROSSANO

Fundamental and applied air resource engineering; physics and chemistry of the atmosphere; biological and economic effects of air pollution; design of air pollution control systems. Prerequisite, CEWA 461 or permission. (Formerly Civil Engineering 562.)

CEWA

563 Air Resources Management (3) Sp

ROSSANO

The atmosphere as a vital natural resource. Administrative and legal aspects of air conservation; quality criteria and emerging problems. Prerequisite, CEWA 461 or permission. (Formerly Civil Engineering 563.)

CEWA

564 Aerosol Science and Technology I

(3) W
CHARLSON

Topics related to suspended particulate matter in a gaseous medium. Statistics, mechanics, and physical chemistry of aerosols. Particular reference to particulate matter in air and to experimental and engineering methods. Prerequisite, permission. (Formerly Civil Engineering 564A.)

CEWA

565 Aerosol Science and Technology II

(3) Sp
CHARLSON

A continuation of CEWA 564; light scattering, Brownian motion, diffusion and coagulation of aerosols. Prerequisite, permission. (Formerly Civil Engineering 564B.)

CEWA

566 Gas Cleaning Design I (3) W

PILAT

Procedures and equipment for evaluating the emissions of air-pollutant sources. Principles and design of the physical and chemical processes employed in the removal of gaseous pollutants. Comprehensive design of specific processes. Prerequisite, CEWA 461. (Formerly Civil Engineering 561A.)

CEWA

567 Gas Cleaning Design II (3) Sp

PILAT

Principles and designs of processes used to control the emission of particulate air pollutants. Relationship of design parameters to the specifications of commercially available equipment. Prerequisites, CEWA 564 and CEWA 566, or permission. (Formerly Civil Engineering 561B.)

CEWA

599 Special Topics: Water and Air Resources (2-5, max. 15) AWSpS

Prerequisites, permission of instructor and department chairman. (Formerly Civil Engineering 599W.)

CEWA

600 Independent Study or Research—Water and Air Resources (*) AWSpS

ELECTRICAL ENGINEERING

Courses for Undergraduates

231 Introductory Circuit Theory I (5) AWSp

Network elements and sources, Kirchhoff's laws, node and loop equations, solution of linear differential equations. Response of networks to suddenly applied excitations. Superposition property of linear systems. Steady-state response of RLC networks. Resonance. Frequency response and pole-zero patterns. Prerequisites, General Engineering 111, Mathematics 125; corequisites, General Engineering 115, Mathematics 126, and Physics 122.

233 Introductory Circuit Theory II

(4) AWSp

Network graph, branches, trees, and links. General equilibrium equations for networks. N-terminal networks, N-port networks, and network parameters. Mutual inductance and ideal transformer. Thevenin's theorem, Norton's theorem, and Tellegen's theorem. Energy and power in RLC networks. Vector power. (To be taken concurrently with 234.) Prerequisite, 231.

234 Introductory Circuit Laboratory

(1) AWSp

One three-hour laboratory each week, covering fundamental electrical measurements. (To be taken concurrently with 233.) Prerequisite, 231.

299 Special Topics in Electrical

Engineering (1-5) AWSp

New and experimental approaches to basic electrical engineering. May include design and construction projects. Prerequisite, permission of Department Chairman.

301 Elements of Electrical Engineering (4)

AWSp

Short course in the analysis of direct- and alternating-current circuits with an introduction to electronics. For nonelectrical engineering majors. Prerequisites, Physics 122 and Mathematics 224. (To be taken concurrently with 302.)

302 Electrical Engineering Laboratory

(1) AWSp

One three-hour laboratory each week covering fundamental electrical measurements. (To be taken concurrently with 301.)

304 Basic Electrical Engineering Laboratory

(1) AWSp

One three-hour laboratory each week covering measurements of direct- and alternating-current circuits. For mechanical engineering majors. Corequisite, Mechanical Engineering 363.

305 Electrical Machinery (5) AWSp

Theory, performance, and analysis of poly-phase circuits, transformers, synchronous machines, induction motors, direct-current machines, and electrical power distribution. Includes one three-hour laboratory per week. Prerequisites, 301 and 302, or 304.

315 Signals and Systems I (4) AWSp

Fourier series, Fourier integral transform, frequency analysis of linear systems, introduction to the Laplace transform method, initial value theorem, final value theorem, and other properties of Laplace transforms, partial fraction techniques, and inverse Laplace transforms, poles, and zeros, the convolution integral and system response, applications. (To be taken concurrently with 316.) Prerequisite, 233.

316 Signals and Systems Laboratory I

(1) AWSp

One three-hour laboratory each week covering measurements of electrical systems; the response of instruments to various wave forms and different frequencies. (To be taken concurrently with 315.) Prerequisite, 234.

317 Signals and Systems II (4) WSp

Elementary state-space concepts, time-domain solution of state equations, state-transition matrix, frequency-domain solutions of state equations, time varying systems, basic concepts of probability, random variables and random processes, auto-correlation functions and cross-correlation functions, spectra densities, response of linear systems to random inputs. Prerequisite, 315.

318 Signals and Systems Laboratory II

(1) WSp

One three-hour laboratory each week covering Fourier analysis of complex wave forms, measurements of feedback systems. Individual project for investigation. (To be taken concurrently with 317.) Prerequisite, 316.

321 Electromagnetic Fields and Waves I

(4) AWSp

Fundamentals of electromagnetic analysis, vector analysis, electrostatics, magnetostatics, Maxwell's Equations, electromagnetic waves, plane waves, polarization, reflection and transmission of waves at boundaries. Prerequisites, 233, Mathematics 238, or 438.

323 Electromagnetic Fields and Waves II (4)

AWSp

Poynting vector and power flow, guided waves, TE, TM, and TEM waves, transmission lines, waveguides, resonators, interaction of fields and matter, radiation, and antennas. (To be taken concurrently with 324.) Prerequisite, 321.

324 Electromagnetic Fields and Waves

Laboratory I (2) AWSp

A four-hour laboratory each week covering topics in electrostatic fields, wave propagation, guided waves and resonators, radiation and optics. (To be taken concurrently with 323.)

325 Modern Topics in Electromagnetics

(4) W

Detailed treatment of specialized topics, may vary from year to year. Includes microwave generation, transmission and applications; antennas, radiation and optics; radio astronomy, radio propagation and ionospheric physics; radar techniques and scattering cross section; fields in plasma and solids. Prerequisite, 323.

343 Introduction to Electromechanical

Energy Conversion (5) AWSp

Physical aspects and energy relationships in electromechanical devices. Frequency-power relationships in rotating machines. Commutator, synchronous, and induction machines. Field theory in rotating machines. Includes a 4-hour laboratory on alternate weeks. Prerequisite, 321.

361 Electronic Properties of Materials

(4) AWSp

Introduction to quantum and statistical mechanics; electrons in metals, semiconductors and insulators; p-n junction theory; introductory quantum electronics. Prerequisites, 321, Physics 221 or 320.

362 Physical Electronics Laboratory

(1) AWSp

A 3-hour laboratory each week in physical electronics. Prerequisite, 361.

363 Electronic Devices and Circuits I

(4) AWSp

Elementary semiconductors, circuit models for p-n junction diodes, transistors and other semiconductor devices. Applications to switching circuits. (To be taken concurrently with 364.) Prerequisite, 315.

364 Electronic Devices and Circuits

Laboratory I (1) AWSp

A three-hour laboratory each week. (To be taken concurrently with 363.)

365 Electronic Devices and Circuits II

(4) AWSp

Application of semiconductor devices and semiconductor integrated circuits to linear and digital systems. Emphasis on bias networks, amplification, feedback, and elementary systems. (To be taken concurrently with 366.) Prerequisite, 363.

366 Electronic Devices and Circuits

Laboratory II (1) AWSp

A 3-hour laboratory each week. (To be taken concurrently with 365.)

399 Special Topics in Electrical Engineering (1-5) AWSp

New and experimental approaches to current electrical engineering problems. May include design and construction projects. Prerequisite, permission of Department Chairman.

400 Electronic Instrumentation and Control (5) AWSp

Principles of operation and application of electronic tubes, transistors, and circuits in the fields of instrumentation, control, and communication. Includes one 3-hour laboratory weekly. For nonelectrical engineering majors. Prerequisites, 301 and 302, or 304.

415 Computer-Aided System Analysis (3) Sp
Concepts, principles, and techniques concerned with the design, testing, and application of general-purpose problem-oriented computer programs for analyzing large-scale systems. Specific attention to implementation on computers. Prerequisites, General Engineering 115 and senior standing.

421 Electroacoustics (4) A

Fundamentals of acoustics and the electroacoustical aspects of electromechanical systems. Characteristics of transducers. Synthesis of systems. Prerequisite, 323 or permission.

433 Electronic Circuit Design (3) ASp

Electronic circuit design using modern electronic devices. Topics include application of integrated-circuit amplifiers and multipliers, design of solid-state amplifiers for low noise, wide bandwidth, high frequency, high power output, and the application of modulation theory to modern systems. The design aspect of solid-state electronic circuitry is emphasized. Prerequisite, 365.

441 Linear System Analysis (3) AWSp

Frequency and time domain properties of signals. Fourier methods used for determining the response of linear systems. Transform methods and operational properties. Comparison of Fourier and Laplace transform methods. Prerequisites, 315 and senior standing, or permission.

445 Nonlinear Systems Analysis (4) W

Linear, time-varying systems. First-order nonlinear systems; exact and approximate solutions. Second-order nonlinear systems; phase-plane, approximate solutions of Ritz and Kryloff-Bogoliuboff, forced vibrations, stability. Analog and digital computer methods. Prerequisite, senior standing in electrical engineering.

449 Electrical Machinery I (6) W

Unbalanced polyphase circuits, symmetrical components, transformers, transients in transformers, core materials. Introduction to saturable reactors and magnetic amplifiers. Analysis of synchronous machine performance, transients in synchronous machines, short-circuit calculations, polyphase induction motors. Includes one 4-hour laboratory per week. Prerequisite, 343.

450 Electrical Machinery II (6) Sp

Electrodynamics of synchronous machines; single-phase induction motors; other single-phase motors; conversion of a.c. to d.c.; motor control with rectifiers; inversion; introduction to transmission lines and power transmission; short-circuit calculations in networks. Includes one 4-hour laboratory per week. Prerequisite, 449.

451 Dynamics of Electromechanical Systems (3) W

Energy principles and applications to electromechanical systems; circuit-theory methods; matrix transformations of voltage and force equations; elementary applications of field theory to analysis of electromechanical systems. Prerequisite, 343 or permission.

453 Electric Power Systems (3) Sp

ROBBINS

Theoretical, analytical engineering study of complete electrical power systems under steady state, faulted, and transient conditions using data computer, system analyzer, and symmetrical components methods; utility management, control, operation, and protection. Weekly laboratory with field trips to existing installations including a nuclear plant. Prerequisite, 343 or permission.

468 Applied Optics (4) W

Fundamentals of optical image formation, data processing, holography, interferometry, laser principles, optical detection, material interactions, scattering, and fiber optics. Prerequisite, 323.

469 Boundary Value Problems and Wave Fundamentals (4) Sp

Boundary value problems, expansions in orthogonal functions, Green's theorem, Green's function, retarded potentials, dispersive and anisotropic media. Prerequisite, 323.

470 Design of Digital Data Systems (4) Sp

KEHL

Fundamental gating circuits are developed into large logic gating structures. The use of these structures in the design of central processing units, memories, and peripheral equipment is illustrated. Primarily for non-electrical-engineering majors. Offered jointly with Computer Science as Computer Science 470. Prerequisite, permission of instructor.

473 Wave Shaping (5) AW

Generation and transmission of special waveforms, including pulses, square waves, and linear ramps; clipping, clamping, and d-c restoration; astable, monostable, and bistable multivibrators; applications to analog and digital systems. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 365.

475 Digital Systems (4) Sp

Synthesis of digital systems from functional electronic subassemblies; integrated logic circuits; shift registers; generation and conversion of digital codes; analog to digital conversion. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 365.

476 Logical Design of Digital Devices (3) W

Number theory of formal and informal systems, translation, error detection characteristics. Arithmetic operations in formal and informal systems. Boolean algebra, algebraic manipulation and simplification. Topological methods. Switching and logical applications in combinatorial minimization. Analysis and synthesis of sequential logic, minimization criteria. Systems design. Prerequisite, upper-division standing.

477 Digital Computer Applications (4) ASp

Application of the digital computer to the solution of engineering problems. (a) Selected topics in numerical analysis: Chebyshev polynomials, Bairstow's method for polynomial roots, Gaussian quadrature, iterative methods for eigenvalues, Runge-Kutta methods for

differential equations, fast Fourier transform, random numbers, linear programming; simulation of discrete and continuous systems; (b) principles of computer graphics: interactive problem-solving; (c) non-numerical programming: Application of FORMAC and SNOBOL to engineering problems. Prerequisites, General Engineering 115 and 390, or permission.

478 Computer Organization and Machine Language Programming (4) ASp

Differences and similarities in computer structure. Flow of control. Instruction codes and their execution for arithmetic, logical, character manipulation, and input-output operations. Indexing and indirect addressing; subroutine linkage. Study of information representations and their relationship to processing techniques. Offered jointly with Computer Science as Computer Science 478. Prerequisites, General Engineering 115 or equivalent, and Assembly Language Programming.

479 Fundamentals of Automatic Control (4) AWSp

Linear servomechanism theory and design principles. Pole-zero analysis, stability of feedback systems by root-locus and real-frequency response methods. Design methods of Bode and Nichols. Introduction to advanced topics in automatic control theory. Prerequisite, 315.

481 Fundamentals of Microwaves (4) Sp

Microwave circuit elements, waveguides and resonators; microwave measurement techniques; high frequency triodes, klystrons, and other transit-time devices; beam-type and solid-state amplifiers. Includes one 3-hour laboratory per week. Prerequisites, 323, 365.

483 Introductory Communication Theory (3) Sp

Frequency analysis; modulation; mathematical concepts of Fourier integral and probability theory; correlation techniques; elementary study of noise and communication theory. Prerequisite, senior standing.

485 Semiconductor Devices (4) AW

Physics of p-n junctions and semiconductor surfaces; operating principles of various semiconductor devices. Development of small-signal and switching circuit models. Includes junction transistors, controlled rectifiers, surface and junction field effect transistors, microwave semiconductor devices, and devices for integrated circuits. Prerequisite, 361 or equivalent.

493 Guidance and Control (3) Sp

Analysis and design problems in attitude control and flight-path guidance of aerospace vehicles. Principles of inertial instruments and navigation systems. Prerequisite, 479.

498 Control System Components and Measurements (3) Sp

Study of control system components and formulation of their mathematical models. Amplifiers, servomotors, synchros, gyroscopes, and fluid-power devices. Experimental determination of dynamic parameters, and behavior of closed-loop systems. Two 3-hour laboratories per week. Corequisite, 479 and permission.

499 Special Projects (2-5, max. 10) AWSp

Assigned construction or design projects carried out under the supervision of the instructor. Prerequisite, permission of Department Chairman.

Courses for Graduates Only

501, 502 Programming Languages and Systems I, II (3,3) WSp GOLDE

Classification, formal definition, and comparison of computer languages. Basic concepts and design of interpreters, assemblers, and compilers. Offered jointly with Computer Science as Computer Science 501, 502. Prerequisites, 478 or permission for 501; 501 for 502.

505 Analysis of Random Processes (4) AS LYTLE, MARTIN, METZ

Probability theory; discrete and continuous random variables; stochastic processes. Spectral analysis of random signals and noise. Prerequisite, graduate standing.

506, 507 Stochastic Processes and Communication Theory I, II (3,3) WSp LYTLE, MARTIN, METZ

Stochastic signals and noise, sampling theorem, and other representations. Communication channels, bandpass and fading channels, modulation techniques. Detection and estimation theory, optimum filters and receivers. Prerequisite, 505 or permission.

510 Introductory Network Theory (5) A
Mathematical concepts applicable to network theory. Mesh and nodal formulations in matrix form, linear transformations, and quadratic forms. Elements of complex variables including conformal transformations and complex potential applied to fields and networks. Contour integration and evaluation of residues. Corequisite, 441.

511, 512 Network Synthesis I, II (3,3) W,Sp LEWIS

Network representations in the complex frequency domain, realizability criteria, synthesis of driving point and transfer impedance and coupling networks for prescribed transfer characteristics, canonical forms, and network equivalents, frequency and time domain aspects of approximating response functions. Prerequisites, 510 for 511; 511 for 512.

513 Active Circuit Theory (3) Sp ANDERSEN

Principles of analysis and synthesis of linear active circuits. Emphasis on general principles, including conservation theorems, invariants, performance limitations in the presence of parasitic elements and realizability conditions. Illustrative applications related to negative resistance amplifiers, feedback amplifiers, and active filters. Prerequisite, 441 or permission.

514 Power System Analysis (5) W BERGSETH

Methods of analysis of power systems, with emphasis on the interrelations between generation, transmission, and distribution; symmetrical components; evaluation of system parameters and sequence networks; fault studies; transient and steady-state behavior of systems; elements of system control. Prerequisite, 343. (Offered when adequate enrollment develops prior to close of advance registration.)

515 Physical Principles in Instrumentation (3) W HARRIS, HELMS, SIGELMAN, YEE

Basic electrophysics underlying selected electronic instruments. Electron microscopy, x- and gamma-ray spectroscopy, infrared devices; motion, density, and biomedical measurements. Prerequisite, graduate standing or permission.

525 Acoustics in Engineering (3) Sp HARRIS, ISHIMARU, SIGELMAN

Acoustic wave transmission, reflection, refraction, and diffraction in solids, liquids, and gases. Includes review of continuum mechanics and examples from electro-mechanical systems. Offered jointly with Mechanical Engineering as Mechanical Engineering 525. Prerequisite, graduate standing in electrical or mechanical engineering, or permission.

530 Quantum Electronics (4) A BJORKSTAM, YEE

Matrix formulation of quantum theory, perturbation theory, dirac notation, quantization of lattice vibration and electromagnetic radiations; interaction of radiation and atoms, laser principles; electro-optic effect in crystals and electro-optics modulation of light; nonlinear optics. Prerequisites, 323 and 361, or permission.

531 Solid State Electronics I (4) W BJORKSTAM, YEE

Band structure of solids; cyclotron resonance, effective mass; lattice vibrations, phonons; transport theory; dielectric and magnetic properties of materials; some aspects of superconductivity. Prerequisite, 530 or permission.

532 Solid State Electronics II (4) Sp BJORKSTAM, YEE

Devices and phenomena of current interest, making use of the current literature. Content depends, to some extent, on interests of instructor and students. Commonly includes such topics as ferrite, Impatt, Gunn, and semiconducting and superconducting devices. Prerequisite, 531 or permission.

535 Semiconductor Circuits (4) Sp GUILFORD, LAURITZEN

Characterization of semiconductor devices for high frequency and switching circuits; use of feedback in circuit design; discrete and integrated semiconductor circuit applications. A laboratory project is included as a part of the course. Prerequisite, 485 or permission.

545 Linear Control System Analysis (3) A BERGSETH, CLARK

Linear continuous system theory applied to feedback control systems. Block diagrams and signal flow graph representations. Steady-state errors and performance. Stability and dynamic response by root-locus, Nyquist, and Bode techniques. Prerequisite, graduate standing.

546 Advanced Topics in Control System Theory (3) AWSp

Topics of current interest in automatic control system theory, for advanced graduate students having adequate preparation in linear and nonlinear system theory. Prerequisite, permission of instructor. (Offered when sufficient enrollment develops prior to close of advanced registration.)

547 Neural Communication and Control in Biological Systems (3) Sp PINTER

A first course which conveys the state of quantitative knowledge of how neural events, that is, motion of charged particles, accomplishes communication and control in biological systems. The stress is on experimentally derived mathematical models and their limitations. Prerequisites, 479 and graduate standing, or permission.

548 Optimal Control (3) A HSU

Variation calculus and optimal control, the Pontryagin Maximum principle, Bellman's

principle of optimality and dynamic programming, optimum control of distributed parameter systems, sensitivity in optimum control, quasilinearization and computational methods for optimal control. Prerequisite, advanced graduate standing or permission.

551 Power System Protection (3) Sp BERGSETH

Protection of power systems and equipment against both overvoltages and overcurrents; includes power circuit breakers, fuses, relays, lightning arrestors, and the influence of neutral grounding methods on overvoltages. Prerequisite, 514 or permission. (Offered when adequate enrollment develops prior to close of advance registration.)

560 Wave Phenomena (4) W ROGERS

A general study of wave phenomena in which vibrations in physical structures and in elastic media are compared with electromagnetic waves. Interaction of physical materials with electromagnetic wave. Prerequisite, 323 or permission. (Offered when adequate enrollment develops prior to close of advance registration.)

563 Noise in Electron Devices (3) W LAURITZEN

The physical mechanisms of noise generation in electronic devices: thermal noise, quantum noise, shot noise, flicker noise. Characterization of noise: noise figure, noise temperature, noise measurements. Application of noise theory to optimum circuit and device design with emphasis on semiconductor and quantum electronic devices. Prerequisites, 485, 505, or permission.

570 Antenna Theory (3) A DUFF, REYNOLDS, SWARM

Theory of radiation; impedance characteristics and radiation patterns of thin linear antenna elements; antenna arrays; pattern synthesis; aperture antennas. Prerequisite, graduate standing or permission.

572 Electromagnetic Theory and Applications I (4) A ISHIMARU, SIGELMANN, CARLSON

Plane, cylindrical, and spherical electromagnetic waves; eigenfunctions, eigenvalues, and boundary value problems applied to waveguide, cavity, junctions, and other guiding structures; waves in dispersive, inhomogeneous, and anisotropic media. Prerequisite, graduate standing or permission.

573 Electromagnetic Theory and Applications II (4) W ISHIMARU, SIGELMANN, CARLSON

Boundary value problems for scattering, diffraction, and radiation of electromagnetic waves using Green's function, integral equation, and Fourier transform techniques. Approximation techniques using the saddle point method, Watson transform, residue series, the WKB method, and variational principle. Prerequisite, 572.

574 Electromagnetic Theory and Applications III (4) Sp ISHIMARU, SIGELMANN, CARLSON

Topics of current interest, including the radiation of waves, transients in dispersive media, Wiener-Hopf techniques, fluctuations and coherence, and moving sources and media. Applications to radio wave propagation and optics. Prerequisite, 573.

575 Waves in Random Media (4) A
ISHIMARU, SIGELMANN, CARLSON

Propagation and scattering of electromagnetic, optical, and acoustic waves in random media (atmospheric and water) and scattering of waves from rough surfaces and randomly distributed particles. Applications to bioengineering and ocean engineering. Prerequisite, 572 or permission.

576, 577 Information Theory and Coding I, II (3,3) WSp
LYTLE, MARTIN, METZ

Mathematical theory of communication. Information theory for discrete and continuous systems. Channel capacity and coding; principles and techniques of algebraic and other types of error-detecting, error-correcting codes. Prerequisite, 505 or permission.

578 Radio Propagation I (3) W
HELMS, REYNOLDS, SWARM

Theory of electromagnetic propagation over a finite conductive earth and in a horizontally stratified media; theory of scattering in random medium with applications to the troposphere. Prerequisite, graduate standing.

579 Radio Propagation II (3) Sp
HELMS, REYNOLDS, SWARM

Theory of electromagnetic propagation in ionized medium with application to the ionosphere. Theory of ionospheric scattering, meteor reflection, and auroral propagation. Prerequisite, graduate standing.

580 Electroacoustics (4) Sp
HILL, ROGERS

Vibration of strings, bars, and membranes; acoustical wave equation and solutions; electric, acoustic, and mechanical analogs; acoustical networks and measurements; architectural acoustics; properties of hearing; loudspeakers, microphones, and sound reproduction. Includes one 4-hour laboratory on alternate weeks. Prerequisite, 323. (Offered when adequate enrollment develops prior to close of advance registration.)

582 Stochastic Control Systems (3) W
CLARK, HSU

Performance measure and minimization techniques; continuous and discrete random processes in control systems; optimal design of systems having stochastic signals and noise; application of the Wiener-Hopf method to control system design; the Wiener-Kalman filter and its application in stochastic control systems. Prerequisites, 505, 545, 584.

583 Nonlinear Control Systems (4) Sp
NOGES, PINTER

Dynamic analysis of nonlinear control systems. Analytical, graphical, numerical and simulation techniques for solving nonlinear control system problems. Lyapunov functions, phase space, and describing functions. Prerequisites, 545, 584.

584 Continuous and Discrete State Variable Methods (3) AW
ALEXANDRO, HSU

Matrices and linear spaces, quadratic forms; system representation in state variable form; selection and transformation of state variables; controllability and observability of multivariable control systems; state transition matrix for continuous and discrete time systems; difference equations and Z-transform; application of state space approach to control system design. Prerequisite, graduate standing.

585 Digital and Sampled-Data Systems (3) Sp
ALEXANDRO, HSU

Sampling process and data holds, state variables and state transition equations for sampled-data systems, frequency domain and time domain analysis of sampled-data systems, stability of sampled-data systems, digital compensation of sampled-data systems. Prerequisites, 545, 584.

586 Digital Computer Applications and Communications I (4) A
JOHNSON, HOLDEN, GOLDE

Theory and practice of number systems, logical analysis, digital computer system organization. Numeric and non-numeric techniques and processes. Algorithmic and heuristic applications by various representative languages. Prerequisites, FORTRAN and graduate standing.

587 Digital Computer Applications and Communications II (4) W
JOHNSON

Evaluation and application of computational methods in solution of typical systems problems. Optimization, error analysis, stochastic and statistical methods, computer learning, pattern recognition. Prerequisite, 586.

588 Logical Design of Digital Computers I (3) Sp
JOHNSON

Number systems, error detect-correct, Boolean algebra. Optimization of logical systems under various criteria. Topological methods of optimization and synthesis. Sequential logic, memory input, and application equations. Application of logical techniques to digital systems. Prerequisite, graduate standing.

589 Logical Design of Digital Computers II (3) A
JOHNSON

Analysis and synthesis of digital systems from logical models. Time-independent and sequential logic, multi-function logic. Boolean matrix synthesis, partitioning, weighting, cellular implementation. Threshold logic theory. Evaluation of various analysis and synthesis methods in logical systems. Prerequisite, 588.

590 Advanced Topics in Digital Computers (2-5, max. 15) AWSp
GOLDE, HOLDEN, JOHNSON

Lectures or discussions of topics of current interest in the field of digital computers. Subject matter may vary from year to year. Prerequisite, permission.

595 Advanced Topics in Communication Theory (3) AWSp
LYTLE, MARTIN, METZ

Extension of 507, 577. Material will differ each year, covering such topics as: detection theory, decision theory, game theory, adaptive communication systems, nonlinear random processes, etc. May be repeated for credit by permission. Prerequisite, permission.

599 Selected Topics in Electrical Engineering (*) AWSp
Prerequisite, permission of department chairman.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

GENERAL ENGINEERING

Courses for Undergraduates

100 Engineering Orientation (1) AW
CHALK

Lectures, discussion, and reading assignments on the functions of engineering, the various fields of the profession, and on the College of Engineering.

104 Engineering Graphics (3) AWSpS
BONOW

Orthographic projection and orthogonal view relationships. Principles for solution of problems involving points, lines, and planes. Layout drawings, dimensioning, lettering, and standard practices on engineering and industrial drawings. Sketching and freehand pictorials. Introduction to basic steps in the engineering design process. Redesign project. Prerequisite, freshman standing or permission.

105 Engineering Graphics (3) AWSpS
CHALK

Continuation of 104. Engineering graphics in analysis, research, and design. Systematic design procedure and comprehensive project. Prerequisite, 104.

107 Applied Descriptive Geometry (2) AWSp
BOEHMER

Selected topics in descriptive geometry including: rotation, locus problems, intersection and transition of planes and solids, warped surfaces, forces in space, central projection, and mining and geology problems. Prerequisite, 105 or permission.

111 Engineering Problems (3) AWSpS
NESS

An introduction to some fundamental principles, including dimensional analysis, theory of measurements, and vector algebra. Designed to develop the ability to analyze and solve engineering problems. Instruction in effective methods of work and study, and in systematic arrangement and clear workmanship. Prerequisites, high school physics, trigonometry, and Mathematics 105.

112 Statics (3) AWSpS
ALEXANDER

A fundamental and rigorous course in engineering statics using the vector notation. Prerequisites, 104, 111, and Mathematics 125, which may be taken concurrently.

115 Introduction to Digital Computing (2) AWSpS
DOUTHWAITE

The language of Fortran applied to engineering problems. Flow charts, problem organization, and basic computer statements. Introductory problems solved on IBM 7094. Prerequisites, 111, Mathematics 124, which may be taken concurrently, or permission.

121 Plane Surveying and Measurements (3) Sp
KONICHEK

Plane surveying methods; use of the engineer's level, transit, and tape; computations of bearings, plane coordinate systems, areas, stadia surveying; public land system. The theory of measurements and errors, and the applications of probability to engineering measurements. Prerequisites, 104 and trigonometry, or permission.

215 Topics in Digital Computing (3) AWSp
CRANDALL, DUNCAN

Continuation of material in 115 to include the entire FORTRAN language, description of

ENGINEERING

the current monitor system, and an introduction to the use of problem-oriented languages. Prerequisite, 115.

351 Inventions and Patents (1) Sp

SEED

Law and procedures for patenting inventions, employer-employee relationship, and trademarks. Primarily for engineering students. Prerequisite, junior standing.

390 Computer Applications in Engineering Problems (3) AWSp

DOUTHWAITE, REDEKER

The development and application of numerical methods and algorithms to solve problems in engineering. Simultaneous equations, curve fitting, ordinary and partial differential equations. Prerequisites, 115 or permission, and Mathematics 238, which may be taken concurrently.

HUMANISTIC-SOCIAL STUDIES

Courses for Undergraduates

265 Techniques of Communication (3) AWSp

JOHNSTONE, LEAHY, TRIMBLE

Organization, development, and expression of ideas. Prerequisite, passing of tests.

270 Engineering Report Writing (2) AWSp

SOUTHER, TRIMBLE, WHITE

Practical problems in making a logical, concise, and attractive presentation of technical materials; periodicals and reference works; the requirements of the reader; style; principles of spacing; illustrations; accepted abbreviations, proper bibliographical usages. Prerequisites, 265 and sophomore standing or permission.

302 Technical Writing (3) Sp

SOUTHER

An advanced course focusing on various types of technical and scientific writing: reports, articles, technical papers, manuals, proposals, books. Prerequisite, 270 or permission.

331 Origins of Western Cultural Institutions (3) AWSp

CHAPMAN, HUNNER

The nature of man and the nature of culture. Historical study of selected cultures, such as Mesopotamia, Greece, Rome, and medieval Europe; consideration of the social character of these cultures through their myth and literature.

332 Development of Western Cultural Institutions (3) AWSp

BOTTING, CHAPMAN, HIGBEE

The growth of modern institutions and of the ideas underlying them during the periods of the Renaissance, the Protestant Revolt, the Commercial Revolution, the Enlightenment, and the Industrial Revolution. Major emphasis is on political, economic, religious, and intellectual change.

333 Contemporary Political and Social Problems (3) AWSp

BOTTING, HIGBEE, RUSTAD

Twentieth-century background and development of contemporary political and social problems; comparison of competing political philosophies and systems: democracy, Fascism, Communism; current international and national events and issues.

407 Thesis Guidance for Foreign Students (1, max. 3) AWSp

TRIMBLE

Individual tutorial assistance in writing problems for the foreign student preparing to write

or writing a thesis in one of the engineering disciplines. Prerequisites, English 303, or HSS 265 (for foreign students), or an equivalent and permission.

431 Human Rights and the Governmental Process (3) W

HIGBEE

An analysis of governmental actions (particularly antidiscrimination legislation) designed to reduce discrimination on account of race, color, religious creed, national origin, and, more recently, age and sex in various sectors of American life. The attendant issues, problems, and administrative solutions to leading cases are examined. Prerequisite, upper-division standing.

461 Experience in the Arts (1) W

LEAHY

Informal experiences with the arts through attendance at theatres, concerts, art exhibits, etc.; through discussions with creative artists; and through personal attempts at producing a work of art. Prerequisite, upper-division standing or permission.

471 Introduction to the Folktale Among Literate Peoples (3) A

SKEELS

Techniques of classification, geographic-historical distribution, theories of origin and interpretation, and related areas of investigation of the oral prose folk narrative of literate peoples. Offered jointly with English as English 471. Prerequisite, upper-division standing.

491, 492, 493 Literary Heritage of the Western World I, II, III (3,3,3)

AWSp, AWSp, AWSp

JOHNSTONE, LEAHY, SKEELS, WHITE

The nature of literature and its role in culture, studied in a historical sequence of selected literary figures and works of Western civilization. 491: French medieval romance, Chaucer, Shakespeare, seventeenth-century poetry, Racine; 492: Voltaire, Goethe, Wordsworth, Flaubert, Tennyson; 493: twentieth-century literary figures.

INDUSTRIAL ENGINEERING

For a description of courses required in this curriculum, see *College of Engineering* section.

MECHANICAL ENGINEERING

Courses for Undergraduates

201 Metal Casting (1) AW

FORD

Theory and application of the science of producing metal castings; preparation and testing of foundry sands; manual and machine preparations of sand molds and cores; gravity casting of gray cast iron and aluminum alloys into sand, shell, and permanent molds. Lecture and laboratory.

202 Welding (1) ASp

HOLT

Basic theory and application of the art and science of thermal metal-joining processes; fundamentals of weld design, sequence, and distortion; flame cutting and flame bending. Lecture and laboratory.

203 Metal Machining (1) WSp

ANDERSON

Introduction to basic machining methods used in industrial metal processing. Fundamental

concepts of the use of machine tools, layout methods, and measuring tools. Lecture and laboratory.

204 Introduction to Manufacturing Methods (3) AWSp

WOLAK

A survey of production techniques in the foundry, welding, and machining manufacturing areas. Emphasis is on the economics and the mechanical characteristics produced by the design choice specifying the manufacturing process. Projections beyond current techniques are included. Lecture and laboratory.

215 Statistical Methods in Engineering (3) AWSp

SHERRER

Application of statistical techniques to provide a measure of confidence in experimental data; normal and discrete distributions, least squares, elementary design of experiments. Prerequisite, Mathematics 124.

222 Introductory Mechanical Engineering Laboratory (2) AWSp

EMERY

A laboratory course emphasizing measurements, interpretation of instrument readings, and analysis of errors. Special topics such as thermometry, piezometry, and dynamometry. Study of basic mechanical engineering equipment. Prerequisite, sophomore standing in engineering. Prerequisite, 215.

261 Kinematics and Dynamics (3) AWSp

KIELING

Introduction to kinematics and dynamics. Newton's laws applied to particles and elementary systems of particles. Study of motion in various coordinate systems. Prerequisites, General Engineering 112 and Physics 121. (Formerly 260.)

263 Mechanical Systems (3) AWSp

BALISE

Study of the mathematically common ground in engineering principles. State variables, system equations, mechanical and electrical circuits, free and forced response, complex plane representation. Illustrative use of analog computer. Prerequisites, Mathematics 125 and Physics 122.

308 Production Methods (3) AWSp

HOLT

A study of the principles and application of thermal and mechanical processes in the production of manufactured parts. Lecture and laboratory. Prerequisites, 204 or 201, 202, and 203.

312 Machine Tool Fundamentals (3) A

ANDERSON, WAIBLER

Study of machine tools and machining processes, including exercises on all principal tools. Laboratory. Not open to engineering students. Prerequisite, junior standing in industrial education or permission.

320 Thermodynamics I (4) AWSp

WAIBLER

An introduction to classical, macroscopic thermodynamics, beginning with the required concepts and definitions, and including the development of the basic laws applicable to energy transformations. Theoretical developments are reinforced by their application to engineering problems.

321 Thermodynamics II (4) AWSp

WAIBLER

A continuation of classical thermodynamics, lectures and laboratory. The mathematical relations between thermodynamic properties are developed. The basic principles are applied to the study of mixtures and solutions, chemical reactions, phase and chemical reactions, phase and chemical equilibria and the flow through nozzles and passages. The laboratory experiments are related to the current classroom work. Prerequisite, 320.

322 Microscopic Thermodynamics (4) AWSp

ROBERTS

An introduction to kinetic theory and statistical thermodynamics. A preliminary treatment of transport phenomena, mathematical probability statistics and relevant mathematical procedures. The macroscopic and microscopic viewpoints are related, and quantum mechanics is introduced with some solutions of the Schrödinger wave equation. (No background in quantum mechanics is assumed.) Prerequisite, 320.

331 Introduction to Heat Transfer (4) AWSp

MC FERON

Study of steady-state heat transfer by conduction, radiation, and natural and forced convection; design of elementary heat-exchangers; transient heat flow. Prerequisites, 320 or equivalent, and CEEM 342 (which may be taken concurrently). (Formerly 430.)

340 Engineering Materials (3) AWSp

DAY

Fundamental aspects of the behavior of engineering materials. Elastic and plastic deformation, fracture, creep, fatigue, impact, temperature effects, and corrosion. Destructive and nondestructive evaluation. Prerequisites, Materials Engineering 250 and CEEM 292.

342 Industrial Materials and Processes (3)

FORD

The nature, properties, and behavior of materials and finishes used in industrial design and their effects on processing or fabrication methods. Factors involved in materials selection for design adequacy and processing suitability. Not open to engineering students. Lecture, laboratory, and field trips. Prerequisite, junior standing in industrial design or permission. Offered odd-numbered years.

360 Dynamics of Machines (3) AWSp

MERCHANT

A study of the principles of dynamics as applied to the analysis and design of machinery. Includes force, momentum, and energy analysis of linkages and rotating machinery. Prerequisite, 261 or CEEM 291. (Formerly 367.)

361, 362 Machine Design (3,3) AWSp

MORRISON

Introduction to the synthesis of mechanical components and systems, emphasizing principles of mechanics, properties of materials, and manufacturing methods as they relate to design. Lecture and laboratory. Prerequisites, 340 and CEEM 292 for 361; 360 and 361 for 362.

363 Mechanical Systems II (3) AWSp

BALISE

Continuation of 263 to include sinusoidal inputs, Fourier series, Fourier integral, and introduction to Laplace transform. Transfer functions, poles and zeros, immittance, resonance, filtering. Prerequisites, 263 and Mathematics 238.

364 Mechanical Systems Dynamics (3)

AWSp

CHALUPNIK

Application of system concepts to the study of mechanical system dynamics. Vibrations of systems with several degrees of freedom; random oscillations. Laboratory emphasizing dynamic measurements of various physical quantities. Prerequisites, 360 and 363.

401 Metal Casting Theory and Design (3) Sp

FORD

Study of the physical phenomena involved in the metal casting process and how their effects can be controlled. Introduction to quantitative analysis of process variables for control. Prerequisites, 201 or 204, and 340, or permission.

403 Material-Removal Processes (3) A

WOLAK

Cutting and noncutting processes for material removal in the shaping of manufactured products. Study of forces and of power consumption in the various processes, and relative costs. Prerequisites, 204 or 203, and 340, or permission.

404 Theory of Welding (3) W

HOLT

Theory of arc welding and flame cutting application to structural aircraft, and nuclear fabrication. Prerequisite, senior standing in mechanical engineering or permission. (Formerly 464.)

406 Corrosion and Surface Treatment of Materials (3) W

SANDWITH

Corrosion, plating, coating, welding, diffusion bonding, carburizing, and nitriding, from the standpoint of solid-state diffusion theories, adhesion theories, and phase equilibria. Prerequisite, 340 or permission.

410 Engineering Administration (3) AWSp

DRUI

Structure, organization, management, and operation of manufacturing enterprises as related to production planning and control, methods analysis, product development, and industrial and human relations. Prerequisite, senior standing or permission.

411 Engineering Economy (3) AWSp

FORD

The evaluation of engineering alternatives. Use of interest computations, valuation, depreciation, and operating cost estimates to predict the economic result of the application of engineered products or processes. Prerequisite, senior standing in engineering or permission.

414 Industrial Safety (2) Sp

ANDERSON

Recognition of hazards; analysis of industrial accidents, their costs, and fundamentals of prevention; organization of safety programs; personnel training for safety. Prerequisite, senior standing in engineering or permission.

415 Statistical Quality Control (3) AWSp

OWENS

Statistical methods applied to the control of manufacturing processes, estimating lot and process characteristics, and acceptance sampling procedures. Statistics of variables and proportions. Design of decision instructions. Prerequisite, senior standing in engineering or business, or permission.

417 Methods Analysis (3) AW

OWENS

Work design and work measurement principles;

time utilization studies by work sampling, flow and operations studies, principles of motion economy, time study principles and practices, physiological and psychological aspects of work. Lectures and studies in selected local businesses as laboratory. Prerequisite, senior standing in engineering or business, or permission.

418 Work Simplification (2) Sp

OWENS

For majors in nursing, home economics, and allied fields. Principles of motion economy; work distribution and human-activity analysis; flow-process charts and diagrams; layout of work areas; economic and human factors involved in methods-study applications. Lecture and laboratory. Prerequisite, senior standing in nursing or home economics, or permission.

419 Industrial Facilities Design (3) Sp

DRUI

Engineering approach to the design of new or expanding industrial facilities. Scope considers environmental engineering, heat and power requirements, structural equipment selection, economic factors, modifications, maintainability. Prerequisite, senior standing in engineering.

420 Engineering Reliability (3) W

ROBERTS

An introductory course in reliability technology, covering prediction, measurement, control, reporting, and analysis of failure modes and failure rates. Prerequisite, senior standing in engineering or permission.

425 Air Conditioning (3) W

CRAIN

Theory and practice in the field of heating, ventilating, and air conditioning for human comfort, including psychrometry, heat transfer, air distribution, humidity and temperature control, cooling and dehumidifying equipment, and air cleaning. Prerequisite, 321.

432 Gas Dynamics I (3) Sp

CHILDS

A study of the dynamic and thermodynamic relationships for the flow of a gas within closed channels. Analysis of the basic flow equations; study of the effects of friction and normal shock; application to thermodynamic processes involving nozzles, diffusers, compressors, and turbines. Prerequisites, 321 and CEEM 342.

434 Advanced Mechanical Engineering Laboratory (3) AWSp

CRAIN, FIREY, GUIDON

Methods of planning, carrying out, and interpreting engineering experiments on prime movers, refrigerators, and other heat power plants. Design and operation of complete multicomponent plants. Prerequisite, 321.

436 Friction and Lubrication (3) ASp

FIREY

Study of the fundamental principles of friction and lubrication. Behavior of lubricants and bearing materials. Engineering applications, including journal bearing design, gear lubrication, cutting fluids, and rolling bearings. Prerequisite, senior standing in engineering or permission.

440 Mechanical Behavior of Solids (3) Sp

WOLAK

Study of elastic and plastic deformation of solids, with particular reference to metal-forming processes. Yield criteria. Strain-hardening characteristics. Plastic instability of

materials in tension and in compression. Classification of metal-forming processes. Prerequisite, 340 or permission. (Formerly 450.)

445 Fracture of Engineering Materials (3) A TAGGART

Deformation processes leading to fracture, and the basic mechanics of materials fracture from microscopic and macroscopic viewpoints. Microscopic aspects of plastic deformation and crack propagation. Principles of design and testing for fracture resistance. Prerequisite, 340 or permission.

451 Human Factors in Design (3) W WALKER

Engineering considerations of the abilities and limitations of the human operator in the design of industrial systems and components. The scope includes functional, psychological, physiological, and environmental aspects. Prerequisite, senior standing in engineering or permission.

460 Kinematics and Linkage Design (3) W KIELING

Introduction to the theories of advanced kinematics. Emphasis on synthesis and design of linkages, cam surfaces and mechanical computer mechanisms, number synthesis for plane and space mechanisms using graphical and computer methods. Prerequisite, 360 or permission.

465 Welding Design (3) Sp HOLT

Theory of joint design, sequence, fixturing, and dimensional control in fusion welding. Prerequisite, senior standing in mechanical engineering or permission.

468 Machine Design (3) AWSp MORRISON

Current topics in engineering design. Projects in the design of major mechanical systems. Prerequisite, 362.

469 Introduction to Advanced Dynamics (3) AWSp KOBAYASHI

Energy methods in classical mechanics: Hamilton's principle, derivation of Euler-Lagrange equations using variational principles: generalized coordinates, constraints, and forces of constraint, inertia tensor; Euler's equations; with applications to problems in particle, and rigid-body dynamics. Prerequisite, 360 or CEEM 291 or permission.

470 Mechanical Vibrations (3) Sp MERCHANT

Application of single degree of freedom linear systems techniques to mechanical vibration problems. Vibration of multidegree of freedom linear systems using matrix techniques. Applications in vibration isolation, transmission, and absorption problems and instrumentation. Prerequisite, 364 or permission.

471 Automatic Control (3) Sp GALLE

Theory and practice of industrial process control; system description and identification of the control problem; stability; equipment considerations. Lecture and laboratory. Prerequisite, senior standing in engineering or permission. (Formerly 441.)

473 Instrumentation (3) A GALLE

Principles and practice of industrial measurement. Dynamics of instrument response; the-

ory of transducers for temperature, pressure, flow, and other measurements. Indicating, recording, and telemetering in industry. Lecture and laboratory. Prerequisite, senior standing in engineering. (Formerly 443.)

481 Internal Combustion Engines (3) ASp GUIDON

Study of the fundamental principles of operation of gasoline and diesel engines; analysis of theoretical and actual cycles; fuels; combustion; detonation; carburetion, ignition, injection and performance characteristics of typical engines. Prerequisite, 321.

482 Internal Combustion Engine Laboratory (3) W FIREY

Laboratory experiments on gas, gasoline, and diesel engines and gas turbines with analysis and interpretation of results. Effects of principal design and operating variables. Prerequisite, 481 or permission.

483 Internal Combustion Engine Design (3) Sp FIREY

Fundamental principles of engine design, laws of similitude; properties of engine materials; design of important component parts; preliminary calculations for an engine. Lecture and laboratory. Prerequisite, 481.

485 Rocket Propulsion (3) W GUIDON

Study of the types of rocket engines; thermodynamic relations and nozzle theory; characteristics of gaseous, liquid, and solid propellant systems; rocket testing; performance calculations. Prerequisite, 321.

490 Naval Architecture (3) A BARTLETT, MERCHANT

Theory of naval architecture; ship's lines, displacement, stability, curves of form, displacement sheet computations, and launching. Prerequisites, junior standing in engineering.

491 Naval Architecture (3) W BARTLETT, MERCHANT

Theory of naval architecture; arrangements, strength, A.B.S. rules, construction, weights, shipyard practices. Prerequisite, junior standing in engineering.

492 Naval Architecture (3) Sp BARTLETT, MERCHANT

Waves and ship motions, resistance, propellers, powering, model testing, and steering. Prerequisite, junior standing in engineering.

499 Special Projects (2-5, max. 9) AWSpS

Courses for Graduates Only

501 Advanced Materials Processes (3) A SANDWITH

Consideration of hot and cold fabrication processes with respect to their effects on the mechanical properties of engineering materials. Fundamental aspects of strengthening, anisotropy, and thermal stability in materials processing. Prerequisite, graduate standing in engineering or permission.

502 Plastic Metal Forming (3) W WOLAK

Stress-strain and stress-strain-rate relations in metal forming. Work of deformation. The slip-line field. Load bounding. Metal characteristics and forming. Applications to basic metal forming processes. Prerequisite, graduate standing in engineering or permission.

506 Friction and Wear (3) Sp FIREY, WOLAK

The general nature of the processes of friction and wear. Rough surfaces and the area of contact. Temperature rise at contact surfaces during sliding, and resulting wear. Boundary friction. Friction and antifriction materials. Prerequisite, graduate standing in engineering or permission.

516 Statistical Analysis of Engineering Measurements (3) ASp OWENS, ROBERTS

Application of statistical techniques to engineering problems; design of engineering test procedures so as to evaluate experimental error; investigation of inherent variability of processes and systems. Prerequisites, 215 and graduate standing, or permission.

518-519-520 Seminar (0-0-1, max. 6)

521 Thermodynamics III (3) AW DEPEW, EMERY, WAIBLER

The fundamental concepts of temperature, thermodynamic properties, and systems. The first, second, and combined laws. The general form of the energy equation, and applications. Development of the relations of classical thermodynamics. Prerequisites, 321 and graduate standing in mechanical engineering or permission.

522 Thermodynamics IV (3) Sp CORLETT, DEPEW, EMERY, ROBERTS, WAIBLER

Topics from statistical thermodynamics, including the Boltzmann, Bose-Einstein, and Fermi-Dirac statistics. Solutions of the Schrödinger wave equation and evaluation of the partition function for translation, rotation, and vibration. Prerequisite, 521 or permission.

524 Combustion (3) Sp CORLETT, FIREY

Chemical and physical processes of combustion, sources, and preparation of fuels, applications, design of combustion equipment. Prerequisite, graduate standing in mechanical engineering or permission.

525 Acoustics in Engineering (3) Sp CHALUPNIK, MERCHANT, MURPHY

Acoustic wave transmission, reflection, refraction, and diffraction, in solids, liquids, and gases. Includes review of continuum mechanics and examples from electromechanical systems. Offered jointly with Electrical Engineering as Electrical Engineering 525. Prerequisite, graduate standing in mechanical or electrical engineering, or permission.

529 Experimental Heat Transfer (3) A DEPEW, EMERY, KIPPENHAN, MC FERON, WAIBLER

Study of instrumentation and techniques used in heat transfer measurements; investigation of conduction, radiation, and convection phenomena. Water heat-transfer loops will be used for experiments to determine heat flux, film coefficients, boiling pressure drops, and other phenomena of current interest. Prerequisite, graduate standing in mechanical engineering or permission of instructor. (Formerly 534.)

530 Radiative Heat Transfer (3) W DEPEW, EMERY, MC FERON

Fundamentals of thermal radiation for black, gray, nongray, diffuse, and specular surfaces. Gaseous radiation and special applications of thermal radiation. Prerequisite, graduate standing in mechanical engineering or permission.

531 Conductive Heat Transfer (3) A
CORLETT, EMERY, GESSNER, MC FERON,
OSBORN, WAIBLER, WOLAK

Fundamentals of the conduction process. The analysis of steady-state and transient heat conduction in single and multidimensional systems by mathematical, graphical, numerical, and analogical methods. Solutions for transient systems with unsteady boundary conditions, and with moving or fixed heat sources. Prerequisite, graduate standing in mechanical engineering or permission.

532 Convective Heat Transfer (3) Sp
EMERY, GESSNER, WAIBLER

An introduction to fluid flow and boundary layer theory as applicable to forced- and natural-convection heat transfer. Dimensional analysis. Condensation and boiling heat transfer. The design of heat exchangers. Prerequisites, CEHY 542 and graduate standing, or permission.

533, 534 Gas Dynamics (3,3) W,Sp
BODOIA, CHILDS, CORLETT, EMERY,
GESSNER

A study of the dynamic and thermodynamic relationships for the flow of fluids; application of basic laws to flow processes in pipes, nozzles, diffusers, compressors, turbines; wave phenomena; multidimensional flow; unsteady flow; processes involving chemical reactions. Prerequisite, CEHY 542 or permission. (534 formerly 536.)

535 Heat Transfer Studies (3)

CORLETT, DEPEW, EMERY, KIPPENHAN,
MC FERON, WAIBLER

Advanced heat transfer studies of interest to mechanical engineers. Subject coverage will vary from year to year. Offered when demand is sufficient. Prerequisite, permission.

537 Boundary Layer Theory (3) W
BODOIA, CHILDS, GESSNER

A study of the dynamic and thermodynamic relationships for the flow of real fluids considering effects of viscosity and heat conductivity; applications of basic laws to problems involving flow through nozzles, diffusers, and ducts; jets and wakes. Prerequisites, 432 and CEHY 542, or permission.

538 Turbulent Boundary Layer Theory (3) A
BODOIA, CHILDS, GESSNER

A continuation of 537 with special emphasis on turbulent boundary layers. The origin of turbulence; turbulent flow through pipes; influence of pressure gradient on turbulent boundary layers; free turbulent flows, jets, and wakes; application to base pressure and base heating problems. Prerequisite, 537 or permission. Offered even-numbered years.

541 Advanced Engineering Materials (3) W
DALY, MILLS, SANDWITH, TAGGART

Behavior of engineering materials as affected by various conditions of loading and environment. Lecture, laboratory, and studies of technical literature. Prerequisite, graduate standing in mechanical engineering or permission.

542 Topics in Engineering Materials (3) Sp
DALY, MILLS, SANDWITH, TAGGART

Selected topics of current importance concerning the nature and behavior of engineering materials. Lecture, laboratory, and studies of technical literature. Prerequisite, 541 or permission.

543, 544 Fluid Turbulence (3,3) A,W
GESSNER, SLEICHER

Statistical and phenomenological theories of

turbulence. Introductory concepts, velocity correlations, the energy spectrum, the decay of turbulence, scalar fields, turbulent transport, shear turbulence, wall turbulence, phenomenological theories of energy transport, instrumentation, recent literature. Offered jointly with Chemical Engineering as Chemical Engineering 543, 544. Prerequisite, 6 credits in graduate fluid mechanics. Offered Autumn Quarter in odd-numbered years; Winter Quarter in even-numbered years.

551 Applied Elasticity (3) A

KOBAYASHI, OSBORN, SHERRER, WOLAK

General equilibrium and stress-strain relations in homogeneous, isotropic, elastic materials. Elastic stress distributions in machine components; plane-stress and plane-strain problems; torsion and bending in machine members; problems in thermal stresses. Prerequisite, graduate standing in mechanical engineering or permission.

552 Applied Plasticity (3) W

EMERY, KOBAYASHI, OSBORN, SHERRER

Elastic-plastic stress distributions in machine components; stress-strain relations in the plastic range; yield in thick-walled pressure vessels, rotating cylinders and disks; torsion and bending of machine members with plastic flow; thermal stresses in shells, rotating disks and plates. Prerequisite, 551 or permission.

553 Applied Viscoelasticity (3) Sp

EMERY, KOBAYASHI, OSBORN, SHERRER

Time-dependent aspects of stress and strain, and stability in mechanical engineering design. Stress analysis in the presence of creep and stress relaxation. Uniaxial loading, pressure vessels, rotating disks, plates, columns. Cyclic variation of load and temperature. Prerequisite, 551 or permission.

554 Advanced Theory of Plasticity (3) Sp
KOBAYASHI

Basic equations for three-dimensional problems of perfectly plastic solid, general consideration of discontinuous solutions, problems in plane strain and plane stress, problems in elastic-plastic solids and rigid-plastic solids. Prerequisites, 552 and CEEM 592, or permission. Offered even-numbered years.

555 Thermoelasticity (3) W

EMERY

Basic equations of thermoelasticity for isotropic elastic solids. Analysis of disks, cylinders, spheres, beams, and plates under steady temperature and sudden and slow heating and cooling. Introduction to thermoelastic stability. Prerequisite, 551 or permission. Offered even-numbered years.

556 Experimental Stress Analysis (3) A
DAY

Studies of stress and strain relationships under static and dynamic loading. Analytical methods for determination of stress and strains in irregular members. Theory and practice of the photoelastic method. Brittle lacquer method for study of strain. Application of resistance wire strain gauges to measurement of dynamic and static strain. Interferometry as a tool in stress analysis. Principles and application of mechanical strain gauges. Lecture and laboratory. Prerequisite, graduate standing in mechanical engineering or permission.

557 Experimental Stress Analysis (3) W

DAY

Study of structural similitude, dimensional

analysis, and brittle models as they apply to experimental stress analysis. Use of nomographs with electric strain-rosettes, study of principles and application of instrumentation available for strain-sensitive pickups. Non-destructive methods of testing and inspecting structures and machine parts. Calibration of stress-analysis instruments. Prerequisite, 556.

558 Experimental Stress Analysis (3) Sp
DAY

Seminar and individual research on special problems in experimental stress analysis. Prerequisite, 557 or permission. Offered odd-numbered years.

559 Fracture Mechanics (3) A
KOBAYASHI

Linear fracture mechanics based on the Griffith-Irwin theory; crack extension force and stress intensity factors in two- and three-dimensional solids, fracture toughness of engineering materials; ductile fracture, fracture dynamics, and crack growth rate. Prerequisite, 551 or permission. Offered even-numbered years.

564 Mechanical Engineering Analysis I (3) AW
BALISE, GALLE, OSBORN

Application of Fourier series and integral transforms, the Laplace transform, the complex variable theory to the description and analysis of linear systems in mechanical engineering. Analogies in heat transfer, fluid flow, stress distribution, dynamics, and feedback control. Prerequisite, graduate standing in mechanical engineering or permission.

565 Mechanical Engineering Analysis II (3) W
BALISE, GALLE, OSBORN

A continuation of 564 into the representation of systems by vectors, matrices, tensors, and partial differential equations. Emphasis is on physical interpretations of the mathematical representations and on analogies. Prerequisite, 564 or permission.

567 Advanced Dynamics (3) A

CHALUPNIK, MERCHANT, SHERRER

Dynamics of particles and of rigid bodies, with emphasis upon applications involving machine parts and other engineering components. Generalized coordinates, Lagrange's equations, Hamilton's principle. Prerequisite, graduate standing in mechanical engineering or permission.

568 Analytic Methods in Vibrations (3) A

BALISE, CHALUPNIK, MERCHANT, SHERRER

Analysis of vibration phenomena in multi-degree-of-freedom and continuous systems. Prerequisite, graduate standing in mechanical engineering or permission.

571 Servomechanisms I (3) W

BALISE, GALLE, JORGENSEN

Linear and introductory nonlinear closed-loop system analysis and design on the complex plane and by frequency response; application to mechanical components; analogs. Prerequisite, 564 or permission.

572 Servomechanisms II (3) Sp

BALISE, GALLE, JORGENSEN

Continuation of 571 to include topics of current importance. Further study of nonlinear control, statistical analysis of feedback systems, sampled-data methods, self-adaptive systems. Prerequisite, 571 or permission.

575 Systems Theory (3) Sp

BALISE, GALLE

A study of the state variable approach as applied to the analysis and synthesis of systems. System state vectors, response matrices, simulation diagrams, controllability and observability. Geometrical and physical interpretations of the mathematical methods. Prerequisite, 565 or permission. (Formerly 545.)

579 Fluid Power Control (3) W

BALISE, GALLE, JORGENSEN

An analytical treatment of hydraulic and pneumatic power applied in control systems. Valve actuators, hydraulic transmissions, block diagram representation, steady-state and dynamic analysis, applications, recent developments. Prerequisite, graduate standing in mechanical engineering or permission. (Formerly 549.)

584 Gas Turbines (3) A

BODOIA, GU.DON

Applications of the gas turbine; gas turbine cycles (theoretical Brayton, simple open, regenerative, reheat, intercooling, and closed cycles); axial-flow compressors; centrifugal compressors; turbines; combustion systems; gas turbine power plant materials; plant performance. Prerequisite, graduate standing in engineering or permission.

589 Nonlinear Mechanical Vibrations (3) W

CHALUPNIK, MERCHANT, SHERRER

Study of systems with nonlinear damping and restoring forces, applications of the phase-plane delta and the Ritz averaging method, and stability of nonlinear oscillations. Prerequisite, 568 or permission.

590 Random Mechanical Vibrations (3) Sp

CHALUPNIK, MERCHANT, SHERRER

The study of the problems in measuring random vibrations, in designing simulation equipment, and in mechanical design for random vibration in aircraft and missiles. Prerequisite, 568 or permission.

592 Impulsive Loading and Wave

Propagation (3) Sp

CHALUPNIK, MERCHANT, SHERRER

Analysis of impulsive loading and wave propagation in solids, liquids, and gasses. Includes acoustics, linear and nonlinear wave propagation, determination of equations of state, spallation, impulsive metal forming, and other topics. Offered odd-numbered years. Prerequisite, 568 or permission.

599 Special Projects (1-5, max. 9) AWSpS

Prerequisite, permission of department chairman.

600 Independent Study or Research (*)

AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

MINING, METALLURGICAL, CERAMIC ENGINEERING

MATERIALS ENGINEERING

Courses for Undergraduates

250 Fundamentals of Materials Science (4)

AWSp

ARCHBOLD

Basic principles underlying the structure and properties of engineering materials. Internal structures of crystalline and noncrystalline materials, including metals and alloys, non-metallic materials and polymers; phase diagrams; rate processes including diffusion and

phase transformation; behavior under mechanical stress, elevated temperature, corrosive conditions, irradiation, and electromagnetic fields. Prerequisite, Chemistry 160.

251 Materials Science Laboratory (1)

Experiments in materials science designed to illustrate fundamentals related to the structure and properties of engineering materials: optical microscopy, X-ray diffraction, mechanical properties, electrical conductivity, crystal growth, solid-state reactions. Prerequisite, 250 or concurrent registration.

351 Mineral Processing I (4) A

BRIEN

Physical and chemical principles of mineral preparation and concentration. Comminution; classification, thickening, filtering of mineral suspensions; sampling; transport; and related physical processes. Physical and chemical theory applied to concentration processes; surface phenomena, electromagnetic, electrostatic, phase change, solution, and precipitation. Laboratory illustrates fundamental principles. Prerequisites, Chemistry 160 and Physics 122.

352 Mineral Processing II (2) Sp

BRIEN

Continuation of 351. More detailed development of fundamentals of particular concentration processes with pertinent laboratory exercises. Prerequisite, 351.

CERAMIC ENGINEERING

Courses for Undergraduates

201 Introduction to Ceramics (1) A

MUELLER

Scope of ceramic materials and ceramic industries; use of ceramics as engineering materials; economic importance.

202 Ceramic Raw Materials (3) W

WHITTEMORE

Natural and synthetic materials used in ceramic products; their mineralogy, physical properties, compositions, and sources.

203 Ceramic Measurements (3) Sp

MUELLER

Theory and methods used in measuring properties of ceramic materials; control of ceramic processes.

301 Ceramic Processing I (3) W

CAMPBELL

Application of principles of material and energy balances to ceramic processes, combustion, reactions.

302 Ceramic Processing II (3) Sp

CAMPBELL

Transport in ceramic processing systems; gas, solid and fluid flow, heat flow, mixing, and applications of drying and firing.

306 Ceramic Engineering Excursion (1) A

Plant-inspection trip; junior year.

307 Ceramic Engineering Excursion (0) A

Plant-inspection trip; senior year.

312 Physical Ceramics: Structure and

Rheology (5) A

MILLER

Crystalline and glassy state; physical-chemical reactions of ceramic materials. Colloidal and rheological phenomena and their effects on ceramic materials. Prerequisite, Materials Engineering 250 or permission.

314 Physical Ceramics: Ceramic

Equilibria I (3) W

SCOTT

Equilibrium diagrams and their applications

to ceramic research and control problems. Prerequisite, 312 or permission.

315 Vitreous State (4) Sp

CAMPBELL

Chemistry and physics of glass, glazes, and porcelain enamels; structure and properties of vitreous materials. Prerequisite, 312 or permission.

322 Microscopy of Ceramics (3) W

SCOTT

Polarizing microscope study of natural and artificial minerals peculiar to the ceramic industry.

400 Ceramic Materials (3) A

SCOTT

The nature and properties of ceramic materials and their relation to ceramics in engineering design. The atomic, micro- and macro-structure of ceramics related to their stability in electrical, mechanical, and thermal environments. Laboratory exercises relating properties to test environments. For nonmajors only. Prerequisite, Materials Engineering 250.

401 Ceramic Process Analysis (3) A

WHITTEMORE

Case histories of ceramic industrial facilities. Plant visits. Economic factors and overall process integration, including raw materials, processes, fuels, personnel, distribution.

402 Equipment and Plant Design (2) W

BAUER

Calculation and design of processing equipment.

403 Equipment and Plant Design (2) Sp

WHITTEMORE

The design process and its application in ceramic engineering. Individual design projects.

409 Ceramic Materials Laboratory (1) A

SCOTT

410 Physical Ceramics: Ceramic

Equilibria II (3) A

SCOTT

Derivation of phase equilibria relations, phase transformations, solid and liquid solutions, and non-equilibrium systems. Prerequisite, 314 or permission.

412 Introduction to X-ray Diffraction (3) A

MUELLER

Theory and application of X-ray diffraction and spectroscopic techniques. Prerequisite, Materials Engineering 250 or equivalent.

420 Colloidal Ceramics (3)

WHITTEMORE

Properties and surface chemistry of ceramic colloids. Topics include absorption, adsorption, gels and their contributions to cementitious bonding, ion exchange, rheological properties, and analytical techniques applicable to these studies. Prerequisite, 312.

421 Ceramic Bodies Laboratory (3) W

MILLER

Quantitative determination of physical properties of ceramic bodies; study of the effects of variables in composition, forming, and firing. Prerequisites, 322, 412.

422 Electronic Ceramics (3)

Principles and theory of conductive, ferro-magnetic, piezoelectric, thermoelectric, and electroluminescent materials. (Formerly 522.)

430 Nuclear Ceramics (3) Sp

MILLER

Uses and properties of ceramic materials for

nuclear reactors; radiation effects. Offered alternate years.

440 Glass Technology (3) Sp

MUELLER

Raw materials; chemistry and physics of glass; batches and calculations; melting and fabrication practices; physical properties; special glasses. Prerequisites, 315 or equivalent.

441 Undergraduate Seminar (1, max. 3)

AWSp

460 Ceramic-Metal Systems (3) Sp

Vitreous and crystalline coatings for metals; ceramic-metal composites. Prerequisite, junior standing.

470 Refractories (3) Sp

WHITEMORE

Chemical and mineralogical composition; processing methods; thermal, physical, and chemical properties and tests; application.

499 Special Projects (*, max. 5) AWSp

Problems in ceramics; laboratory investigations and bibliographic research. A total of 5 credits is required.

Courses for Graduates Only

501 Process Ceramics I (3) W

WHITEMORE

Technology of ceramic fabrication processes. Characterization of ceramic materials at stages of processing.

502 Process Ceramics II (3)

Principles of process control as applied to the ceramic industry; methods of measurement and evaluation of data and its application to industrial production.

503 Research Techniques (3) Sp

CAMPBELL

Principles and methods for deriving heat transfer, optical characteristics, electrical response, surface dependent properties, rheological behavior, and dynamic, thermal, gravimetric, and mechanical analyses in ceramic research.

511 Advanced Physical Ceramics I (3) A

MUELLER

Theories and principles of diffusion; concepts of sintering and solid-state reactions with emphasis upon the role of diffusion; the effect of the defect nature of solids upon these phenomena.

512 X-ray Diffraction Analysis (3) W

MUELLER

Application of X-ray diffraction and spectroscopic techniques and their evaluation in the structure and properties of materials. Laboratory practice in analysis, line broadening and displacement phenomena; structural effects on intensity. Prerequisite, 412 or equivalent.

513 Advanced Physical Ceramics II (3) Sp

Physical and thermal properties of multiphase materials. Simple and complex mixture rules. Mechanical properties of multiphase materials. Enhancement of properties by material design. Production of preferred microstructure by special processing. Composite materials including cermets and oriented composites involving ceramics.

514 Thermodynamic Topics in Ceramics (3)

Applications of thermodynamics to predict behavior of materials at high temperature. Techniques of measurement and estimation of high temperature thermodynamic properties,

use of estimated values for thermodynamic calculations.

515 Ceramic Single Crystals (3)

Science and technology of the growth of single crystals. Topics include growth from solutions, solidification from melts, vapor deposition, flame fusion, and recrystallization.

520 Seminar (1, max. 6) AWSp

Required for all graduate students.

521 Mechanical Behavior of Ceramics

(3) Sp

SCOTT

Dislocation structures in ceramics; influence of dislocations on the deformation and fracture of single crystals and polycrystalline ceramics; brittle fracture and theoretical strength. Prerequisite, 511 or permission.

523 Solid State Ceramics (3) Sp

MILLER

Modern bonding concepts and wave mechanics are used to study solid state aspects of ceramic systems. Selected phenomena are examined from the viewpoint of crystal chemistry. Prerequisite, Metallurgical Engineering 466.

590 Industrial Minerals Research (*) AWSp

599 Special Topics in Ceramics (*) AWSp

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

METALLURGICAL ENGINEERING

Courses for Undergraduates

255 Introductory Metallurgical

Engineering (3) W

ARCHBOLD

Instrumentation, equipment, and laboratory techniques in metallurgical engineering. Metallographic laboratory practice, mechanical property measurements, X-ray generation and detection, heat generation and control, vacuum methods. Laboratory experiments designed to illustrate basic metallurgical principles. Prerequisite, Materials Engineering 250. (May be taken concurrently.) (Formerly 224.)

270 Principles of Unit Processes (4) Sp

JONES

Introduction to the physical chemistry basis of metallurgical processes with emphasis on high-temperature reactions involving gas-solid systems, liquid metals, mattes, and slags. Thermochemistry and problems related to mass and energy balances in metal production processes. Laboratory experiments to illustrate experimental methods of chemical metallurgy. Prerequisites, Chemistry 350; Chemistry 351 concurrently. (Formerly 204.)

306 Metallurgy Excursion (1, max. 2) Sp

Plant inspection trip; junior and senior years. Required of all majors.

322 Metallurgical Thermodynamics (3) A

JONES

The quantitative application of thermodynamics to systems of interest to metallurgists: metals, slags, gases, and refractories. A detailed review of thermodynamic quantities and equations of state. Prerequisites, 361, Chemistry 351.

323 Applied Thermodynamics and

Kinetics (3) W

JONES, ZUPP

The application of thermodynamics and reaction kinetics to metallurgical systems and reactions; oxidation and reduction, equilibrium

and nonequilibrium conditions in metallurgical unit processes. Prerequisite, 322. (Formerly 321.)

361 Structure of Solids (4) A

ARCHBOLD

Elements of crystallography and the structure of metals and alloys, intermediate phases, superlattices. Theory and application of X-ray and electron diffraction for the determination of crystal structure. Laboratory experiments related to these principles. Prerequisites, 255 and Materials Engineering 250.

362 Properties of Solids (4) W

DAWSON

The physical, mechanical, and transport properties of solids: crystal defects and their influence on physical and mechanical properties. Introduction to transport properties and the theory of atomic diffusion. Laboratory experiments related to the measurement of the properties of engineering solids. Prerequisite, 361.

363 Reactions in Solids (4) Sp

POLONIS

The application of elementary kinetics and thermodynamics to solid state reactions. Theories of nucleation and growth and their application to diffusional and diffusionless transformations. Recovery and recrystallization. Heat treatment of alloy systems and relations between properties and microstructure. Laboratory experiments related to these topics. Prerequisite, 362.

400 Materials Science for Teachers (5)

A course designed to give junior and senior high school science teachers and science consultants a broad background of the structure and properties of solids, solid state reactions, phase equilibria, and typical engineering applications of these principles. Laboratory and discussion sections on the educational implications and applications of this material in the classroom.

421 Thermodynamics of Solids (3) W

ZUPP

Applications of thermodynamics to the solid state. Statistical interpretation of entropy. Theories of solutions. Thermodynamics of defects in solids and surfaces. Theories of liquid metals and solidification. Prerequisite, 322 or equivalent.

422 Process Metallurgy (3) Sp

JONES

Application of physical chemistry and transport theory to metal process engineering. Process design, control, and economics. Prerequisite, permission.

423 Corrosion of Engineering Materials (3) Sp

JONES

Applications of physical chemical principles to the reaction of materials with their environments. Prevention and control of corrosion and oxidation processes. Corrosion problems in materials applications including chemical process industries, nuclear engineering, and marine environments.

455 Metallurgical Experimental Techniques (3) A

STOEBE, ZUPP

Modern research techniques in physical metallurgy. Emphasis on the design and execution of experiments and the analysis of data. Laboratory experiments to illustrate solid-state phenomena. Prerequisite, 363. (Formerly 424.)

460 Advanced Physical Metallurgy (3)

Current engineering topics in physical metallurgy. May be repeated for credit. (Formerly 461.)

461 Deformation and Mechanical Behavior of Metallic Systems (3) A

DAWSON

Theories of elastic and plastic behavior of solids. Role of imperfections in mechanical behavior. Yielding, work hardening, strengthening mechanisms, creep, and fatigue. Prerequisite, 362. (Formerly 460.)

462 Engineering Physical Metallurgy (3) W

OLONIS

Rheological behavior of solids. Descriptions of states of stress and strain. Phenomenological theory of deformation, fracture mechanics, microstructural aspects of deformation. Heat treatment and the control of metallurgical structure. Casting and solidification of metals and alloys. For majors and nonmajors. Prerequisite, 363 or Mechanical Engineering 340. (Formerly 441.)

463 Reliability and Design in Metallurgical Systems (3) Sp

ARCHBOLD

Properties of commercially important engineering alloys. Metallurgical design problems and failure analysis. Prerequisite, 363. (Formerly 464.)

466 Theory of Metals (3) W

STOEBE

Application of wave mechanical concepts to assemblies of atoms. Atomic bonding, statistical mechanics, free electron and band theories. Application of principles to conduction in metals, insulators, semiconductors, and magnetic processes.

468 Undergraduate Seminar (1, max. 3) AWSp

470 Minerals Processing: Flotation (3) A

BRIEN

Theory and practice; applied surface chemistry, adsorption, surface tension, flocculation and dispersion and related fundamentals. Laboratory illustrates basic phenomena, practical testing and flotation variables. Prerequisite, Materials Engineering 351.

471 Hydrometallurgy (3) Sp

BRIEN

Physical-chemical principles of solution processes; fundamental theory applied to effects of pressure, temperature, diffusion rates, pyrometallurgical pretreatment, activities, oxidation and reducing conditions, impurities, contact time, interphase areas and associated variables. Ion exchange and solvent extraction principles. Laboratory. Prerequisite, Materials Engineering 351 or equivalent.

472 Mineral Processing Practices (3) W

BRIEN

Methods of laboratory investigations and recent plant and process innovations reported in the current literature. Prerequisite, Materials Engineering 351.

473 Mineral Process Plant Design (2) Sp

BRIEN

General arrangement planning and design calculations on a project basis. Prerequisite, Materials Engineering 351.

499 Special Projects (*, max. 5) AWSp

Laboratory investigation of a metallurgical problem on an independent basis. Maximum of 5 credits may be counted toward graduation.

Courses for Graduates Only

511 Advanced Theory of X-ray Diffractions (3) Sp

ARCHBOLD

The use of the reciprocal lattice concept and Fourier analysis in the study of atomic arrangements in crystals. Line shape and diffuse scattering analysis. Analytical interpretation of diffraction patterns. Prerequisite, 361 or equivalent. (Formerly Materials Engineering 513.)

512 Transmission Electron Microscopy (3) A

ARCHBOLD

Fundamentals of electron optics as applied to microscopy. Applications of contrast theory and electron diffraction with emphasis on defect and multiphase structures in crystalline solids. Prerequisite, 511 or equivalent.

520 Seminar (0) AWSp

Review of research problems and recent literature. Required for all graduate students.

525 Thermodynamic Topics in Metallurgy (3) Sp

JONES, ZUPP

Selected topics in application of classical and statistical thermodynamics to systems of current metallurgical interest. Prerequisite, 421.

531 Advanced Metallurgy (*) AWSp

Study of selected problems, with particular attention to recent publications and scientific applications in physical or extractive metallurgy.

541 Theoretical Structural Metallurgy I (3) A

DAWSON

Detailed study of the general properties of dislocations: elastic theory; glide motion of dislocations; vacancies, interstitial atoms, and dislocation climb; imperfect dislocations. Prerequisite, 363.

542 Theoretical Structural Metallurgy II (3) W

DAWSON

Dislocation arrays in crystals and their plastic properties: the elastic and plastic properties of real crystals; cold work, annealing, polygonization, recrystallization and grain boundaries; creep; cleavage. Prerequisite, 541.

543 Theoretical Structural Metallurgy III (3) W

DAWSON

The nature of the interactions of dislocations with impurities. Influence of impurities and precipitates on the mechanical properties of crystals. Prerequisite, 541.

551 Special Topics in Advanced Physical Metallurgy (*, max. 6) AW

Prerequisite, 363 or equivalent.

561 Phase Transformations in Metals and Alloys I (3) A

OLONIS

Thermodynamics and kinetics of solid-state reactions in metals, phase stability, theories of nucleation and growth, precipitation from solid solutions, applications to specific metal and alloy transformations.

562 Phase Transformations in Metals and Alloys II (3)

OLONIS

Theory of transformation processes in solids, with emphasis on energetics and structural mechanisms; melting and freezing, role of imperfections in solid-state reactions, martensite transformation, eutectoid decomposition, cellular precipitation.

563 Phase Transformations in Metals and Alloys III (3)

STOEBE

Theory of diffusion; application of diffusion theory to solid state reactions; thermodynamics of irreversible processes. Prerequisite, 561.

566 Advanced Theory of Metals (3)

Modern theories of the metallic state and their relationship to the physical properties of metals. Prerequisite, 466.

570 Topics in Advanced Mineral Processing (*) WSp

BRIEN

Special topics of current interest in the preparation and concentration of minerals and the application of physical and surface-chemical fundamentals in investigative research.

571 Advanced Mineral Processing Theory I (3) A

BRIEN

Thermodynamics and electrochemistry of surfaces. Potential differences across interfaces; electrical double layer, surface tension; Gibbs' adsorption equation in three-phase flotation systems; anionic and cationic selectivity.

572 Advanced Mineral Processing Laboratory (*) A

BRIEN

Experimental study of theoretical principles in preparation and concentration. Arranged concurrently with 571 and 573, or as required.

573 Advanced Mineral Processing Theory II (3) W

BRIEN

Rate controlling processes in hydrometallurgical separations. Magnetic and electrostatic fundamentals in concentration. Movement of solids in solid-liquid suspensions. Comminution of solids.

574 Advanced Mineral Processing Design (*) Sp

BRIEN

Plant design studies and discussion of systems of current interest. Subjects may change from year to year.

599 Special Topics in Metallurgy (*) AWSp

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

MINING ENGINEERING

Courses for Undergraduates

221 Explosives and Rock Drilling (2) W

ANDERSON

Principles of rock breaking and characteristics of explosives. Theory of fragmentation; design of blast and explosive loading patterns; nuclear explosives in industry; safe practices, and elements of costs. Applications in tunneling and surface work.

306 Mine Excursion (1, max. 2) Sp

Five-day trip to a neighboring mining region. Required in junior and senior years during spring vacation, or as scheduled.

322 Principles of Mine Production (4) A

ANDERSON

Working of open pit and underground mines. Delineation of ore bodies; shafts and development; level planning and underground stoping methods; characteristics of mine rocks; support systems; introduction to transport, drainage, ventilation, hoisting, and mine organization. Emphasis on labor and equipment, productivity, and costs.

325 Mineral Land Valuation (2) W

ANDERSON

Sampling methods in mines and placers; drill hole and coring methods; geological aspects; estimation of deposits and reserves; use of computers in ore reserve calculations; metallic and nonmetallic depletion and financial calculations; reports. Prerequisite, 322 or permission.

330 Mine Surveying (3) Sp

ANDERSON

Practice in underground methods, use of special instruments, stope measurements, shaft surveying, solar observations, and carrying of meridian underground; production of working and geologic maps and sections. Prerequisite, General Engineering 121.

425 Rock Mechanics (2) A

PIFER

Physical properties of rocks; stress around underground openings; behavior of rocks under stress; design of underground openings; measurement of stress in mines; rock slope stability; rock bolting system design. Prerequisite, CEEM 292 or permission.

426 Exploration and Development of Mineral Deposits (4) Sp

PIFER

Mining geology; procurement of data by geologic mapping and drilling; solution of mine structural and fault problems; physiographic, mineralogical, and structural guides to ore applied to mine exploration; exploration and development programs; evaluation of prospects. A feasibility report is required after field study of a mineral deposit.

427 Exploration Geophysics: Introduction (3) Sp

ANDERSON

Elementary principles of seismic, magnetic, radiometric, electrical, and gravitational methods in exploration for ore; applications and limitations of methods. Prerequisite, junior standing.

432 Mine Plant Design (5) Sp

ANDERSON

Principles and application; design of transport systems; air compression practice and distribution; pumping plant and mine water handling; electrical equipment and distribution systems in mines; plant design and construction. Prerequisites, 322 and Electrical Engineering 303.

433 Environmental Control in Mines (3) A

ANDERSON

Principles and practices. Physical and chemical aspects of mine atmosphere, gases, and dusts; physiological considerations; air flow and measurement; mechanical ventilation, and air conditioning equipment and systems. Prerequisite, 322.

465 Opaque Minerals Microscopy (2) W

BRIEN

Microscopic determination of the ore minerals; physical and optical properties, etch reactions; microchemical testing of polished sections; mineral associations, liberation, grain counting.

481 Mineral Industry Economics (3) W

PIFER

World mineral resources, their distribution, exploitation, and depletion; social, economic, and political effects; international control and trade, industrial organization, government policies, taxation, tariffs, marketing, and pricing; elements of production costs. Prerequisite, Economics 211.

483 Mining Laws (1) Sp

ANDERSON

Mineral land laws of the United States; federal, Washington State oil and gas acts. Federal and state mine safety regulations. Canadian and other foreign laws of importance. Prerequisite, senior standing.

499 Special Projects (*, max. 5) AWSp

Problems in mining or mineral processing; field or laboratory investigations on an independent basis. Total of 5 credits required.

Courses for Graduates Only

520 Seminar (1, max. 6) AWSp

Lectures and discussions; review of research problems and recent literature. Required for all graduate students.

521 Mining Systems (*) AWSp

ANDERSON

Production methods; mining control; support; applied efficiency methods; administration; equipment and machinery; health and safety; special problems. Arranged in accordance with student's major interest.

522 Mine Shafts (3) A

PIFER

Location and design, surface plant, collar preparation; sinking, mechanization, and organization, support, concrete lining, stations and bottoms, equipment and maintenance, safety and costs; special attention to modern circular shafts.

523 Mining Stratified Deposits (*) Sp

PIFER

Studies in mining, with particular reference to mechanization and strata control. Prerequisite, graduate standing.

525 Rock Mechanics (3) W

PIFER

Physical characteristics and mechanics of response by rocks under stress; theories of stress distribution around structures; stability of rock slopes; subsidence and strata control; rock fragmentation. Prerequisite, 425.

551 Special Topics (3-5, max. 15) AWSp

Topics of current interest and importance in the mineral industries or individual study on a subject of special interest.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

NUCLEAR ENGINEERING

444 Nuclear Materials (3) W

POLONIS

A lecture course covering the structure, properties, and performance of materials in nuclear reactor applications; engineering requirements and selection of materials for reactors; technology of materials for reactor fuels, moderators, shields, control elements, and structural components; corrosion and oxidation; effects of radiation on the structure and properties of materials. Prerequisites, Physics 320, and Materials Engineering 250 or equivalent.

445 Nuclear Materials Laboratory (2) W

POLONIS

This course comprises a series of experiments to supplement the lecture material of 444. The experiments are designed to illustrate

fundamental behavior of metals important in nuclear engineering. The principles of melting, casting, and heat treatment are covered, together with the more basic aspects of structural changes and transformation kinetics. The course will require 6 hours of laboratory work per week. Prerequisite, 444, which may be taken concurrently.

477 Introduction to Radioactive Tracer Techniques (2) A

ROBKIN

Introduces the student to the basic concepts of the use of radioactive tracers to measure the transfer between the compartments of a biological system. The theoretical analysis will be restricted to systems with no more than three compartments. The experiments are designed to permit the student to utilize the theory discussed and to make actual determinations of transfer coefficients. Offered jointly with Radiology as Radiology 477.

484 Introduction to Nuclear Engineering (4) A

BABB

An introductory course in nuclear engineering for seniors, graduate students, and practicing engineers. The course is designed to demonstrate the application of the principles of nuclear science to the processes associated with the release, control, and utilization of all forms of energy from nuclear sources, including elements of reactor nuclear physics; elementary nuclear reactor theory; control of nuclear reactors; thermonuclear reactions. Prerequisites, Physics 320 and Mathematics 238, or permission.

485 Nuclear Instruments (3) W

ROBKIN, WOODRUFF

A lecture and laboratory course devoted to the principles of measurement and detection of various types of radiations encountered in nuclear energy systems. Laboratory demonstrations will include the use of Geiger, proportional and scintillation detectors; ionization chambers; analog-digital data logging equipment; and multi-channel gamma ray spectrometers. Sources of radiation will include the 100 KW UW Nuclear Reactor and pulsed neutron generators. Typical applications of neutron activation analysis and various radioactive tracer techniques in medicine, oceanography, forensic science, and engineering will also be presented. Prerequisite, Physics 320 or permission.

486 Nuclear Power Plants (3) Sp

BABB

A course for students interested in applications of nuclear energy to power generation. Discussions of various types of nuclear reactor systems will include pressurized water, boiling water, high temperature gas cooled, sodium graphite, as well as advanced converter and breeder reactors. Particular attention will be given to the problem of world energy resources and the United States and world views of the availability and consumption of nuclear fuels. The use of nuclear energy in land, sea, air, and space transportation will be described, and various design concepts including radiation shielding and materials selection will be considered. The economics of nuclear power will be emphasized throughout the course. Prerequisite, senior standing; 484 recommended.

487 Radioactive Tracer Techniques (2) A

ROBKIN

The use and behavior of radioactive tracers; attention to the dynamics of the distribution

of trace elements after their introduction into the system under analysis; analysis of current models and application to examples from both living and nonliving systems. Offered jointly with Radiology as Radiology 487.

500, 501 Nuclear Reactor Theory I, II (4, 3) A,W

GARLID, MC CORMICK

Consecutive lecture courses in fission reactor theory covering interactions of neutrons with matter; neutron production, dispersion, and slowing down; diffusion, age-diffusion, and multigroup treatment of homogeneous and heterogeneous systems; elements of reactor kinetics and dynamics; elements of control rod theory. Prerequisites, 484, Physics 323 and Mathematics 238, or permission; equivalent of Mathematics 428 recommended.

505 Nuclear Engineering Laboratory I (3) A

ROBKIN, WOODRUFF

A laboratory course involving the use of a graphite moderated subcritical assembly, the UW nuclear reactor, a pulsed neutron generator, and analog and digital computers. The experiments involve the determination of reactor parameters such as diffusion length, Fermi age, material buckling, control rod worths and other reactivity effects, and flux measurements. Prerequisite, 500 or permission.

506 Nuclear Engineering Laboratory II (4) Sp

ALBRECHT, WOODRUFF

An advanced laboratory course in which experimental research is conducted. Selected experiments are performed which involve the use of such equipment as the reactor as a neutron and gamma ray source, pulsed neutron generator, helical neutron monochromator, neutron diffraction spectrometer, pile oscillator, pile-noise analysis equipment, time-of-flight equipment, and analog and digital computers. Prerequisite, 505 or permission.

510 Nuclear Reactor Engineering (3) W

BABB

An advanced course in engineering analysis of nuclear reactor systems. The course covers core design methods; heat generation and distribution in nuclear reactor systems; the removal and utilization of heat for power production; fuel cycles; shielding of nuclear radiations. Prerequisite, 500.

512 Nuclear Reactor Design (4) Sp

ALBRECHT, FOX

A design laboratory course involving the synthesis of reactor theory, engineering analysis, material specifications, and economics to meet the design specifications for a complete nuclear reactor facility. Emphasis upon cycle analysis, hazards, arrangements, and requirements peculiar to nuclear reactor plants. Prerequisite, 510.

521, 522, 523 Graduate Seminar (0,0,1) A,W,Sp

GARLID

524 Seminar in Nuclear Systems Analysis (1-2, max. 12) AWSp

GARLID

Studies of recent advances in nuclear systems analysis with students and faculty reporting on recent research and publications. Only open to students having a master's degree or equivalent.

530 Advanced Reactor Analysis (3) A

MC CORMICK

Methods giving improvement over elementary approaches based upon diffusion theory: in-

cludes the matrix formulation of multigroup equations and their solution, as well as multigroup perturbation theory, the Boltzmann equation for neutrons, and the moments method. Fast reactor analysis including different reactivity coefficients, safety analysis, and various reactor concepts. Prerequisite, 501.

540, 541 Topics in Bionuclear Engineering I, II (3,3) W,Sp

ROBKIN

Investigations into various aspects of the interaction of radiation with biological material. Included may be topics in the analysis of radiation fields, dosimetry, shielding, biological response to radiation, mathematical modeling, etc. Some experiments may be designed and carried out as part of the course. The course will be conducted on a seminar basis with the discussion not limited to material which is already described in the literature. Original research is not excluded. Offered jointly with Radiology as Radiology 540, 541.

550 Neutron Transport Theory I (3) W

GARLID, MC CORMICK

Selected approximate techniques for solution of the Boltzmann equation. Emphasis upon obtaining numerical solutions by the spherical harmonics method, various discrete-ordinate and transform methods, and the Monte Carlo method. Prerequisite, 530.

551 Neutron Transport Theory II (3) Sp

MC CORMICK

Exact solutions of specialized transport problems and relationship of the results to those obtained by approximate techniques. Variational principles and solutions in transport theory; reciprocity theorems. Prerequisites, 550, Mathematics 427, 428, or permission.

556 Nuclear Fusion Reactor Theory I (3) W

ALBRECHT, VLASES

A lecture course in fusion reactor theory concentrating on the plasma state in which the possibility exists of achieving controlled fusion. Included are discussions of collision phenomena, Maxwell's equations, charged particle motion, radiation losses from plasmas, plasma Boltzmann equation, hydromagnetics, properties of plasmas.

557 Nuclear Fusion Reactor Theory II (3) Sp

ALBRECHT, VLASES

Emphasis on special problems such as plasma oscillations and plasma stability. A study is made of specific types of devices including those using pinch and magnetic mirror principles. Prerequisite, 556.

559 Control of Radioactive Wastes (3) W

Environmental problems resulting from utilization of nuclear reactions; radioactive waste disposal practice; decontamination of water supplies; reactor site location, and control of stream and atmosphere pollution. Prerequisite, Physics 320 or permission.

560 Nuclear Reactor Dynamics I (3) W

ALBRECHT

Nuclear reactor dynamic equations, delayed neutron representations, response of reactors to various perturbations, operational techniques of system analysis, feedback mechanisms, stability criteria, power coefficients. Prerequisites, 501, Mathematics 427, 428.

561 Nuclear Reactor Dynamics II (3) Sp

ALBRECHT

Experimental nuclear reactor dynamics, oscil-

lators, pulsed neutrons, stochastic processes; dynamics of heat removal system components, analysis of closed loop system, space-dependent dynamics. Prerequisite, 560.

570 Neutron Thermalization I (3) W

MC CORMICK

A detailed study of the energy distribution of neutrons at energies below 1 ev. Kinematics of scattering of intermediate and slow neutrons, scattering data and the scattering law, scattering kernels, calculation of stationary neutron spectra, variational methods. Prerequisite, 530.

571 Neutron Thermalization II (3) Sp

GARLID

Emphasis on the slowing down of neutrons. Nonstationary neutron spectra, pulsed neutron fields, temperature and material discontinuities, experimental measurement of neutron spectra, influence on reactor design, computer codes. Prerequisite, 570.

588 Nuclear Fuel Management (2) W

BABB

Technical and economic principles for management of nuclear fuels including: energy resources, fuel cycle schemes, fuel cycle neutronics, fuel cycle economics, irradiated fuel processing, isotopic separations, utilization of fission products and other radioactive isotopes. Offered jointly with Chemical Engineering as Chemical Engineering 588. Prerequisites, 484, Chemical Engineering 530, or permission.

599 Special Topics in Nuclear Engineering (*) AWSp

CLAYTON, ROBKIN

Discussions and readings of topics of current interest in the field of nuclear engineering research. Subject matter may include reactor fuels and materials, reactor dynamics and control, instrumentation, thermonuclear processes, direct conversion problems. Prerequisite, permission of department chairman.

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

COLLEGE OF FISHERIES

FISHERIES

Courses for Undergraduates

101 Introduction to Fisheries Science (5) A

ROYCE

Identification, distribution, and life histories of selected fish and shellfish; commercial and recreational fishing; utilization of fisheries products; problems faced in fisheries conservation and management. Recommended for nonmajors.

240 Applications of Digital Computers to Biological Problems (4) W

BEVAN

Methods and procedure for processing biological data by means of digital computers; problem analysis, elementary programming, use of package programs for statistical analysis. Prerequisite, Mathematics 281.

311 Biology of Fishes (3) A

Diversity in the structure, function, and habits of fishes viewed as an expression of variations in their biological and physical environment. Prerequisites, Biology 212 or Zoology -112.

314 Methods and Instruments for Fishery Investigations (3) WS

SALO

Theory and practice of instrumentation and sampling in Fisheries; shipboard experience with equipment, collecting and recording data from biological samples, and the physical environment. Prerequisites, 5 credits in Fisheries.

379 Fisheries of the World (3) A

KASAHARA

Fisheries in relation to the distribution, abundance, and productivity of fishes; exploitation and problems of development, conservation of aquatic resources.

401 The Comparative Anatomy and Classification of Fishes (5) ASpS

WELANDER

The comparative anatomy, classification, identification, and distribution of fishes. Prerequisite, Biology 212 or Zoology -112.

405 Economically Important Mollusca (5) A

CHEW

Classification, life histories, distribution, methods of cultivation, and economic importance of oysters, clams, scallops, abalones, cephalopods, and other mollusca. Prerequisite, Zoology -112.

406 Economically Important Crustacea (5) W

CHEW

Classifications, life histories, distribution, methods of capture, and economic importance of crabs, shrimps, lobsters, crayfish, and the smaller crustacea. Prerequisite, Zoology -112.

410 Zoogeography of Freshwater Fishes (3)

Distribution of freshwater fishes with special emphasis on the historical and ecological factors governing present distribution. Prerequisite, 401, or Zoology 362, or permission.

425 Life History of Marine Fishes (5) W

DELACY

Fecundity, spawning, incubation, and hatching of marine fishes; identification and survival of larvae and juveniles; food and feeding of adults; migration; recognition of subpopulations. Prerequisite, 401.

450 Reproduction of Salmonoid Fishes (3) A

DONALDSON

Spawning and incubation; natural and artificial methods of hatching and rearing, rates of development; racial strains and selection; evaluation of procedures; design, structure, and maintenance of facilities. Prerequisites, 401 and 10 credits in chemistry.

451 Reproduction of Salmonoid Fishes Laboratory (2) A

DONALDSON

Prerequisite, 450 concurrently.

452 Nutrition and Care of Fishes (3) W

DONALDSON

Basic nutritional requirements of fish in natural and artificial environments; feeding and efficiency of diets; nutritional diseases; stocking policies; quality evaluation. Prerequisites, 401, and 10 credits in chemistry.

453 Nutrition and Care of Fishes Laboratory (2) W

DONALDSON

Prerequisite, 452 concurrently.

454 Communicable Diseases of Fishes (5) Sp

SPARKS

Organisms causing diseases in fishes; preven-

tion and known treatments of fish diseases. Prerequisites, 401 and Microbiology 301.

456 Principles of Management of Natural Resources (3) W

MATHISEN

Concept of renewable resources; fundamentals of population dynamics; data collection, storage, retrieval, and processing. Practice with simulated resource utilization. Prerequisite, 240, Mathematics 157 or equivalent.

457 Principles of Management of Natural Resources (3) Sp

WHITNEY

Management alternatives; the relationship between research and management; case history studies of managed and mismanaged resources. Practice with computer simulation of resource utilization. Prerequisite, 456.

459 Aquatic Food Chains (5) WS

TAUB

A survey of the sources and nutritional values of foods for fisheries resources. Efficiencies, rates of transfer through the food chain, pollution effects and the potential for using pollution will be considered. Prerequisite, upper-class standing in a biology program.

460 Water Management and Pollution Studies (5) ASp

M. C. BELL

Stream flows and mechanics of freshwater environment, and other problems such as natural propagation; water flow measurement in streams and pipes; use of weirs; hatchery water requirements; screening of water diversions for protection of downstream migrants; nomenclature, water rights, and protective laws. Prerequisites, 401, Mathematics 105, and physics, or permission.

465 Problems in Fish Biology (6) S

Taxonomy, ecology, and life history of the fishes of the San Juan Islands and Northeast Pacific. (Offered at Friday Harbor Laboratories Summer Quarter only.) Prerequisite, permission.

471 Principles of Aquatic Radioecology (3) A

SEYMOUR

The nature, detection, measurement, differential biological effects, and evaluation of the hazards of ionizing radiations. Prerequisites, 15 credits in chemistry and 10 credits in zoology.

472 Methods of Aquatic Radioecology (3) W

SEYMOUR

Methods of radiobiological analyses, of accumulation and loss of radionuclides, and of radionuclides as tracers in aquatic organisms. Prerequisites, 15 credits in chemistry, 10 credits in zoology.

473 Radionuclides in the Aquatic Environments (3) Sp

SEYMOUR

The distribution of natural and artificial radionuclides, the allowable concentrations and the biological cost of introducing radionuclides in aquatic environments. Prerequisites, 15 credits in chemistry and 10 credits in zoology.

495 Introduction to Fisheries and Food Science Literature (2, max. 4) AWSp

Directed training in searching bibliographic sources. Prerequisite, 15 credits in fisheries.

499 Undergraduate Research (1-3, max. 9) AWSpS

Individual research within the College of Fisheries or on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

Courses for Graduates Only**501 On-the-Job Training (1-3, max. 3 for M.S., max. 9 for Ph.D.) AWSp**

Guided on-the-job training in governmental or industrial fisheries organizations. Prerequisite, permission.

503 Systematic Ichthyology (5) W

WELANDER

Principles and procedures of ichthyological taxonomy demonstrated by current problems and research. Prerequisites, 401 and permission.

504 Invertebrate Pathology (5) A

SPARKS

Pathological effects and response to injury in invertebrates. The approach is topical, e.g., inflammation, tumors, physical and chemical trauma, and parasitic diseases, rather than phylogenetic. Under each topic, the discussion is phylogenetic and comparative. Prerequisite, permission.

505 Research Techniques in Shellfish Biology (5) W

SPARKS

A field and laboratory course dealing with research methods in the reproduction, growth, and mortality of oysters and clams.

506 Shellfish Sanitation (5) Sp

SPARKS, MATCHES

Problems of the shellfish industry with emphasis on chemical and microbiological contamination and control during culture, harvest, and processing. Prerequisite, permission.

507 Topics in Fish Ecology (1-5, max. 15) AWSp

Selected topics in the ecology of marine and freshwater fish and shellfish; factors affecting survival and migration; definition and distribution of fish populations. Prerequisite, permission.

510 Fish Behavior (3) A

HAGEN

A review of recent research and concepts in ethology as it relates to fish.

515 Fish Physiology (3) W

SMITH

A survey of the functions of the organic system of teleost fishes. Prerequisites, 5 credits in zoophysiology and 5 credits in biochemistry.

516 Fish Physiology Laboratory (2) W

SMITH

Selected experimental techniques in fish physiology. Prerequisite, 515 or concurrent registration in 515.

520 Graduate Seminar (2, max. 6) AWSp

Training in methods of searching fisheries literature.

530 Biological Problems in Water Pollution (3) W

Biological and ecological changes in the aquatic environment resulting from domestic, industrial, radioactive, and agricultural wastes and methods for their evaluation. Prerequisite, permission.

531 Seminar in Water Pollution Problems (3) Sp

KATZ

Analysis of current problems in biology of water pollution in freshwater and marine habitats; critical review of current scientific literature. Integration of biological parameters into social and political systems. Philos-

ophy of water pollution control procedures. Prerequisite, 530 or permission.

535 Metabolic Effects of Chemical Pollutants (4) Sp

BROWN

Physiological and biochemical effects of industrial biota; specific metabolic effects of trial, urban, and agricultural chemicals on various poisonous and inhibitory substances; modes of inhibition of enzymes systems of aquatic organisms. Prerequisites, upper-division or graduate standing, organic chemistry, general physiology, biochemistry, or cell physiology, or equivalent.

540 Application of Digital Computers to Problems in Aquatic Ecology (3) W

BEVAN, PAULIK

Laboratory problems adapted to special interests of the student. Consideration of the simulation of aquatic communities, analysis of aquatic populations, and ecological changes. Prerequisite, 240 or permission.

545 Speciation (3) W

HAGEN

Intraspecific variation, mechanisms of speciation, and interspecific interactions, with special emphasis on fishes. Prerequisite, Genetics 451 or equivalent.

556 Introduction to Quantitative Population Dynamics (5) A

PAULIK

Simple analytic approaches to population management; applications of parent-progeny models and logistic models; biological and economic yields of natural populations; analysis of population data on high-speed digital computers. Prerequisites, Mathematics 124, 125, 383, and permission.

557 Theoretical Models of Exploited Animal Populations (5) W

PAULIK

Mathematical representation of basic population processes such as growth, mortality, natality, and mobility; application of optimization technique to yield models. Laboratory work on digital computer. Prerequisite, 556 or permission.

558 Estimation of Population Parameters (5) Sp

PAULIK

Statistical analysis of population data; design and analysis of mark-recapture experiments on natural populations; laboratory work on digital computer. Prerequisite, 557 or permission.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

FOOD SCIENCE

Courses for Undergraduates

378 Principles of Fishing Gear and Vessel Development (3) A

JONES

Principles of fishing techniques used in the major commercial fisheries related to vessel design and instrumentation required in the operation and handling of specialized fishing gear, together with shipboard experience.

380 Principles of Fisheries Technology I (3) W

JONES

Composition of fish; biochemical and micro-

biological changes in fish post-mortem; nature and effects of processing procedures, analytical control procedures; current technological developments. Prerequisite, Chemistry 102 or 160. (Formerly Fisheries 380.)

381 Principles of Fisheries Technology II (3) Sp

LISTON, JONES

Principles of process operations for seafood production. Prerequisite, Food Science 380.

481 Introduction to Food Technology (5) Sp

LISTON

Chemical and biological properties of foods; principles of processing, storage, distribution, and spoilage. Prerequisite, permission.

482 Food Analysis I (4) A

RIDDLE

Proximate analysis of foods by physical and chemical methods. Prerequisite, Biochemistry 442 or permission.

483 Food Analysis II (4) W

RIDDLE

Analysis of foods for vitamins, fatty acids, other biological substances and additives by physical, chemical, and microbiological methods. Prerequisite, 482.

484 Principles of Food Processing I (5) A

LISTON, RIDDLE

Unprocessed foods, their composition, nutritional availability, associated microorganisms, storage, and distribution. Prerequisite, 481 or permission.

485 Principles of Food Processing II (5) W

PIGOTT

Unit operations in food processing, engineering, and technological bases of food operations. Prerequisite, 484 or permission.

486 Deteriorative Processes in Foods (5) Sp

LISTON, RIDDLE

Biochemical, microbiological, physical, and chemical changes occurring in foods. Prerequisites, 483, 485, or permission.

487 Food Analysis III (4) Sp

LISTON, RIDDLE

Quality assessment of foods including spoilage methods, rancidity methods, organoleptic and microbiological methods. Prerequisite, 483.

490 Space Biology: Sealed Life-Support Systems (3) Sp

TAUB

Problems and proposed solutions for supporting human life in sealed environments. Emphasis on long-term space travel. Prerequisite, 10 credits in chemistry or biology, or permission.

498 Undergraduate Thesis (2-6, max. 6) AWSpS

Prerequisite, permission.

Courses for Graduates Only

504 Principles of Technological Research in Food (3, max. 6) AWSp

LISTON

A lecture and laboratory course designed to familiarize graduate students with the methods used in technological research. Prerequisite, permission.

521 Graduate Seminar in Food Science (1, max. 6) AWSp

Lectures and discussions of current problems and current research in food science. Prerequisite, permission.

522 Biological and Chemical Origins of Foods and Food Components and Their Functional Characteristics (3) W

RIDDLE

Primary sources of natural food materials with emphasis on living plant, animal, and microbial cells. Natural and synthetic food adjuncts such as flavorings, coloring agents, preservatives, and conditioning agents. Prerequisite, graduate standing in Food Science or equivalent.

523 Advanced Marine Food Processes (5) S

LISTON, JONES, PIGOTT

Principles and laboratory studies of advanced processes used in the extraction, concentration, and preservation of food from fish and other marine animals. Prerequisite, graduate standing in Food Science or equivalent.

524 Microorganisms in Foods (4) W

LISTON, MATCHES

Occurrence and activity of microorganisms important in foods as agents of spoilage, fermentation, and food-borne disease; relationship to food or food process; control and detection. Prerequisite, graduate standing in food science or equivalent.

525 Advanced Unit Operations in Food Processing (3) Sp

PIGOTT

Application of modern engineering principles to operations such as evaporation, drying, distillation, pumping, and heat transfer in the handling, processing, and packaging of foods.

526 Advanced Unit Operations in Food Processing Laboratory (3) Sp

PIGOTT

Laboratory investigations concerned with the engineering of food processes and processing facilities. To be taken concurrently with Food Science 525.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

QUANTITATIVE SCIENCE

Courses for Undergraduates

Administered by the College of Fisheries and the College of Forest Resources.

APPLIED STATISTICS

281 Elements of Statistical Method (5)

AWSp

THORSUND

Elementary concepts of probability. Binomial and normal distributions. Basic concepts of testing hypotheses and estimation. Chi-square tests. Linear regression theory. Applications of these methods primarily to biological problems. Equivalent to Mathematics 281. Prerequisite, Mathematics 105.

382, 383 Statistical Inference in Applied Research (5,5) AW, WSp

CHAPMAN

Analysis of variance and covariance; chi-square tests; multiple and curvilinear regression; sampling theory; discrete distributions; experimental design and power of tests. Application to biological problems. Use of computer programs in standard statistical problems. (Formerly Mathematics 382, 383.) Prerequisites, 281, Mathematics 124, Quantitative Science 291, or permission for 382; 382 for 383.

485 Introduction to Experimental Design (3) A
TURNBULL

Review of basic concepts; analysis of variance; classical designs, randomization, controls, randomized blocks, Latin squares, regression, and covariance. (Formerly Forest Resources 495.) Prerequisite, 281 or permission.

486 Experimental Design (3) A
CHAPMAN

Topics in analysis of variance and experimental designs: choice of designs, comparison of efficiency, power, sample size, use of computer for standard analyses. (Formerly Mathematics 486.) Prerequisite, 383 or Mathematics 485.

APPLIED MATHEMATICS, OPERATIONS RESEARCH

291, 292 Analysis for Biologists (3,3) W,Sp
CHAPMAN

Differentiation; integration including multiple integrals and partial derivatives. Numerical and computing techniques in analysis. Emphasis on biological problems, particularly in ecology. Prerequisites, Mathematics 105 for 291; 291 or Mathematics 124 for 292.

391 Introduction to Matrices and Their Applications (3) W

Elementary concepts of matrices and matrix operations; use of computer in inverting matrices, solving systems of equations and other matrix operations; applications in operations research and biology. Prerequisites, 281, Mathematics 125 and 114, or Fisheries 240 or equivalent course in computer use, or permission.

392 Techniques of Applied Mathematics in Biology (3) Sp
CHAPMAN

Methods of approximation including series approximations; solution of nonlinear equations by numerical methods; introduction to differential equations. Applications to biology. Prerequisites, Mathematics 126, or Fisheries 240 or equivalent course in computer use, or permission.

396 Introduction to Operations Research in Resource Utilization (3) W
BARE

Principles and practices in optimization of supply, inventory, and products in forest industries. Principles and practice in control of quality of forest products. (Formerly Forest Resources 496.) Prerequisite, 281 or 485, or permission.

496 Operations Research in Resource Utilization (3) Sp
BARE

Principles of problem formulation and optimization through models for inventory control allocation, waiting-line and replacement; dynamic models for inventory control, and replacement. Application of those principles and theories of operations research in resource management and resource product manufacturing. Prerequisites, 392, 396, or permission.

WILDLIFE SCIENCES

401 Wildlife Biology (5) A

The relationships of the animal and its environment: the biotic community, climate as

an environmental factor, cover requirements, food and nutrition, water requirements, mobility and local adaptation in birds and mammals. Properties (characteristics) of wildlife populations: population dynamics, sex and age structure of the population, social structure of the population, reproduction, mortality and dispersal, predation, parasites and disease, introduced populations, and cyclic populations.

402 Wildlife and Man (5) W

Human customs, attitudes, and institutions with regard to wild bird and mammal populations. Economics of wildlife populations. Governmental administration and custodianship of wildlife. Frictional relationships between human and wildlife populations (crop damage, public health, etc.)

403 Wildlife and Land Use (5) Sp

Review of natural habitats and faunas. Wildlife diversity and abundance in relation to range management, forest management, agricultural land management, wetlands; and in relation to human population growth and engineering developments (cities, highways, airports, dams, etc.), wildlife diversity and development.

COLLEGE OF FOREST RESOURCES

FOREST RESOURCES

Courses for Undergraduates

101, 102, 103 Development of Forestry (1,1,1) A,W,Sp
SCHAEFFER

History of forestry and its present status in the United States. Orientation course required of all freshman forestry students; not open to others.

204 Dendrology (5) A
STETTLER

Concepts of taxonomy, genetics, and organic evolution as applied to the classification of major tree genera of North America; lectures, laboratory demonstrations, and field exercises. Prerequisite, Botany 111.

301 Forests in the Life of Man (3) W
GESSEL

The forest ecosystem—forests throughout the world. History of forest use by man. Ecological principles and forest land use. Forest conservation. For nonmajors.

306 Wood Anatomy (3) A
LENEY

Familiarization with the development of wood as a plant tissue, and the relationship between wood structure and wood properties. Prerequisite, Botany 112.

310 Forest Soils (5) A
COLE

Physical, chemical, and biological properties of forest soils; soil development and classification; and soils in relation to use of forest resources. Prerequisite, Geological Sciences 205.

320 Introduction to Forest Ecology (3) S
SCOTT

An elementary study of the ecology of forest communities. Particular emphasis on field investigations of succession and development as

related to different environments. Prerequisite, Botany 112. (Offered Term *a*, Summer Quarter only, at Pack Forest.)

321 Silvics (3) W
SCOTT

A study of forest ecology and the silvical characteristics of forest trees. Includes environmental and genetic factors, forest influences, the establishment, development, and general characteristics of trees and stands. Prerequisites, Botany 112 and permission.

322 Silvicultural Methods (3) Sp
SCOTT

The theory and technique of applying silvical knowledge in controlling establishment, composition, and growth of forest stands. Includes reproduction methods and intermediate cuttings. Prerequisites, 321, 361.

323 Forest Biology I (3) A
GARA

Taxonomy, genetics, evolution, and physiology of forest species as related to structure and environment. Prerequisites, 101, 102, 103.

324 Forest Biology II (3) W
GARA

Consideration of environmental parameters and specific forest ecology, after an initial exposure to ecological principles. Prerequisite, 323.

325 Applied Forest Biology (3) Sp
GARA

Basic concepts and possibilities in the biological manipulation of forests. Includes population, genetic, and environmental manipulation. Prerequisite, 324.

331 Introductory Forest Pathology (4) Sp
DRIVER

The study of typical forest diseases stressing significance of forest ecology on disease occurrence and control. Prerequisites, 310, 321, Botany 112.

340 Forest Surveying (3) S
WILLITS

Plane surveying with special emphasis on surveying and mapping forest areas, using compass, abney level, steel tape, trailer chain, pacing, transit, and level. Prerequisite, General Engineering 121. (Offered Term *a*, Summer Quarter only, at Pack Forest.)

341 Timber Harvesting (4) Sp

Forest road engineering; timber harvesting methods and planning procedures; elements of CPL and mathematical programming. Emphasis on quantitative methods in decision-making. Prerequisites, 320, 340, 360, Mathematics 124.

350 Survey of Wildlife Biology and Conservation (3) W
TABER

Wildlife ecology and population biology, and inter-relationships between wild animals and man, including encouragement of wildlife population growth and productivity, control of pest populations, and preservation of endangered species. Prerequisites, junior standing.

353 Range Ecology (3) Sp
STOATE

Interrelations of plants, animals, and man on range lands. History of range-land use, principles and economics of proper use. One Saturday field trip required. Prerequisite, permission. (Offered alternate years; not offered 1970-71.)

354 Field Studies—Outdoor Recreation (6) S SHARPE

Studies of outdoor recreation in action. An introduction to the problems of managing large recreation complexes or private county, state, and federal lands during the period of maximum visitor use. Field trips. (Offered term b, Summer Quarter only.)

360 Introduction to Forest Mensuration (3) S TURNBULL

Elementary principles of measurement, estimation, and analysis of forest tree and stand parameters. Field techniques and practices. Prerequisite, Mathematics 105. (Offered Term a, Summer Quarter only, at Pack Forest.)

361 Forest Mensuration (4) W TURNBULL

Forest tree and stand models. Studies of forest tree and stand parameters. Estimation processes. Growth and yield analysis. Prerequisite, 360, Quantitative Science 281, or permission.)

374 Wood Utilization (3) A BRYANT

Nature of wood products industry; processing; demand and specifications for raw material and end products.

375 Wood Utilization Laboratory (2) A BRYANT

Nature of wood products industry; processing; demand and specifications for raw material and end products.

377 Elements of Timber Design (4) A JAYNE

The mechanical behavior of wood: its structural utilization as beams, columns, and panels; derivation of working stresses for wood. Prerequisite, junior standing.

380 Wood Machining (3) Sp LENEY

Study of concepts of wood surface generation by separation of the wood structure in various methods of machining. Prerequisites, Physics 116 and Mathematics 124.

400 Wood and Fiber Structure (5) A LENEY

Woody plants. Growth of the tree stem. Development of the woody cell and the structure of coniferous woods including fiber characteristics. Structure of hardwoods, including fibrous relationship of wood structure to its total physical properties. Natural defects in wood and fiber. Prerequisite, Botany 111 or permission.

401, 402 The Physics of Wood and Fiber Composites (4,4) W,Sp JAYNE

401: Equilibrium physical properties of composite systems. Structure and models, mass density, equilibrium moisture-properties and equilibrium thermal properties. Stress, strain, Hooke's Law for orthotropic materials. Electrical polarization, avial and bending stress, dielectric heating. 402: Nonequilibrium properties, mass and energy transport, time dependent electrical behavior, inelastic behavior and vibration. Prerequisites, Mathematics 124, 125, 126, Physics 114, 115, 116.

403 Fibrous Structure and Rheology I (3) W ALLAN, JAYNE

A review of the synthetic and natural fibers and their chemical, physical, microscopic, and submicroscopic properties. Prerequisites, 401, 488.

404 Fibrous Structure and Rheology II (3) Sp ALLAN, JAYNE

Fluid flow, sedimentation and other properties of fiber suspension, structure and rheology of paper board and textile webs; modification of these webs by plastic additives. Prerequisite, 403.

405 Woods of the World (3) W LENEY

A detailed study of the anatomy of woods of the world as related to their identification properties and utilization. Prerequisite, 400.

406 Microtechnique (3) W LENEY

The technique of preparing, sectioning, staining, and mounting woody tissues and fibers for microscopic study. Prerequisite, 306 or permission.

407 Wood Chemistry I (5) A SARKANEN

Chemical and physical properties of cellulose, lignin, hemicellulose and extractives. Wood as a raw material for the chemical industry. Prerequisite, permission.

408 Wood Chemistry II (3) W SARKANEN

A fundamental review of the chemistry and properties of wood and other plant lignins. Prerequisite, 407.

409 Wood Extractives Chemistry (2) Sp HRUTFIORD

The nature, origin, and occurrence of the extraneous components of wood, their influence on pulp and paper preparation and their utilization. Prerequisite, Chemistry 232.

410 Forest Soil Properties (3) W COLE

A laboratory study of physical, chemical, and biological properties of forest soils. Prerequisite, 310.

411 Soil and the Forest Ecosystem (3) Sp COLE

A study of soil in the field with emphasis on measurement of properties. Relationship of soils to forest vegetation. Prerequisite, 310.

415 Applied Forest Hydrology (4) A WOOLDRIDGE

Study of fundamental aspects of hydrology as influenced by silvicultural and timber harvest methods. Includes soil erosion, water quality, and manipulation of the forest stands for altered water yield. Prerequisite, senior standing or permission.

416 Micrometeorological Measurements and Instrumentation (3) W FRITSCHEN

Principles and theories of biometeorological instrumentation. Accuracy, measuring solar and thermal radiation, heat flux, air and soil temperature, atmospheric moisture content, wind. Prerequisites, Mathematics 124, 125, 126, Physics 121, 122, 123, or permission.

420 Ecology and Natural Science as an Approach to Conservation Education (3) S SCOTT

Classroom and field instruction in ecology, geology, soils, climate, forest pathology, entomology, and wildlife. Course includes field trip designed to give students opportunity to apply knowledge received in classroom. Prerequisite, teacher of science. (Offered Term b, Summer Quarter only, at Pack Forest.)

423 Advanced Forest Ecology (3) AW SCOTT

A course intended for students with some previous training in ecology. Discussion centered around primary processes and growth, patterns in forest tree species and forest community dynamics and productivity as affected by environment. Several one- to three-day trips throughout the Pacific Northwest. Prerequisite, permission.

424 Selected Topics in Silviculture (3) AW SCOTT

A detailed discussion of special problems or subjects in silviculture of interest to advanced students. Prerequisite, permission.

430 Elementary Forest Fire Science and Technology (3) Sp MURPHY

Forest fire behavior; fire and ecology; organization and management of forest fire control systems; economics of fire control; use of fire in forest land management. Emphasis is on the meteorological and thermophysical bases for forest fire behavior and the organization and management of technically and economically efficient forest fire control systems.

433 Biology of Forest Diseases (5) W DRIVER

Detailed studies on the biology of host-pathogen relationships exhibited by certain forest diseases. Prerequisites, 331, Botany 112, Chemistry 231. (Offered alternate years; not offered 1971-72.)

435 Forest Entomology (4) W GARA

Characteristics, life histories, ecological relations, prevention and control of forest insects. Prerequisite, Zoology-112.

436 Autecology of Forest Insects (4) A GARA

Host-insect interactions, approaches to forest insect problems, research technique, and pertinent forest entomological literature. Prerequisite, permission.

437 Population Dynamics of Forest Insects (4) W GARA

Advanced study of animal-plant interactions in the forest environment. Emphasis on individual search and interpretation of original research. Prerequisite, permission.

440 Construction (4) W STENZEL

Design and construction of forest roads; earthmoving methods and costs, explosives, surfacing, drainage facilities. Laboratory: design of timber bridges. Prerequisite, 404.

441 Forest Engineering (5) A STENZEL

Planning the logging operation: logging methods, route projection, selection of landings and settings, logging cost control. Prerequisite, Civil Engineering 310.

442 Logging Engineering (4) W DOWDLE

Business investment management in logging industry with particular emphasis on equipment replacement. Engineering performance of various types of logging equipment. Individual student project includes some field work. Prerequisite, 441 or permission.

443 Safety Practices in Forest Industries

(1) A

STENZEL

Accident costs and frequency rates; accident investigations; safety inspection; safety organization and program. Prerequisite, forest engineering major or permission.

446, 447, 448, 449 Senior Forest Engineering Field Studies (3,5,5,3) Sp

STENZEL

446: route projection and logging planning. 447: reconnaissance and preliminary surveys. 448: road location and construction surveys. 449: cost estimates and reports. Development of a complete logging plan for a timber tract. Courses given consecutively in Spring Quarter. Prerequisite, 442.

450 Recreational Use of Wild Lands (3) A

SHARPE

History and philosophy of outdoor recreation development as it pertains to the natural environment. A survey of visitor needs and preferences, trends in use and objectives of outdoor recreation in a modern society. Emphasis on county, state, and national levels. One field trip.

451 Outdoor Recreation Economics (3) Sp

WAGGENER

The application of economic principles to outdoor recreation problems. The elements of demand for outdoor recreation opportunities, the evaluation of recreation alternatives, and the allocation of resources for recreational use on public and private lands. Prerequisite, Economics 201.

453 Principles of Interpretation (5) W

SHARPE

A consideration of the interpretive specialist in outdoor recreation. Increasing visitor enjoyment and manipulating visitor impact through interpretation. Special emphasis on promoting visitor interest and an ecological understanding through information progress. Prerequisite, 450.

454 Regulation of Recreation Areas (5) A

SHARPE

Acquaints the student with the problems of administration and management of large recreational land areas. Includes control of public use, protection of environmental quality, determining carrying capacity, organization structure, and other administrative details. Prerequisite, Administrative Organization 440.

455 Planning and Design of Outdoor Recreation Areas (5) W

MALBON, SHARPE

The physical planning process in resource-oriented recreation and urban development. Relates both the general influences of sun, climate, access, and urban proximity, with specific site influences of topography, vegetation, soil, and water in recreation design. The laboratory includes graphic methods of communication and field trips.

456 Wilderness Preservation and Management (3) A

HENDEE

A review of American wilderness philosophies, concepts, and values. Development of the Wilderness Act. Examination of current wilderness-management policies, problems, trends in use, issues and controversies, wilderness research, social costs, and benefits of wilderness. Prerequisite, permission.

457 Field Problems in Outdoor Recreation (5) Sp

SHARPE

An investigation of the problems, policies, and procedures of selected public and private lands used for outdoor recreation, using the comprehensive master planning approach. Extensive field trips. Prerequisites, 450, 451, 453, 454, 455.

460 Forest Management (5) W

BARE

Economic and technical principles involved in the management of federal, state, and private forest lands. Emphasis is placed on principles of forest management applied to integrated use of all forest resources. Techniques used in timber inventories and management plans for continuous production of forest crops. Prerequisite, senior standing.

461 Forest Resources Economics (5) A

DOWDLE

Economic analysis of forest land management and the forest products industry. The role of government in forest land management. Resolving problems of conflicting forest land uses. Prerequisite, Economics 200.

462 Forest Policy and Administration (3) W

HEACOX

Development of the attitude of the federal government and the states toward forests, and the general methods of administering public interest in forests; the development of private forestry in the United States.

463 Contemporary Problems in Forest Land Use (3) W

DOWDLE

Current conflicts among competing uses for forest land; trends in forest land use; impact of public policy on growth and development of forest products industries. Prerequisite, permission.

464 Forest Economics and Utilization (3)

WAGGENER

Economic principles of market allocation. Changing pattern of forest land use. Major forest products from a process and product perspective. Distribution and marketing of forest products. Growth and development of the forest products industries. Prerequisite, Economics 200.

465 Forest Photo Interpretation (3) AW

The use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of aerial photomosaics. Use of aerial photographs in fire control and range and timber management. Allocation of cut; logging road location; construction of planimetric and topographic maps from vertical photographs. Prerequisite, permission.

466, 467, 468, 469 Senior Management Field Studies (5,5,4,2) Sp

466: surveys, use of aerial photographs in mapping forest types and estimating timber volumes. Application of statistical methods to cruising. 467: forest and land inventory in pine and fir regions. 468: growth and yield studies, permanent sample plots. 469: reports and summary of work accomplished by field studies. Course leads to development of a working plan for a large operation. All four courses are taken during the same quarter, and the entire quarter is spent off campus. Prerequisite, 460.

470 Wood Deterioration and Control (4) A

ERICKSON

Wood and fiber destroying agencies, biological

and physical, classification and manner of attack. Theory of toxicity and the important preservatives; pressure and nonpressure treatments. Fire retardant chemicals and treatments, coatings and impregnation.

472 Wood Adhesion (3) W

BRYANT

Theory of wood adhesion, chemical nature of wood adhesives, requirements of an adhesive relative to important wood and process variables. Prerequisite, senior standing in Wood Science and Technology.

473 Gluing Process Technology (6) Sp

BRYANT

Gluing technology as it relates to the important variables that affect the properties of plywood, particle board, hardboard, insulation board, and lumber laminates. Prerequisite, 472.

475 Wood Drying Technology (3) Sp

THOMAS

Analysis of wood drying; practical and experimental studies in the drying of processed wood in the form of lumber, veneer, particle, and fiber. Prerequisite, senior standing in Wood Science and Technology or permission.

476 Pulp and Paper Technology (3) W

GARDNER

Chemical and technological aspects of the manufacture of mechanical and chemical pulps, and of paper and paper products. Prerequisite, Chemistry 102 or 232 or permission.

477 Pulp and Paper Laboratory (2) Sp

GARDNER

Laboratory experiments in the pulping of wood, fiber technology, and physical and chemical characteristics of paper and pulp. Prerequisite, 476.

478 Advanced Wood Technology (5) W

ERICKSON

The physical and chemical nature of wood; its colloidal properties as related to its physical and mechanical behavior in its solid and transmuted forms. Prerequisite, permission.

479 Analysis of Wood Processing Facilities (3) W

BETHEL, JAYNE

Application of wood science and technology to analysis of the effectiveness of wood processing facilities. Production control and quality control related to materials and processes. Procurement control problems. Decision making with respect to product mix, equipment modification, analysis of inventory control, and material movement.

480 Wood Process Development and Design (3) Sp

BETHEL, JAYNE

Study of the factors influencing feasibility judgments with respect to industrial development and factory design. Feasibility of new forest products manufacturing installations with reference to raw material supply, markets, transportation, and labor supply. Analysis of case histories of forest products manufacturing and facility development. Use of operations research methods in feasibility studies. Prerequisite, permission.

481 Pulp and Paper Unit Operations (4) Sp

GARDNER

Unit operations of particular interest in the pulp and paper industry in addition to those covered in Chemical Engineering 340 and 435. Prerequisite, Chemical Engineering 435.

482 Structure of Wood Products Industry (3) W

WAGGENER

Market structures and industrial organization of the major sectors of the forest-related industries including lumber, plywood, and pulp and paper. Economic principles related to international, inter-regional, and intra-regional competition. Prerequisite, 374 or permission.

485 Undergraduate Research (1-3, max. 3) AWSp

Undergraduate research or independent study project under the supervision of the faculty. Prerequisite, senior standing in Wood Science and Technology.

487 Introduction to Wood Biochemistry (3) A

HRUTFIORD

Basic biochemical concepts; emphasis on the chemistry of photosynthesis, plant metabolism, and protein biosynthesis. Prerequisite, Chemistry 232 or permission.

488 Polymer Chemistry (3) Sp

ALLAN

A fundamental review of synthetic and natural polymers, including kinetics of formation, molecular weight distributions, and solid state and solution properties. Prerequisite, Chemistry 232.

489 Wood Biosynthesis (3) W

HRUTFIORD

Biosynthesis of carbohydrates, phenolic and terpenoid compounds in forest trees, and biochemistry of wood degradation. Prerequisite, 487 or Biochemistry 406.

490, 491, 492 Undergraduate Studies (1-5,1-5,1-5)

Individual tutorial study of topics for which there is not sufficient demand to warrant the organization of regular classes. The courses are offered in all quarters and credits can vary from 1 to 5, and, with the permission of the instructor, each course may be repeated for credit. Credits are individually arranged for each course. Prerequisite, permission.

Elective Courses for Undergraduates

Forest Resources curricula provide for a considerable number of elective courses which are selected in consultation with faculty advisers to fit the individual student's educational objective. These may be offerings of the College of Forest Resources or of any other undergraduate unit of the University.

Courses for Graduates Only

500 Graduate Seminar (2) A

TURNBULL, STETTLER

Discussion of current issues and problems in forestry and forestry research. Required of all graduate students in their first year of residence.

501 Elasticity of Wood and Fiber Composite (4) W

JAYNE

The concept of stress, strain, and Hooke's law for the orthotropic continuum. Tensor transforms of stress, strain and the elastic coefficients. The compliance and stiffness tensors. Strain energy. Distribution functions for descriptions of internal geometry of composites. Orthotropic elasticity of the fiber wall. Elasticity and two- and three-dimensional fiber networks. Elasticity of particle composite and laminates. Prerequisites, 401 and 402.

502 Transport Processes in Composite Systems (4) Sp

JAYNE

Time-dependent and time-independent diffusion of moisture and energy in composite materials. Coupled moisture and thermal diffusion. Mechanisms of moisture and thermal transport. Diffusion in the fiber and fiber networks. Diffusion in particle composites. Solution of the diffusion equation by separation of variables and finite difference methods. Prerequisites, 401 and 402.

511 Forest Soils Seminar (2) W

COLE, GESSEL, UGOLINI

Discussion of current topics in forest soils research and management. Prerequisite, permission.

512 Soil Genesis (4) W

UGOLINI

Consideration of soil as a natural system. Description of soils and basic processes in soil, including weathering and soil formation. Prerequisite, permission.

513 Soil Formation and Classification (3) Sp

GESSEL

A study of soil-forming factors and processes, and principles of soil classification. Distribution of soils. Prerequisite, 310.

514 Forest Influences (4) Sp

WOOLDRIDGE

Study of the interacting effects of climate, soil, and plants as a basis for understanding the hydrologic cycle. Places special emphasis on disposition and movement of water in forest ecosystems. Prerequisite, graduate standing or permission.

517 Soil Plant-Atmospheric Relations (3) A

FRITSCHEN

Principles of mass and energy exchange between the earth and the atmosphere with special emphasis upon the state and movement of water in soils, energy balance of the vegetated surface and individual leaves, and methods of evapotranspiration determination. Prerequisites, Mathematics 126, Physics 123, Atmospheric Science 329.

518, 519 Mass and Energy Transport in Living Systems I and II (4, 4) WSp

JAYNE

518: Equilibrium concepts, first and second laws of thermodynamics and their applications to living systems, including osmosis, capillarity, and photosynthesis. 519: Thermodynamics of irreversible flow processes. Mass and energy transport. The diffusion equation with emphasis on diffusion in living systems. Secondary flow processes including thermos-diffusion and thermo-osmosis. Introductory statistical physics with applications to life processes. Prerequisites, Mathematics 124, 125, 126, Physics 114, 115, 116.

521 Current Problems in Forest Ecology (3) W

SCOTT

A consideration of current literature and topics in forest ecology and tree physiology. Prerequisite, permission.

522 Current Problems in Silviculture (3) Sp

SCOTT

A detailed study of the literature dealing with recent applications of silviculture in world forestry. Prerequisite, permission.

524 Tropical Forests (3) AW

BETHEL

A comparative study of the forests of temperate and tropical regions. Diversity in trop-

ical ecosystems. Comparisons among tropical forest biomes. The structure and properties of tropical forest trees and woods. Problems in the utilization of tropical woods basic to the development of tropical forestry management practice. Forest land-use practices and problems in the tropical regions of the world. Prerequisite, permission.

527 Forest Genetics (3) W

STETTLER

Tree-improvement breeding theory as related to elementary population genetics, variation in plant populations, and natural and artificial selection. Prerequisite, Genetics 451 or permission.

531 Forest Fire Science Seminar (2) W

MURPHY

Preservation and discussion of current issues in forest fire prevention, control, use, and discussion of ongoing fire research. Prerequisite, permission.

532 Planning, Management, and Analysis of Forest Fire Control Systems (3) Sp

MURPHY

The Forest Fire Control System. Study of plans, service, finance, line, and command functions. Forest fire control and production economics, techniques of operations research and computer sciences applicable to planning and analyzing forest fire control systems. Prerequisites, Administrative Theory and Organizational Behavior 550, Quantitative Methods 510.

533 Investigations of Forest Diseases (5) W

DRIVER

Studies on concepts and experimental procedures used in forest microbiological research. Prerequisites, 433 and permission. (Offered alternate years; offered 1970-71)

536 Advanced Forest Entomology (4) Sp

GARA

A review and discussion of current problems in forest entomology. Emphasis on individual literature reviews, presentation, and research technique. Prerequisite, permission.

537 Forest Fire Behavior (3) Sp

MURPHY

Basic combustion and heat transfer processes related to behavior of free burning fires. Forest fuels. Effect of fuel, weather, and topography on the spread, intensity, and difficulty of control of forest fires. Prediction of fire behavior. Prerequisites 538, Atmospheric Sciences 301, 329.

538 Forest Fire Thermophysics (3) W

CORLETT

Principles of combustion and heat transfer. Basic processes of ignition and flame spread; high intensity fires. Emphasis is on free-burning fires in cellulose fuels. Prerequisites, Mathematics 105, Physics 114, 115.

541 Advanced Forest Engineering (5) W

STENZEL

Logging organization and management; logging cost analysis and budgeting. Prerequisite, permission.

542 Advanced Logging Engineering (3) A

STENZEL

Detailed consideration of problems of logging planning and truck road engineering, including the preparation and field layout of logging plans; location, design, and construction of logging truck roads. Prerequisite, permission.

551 Current Problems in Recreational Management of Wild Lands (3) Sp

SHARPE

An investigation, examination, and discussion of current problems of recreational management of wild lands. Prerequisite, graduate standing.

552 Outdoor Recreation Research Methods (3) A

WAGAR

The application of scientific method to the study of outdoor recreation problems. The procedures and techniques used in conducting recreation research, such as preparation of problem analyses, research proposals, and study plans; the collection, analysis, and interpretation of data normally used in recreation studies. Prerequisite, graduate standing.

564 Advanced Forest Biometry (3 or 5) W

TURNBULL

Classical problems in analysis of forest populations and growth theory, and principles of parametric analysis and estimation processes in forest biometry. Prerequisite, permission.

571 Advanced Wood Preservation (3) W

ERICKSON

Permeability of wood; theory and factors affecting penetration, liquid movement in wood, chemical effects on wood. Prerequisite, permission.

572 Wood Chemistry and Analysis (3-5) WSp

ERICKSON

Techniques for analyzing the chemical constituents of wood; the relationships between chemical properties and the structural properties and uses of various species of wood. Prerequisite, permission.

573 Wood-Moisture Relations (2-3) A

ERICKSON

Theories and practice on relationships between wood and moisture over a range of moisture contents; effects of other polar and nonpolar compounds; capillarity, adsorption, and diffusion in wood. Prerequisite, permission.

574 Wood-Resin Relations (3) Sp

BRYANT

The technology of synthetic resins as wood adhesives, wood impregnants, binders, overlays, and surface coatings. Prerequisite, permission.

575 Forest Products Economics (3) A

WAGGENER

Economic analysis of the forest products industries; market structure, regional impact of forest products industries, current problems in forest products economics. Prerequisite, permission.

576 Photomicrography of Woody Tissues (3) Sp

LENEY

Theory and method in microscopy and photomicrography of woody tissues. Prerequisite, permission.

577 Wood and Fiber Science Seminar (1) AWSp

HRUTFIORD

Discussion of current topics in the science of wood and its various composites in the form of composition boards, laminates, and paper. Prerequisites, permission.

590 Graduate Studies (1-5)

Study in fields for which there is not sufficient demand to warrant the organization of regular courses. Prerequisite, permission.

600 Independent Study or Research (*)

700 Thesis (*)

800 Doctoral Dissertation (*)

Tutorial Study

Tutorial study designed to meet individual requirements is available to graduate students in the Graduate Studies courses listed below. Such study may include literature review, field and laboratory work. The courses are offered in all quarters and credits can vary from 1 to 5, and with the permission of the instructor, each course may be repeated for credit. Credits are individually arranged for each course. Prerequisites include graduate standing and permission of the instructor.

510 Graduate Studies in Forest Soils (1-5)

GESSEL

515 Graduate Studies in Forest Influences (1-5)

GESSEL, SCOTT

516 Graduate Studies in Forest Meteorology (1-5)

FRITSCHEN

520 Graduate Studies in Silvics and Silviculture (1-5)

SCOTT

526 Graduate Studies in Forest Genetics (1-5)

STETTLER

530 Graduate Studies in Forest Fire Control (1-5)

MURPHY, SCHAEFFER

534 Graduate Studies in Forest Pathology (1-5)

DRIVER

535 Graduate Studies in Forest Entomology (1-5)

GARA

540 Graduate Studies in Logging Engineering (1-5)

STENZEL

550 Graduate Studies in Forest Recreation (1-5)

SHARPE, WAGAR

555 Graduate Studies in Wildlife Management (1-5)

TABER

560 Graduate Studies in Forest History and Policy (1-5)

563 Graduate Studies in Forest Mensuration (1-5)

TURNBULL

565 Graduate Studies in Forest Management (1-5)

BARE

566 Graduate Studies in Forest Photogrammetry (1-5)

568 Graduate Studies in Forest Economics (1-5)

DOWDLE, WAGGENER

570 Graduate Studies in Forest Products (1-5)

ALLAN, BRYANT, ERICKSON, GARDNER, HRUTFIORD, JAYNE, LENEY, THOMAS, SARKANEN

QUANTITATIVE SCIENCE

Courses for Undergraduates

Administered by the College of Fisheries and the College of Forest Resources.

APPLIED STATISTICS

281 Elements of Statistical Method (5) AWSp

THORSLUND

Elementary concepts of probability. Binomial and normal distributions. Basic concepts of testing hypotheses and estimation. Chi-square tests. Linear regression theory. Applications of these methods primarily to biological problems. Equivalent to Mathematics 281. Prerequisite, Mathematics 105.

381 Elements of Statistical Design and Analysis (3) A

TURNBULL

Review of basic concepts; analysis of variance; classical designs, randomization, controls, randomized blocks, Latin squares, regression, and covariance. (Formerly Forest Resources 495 and Quantitative Science 485) Prerequisite, 281 or permission.

382, 383 Statistical Inference in Applied Research (5,5) AW, WSp

CHAPMAN

Analysis of variance and covariance; chi-square tests; multiple and curvi-linear regression; sampling theory; discrete distributions; experimental design and power of tests. Application to biological problems. Use of computer programs in standard statistical problems. (Formerly Mathematics 382, 383.) Prerequisites, 281 or 381 and 291 or Mathematics 124 or permission for 382; 382 for 383.

486 Experimental Design (3) A

CHAPMAN

Topics in analysis of variance and experimental designs: choice of designs, comparison of efficiency, power, sample size, use of computer for standard analyses. (Formerly Mathematics 486.) Prerequisite, 383 or Mathematics 485.

APPLIED MATHEMATICS, OPERATIONS RESEARCH

291, 292 Analysis for Biologists (3,3) W, Sp

CHAPMAN

Differentiation; integration including multiple integrals and partial derivatives. Numerical and computing techniques in analysis. Emphasis on biological problems, particularly in ecology. Prerequisites, Mathematics 105 for 291; 291 or Mathematics 124 for 292.

391 Introduction to Matrices and Their Applications (3) W

Elementary concepts of matrices and matrix operations; use of computer in inverting matrices, solving systems of equations and other matrix operations; applications in operations research and biology. Prerequisites, 281 and 292 or Mathematics 125, or permission.

392 Techniques of Applied Mathematics in Biology (3) Sp

Methods of approximation including series

INTERDISCIPLINARY GRADUATE DEGREE PROGRAM

approximations; solution of nonlinear equations by numerical methods; introduction to differential equations. Applications to biology. Prerequisites, 292 or Mathematics 126, or permission.

396 Operations Research in Resource Utilization I (3) W

BARE

Introduction to fundamental concepts of operations research and the application of these tools in examining, defining, analyzing, and solving complex problems of resource management and resource-product manufacturing. Emphasis is placed on mathematical programming, network analysis, and decision theory. Prerequisites, 281 or 381, 291 or Mathematics 124, or permission.

491 Systems Analysis in Resource Management (4) A

ROTHSCHILD

Nature of systems; systems goals and objectives; models; transformation of inputs to outputs; control systems; information; survey of methods of optimization; general systems; comparative systems; fishing systems; design and analysis of actual systems. Prerequisite, Mathematics 124.

496 Operations Research in Resource Utilization II (3) Sp

BARE

Introduction to additional tools of operations research, particularly inventory models, waiting-line models, dynamic programming, Markov chains, and simulation. Application of these techniques to management and control of natural resources or in resource-product manufacturing. Prerequisite, 396.

WILDLIFE SCIENCES

401 Wildlife Biology (5) A

TABER

The relationships of the animal and its environment: the biotic community, climate as an environmental factor, cover requirements, food and nutrition, water requirements, mobility and local adaptation in birds and mammals. Properties (characteristics) of wildlife populations: population dynamics, sex and age structure of the population, social structure of the population, reproduction, mortality and dispersal, predation, parasites and disease, introduced populations, and cyclic populations. Prerequisite, permission.

402 Wildlife and Man (5) W

TABER

Human customs, attitudes, and institutions with regard to wild bird and mammal populations. Economics of wildlife populations. Governmental administration and custodianship of wildlife. Frictional relationships between human and wildlife populations (crop damage, public health). Prerequisite, 401 or permission.

403 Wildlife and Land Use (5) Sp

TABER

Review of natural habitats and faunas. Wildlife diversity and abundance in relation to range management, forest management, agricultural land management, wetlands; and in relation to human population growth and engineering developments (cities, highways, airports, dams, etc.), wildlife diversity and development. Prerequisite, 401, 402, or permission.

INTERDISCIPLINARY GRADUATE DEGREE PROGRAM

COMPUTER SCIENCE

470 Design of Digital Data Systems (4) A

Fundamental gating circuits are developed into large logic gating structures. The use of these structures in the design of central processing units, memories, and peripheral equipment is illustrated. Course for majors in Computer Science. Offered jointly with the Department of Electrical Engineering as Electrical Engineering 470. Permission of instructor.

478 Computer Organization and Machine Language Programming (4) ASp

Differences and similarities in computer structure. Flow of control. Instruction codes and their execution for arithmetic, logical, character manipulation, and input-output operations. Indexing and indirect addressing; subroutine linkage. Study of information representations and their relationship to processing techniques. Offered jointly with the Department of Electrical Engineering as Electrical Engineering 478. Prerequisites, General Engineering 115 or equivalent and Assembly Language Programming.

501 Programming Languages and Systems I (3) W

Discussion of computer languages: machine language, assembly language, problem-oriented languages. Manipulation of symbols and strings. Formal definition of computer languages. Offered jointly with the Department of Electrical Engineering as Electrical Engineering 501. Prerequisite, 478 or permission.

502 Programming Languages and Systems II (3) Sp

Basic concepts and design of interpreters, assemblers, compilers, and operating systems for digital computers. Offered jointly with the Department of Electrical Engineering as Electrical Engineering 502. Prerequisite, 501.

508 Representation and Handling of Data Structures (3) W

Linear lists (stacks, queues, deques): sequential and linked allocation. Circular and doubly-linked lists. Trees, binary trees and threaded lists: traversal algorithms—analysis of flowcharts—path length on trees. Garbage collection. Dynamic storage allocation. Transferring algorithms. Data management on external media. Prerequisite, 478 or consent of the instructor.

510 List Processing and String Manipulation (3) Sp

Structure of information sets which reflect the syntactic or semantic relationships in the information. The generation and processing of structures such as lists and trees. Generalized information systems. Pattern recognition and manipulation of symbolic strings. Markov algorithms. Algebraic symbol-manipulation processes. Syntax, semantics, and use of recent versions of languages such as LISP, FORMULA-ALGOL, SNOBOL, and FOR-MAC. Prerequisite, 501 or permission.

520 Computer Science Seminar (1, max. 3) AWSp

Weekly discussion by students and faculty or visitors on topics of current interest. Must be

taken by all graduate students for three quarters.

531 Automata Theory I (3) W

Finite, probabilistic, growing, and reproducing automata. Representation of automata by state graphs, regular expressions, logical nets, recursive functions, Turing machines. Prerequisite, Mathematics 305.

532 Automata Theory II (3) Sp

Continuation of 531. Prerequisite, 531, Mathematics 403, and Mathematics 405 concurrently.

541 Computer Measurements and Evaluation Techniques (3) W

Viewpoints, problems, and techniques in assessment of computer systems and subsystems. Selection of models, analysis, simulation, and instrumentation, with problem assignments making use of computers available on campus. Prerequisites, 478, Electrical Engineering 478, or permission.

551 Operating Systems (3) A

Description of design of operating requirements and design criteria for batch processing, real time, and time-sharing systems. Practical exercises and illustrations using Computer Science Teaching Laboratory. Prerequisite, 502 or permission.

552 Systems Programming Practicum (3) WSp

Designed to give students experience in implementation of computer software for controlling equipment allocation, e.g., operating systems. Students must enroll for two quarters. A systems project will be selected, designed, and implemented using the Computer Science Teaching Laboratory equipment. Prerequisites, 551 and permission.

573 Artificial Intelligence I (3) A

Introduction to the use of the computer in non-numerical problem solving. Survey of theorem proving, symbol manipulating, pattern recognition, and inductive problem-solving techniques. Computer models of human thought. Prerequisite, 478.

574 Artificial Intelligence II (3) W

Continuation of studies of artificial intelligence systems, emphasizing theorem proving, symbolic problem solving, pattern recognition, and natural language data processing. Students will be required to do projects. Prerequisite, 573 or permission of instructor.

590 Special Topics in Computer Science (*) AWSp

Lectures and discussions of current interest in Computer Science. May not be offered every quarter; content may vary from one offering to another. May be repeated for credit. Prerequisite, permission.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

SCHOOL OF LAW

400 Contracts (8) AWSp

CORKER, COSWAY, RIEKE

Principles that regulate the creation, operation, and extinguishment of the legal relation known as contract. The major subdivisions

covered are mutual assent, consideration, conditions (express and constructive), performance, breach, damages, discharge, assignment, and beneficiaries. More limited coverage is accorded interpretation, the parol evidence rule, the statute of frauds and illegality.

410 Civil Procedure (5) AW

MEISENHOLDER, TRAUTMAN

Fundamentals of procedure prior to trial in civil litigation. The major subdivisions include jurisdiction of courts, venue, commencement of actions, pleading, discovery and other pre-trial devices, and parties. The effect of former adjudication may be discussed.

416 Legal Research and Analysis (5) AWSp

CROOKS, LYNESS, ROMBAUER

An integrated introduction to analysis, research, and legal writing. In the orientation phase, how to study law, including briefing, basic decision analysis, synthesis of decisions, and problem solving are discussed. The next phase continues a more intensive introduction to basic research tools through instruction in legal bibliography. Students integrate their research, analysis, problem solving, and writing skills through preparation of office memoranda or exercises in drafting or preparation of memoranda for lower courts. In the final phase, students prepare appellate briefs and argue orally before a moot appellate court.

420 Criminal Law and Procedure (6) AW

JUNKER, RODGERS

Definitions of principal crimes and defenses to criminal prosecution, both common law and statutory, along with a critique of these definitions in light of the actual roles and goals of criminal law processes in a democratic society. Constitutional problems of criminal procedure are discussed.

430 Property I (8) AWSp

CROSS, PROSTERMAN, STOEUBUCK

Ownership and transfer of realty and personality. The course analyzes the legal relationship of persons to things, from both a historical and a contemporary point of view. Specific subjects included are bailments, fixtures, gifts, leases, real estate contracts, deeds, the recording system, title insurance, and transfers of personal and real property. There is also a brief introduction to the law of nuisance and water rights.

440 Torts (8) AWSp

GRAHAM, HERMANN, MARTIN, PECK

Liability for civil injuries arising from the intentional and unintentional interference with personal and property interests.

441 Land-Use Planning (3) Sp

HUNT, STOEUBUCK

The process of land-use planning with emphasis on its legislative and administrative aspects. The primary thrust is to introduce the first-year student to statutory and administrative law. Attention is devoted to intensive analyses of state enabling acts, selected zoning ordinances, and rules and regulations thereunder. Brief attention is given to judicial controls and to private law devices to control land development.

504 Poverty and the Legal Process (3) Sp

An intensive analysis of eight or nine doctrinal areas in which the law's response (or non-response) to poverty is especially instructive from the general standpoint of legal process.

SECOND- AND THIRD-YEAR ELECTIVES

500 Administrative Law IV (4) A

PECK

Administrative process and its role in the legal system. Because the administrative process involves action which is susceptible of characterization as executive, legislative, and judicial, a considerable portion of the course involves a study of the relationship of administrative agencies with these more traditional departments of government. Both formal and informal administrative procedures are examined.

501 Administrative Law III (3) Sp

ANDERSEN

A shorter version of Law 500.

503 Associations I (3) W

TUNKS

Introduction to law relating to association in business and its nonprofit analogues through agency, partnership, other unincorporated forms, and corporations. Emphasis throughout will be upon the legal, financial, and tax factors bearing upon the type of structure to be selected for group activity. Basic principles concerning operation of agency and partnership relationships will be considered along with an introduction to related corporate law doctrines, all in the context of both profit and nonprofit activities. Complete in itself, this course can also serve as a foundation for further study in such areas as business organization. Not open to students who have taken Law 503, Agency and Partnership.

505 Corporations V (5) W

CHISUM

Promotion, organization, and financing of business corporations. Examination is made of how and by whom corporations act, with emphasis on management and shareholder roles in corporate government, insiders' duties, devices for separating control from ownership, shareholders' individual and derivative suits, and issuance of shares, including a brief survey of securities regulation.

506 Corporations IV (4) A

HJORTH

A shorter version of Law 505.

507 Business Planning (6) AW

KUMMERT

Advanced work in corporations and federal taxation in the context of business planning and counseling. Examination will be made of a series of problems involving common business transactions and presenting corporate and tax issues for analysis and resolution. The problems covered include such topics as the formation of corporations, both closely held and publicly owned, stock redemption, the sale and purchase of businesses, mergers and other forms of acquisition, and recapitalization, division and dissolution of corporations. Prerequisite, Law 505 or 506. Students normally should complete Law 530 before taking Law 507. With permission of the instructor, however, students may take the necessary tax course concurrently with Law 507.

508 Securities Regulation (3) W

HUNT

Legal controls over the issuance and distribution of corporate securities with primary emphasis on federal regulation: registration and distribution under the Securities Act of 1933; regulation of trading under the Securities and Exchange Act of 1934; regulation of

investment companies under the Investment Company Act of 1940; regulation under state Blue Sky laws. Prerequisite, Law 505 or 506.

509 Federal Courts and the Federal System (4) A

CHISUM

A study of the role of the federal courts in the operation of the federal system. The course is planned as an advanced course in public law and judicial administration, presupposing a foundation in both constitutional law and administrative law. It is concerned with the relations of the federal courts both with other branches of the federal government and with state courts and state governments. In the study of federal-state relationships there are two major themes: problems of the allocation of jurisdiction as between state and federal courts, and the distinct problems of allocation of authority as between state and federal law. The course is intended to give a working knowledge of the rules governing access to the federal courts and to the state courts in federal matters, of the powers under federal law of both sets of courts, and of significant practices characteristic of federal judicial administration. Its principal emphasis, however, is upon the central problems of legal statesmanship in the delimitation of the powers of government with which the federal courts have been and are confronted.

516 Commercial Transactions V (5)

Section A, AW; Section B, WSp

COSWAY, SMITH

Payment, financing, and other problems in the distribution of merchandise. Sale, transportation, and storage of goods, as well as commercial paper, including notes, drafts, and checks, are studied. Emphasis is given the Uniform Commercial Code.

520 Constitutional Law VIII (8)

Section A, AW; Section B, WSp

FLETCHER, MORRIS

Principles of constitutional law under the United States Constitution as they relate to the scope of and limitations on the powers of state and national governments in dealing with matters of life, liberty, and property. Federal-state relationships and the constitutional role of the courts are also analyzed.

521 Legal Accounting (3) A

HEATH

This course includes a critical examination of selected issues illustrating generally accepted accounting principles and an introduction to corporate financial problems. After an introduction to financial statements and bookkeeping, consideration will be given to the principles governing recognition of income, the matching of costs with appropriate revenues (with particular stress on inventory and depreciation accounting), and accounting for such proprietary transactions as repurchase of stock, stock dividends, and quasi-reorganization. Emphasis throughout will be laid on the legal contexts in which the lawyer is likely to confront accounting problems.

522 Nonlegal Decision Theory (4) Sp

KUMMERT, MEIER

An introduction to problem-solving methods (principally quantitative) currently used in other disciplines that have relevance to the legal-policy-decision process. In a separate laboratory accompanying the course, students will be introduced to computer operation and programming. Among the various methods to be surveyed, will be systems analysis, sampling,

correlation and regression analysis, linear programming, nonlinear optimizing, heuristics, simulation, operational gaming, scenarios, and future prediction. A paper covering a two-quarter project will be required. The course assumes no exposure to college mathematics courses.

525 Equitable Remedies IV (4) Sp
RODGERS

Basic substantive and procedural rules developed and applied in equity, including specific performance and reformation of contracts, desegregation of public schools, and injunctions against proceedings in another jurisdiction will be considered. Particular emphasis will be placed on issues arising out of the formulation, modification, and enforcement of an equitable decree. Procedural devices developed in equity for managing multiparty litigation (such as interpleader, intervention, and class suits) and for hastening the determination of rights (such as an injunction to settle the validity of projected governmental action) will also be considered.

526 Equitable Remedies III (3) Sp
ROMBAUER

An introduction to the basic equitable remedies— injunctions, specific performance, reformation, cancellation, and specific restitution—and to the federal and Washington rules governing availability and enforcement of these remedies. History, basic rules, and guiding considerations will be surveyed through textual materials; some persisting and current problem areas and areas wherein the Washington court has taken distinctive positions will be examined in depth through study of opinions and representative problems; a comprehensive problem will be used to examine the obtaining and actual working of each of the remedies.

527 Intellectual Property (3) W
DOI

A study of the patent and copyright systems, both domestically and internationally, with comparison being made with systems in other countries. All major forms of intellectual property will be discussed.

530 Federal Income Taxation V (5) AW
TUNKS

A study of the nature of gross income; business and personal deductions; income splitting and income averaging devices and their effect; and capital gains and losses. Though concerned primarily with the individual as taxpayer, taxation of trusts, partnerships, corporations, and other juristic entities are also considered. Tax policy questions are discussed throughout.

531 Federal Income Taxation III (3) Sp
HUSTON

A survey of the basic structure of federal income taxation undertaken in the context of planning personal and commercial transactions of individual taxpayers. Matters considered: items of income, transactions concerning capital assets, deductions, tax accounting, indirect and deferred compensation for services, family transactions, elementary business transactions, and special tax problems of creative persons and investors.

535 Property II (8) WSp
FLETCHER, PRICE

Problems of voluntary disposition of assets, primarily through wills and trusts. Attention is

paid to disposition by will, creation of and disposition by a trust, and the effectiveness of the disposition in the creation of present and future interests in property. Some consideration is given to alternative methods of wealth transmission and to the basic tax framework important in formulating plans of disposition.

538 Personal Property Security (3) A
SHATTUCK

This is a course concerned with all aspects of security in personal property. ("Personal property" includes everything except land.) Covered are problems and legal principles relevant to the creation of the security interest, to its perfection, to priorities between competing security interests and between a security interest and other kinds of property interest, to payment and redemption, and to realization procedures. Both the Uniform Commercial Code and the non-Code law are considered, with emphasis on the former.

539 Real Property Security (3) A
SHATTUCK

Methods by which an obligation may be secured by property of the obligor or of a third person. The course covers the common law principles and statutes that regulate the creation, operation, and extinguishment of the legal relations known as real property mortgage and deed of trust.

550 Admiralty (3) Sp

Admiralty jurisdiction, including its nature and sources, waters and subject matter within the jurisdiction, vessels subject to the jurisdiction, laws affecting maritime rights and obligations and problems of government vessels. In addition, coverage is given maritime liens, seamen's rights, carriage of goods, charter parties, salvage, general average and limitation of liability.

551 Community Property (3) W
CROSS

Dealing with all aspects of community property, including what constitutes community property as distinguished from separate property, how it may be acquired and disposed of, and the problems of conflict of laws encountered in transactions with common law jurisdictions. Washington cases constitute nearly all of the course material.

552 Comparative Law (3)
DOI

Workings of the civil law system to enable lawyers trained in the common law to recognize and analyze problems arising in a different system and to work with civil lawyers in the solution of such problems. Included is a comparative study of specific problems as handled under the common law and under one or more civil law systems, with particular emphasis on the German and Russian systems.

553 Conflicts of Laws VI (6) AW
TRAUTMAN

Problems arising when one or more fact elements in a case occur in a jurisdiction other than the forum. The course involves the study of that part of the law which determines before the courts of what state or nation a suit may be brought and by the law of what state or nation a suit may or should be decided.

555 Creditor-Debtor Law (4) W
SMITH

Principal rights and remedies of unsecured

creditors, individually and collectively. Among matters discussed are judgments and judgment liens, executions, attachments, garnishments, fraudulent conveyances, compositions, assignments for the benefit of creditors, and debtors' exemptions. Bankruptcy emphasized.

556 Criminal Procedure (3) Sp
JUNKER

State and federal rules of criminal procedure, including the constitutionally derived procedural rights of those accused of crime.

557 Economic Analysis for Lawyers (3) Sp
MC GEE

An introduction to basic economic concepts and analysis as they bear on policy questions commonly confronted by lawyers. In addition to the obvious implications of economic considerations in fields such as antitrust, labor, taxation, regulated industries, and natural resources, economic considerations bear heavily on policy questions arising in contracts, torts, property, urban planning, and most other legal subjects. This course is designed to provide an introduction to especially relevant economic principles, concepts, and skills to serve as a basis for subsequent work in any of these areas.

558 Death and Gift Taxation (3) W
HUSTON

Federal and state death and gift tax systems. The major subdivisions covered include basic application of death and gift taxes, transfers subject to both, and the application of death and gift taxes to joint interests, community property, and life insurance. Territorial jurisdiction to impose these taxes is considered as are the various components of the tax liability and the valuation for tax purposes of property transferred.

559 Domestic Relations (3) W
RIEKE

Law pertaining to marriage, protection of the marital relation, disintegration of the family relation, divorce, adoption, and the juvenile court. Washington law is emphasized, with comparisons being made to the law of other jurisdictions. Consideration is also given to such related conflict of laws problems as jurisdiction, procedure, costs, alimony, support, property division, custody, and modification of orders and their enforcement.

560 Estate Planning Workshop (3) WSp

Techniques of planning and implementing dispositive arrangements, effective during lifetime or at death, of properties and other rights possessed or controlled by an individual. The course attempts to interrelate and integrate principles of trusts, insurance, income tax, gift and death taxes, wills, fiduciary administration, property (real and personal), and accounting in the effectuation of dispositive arrangements. Prerequisites, Law 535 and 558.

561 Evidence (5) A
MARTIN

Scope and function of rules of evidence analyzed in the context of trial practice. Major problems covered include examination of witnesses, admission and exclusion of evidence, competency of witnesses, privilege, relevancy, demonstrative evidence, hearsay and its exceptions, authentication of writings and the best evidence rule, burden of proof and presumptions, judicial notice and the parol evidence rule. Emphasis throughout is laid on trial evidence and trial problems.

563 Government Regulation of Business (5) AW
RODDIS

Regulation of restraints of trade and monopolies resulting from mergers or consolidations, contracts, conspiracies or combinations between individuals, trade associations, or other groups. Common law regulation is surveyed both as an independent set of rules and as a background to current legislation. The course deals especially with the Sherman Act, Clayton Act, and Federal Trade Commission Act, with attention to some other legislation. Particular emphasis is given to preservation of price competition.

564 Insurance (3) W
RODDIS

Aspects of insurance law most commonly encountered by attorneys, with particular emphasis on life, fire, and casualty insurance problems. More specifically, the course examines federal and state control of insurance; insurable interests, third party interests, amount of recovery and subrogation as they relate to property and liability insurance; insurable interests, rights and interests of beneficiaries, community property problems, and double indemnity in the life insurance area. The selection and control of risks and the marketing of insurance are also examined.

565 International Transactions (3) Sp
PROSTERMAN

Legal problems of investment and trading abroad. Examines the impact on typical foreign investment or export transactions of selected foreign and U.S. laws, and international treaties, concerning form and powers of business enterprises abroad, patent licensing, trade restraints, discrimination against aliens, taxation, and investment guarantees. Emphasis is on preventive counseling in putting together the integrated transaction rather than on vindicating the arrangements in court.

566 Jurisprudence and Legal Philosophy (4) AW
MORRIS

An examination of some, but not all, of the major jurisprudential issues will be undertaken. For example, it is possible that the inquiry might focus on any one, or several, of the following problems and their subcategories: the definition of law, the concept of justice, the problem of responsibility, the relation of law and morality, the function of legal analysis, the nature and function of rules, the difference between legal and other rules, the nature of reasoning for legal rules, the concept of a legal "system," the concepts of precedent and *stare decisis*, the notion of *ratio decidendi*, or any other basic legal concept. While a final examination is not excluded, a paper involving substantial effort is required. Materials to be announced.

567 Labor Law (3) W
PECK

Labor problems preceding the establishment of a collective bargaining relationship. More specifically, the course is concerned with the relationship of the individual employee with the union, and the organizational rights of the employee and the union. Included is a coverage of the economic weapons available to parties to labor disputes. Since this background provides the basis for understanding the bargaining process in which the parties engage, it is desirable that this course be taken by students who plan to take Law 568.

It is also recommended that students taking this course first take either Law 500 or 501.

568 Labor Relations (3) Sp
PECK

Processes of collective bargaining. Included is a coverage of the statutory duty to bargain and problems which arise under specific contract clauses. Administration of the contract is also the subject of intensive investigation. Because an understanding of the limitations on the economic weapons available gives meaning to the bargaining processes, it is desirable that students taking this course have taken Law 567 and recommended that they take either Law 500 or 501.

569 Professional Responsibility (1) Sp
HUNT

Selected problems illustrative of the responsibilities of members of the legal profession: admission to the bar and the integrated bar; building a law practice; unauthorized practice of the law; decision to represent the unpopular defendant; relationship between lawyer and judge, legislator, and administrator; lawyer's fiduciary relation; the attorney-client privilege; conflict of interest; fees and remuneration; public responsibilities of the lawyer; the lawyer and the poor.

570 Legislation (3) W
JOHNSON

Characteristics of the legislative process. The objectives of the course are to delineate the uses and functions of statutory law, acquaint students with legislative procedures and controls under which legislative bodies operate, examine different types and parts of legislation and the judicially-developed principles and rules applicable thereto, and review judicial techniques of interpretation.

571 Local Government Law (3) A
TRAUTMAN

Legal problems encountered in the conduct of government at the local level, i.e., cities, counties, and school districts and other specialized local units of government. The course examines legislative control over municipal corporation and municipal powers, both generally, and more specially in the areas of land use, contracting, property, and bonding. Municipal tort liability is also discussed.

574 Natural Resources (3) A
JOHNSON

Legal problems of water use, timber transactions, and mining operations (including federal land management). In the water law area, the major subdivisions covered are riparian and appropriation systems, evolution of administrative control, changing relationship of local, state and federal governments, interstate compacts, international law as applied to waters shared by the United States, Canada, and Mexico, and commercial and sport fishing. Timber transactions in standing timber are examined. In the mining area, study is given federal and state laws concerning the location of placer and lode mining claims in the Western states and the effect of these laws on the management of federal lands. Other aspects of federal land managements are also discussed.

577 State and Local Taxes (3) Sp
HUSTON

State- and locally-levied taxes, with emphasis on sales, use, and business excise taxes. Also considered are certain constitutional problems common to all such taxes. Each student is

required to do independent research and to present an oral and written report on an assigned topic relating to one of the common types of state- or locally-levied taxes.

579 Suretyship (3) A
SHATTUCK

Methods by which an obligation may be secured by the promise of a third person. The course covers the common law principles and statutes which regulate the creation, operation, and extinguishment of the legal relations known as suretyship, guaranty, accommodation paper, and accommodation contracts on negotiable paper. (Not covered are several types of bond typically written by professional corporate bondsmen, particularly court, fidelity, construction, and supply bonds. Bail bonds are also excluded.)

580 Trial and Appellate Practice (5) WSp
PRICE

Washington statutes, rules and decisions governing various aspects of the trial and appeal of cases. Within the available time, the course attempts to provide information and training in the how-to-do-it of trial practice. A required part of the course is the conduct of an actual case before a judge from the local superior courts. The emphasis throughout is on the example of Washington procedure and only limited consideration is given federal practice.

581 Estate and Trust Administration (3) A
FLETCHER

The office of the fiduciary in administering estates in probate and estates in trust, including: (a) the necessity and function of the probate proceeding and the mechanism for proof and contest of wills; (b) the nature of the fiduciary office as to selection, qualification, and removal of the fiduciary, his duties and standards of behavior; (c) briefly, the nature of the Washington nonintervention executorship; (d) the powers of the fiduciary and problems encountered in management, particularly with respect to income-producing property, successive beneficiaries, and allocation of tax burdens; and (e) certain construction problems in determining beneficiaries and making distribution. Prerequisite, Law 535 which may be taken concurrently.

584 International Legal Organizations (3) AW

Understanding the roles of such organizations as the United Nations, including some of its specialized agencies, and other selected organizations with legal impact established by two or more national states. This course does not, however, comprehend the study of the common market.

585 Problems in Evidence (4) W
MEISENHOLDER

A short course in evidence for students intending to concentrate in other areas. The major subdivisions covered are examination of witnesses (direct examination, cross examination, and impeachment), opinion rule, hearsay rule, introduction of documents in evidence, and the best evidence rule. Other topics are covered as time permits.

586 International Legal Order (3) Sp
PROSTERMAN

International law and process of decision; recognition and diplomatic intercourse; allocation of international resources; agreements between states; jurisdiction.

588 Workshop in Land-Use Planning Law (3) A

HUNT

A workshop in selected problems of land-use controls, with specific reference to planning, zoning, and subdivision regulations. The emphasis is on the interrelationship of the respective roles of lawyer and planner in the planning process. Certain concepts, problems, practices, and procedures will be discussed in depth, and several short written memoranda will be required. Open to second- and third-year law students and to candidates for a graduate degree in Urban Planning. Enrollment limited at the discretion of the instructor.

590 Corporate Income Tax (3) Sp

KUMMERT

A study of the tax consequences of conducting business in corporate form, with consideration of such items as the formation of corporations; distributions of dividends; complete and partial liquidations; stock redemptions; stock dividends; and corporate acquisitions, divisions, and reorganizations. Special problems arising from distorted capital structures and unreasonable accumulations of earnings, and special treatment of personal holding companies, collapsible corporations, and corporations electing to be taxed as partnerships are also discussed.

592 Chinese Law and Social Change (4) AW

This course is offered specifically for students with special interests in China. The course will focus on specific problems in the modernization of traditional Chinese legal institutions. Such problems as the relationship between customary law and positive law, the nature of civil and criminal law, will be investigated. A final paper will be required. The course will be available to both law students and other graduate students. Proficiency in the Chinese language is useful but not required.

593 Social Legislation (3) Sp

SMITH

Primary emphasis will be placed on Workmen's Compensation (Industrial Insurance), where some of the basic problems of work-connected injuries and disease will be considered. In addition, major problems in the law of Social Security, Unemployment Compensation, and Wage and Hour legislation will be considered.

594 Transnational Tax (3) Sp

HJORTH

United States taxation of foreign income and tax treaties; concerned mainly with tax problems of American investors and businessmen who have investments, other income producing property, and business operations abroad. Prerequisite, Law 530 or Law 531.

595 Introduction to Japanese Law (3) W

HENDERSON

The topics will be those deemed most useful to American lawyers seeking a career specialty: brief history of Japanese law, and reception of western law; constitutional framework, with emphasis on the judicial power and courts; the training and roles of the bench and bar; elements of the Japanese codes as a system with emphasis on the Code of Civil Procedure, Civil Code, and Commercial Code and the relationship between them and between these general codes and the vast bulk of special

statutes. Enrollment limited at the discretion of the instructor.* No Japanese language requirement.

600 Independent Study or Research (1-6) AWSp

Qualified students, with the consent of a member of the law faculty and the Dean, receive from 1 to 6 credits for individual research in any of the major fields covered by the curriculum.

611 Business Planning Seminar (6) AWSp

KUMMERT

An intensive examination of selected problems in business planning from the standpoint of business consequences and corporation, securities regulations, and tax law. Students will be required to do extended research on a subject affording an opportunity for creative analysis and will be expected to present their analyses, at various stages, to the seminar. Enrollment is limited to eight. Prerequisites, Law 505 or 506, Law 530 and either Law 507 or Law 590. With permission of the instructor, students may take the seminar without meeting the full list of prerequisites.

612 Conflict of Laws Seminar (4) WSp

TRAUTMAN

Selected current problems in conflict of laws. Topics that may be studied include jurisdiction of courts, recognition of foreign judgments, the influence of federal law and the federal courts, and choice of law in torts, contracts, workmen's compensation, taxation, property, administration of estates, domestic relations, and business activities. Independent research projects are required of all students. Enrollment limited to eight. Prerequisite, Law 553, which may be taken concurrently.

613 Corporate Planning and Counseling Seminar (6) AWSp

CHISUM

This seminar will deal with a number of aspects of corporation law and practice, including financing corporations through the use of various forms of stock or debt, and problems of valuing a corporate enterprise; mergers, purchases, and sale of business and other fundamental corporate changes with consideration of the position of stockholders in such changes; various aspects of corporate control, including devices to protect control, and some of the tactical problems of contests for control; and corporate dividends and stock redemptions. The approach to problems in the seminar will emphasize the role and responsibility of the lawyer in planning, counseling, and negotiation. A substantial, written paper will be required.

614 Criminal Procedure Seminar (6) AWSp

JUNKER

A critical study of the criminal law processes at various stages from detention to appeal, including a study of state and federal rules of criminal procedure, and the constitutionally derived procedural rights of persons accused of crime. Consideration will be given to proposals for pretrial reform, including the American Law Institute's proposed Model Pre-Arraignment Code. Possibilities for research will include field studies of "low visibility" practices and studies of the procedure in "quasi-criminal" proceedings involving juveniles, parolees and probationers, and alleged mental incompetents. Prerequisites, Law 556, Criminal Procedure, and Law 520, Constitutional Law. Enrollment limited to eight.

615 Indian Legal Problems Seminar (6) AWSp

JOHNSON

Students in this seminar may choose topics for research that concern Indian tribal laws, conflicts of laws between Indian and non-Indian laws, federal laws concerning Indians, or state laws concerning Indians. A major piece of research and writing will be required.

616 Federal Court Seminar (6) AWSp

MEISENHOLDER

Selected topics in the structure, function, and power of federal courts. Problems not covered in depth in federal courts and the federal system will be considered. Primary emphasis will be placed upon individual research in the production of a written paper. Enrollment limited to eight third-year students. Prerequisite, Law 509, Federal Courts and the Federal System, which may be taken concurrently. Other students are eligible at the discretion of the instructor.

617 Federal Tax Policy Seminar (6) AWSp

HJORTH

An intensive examination of the substance of limited areas of federal tax law and the policy underlying that law. Different aspects of federal tax law, such as the tax treatment of exempt organizations, taxation of capital gains, problems of income splitting, etc., will be considered each year. The seminar will focus upon individual research and writing, and upon the mutual examination and discussion of the research efforts of the group. Prerequisite, Law 530. Enrollment limited to six third-year students.

618 Government Regulation of Business Seminar (6)

This seminar, open only to third-year students, will emphasize development of techniques of factual and economic analysis, and formulation of broader policy guidelines, in particular antitrust areas, which will vary from year to year. The focus was on "structural" problems: one-firm monopolization, oligopoly, and mergers or consolidations. A high-quality paper is required. Prerequisite, Law 563, Government Regulation of Business, which may be taken concurrently with permission of the instructor. Enrollment limited to eight.

619 Insurance Seminar (6) AWSp

RODDIS

A detailed examination of some of the more complex and difficult problems raised in Law 564. Independent research and reports, culminating in an extensive paper, are required. Enrollment limited to eight second- and third-year students. Prerequisite, Law 564.

621 Legal History Seminar (6)

The growth and alteration of selected rules and legal institutions in the light of social, economic, technological, and other developments, with emphasis on common law history except in the case of students especially equipped by competence in foreign languages and/or other background to study such developments in Roman, civil, or other legal systems. Enrollment limited to eight.

622 Consumer Protection Seminar (6) AWSp

SMITH

This seminar will examine selected problems in consumer protection, including those arising

* In courses where class enrollment is limited, the instructor chooses those who may enroll.

from the use of consumer credit, the dissemination of credit information, fraudulent and deceptive practices, and those related to health and safety protection. Consideration will be given to methods of providing protection, such as existing legislation, the proposed Uniform Consumer Credit Code, and consumer education. Each student will be expected to produce a high-quality paper.

623 Natural Resources Seminar (6) AWSp

CORKER

Selected legal problems relating to water resources. Emphasis will be on policy, administration, litigation, and problems connected with federal reclamation law, focusing particularly on the excess land law (often referred to as the "160-acre limitation"). Enrollment limited to six students and open to second-year students with permission of the instructor. (Not offered 1968-69.)

624 Ocean Resources Seminar (6) AWSp

BURKE

International law of the high seas, concerned with fisheries, mineral, and other resources of the continental shelf, navigation, and territorial waters; treaty law and the law of international organizations as they relate to the resources of the sea. Special attention will be paid to the four Conventions concerning the use of the high seas adopted at the Geneva Law of the Sea Conference of 1958. Enrollment limited to eight and open to second-year students with permission of instructor.

625 Political and Civil Rights in The United States Seminar (6) AWSp

MORRIS

Concentrates upon the basic problems inhering in the relationship of the individual to authority and in the protection of the rights of minority groups. Current problems, as illustrated by recent or pending Supreme Court cases, will be emphasized. Students will be required to do substantial amounts of in-depth research, including, but not limited to, an isolation of the history of the doctrines involved, their relations to intellectual endeavor in related areas, and an exploration of alternative, competing solutions to modern problems. The seminar will run throughout the year, but there will be times of recess to facilitate student preparation of a high-quality paper which, in turn, will be thoroughly discussed by the seminar group, plus rewriting(s). Enrollment is limited to eight second- or third-year students, with permission of the instructor.

626 Regulated Industries Seminar (6) AWSp

ANDERSEN

A year-long research seminar in the area of government regulation of major industries through administrative agencies. Problems include those involved in rate-making, entry control, and regulation of service adequacy. In 1969-70 the seminar will focus on that part of the transportation business that especially concerns the urban society. This will comprehend problems of orthodox transport regulation that have special urban relevance (e.g., railroad passenger service discontinuance) as well as problems arising from the creation of new forms of transport for urban areas (e.g., mass transit). The goal of the seminar is a set of fully cross-critiqued research products of publishable quality on current topics in the area. Prerequisites, Law 500 or 501, and 521 or equivalent. Enrollment limited to six third-year students.

627 Selected Problems on Environmental Protection Seminar (6) AWSp

RODGERS

This seminar will examine legal problems resulting from impairment of the environment by technological advances and urban growth. Various issues, including air and water pollution, the use of pesticides, protection of wildlife, and transportation will be considered. Special emphasis will be placed upon examining the utility of litigation as an instrument for assuring protection of the environment. Pending cases will be examined. The current political and legal efforts of groups such as the Sierra Club and the Washington Environmental Council will also be considered. Experts in various fields will be invited to participate.

628 Urban Planning Law Seminar (6) AWSp

HUNT

Investigation and analysis of the lawyer's role in selected problems of an urban society: the impact of federal and state programs; revitalization of the central core; mass transportation and rapid transit; development and control of the suburban and outer fringes; recreational facilities and open space; technical and financial problems relating to housing, sanitation, and other urban services; location and relocation of commerce and industry; modification and development of governmental units. The primary objective will be the production by each student of a high-quality paper on a subject affording an opportunity for original and creative analysis. Enrollment limited to eight third-year students and those who have completed Law 571.

629 Private Land Development Seminar (6) AWSp

STOEBCUK

Focuses on problems encountered by a lawyer representing commercial developers of land. Primary attention will be given to problems incident to the development of a retail shopping center, but some time may be devoted to problems of the development of housing subdivisions. For about the first half of the meetings, those participating will meet as a class to discuss assigned readings; for the balance of the meetings, discussion will be of papers prepared by participants. A high-quality paper is required of each participant. Prerequisite, third-year students or second-year students with permission of the instructor. Enrollment is limited to ten.

630 Legislation Seminar (6) AWSp

JOHNSON

A review of the Washington Constitution and the possibilities for revision of that document. It will be limited to consideration of this constitution and to questions of constitutional revision. It will necessarily raise most of the questions under the heading of "State Constitutional Law." Should produce a set of papers useful to persons concerned with revision of this state's constitution.

631 Human Ecology Seminar (6) AWSp

RIEKE, SMITH

Deals with selected problems drawn from poverty, welfare, health, or correction programs. Emphasis will be placed upon the relation of a nonlegal social system and the legal system with respect to a specific problem (e.g., medicine and law related to alcoholism; social casework and law related to child abuse; parole board operation and law related to deviancy; community organization

and law related to "Model City" structure, etc.) in order to evaluate interaction. It is anticipated that students will work with materials from one discipline other than law. Students will be expected to develop the requisite personal contacts with professionals or students in such other discipline. Joint research with a graduate or professional student in another school would be welcomed.

Postgraduate Courses

548 United States-Japanese Tax Problems (4)

STAFF

This course is concerned with the operation of the income-tax laws of Japan on income earned in Japan by American nationals and on income earned in the United States by Japanese nationals; and with the operation of the income-tax laws of the United States on income earned in the United States by Japanese nationals, and on income earned in Japan by American nationals. A series of problems based on transnational business transactions will be solved by individual students, whose solutions will be scrutinized by the class.

549 United States-Japanese Administrative Law Problems (3)

STAFF

This is a course concerned with selected administrative law problems, discussed comparatively in terms of Japanese and United States law. Especially emphasized will be the legal principles that govern the procedural and decision-making aspects of the administrative process, the Japanese concept "administrative guidance," and the possibilities that gaps between theory and practice may exist.

596 Justiciability in United States-Japanese Transactions (4)

STAFF

Problems of justiciability in the transnational setting will be emphasized in order to obtain a realistic view of the potentials and limitations of litigation in the structuring of United States-Japanese business relations and in the solution of disputes arising therefrom; legal status of aliens and legal problems of threshold governmental approvals for foreign business; peculiarities of Japanese bureaucracy and its relationships with domestic and foreign business. Prerequisites, LL.B. or foreign equivalent, Japanese and English languages.

597 United States-Japanese Contracting Process (4)

STAFF

United States-Japanese contracts with emphasis on documents and case law related to sales, investment, and licensing. The Japanese approach will be presented through Japanese cases and treaties with contrasts from, and cross references to, American materials. Prerequisite, Law 596.

598 United States-Japanese Corporate Relations (4)

STAFF

Corporate law problems with emphasis on transpacific business planning, and United States-parent, Japanese-subsidary problems. Prerequisites, Law 596, 597.

620 Tutorial in Japanese Law (6)

HENDERSON AND STAFF

A seminar in Japanese law centered around critical problems in U.S.-Japanese business. Students with a competence in Japanese will be given an opportunity to use Japanese sources. Additional problems will be presented

in which the Japanese position has been clarified in English and non-Japanese-speaking students will be expected to do research in these areas. Joint research and coauthoring may be arranged with Japanese lawyers for appropriate comparative projects. Topics will be fixed early in Autumn Quarter by individual consultations, and outlines will be discussed by the group. Research reports will be distributed to the group early in Spring Quarter with each paper being discussed and criticized by the group prior to the submission of a final paper. Prerequisite, Law 595 or 552. Enrollment limited to eight.

700 Thesis (*) AWSp

702 Degree Final (3) AWSp

800 Doctoral Dissertation (*)

SCHOOL OF LIBRARIANSHIP

Permission of the Director of the School is required for all librarianship courses.

440 Libraries and Society (3) AS
LIEBERMAN

An introduction to the principal types of libraries and to issues and trends in modern librarianship. A prerequisite to graduate courses in librarianship.

441 Basic Library Materials (3) AS
BEVIS, SKELLEY

A presentation of the materials, book and nonbook, which form the sources of reference for the informational function of the library. A prerequisite to graduate courses in librarianship.

442 Book Selection (3) WS
BEVIS, SKELLEY

Basic principles of book selection applicable to library work. A prerequisite to graduate courses in librarianship.

443 Organization of Library Materials: Theory and Practice (3) SpS
PAGE, PETERSON

Current problems and practices in the organization of recorded information, including an introduction to principles of classification and cataloging. A prerequisite to graduate courses in librarianship.

450 Library Materials for Teachers (3) ASpS
AHLERS

The evaluation and use of various types of instructional materials in teaching, with emphasis on the role of the library program in implementing the curriculum. Not open to librarians or teacher-librarians.

451 Children's Literature I (3) WSpS
BENNE, HENINGER

A survey of children's literature for teachers, librarians, and others interested in evaluating and using children's books according to the needs, interests, and abilities of children.

452 Storytelling (3) AWS
BENNE, HENINGER

The role of the storyteller in the past and present. Selection, preparation, and presentation from folk and contemporary literature for various groups and purposes.

453 Literature for Young People (3) ASpS
AHLERS

Reading and appraisal of literature appropriate to the needs, interests and abilities of young people. For the general student as well as the librarian and teacher.

454 Library in the School (3) SpS
AHLERS

The role of the library in the school, with an introduction to library services and methods of management.

465 Hospital and Institution Libraries (3)
Orientation in the field: organization and techniques that apply to different types of hospitals, institutions, and public library extension services. Special emphasis on bibliotherapy and the library's contribution to rehabilitation.

470 History of the Book (3) WS
BEVIS

Development of the written and printed book, growth of the book trade, and aspects of rare book collecting as it affects libraries.

476 Archival Management (3) *
Lectures and demonstrations in archival administration, organization of manuscript collections and study of the principles and techniques employed by state archival and historical institutions.

480 Supervision of Public School Library Systems (3) W*
AHLERS

A course designed to aid school personnel in the administration and supervision of district-wide school library programs; emphasis will be given to problems involved in the organization and development of library systems.

485 Seminar in Library Programs for Children and Young People (1-5) WS*
AHLERS

A course designed to provide an opportunity for discussing changing concepts in library development for children and young people, and for planning programs that reflect current educational trends. Prerequisites, 454 or equivalent, and permission of instructor.

491 Documentation (3) SpS*
PAGE

A course in the various means of recording, organizing, locating, and duplicating informational materials. Emphasis will be given to practical methods of the documentation cycle.

496 Library Analysis (3) A
STANFIELD

The library as an object of study. Introduction to some concepts and notation of systems analysis, with application to libraries.

497 Computers and Libraries (3) W
STANFIELD

Development of computers and their role in libraries. Introduction to library automation. Prerequisite, 496 or permission of instructor.

498 Introduction to Document Retrieval Systems (3) Sp
STANFIELD

Introduction to computer-based information storage and retrieval systems for collections of documents. Design sequence including: goals, specifications, functional components, measures of performance, and evaluation. Prerequisite, 497 or permission of instructor.

502 Library Organization and Administration (3) WS
NASH, PAGE

Study of public and academic library service, including a consideration of legal structure; finance and statistics; buildings and equipment; personnel; public relations; and other phases of library management. The extension of library service is also considered.

509 Directed Field Work (2-4) SpS
BEVIS, LIEBERMAN

Four weeks of professionally supervised field work in various types of libraries.

513 Government Publications (2) SpS
NASH, SKELLEY

Government publications of the United States and foreign countries, their acquisition, organization, and use.

514 The Library and Audio-Visual Materials (3) SpS
LIEBERMAN

Types, cost, utility, and characteristics of modern sensory aids employed in communicating ideas; organization for handling films, film-strips, recordings and transcriptions, slides, pictures, exhibits, and similar materials in the library; experience in operating various types of equipment; techniques in extending the use of audio-visual materials by community groups; sources of information about materials and equipment.

515 Bibliography and Library Materials in the Humanities (3) AS
BEVIS, SKELLEY

An examination of national and international problems of bibliographic control. Study and evaluation of library resources in the humanities. Prerequisite, 441.

516 Library Materials in the Social Sciences (3) WS
BEVIS, SKELLEY

Study and evaluation of library resources in the social sciences, with attention to written milestones of the field. Prerequisite, 515.

517 Library Materials in Science and Technology (3) SpS
BEVIS, SKELLEY

Study and evaluation of library resources in the natural and physical sciences and in technology. Attention is given to the special characteristics peculiar to library materials in the sciences. Prerequisite, 515.

535 Organization of Library Materials: Comparative Methods (3) AS
PAGE, PETERSON

A consideration of current practices in technical services and a critical study of comparative methods of classification, subject analysis, and descriptive cataloging. Prerequisite, 443.

536 Organization of Library Materials: Advanced Problems (3) WS
PAGE, PETERSON

A study of new developments in technical services, Library of Congress classification schemes, and organization of special types of printed and nonbook materials. Prerequisite, 535.

537 Library of Congress Classification (3) WS
PAGE

An extensive consideration of the basic principles of Library of Congress classification and subject headings. Emphasis is on theory and practice in the use of the scheme. Prerequisites, 443, 535.

540 Advanced Legal Bibliography (2) A

GALLAGHER

Bibliographical data and use of federal and state law reports and statutes; quasi-legal and commissioners' reports of the states; bar association records, legal periodicals, indexes and digests, and cooperative bibliographies of law collections.

541 Selection and Processing of Law Library Materials (4) A

GALLAGHER

Aids to selection, processing, microphotography of legal material, etc.

542 Legal Reference and Research (5)

GALLAGHER

Bibliographical lists, law reference questions, briefing, and annotations.

543 Law Library Administration (5) W

GALLAGHER

Staff, patrons and public relations, circulation, architecture, book arrangements, equipment, rules, publicity, publications, budgets, reports, professional societies, regional service.

550 Introduction to Library Service for Children (3) AS

BENNE, HENINGER

Philosophy of library service to children; examination of aids and review media for selection of materials, with emphasis on the evaluation of children's books for school and public libraries.

553 Public Library Service for Children (3) WS

BENNE, HENINGER

Administration of children's departments in public libraries; planning and promoting pro-collections; community and professional roles of the children's librarian. Prerequisite, 550.

554 Children's Literature II (3) SpS

BENNE, HENINGER

Reading and discussion of children's books of all levels; examination of tools and review media for selection, with practice in selection for various fields of interest. Prerequisite, 451 or 550.

555 History of Children's Literature (3)

BENNE, HENINGER

Literature for children, from the earliest times through the nineteenth century. Consideration of significant qualities in the cultural context of the time, with attention given to representative authors and titles. Prerequisites, 451 or 550, and 554.

590 Special Topics in Librarianship (3)

Seminar dealing with various topics in librarianship. To be offered by visitors or resident faculty. Topics will be changed from quarter to quarter. May not be offered every quarter. May be repeated for credit. Prerequisite, permission.

599 Methods of Research in Librarianship (2) AS

NASH

A survey of problems and methods.

600 Independent Study or Research (*)

700 Thesis (*)

702 Degree Final (3)

*In courses where class enrollment is limited, the instructor chooses those who may enroll.

SCHOOL OF MEDICINE

ANESTHESIOLOGY

480 Basic Clinical Clerkship (*) AWSpS

Clerkship designed to meet specific needs and goals of the individual student who desires greater experience in the principles of anesthetic management, airway management, fluid therapy, emergency care, resuscitation, management of pain, and respiratory care. Prerequisite; Human Biology 460. (Two weeks, full-time.)

481 Advanced Anesthesiology Clerkship (6) AWSpS

Clerkship designed to meet the specific needs and goals of the individual student who desires greater exposure to anesthesiology. Individual programs are arranged with the student's interest in mind, including the areas of respiratory care, regional anesthesia, obstetrical anesthesia and dolorology. Prerequisite, 480. (Four weeks, full-time.)

498 Undergraduate Thesis (*) AWSpS

For medical students. Prerequisite, 499.

499 Undergraduate Research (*)

Specific research problems relating to pulmonary, cardiovascular, renal, and central nervous system functions and their alteration by anesthetic agents and techniques. For medical students. Prerequisite, permission.

521, 522, 523 Anesthesiology Seminar (*, *, *) A,W,Sp

Seminars, covering a period of over two years, deal with basic science correlated to anesthesiology, with quarterly themes of physiology and pharmacology of circulation, respiration, acid-base regulation, anesthetic uptake, gestation, pain. May be repeated for credit.

BIOCHEMISTRY

405, 406 Introduction to Biochemistry I, II (3,3) W,Sp

An introductory two-quarter course in general biochemistry covering basic principles, including the structure and metabolism of biologically important compounds. For students in dentistry, pharmacy, home economics, medical technology, and others. Prerequisites, Chemistry 232 for 405; 405 for 406.

407 Dental Students' Laboratory (1) Sp

Laboratory exercises and conferences. Certain experimental aspects of biochemistry of special interest to dental students are considered. For dental students. Prerequisite, 406, which may be taken concurrently.

408 Introduction to Biochemistry Laboratory (3) Sp

Laboratory exercises in general biochemistry for students in home economics, medical technology, and others by permission. Prerequisite, 406, which may be taken concurrently.

409 Selective Laboratory for Dental Students (2) Sp

Laboratory for small group of dental students to gain knowledge of some of the unique characteristics of macromolecules in human biology, and to familiarize them with some of the tools with which molecular events in biology can be examined. Prerequisite, 406, which may be taken concurrently.

412 Medical Students' Laboratory (3) W

HAPNER, WINTER

The laboratory will cover basic biochemical techniques involved in the study of enzymes, proteins, protein structure, lipids, and nucleic acids. Students will be given an opportunity to undertake independent research on a problem of their own choosing under the close supervision of the attending staff. Prerequisite, Human Biology 410 or equivalent must be taken concurrently.

440, 441, 442 Molecular Biology (3,3,3) A,W,Sp

DAVIE, MCCARTHY, PARSON, WALSH

An interdisciplinary course in general biochemistry with a strong component in molecular biology designed for undergraduate students enrolled in the new curriculum in molecular and cellular biology and graduate students in other science departments. Prerequisites, Chemistry 337 or permission for 440; 440 for 441; 441 for 442; introductory physical chemistry recommended.

444 Biochemistry Laboratory (3) A

Laboratory projects and conferences. For students of biochemistry, chemistry, and various biological sciences. Prerequisite, 440 to be taken concurrently.

498 Undergraduate Thesis (*)

For senior medical students. Prerequisite, permission.

499 Undergraduate Research (*)

Investigative work on enzymes, proteins, lipids, nucleic acids, protein biosynthesis, intermediary metabolism, physical biochemistry, and related fields. Prerequisite, permission.

Courses for Graduates Only

520 Seminar (1-3) AWSp

A seminar course dealing with special topics in the field of biochemistry. May be repeated for credit.

540, 541, 542 Literature Review (2,2,2) A,W,Sp

Discussion in depth of current topics and new developments in biochemistry and molecular biology. Coordinated with Biochemistry 440, 441, 442, and to be taken concurrently. For first-year students in biochemistry and students of other science departments, with permission.

560 Physical Biochemistry (2) A

DERANLEAU, TELLER

Specialized aspects of physical chemistry as applied to systems of biological interest. Particular emphasis on hydrodynamic and optical properties of macromolecules. Prerequisite, physical chemistry.

562 Physical Chemistry of Proteins (2) W

TELLER, WILCOX

The conformation of proteins and enzymes as revealed by X-ray diffraction analyses. Methods of protein crystallography, evaluation of results, mechanism of enzyme action at the atomic level. (Offered alternate years; alternating with 563.) Prerequisite, 442 or permission.

563 Structure and Function of Proteins (2) Sp

NEURATH, WALSH

Consideration of the chemical structure and conformation of proteins as they relate to biological function and molecular evolution. Par-

tical emphasis will be given to the structure and chemical modification of active sites of enzymes and to subunit interaction in more complex proteins. Prerequisite, 442 or permission.

565 Enzymes and Enzyme Action (2) WSp
FISCHER, POCKER

Chemical versus enzymatic catalysis and mechanism of enzyme action. Mapping of active sites, physiological control of activity by covalent and noncovalent modification of enzymes and by protein-protein interactions.

569 Biochemistry of Nucleic Acids (2)
GORDON

Chemistry and structure of nucleic acids, enzymes active toward nucleic acids, replication of nucleic acids, the coding problems and biosynthesis of proteins. Prerequisite, 442 or permission.

572 Electron Transport (2)

Electron transport and oxidative phosphorylation, with emphasis on photosynthesis.

583 Advanced Techniques in Biochemistry (3) W

TELLER, DERANLEAU, WADE

An intensive course involving conferences, reading assignments, and laboratory procedures, including ultracentrifugation, electrophoresis, chromatography, spectrophotometry, and radioactive isotope techniques. For first-year graduate students in biochemistry and students of other science departments, with permission. Prerequisite, Biochemistry 441, 444, and permission.

590 Proteins and Enzymes Seminar (1)

Weekly conferences on current research in proteins and enzymes. For graduate students in biochemistry. Prerequisite, permission. May be repeated for credit.

591 Seminar on Protein Structures (1)

Topics on the determination of protein structure by X-ray crystallography, and on relationships between structure and chemical properties in solution and in the crystalline state. Prerequisite, permission. May be repeated for credit.

592 Topics in the Biochemistry of Regulation (1)

Control of enzyme activity and gene expression related to biology of growth and function. Prerequisite, permission. May be repeated for credit.

593 Seminar in Nucleic Acid Chemistry and Protein Synthesis (1)

Seminar discussions in current developments in the chemistry of nucleic acids and protein biosynthesis. Prerequisite, permission. May be repeated for credit.

594 Glycogen Metabolism Seminar (1)

Weekly conferences on research in glycogen metabolism. Prerequisite, permission. May be repeated for credit.

595 Nucleic Acid Biosynthesis (1, max. 8)
AWSpS

MCCARTHY

Weekly conference on current research in ontogeny and phylogeny. Prerequisite, permission.

596 Clinical Chemistry Seminar (1)

Conferences on research and development in clinical chemistry. For postdoctorals in clinical chemistry and graduate students with permission. Prerequisite, permission. May be repeated for credit.

ical chemistry and graduate students with permission. Prerequisite, permission. May be repeated for credit.

597 Plant Viruses Seminar (1)

The structure and mode of replication of plant viruses will be discussed in detail. The effects of ultraviolet radiation on plant viruses and their component protein and nucleic acids will be examined. Prerequisite, permission. May be repeated for credit.

598 Seminar in Developmental Biology (1) AWSpS

RUTTER

Discussion will cover recent advances in the field of developmental biology, especially those areas that are or can be analyzed by a biochemical approach. Prerequisite, permission.

599 Seminar in Physical Chemistry of Polymers (1)

Weekly conferences on current research in the physical chemistry of macromolecules. For graduate students in biochemistry. Prerequisite, permission. May be repeated for credit.

600 Independent Study or Research (*)

700 Thesis (*)

800 Doctoral Dissertation (*)

BIOLOGICAL STRUCTURE

301 General Anatomy (4) Sp

Elementary work in human anatomy with lectures, correlated laboratories, and demonstrations. For health education, anthropology, physical education, speech students, and medical technicians; others by permission. Not open to premedical, pre dental, or nursing students.

Conjoint 316, 317-318 Introductory Anatomy and Physiology (2, 5-5)
(See Conjoint Courses.)

328 Dental Gross Anatomy (6) A

KASHIWA, GRANEY

Lectures and dissection. The course includes a general coverage of the thorax and abdomen and a detailed coverage of head and neck. For dental students; others by permission.

330 Microscopic Anatomy (4) A

BLANDAU, KOEHLER

Lecture and laboratory work in microscopic anatomy. For dental students; others by permission.

331 Neuroanatomy (2) W

SUNDSTEN

Lecture and laboratory work in neuroanatomy. For dental students; others by permission.

Conjoint 400 Human Anatomy and Physiology (6 or 9)
(See Conjoint Courses.)

401 Gross Anatomy (3 or 6, max. 6) A
SCHWARZ

Lectures and dissection probably most appropriate after first medical year. The area of concern will be thorax and/or abdomen. Prerequisite, permission.

402 Gross Anatomy (4) W
SCHWARZ

Lectures and dissection probably most appropriate after first medical year. The area of concern will be head and neck. Prerequisite, permission.

403 Gross Anatomy (2,4,6, max. 6) Sp
SCHWARZ

Lectures and dissection probably most appropriate after first medical year. The area of concern will be pelvis-perineum (for 2 credits) and/or extremities (for 4 credits). Prerequisite, permission.

404 Human Embryology and Development (3) A

BLANDAU

Lectures and laboratory demonstrations covering the development of the human embryo and fetus, with emphasis on abnormal development; special attention to problems of maturation, fertilization, and physiology of the gametes. Prerequisites for nonmedical students, 401 and permission.

411 Cellular Structure and Function (3) W
KOEHLER

The course will provide an introduction to the principles of cytological experimentation, including a survey of microscopic and other instrumental techniques. Major emphasis will be toward a detailed analysis of cellular architecture, particularly as it can be related to functional considerations and the dynamic behavior of cells. Cellular membranes, organelles, and nuclear constituents will be discussed. Prerequisite, permission.

412 Human Microanatomy (5) Sp
ROOSEN-RUNGE

Human microscopic and ultramicroscopic anatomy, with emphasis on organology. Prerequisite, cytology or permission.

415 Histological Basis of Biomechanics (3) W
LUFT

Certain biological structures are specifically adapted to a biomechanical function. Examples include muscle, skin, and bone. The structure and the mechanical properties of selected biomechanical systems will be studied. Prerequisites, Conjoint 400, Mechanical Engineering 340, or permission.

429 Neuroanatomy (5) W
EVERETT

A comparative approach to the nervous system of mammals, more particularly, primates, including man. Prerequisite, permission.

440 Special Topics in Dissection (1-3, max. 6) AWSp

SCHWARZ

Guided dissection. Primarily for advanced medical students. Prerequisite, permission.

450 Experimental Neuroanatomy (3) Sp
LUND, WESTRUM

Introduction to and critical analysis of the methods available for studying the structural organization of the nervous systems of vertebrates and invertebrates. Emphasis is on principles underlying methods, and on first-hand contact with the various methods. Prerequisite, Human Biology 432 or permission.

498 Undergraduate Thesis (*)

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

For medical students. Prerequisite, permission.

Courses for Graduates Only

505 Comparative General Histology (3) W
ROOSEN-RUNGE

A study of the principles of tissue formation in vertebrates and invertebrates. Prerequisite, permission.

515 Biological X-ray Structure Analysis (3) W
JENSEN

Theory of X-ray diffraction, with emphasis on applications to biological systems. Prerequisite, permission.

516 Instrumentation in Biological Structure Research (2-3) W
LUFT, PROTHERO

Introduction to instrumentation, physical and cytological methods employed in medical research generally and biological structure in particular. Emphasis on principles. Prerequisite, permission.

518 Developmental Neurology (2) W
BODEMER, KELLY

Detailed consideration of the problems of development, growth, and regeneration of the nervous system and its functions. Prerequisite, permission.

519 Female Reproductive System (2) A
BLANDAU

Review of basic aspects of reproductive processes in the female mammal. Conferences, demonstrations, and laboratory sessions. Prerequisite, permission. (Offered 1971.)

521 Seminar in Molecular and Submicroscopic Anatomy (1) AWSpS
LUFT

The molecular and micellar basis of bodily structure. Prerequisite, permission.

525 Brain Dissection (2) AWSpS
EVERETT

A detailed consideration of the macroscopic anatomy of the human brain (individual study). Prerequisite, permission.

531, 532, 533 Electron Microscopy (1-5, 1-5, 1-5) A,W,Sp
LUFT

Theoretical aspects of electron microscopy of biological material, including electron diffraction. Prerequisite, permission.

540 Embryology and Anatomy of Human Cardiovascular System (2) W
BLANDAU

A detailed study of the embryology of the heart and great vessels during the first eight weeks of life. Prerequisite, gross anatomy of thorax and abdomen and permission. (Offered alternate years; offered 1970.)

557 Seminar (1, max. 9) AWSp

Prerequisite, permission. May be repeated for credit.

Conjoint 505 Histochemical and Cytochemical Methods (3) Sp
(See Conjoint Courses.)

Conjoint 585 Surgical Anatomy (1-3, max. 12)
(See Conjoint Courses.)

600 Independent Study or Research (*)

700 Thesis (*)

800 Doctoral Dissertation (*)

rent techniques of the medical literature and provide guided experience in preparing contributions to that literature.

401 Historical Development of Medical Thought (3) A
BODEMER

Survey of the history of medicine from antiquity to the twentieth century, emphasizing concepts and ideas that influenced and were influenced by medicine.

419 Historical Foundations of Modern Biology (3) A
SLOAN

A survey course examining the origins and development of the biological sciences from antiquity to the twentieth century. Major emphasis will be given to the conceptual foundations of biology in antiquity, the relations of the biological sciences to the scientific revolution of the seventeenth century, and the subsequent diversification of the biological sciences.

420 Evolutionary Thought and Society (3) W
SLOAN

An exploration of the social and humanitarian implications of the theory of organic evolution, examined both from a historical and contemporary viewpoint. The impact of Darwin's theory on social, religious, and political thought of the post-Darwinian period will be explored, utilizing the writings of Darwin, T.H. and Julian Huxley, G. G. Simpson, Teilhard de Chardin, and T. Dobzhansky, as well as those of other thinkers.

421 The Theory of Evolution in Historical Perspective (3) A
SLOAN

A detailed examination of the development of the theories of organic evolution from antiquity to the present, emphasizing the eighteenth and nineteenth centuries. The works of Buffon, Cuvier, Lamarck, Darwin, and Mendel will be considered, in addition to those of lesser figures.

422 Revolutions in the Biomedical Sciences (3) W
SLOAN

Major shifts in biological concepts, interpreted as paradigm revolutions. Under consideration will be the theory of the circulation of the blood, the theories of generation in the seventeenth and eighteenth centuries, the germ theory of disease, and the theory of organic evolution, as well as others.

423 Biology and the Scientific Revolution (3) Sp
SLOAN

A detailed analysis of the personalities and concepts in the development of the biological sciences in the sixteenth, seventeenth, and early eighteenth centuries. Under consideration will be the renaissance in the biological sciences, the impact of the new mechanistic science of Galileo, Descartes, and Newton on creation of a mechanistic biological science. Prerequisite, permission.

425 Philosophical Foundations of The Biomedical Sciences (3) Sp
SLOAN

An analysis of the philosophy of the biomedical sciences from the standpoint of the general philosophy of science. Examined from both a contemporary and historical perspective will be such topics as the status of theories and facts, the role of induction and

deduction in scientific theories, and the process of scientific discovery in the biomedical sciences. Emphasis will be given both to contemporary analysis and to actual historical cases drawn from the history of medicine and biology.

430 Medicine in the Age of Reason (3) W
BODEMER

A detailed consideration of the development of medical theory and practice during the seventeenth and eighteenth centuries. Emphasis will be placed upon the interacting forces and ideas leading to the establishment of scientific medicine.

431 Medicine During the Nineteenth Century (3) Sp
BODEMER

A detailed consideration of the development of the basic and clinical medical sciences during the nineteenth century, emphasizing medical theory and practice.

497 Biomedical History Special Electives (9,18) AWSpS
BODEMER

Prerequisite, permission.

498 Undergraduate Thesis (*) AWSp

Prerequisite, permission.

499 Undergraduate Research (*) AWSpS

Investigative work in history of the biomedical sciences. Prerequisite, permission.

500 Biomedical Historiography (4, max. 12) AWSp

Emphasis is placed on bibliography and utilization of bibliographic sources. Practice in techniques of organizing and writing history of medicine. Prerequisite, permission.

501 History of Medicine (4) A
BODEMER

Origins and development of medicine, emphasizing socio-economic, philosophic, religious, and technological factors operative in the growth of concepts. Analysis and critical discussion of original and secondary sources. Students will attend the lectures in Biomedical History 401 at the regularly scheduled time. In addition, they will attend a separate conference designed for in-depth discussion of works, etc., treated in the regular class. Prerequisite, medical students or graduate students only.

510 Topics in Biomedical History (3, max. 9) AWSpS

Detailed study of selected topics in biomedical history through lectures, seminars, and discussion. Open to graduate students and qualified medical students. Prerequisite, permission.

520 Seminar (3-6, max. 12) AWSp

Seminar in the history of medicine and allied sciences, stressing original literature and emphasizing independent research by the student. Prerequisite, permission.

600 Independent Study or Research (*)

700 Thesis (*) AWSpS

BIOMEDICAL HISTORY

310 Medical Writing (1) Sp
ROBERTSON

Elective course to consist of a series of lecture-seminars accompanied by distribution of appropriate printed or duplicated materials. The purpose is to review the history and cur-

CONJOINT COURSES

316, 317-318 Introductory Anatomy and Physiology (2,5-5) A,W,Sp
LANDAU

Human physiology with anatomical demonstrations. An elementary course integrating

anatomy, histology, physiology, and biochemistry of the human body. Offered by the Departments of Biological Structure and of Physiology and Biophysics. For nursing and dental hygiene students; others by permission only.

400 Human Anatomy and Physiology (6 or 9) A
SKAHEN

An advanced course integrating anatomy, histology, physiology, and biochemistry of the human body. Designed to meet the needs primarily of graduate students in psychology, physiology and biophysics, and bioengineering, who have no background in histology, anatomy, and physiology. Offered by the Departments of Biological Structure and of Physiology and Biophysics. Prerequisite, permission.

473 Musculoskeletal Pathology (2) Sp
Advanced musculoskeletal pathology with electron microscopic, light microscopic, x-ray, and clinical correlation. Subjects will include normal histology and electron microscopy of the MS system, biochemistry and physiology of normal and abnormal specialized connective tissues, embryology of the MS system, repair, infections, and circulatory disturbances. This course is offered in even- and odd-numbered years alternately with Conjoint 474. The courses need not be taken in sequence. Offered by the Departments of Orthopedics and of Pathology. Prerequisites, Human Biology 460, Orthopedics 481, or permission.

474 Advanced Musculoskeletal Pathology (2) Sp
Advanced musculoskeletal pathology with electron microscopic, light microscopic, x-ray, and clinical correlation. Subjects will include tumors of the musculoskeletal system, benign and malignant, and hematomas. This course is offered in even- and odd-numbered years alternately with Conjoint 473. The courses need not be taken in sequence. Offered by the Departments of Orthopedics and of Pathology. Prerequisites, Human Biology 460, Orthopedics 481, or permission.

505 Histochemical and Cytochemical Methods (3) Sp
LAGUNOFF
Introduction to principles and techniques of tissue fixation, sectioning, and staining; theory and application of histochemical methods for carbohydrates, lipids, nucleic acids, minerals, and proteins, including enzyme histochemistry and fluorescent antibody methods. Prerequisite, Human Biology 410 or permission.

560 Tumor Biology (2) S
K. E. HELLSTROM, I. HELLSTROM
Primarily designed for graduate students, but may also be taken by interested medical students. It will be given as a combination of lectures and conferences. The general areas covered are the basis of carcinogenesis, tumor progression and metastasis, virus-induced tumors, tumor genetics, and tumor immunology. Offered by the Departments of Pathology and of Microbiology. Prerequisite, permission of either department.

585 Surgical Anatomy (1-3, max. 12) AWSp
SCHWARZ
A course in guided dissection of selected regions supplemented by conferences. Offered by the Departments of Surgery and of Biological Structure. Prerequisite, permission.

HUMAN BIOLOGY

This sequence is required for all medical students. Other students may enroll by permission of the Assistant Dean for Curriculum, School of Medicine.

410 Molecular and Cellular Biology (7) A
GORDON
A coordinated course covering classical molecular and cellular biochemistry, cell fine structure and cell physiology. Special characteristics of microbial cells will be covered and contrasted with mammalian cells. Also viral synthesis and replication; molecular and chromosomal genetics with extension to important examples in medical genetics; nutrition, growth, and death of mammalian and microbial cells.

411 Human Embryogenesis and Tissue Structure (3½) A
KELLY
Development of the embryo from fertilization and implantation to full organ and organismal differentiation, with illustration of basic body plan. Important examples and etiology of faulty prenatal morphogenesis. Cell differentiation leading to a study of basic histology. Developmental and morphological aspects of hemopoietic system.

412 Biostatistics and Epidemiology (2) W
THOMPSON
An introduction to statistical inference and basic concepts of variance and statistical significances as applied to problems in human biology and medicine; statistical and epidemiological health information systems and measurements of morbidity and mortality; computer usefulness, potentialities and limitations; epidemiological approaches to infectious and noninfectious diseases. Interaction of agent, host, and environment in causation and transmission.

413 Social and Cultural Aspects of Health (1½) A
ALDRICH
The impact of general social and cultural factors on the physical and psychological health of the individual, with special reference to economic and minority group problems and the influence of urbanization. Natural selection and human evaluation in health and disease. Episodic consideration of major life crises which concern the well-being of the individual and the family.

420 Cell and Tissue Response to Injury (4) W
LAGUNOFF
Patterns of cell and tissue response to injury. Immunity and immune responses. Hypersensitivity, homograft reaction and auto-immune response. Immunohematology. Morphological, functional, and kinetic aspects of leukocytes and immunocytes. Principles of neoplasia.

421 Natural History of Infectious Diseases and Chemotherapy (3½) W
SHERRIS
Pathogenesis and immunity of infectious diseases, natural barriers. Microbiology, epidemiology, clinical manifestations and control of representative bacterial, fungal, parasitic, and viral infectious diseases. Chemotherapeutics and principles of chemotherapy. Sterilization, principles of asepsis, nosocomial and iatrogenic infections and their prevention.

422 Control Systems and Mechanisms of Homeostasis (4) A
WOODBURY
Bioenergetics. Membrane transport. Introduction to physiologic and biochemical control and feedback mechanisms. Nervous, hormonal, and pressor mechanisms. Blood volume and electrolyte homeostatic mechanisms. Drug absorption, distribution, excretion, and metabolism. Mechanisms of drug actions and selectivity. Dose response and variation. Drug toxicity and detoxification.

423 Musculoskeletal System (3½) W
CLAWSON
Gross, surface, applied and X-ray anatomy of system including entire spine, but excluding head and neck. Histology of bone, cartilage, tendon—myotendinous junction and joints. Musculoskeletal trauma and healing. Pathology and clinical manifestations of other degenerative, inflammatory, metabolic, nutritional, and congenital disorders. Physical examination.

430 Skin System (1½) Sp
ODLAND
Gross and microscopic anatomy. Physiology, protection, temperature control, pigmentation and photosensitivity. Pathology and genetics of skin abnormalities, including tumors. Introduction to clinical evaluation, including physical examination and illustrating examples of inflammatory, vascular, immunological (including drug hypersensitivity), and neoplastic diseases.

431 Head, Neck, Ear, Nose, and Throat (2½) Sp
SCHWARZ
Gross anatomy (including skull, pharynx, and larynx). Audition and balance. Physiology and clinical evaluation. Maxillo-facial disorders, diseases of nasal passages, naso- and oropharynx, accessory sinuses. Physical examination.

432 Nervous System (5½) Sp
PATTON
An integrated approach to: Normal structure and function of the nervous system, including the eye. Basic neuropathology and diseases of the eye. Neuropathology with emphasis on modes of action and classes of drugs. Clinical evaluation of the nervous system and eye with illustrative examples of the manifestations of specific and important neurological lesions, and common and rare, but important and reversible conditions.

433 Psychological System (3½) Sp
HOLMES
An integrated approach to the normal and abnormal intellectual, behavioral, personality, and social development of man: Perception, cognition, learning and memory, expression. Emotion, motivation, ethology, sexuality, identity. Psychophysiology, psychopharmacology, conditioned responses, biochemical basis of behavior. Personality development, self-image, conscious and subconscious function, dreaming and waking, reaction and adaptation. Concepts of mental health, principles of psychopathology, character disorders, affective disorders, conversion-dissociation and obsessive disorders, schizophrenia.

434 Endocrine System (2) Sp
GALE
Gross and microscopic anatomy of the endocrine system. Principles of endocrine physiology as illustrated by model systems (extend-

ing the concepts of homeostasis, control and feed-back systems previously learned), hormonal biosynthesis and important pathophysiological states. The endocrine integration of metabolism.

440 Cardiovascular-Respiratory System (6) A
VAN CITTERS

Anatomy of heart, vessels, and lungs; physiology of heart, circulation, respiration (including gas transport); major pathological disorders of the heart, great vessels, and lungs; physical examination of the chest and cardiovascular system. Prerequisite, permission.

441 Gastro-Intestinal System (3½) A
RUBIN

Anatomy of gastro-intestinal system; physiology and pathology of digestion and hepatic function; and physical and laboratory examination. Prerequisite, permission.

442 Growth and Development (2½) A
SMITH

Physical and psychological development of the whole individual from birth through old age (including neonatal adaptation, nutrition, and developmental milestones in childhood and adolescence, degenerative problems of senescence). Prerequisite, permission.

443 Community Medicine and Health Care Systems (2) A
MCCARROLL

Human ecology and health; characteristics and growth of United States and world population; delivery of health services; planning for community health services. Prerequisite, permission.

450 Reproductive and Urinary Systems (6) W
BLANDA

Gross anatomy of systems to be taught conjointly and then systems subdivided for physiology, pathology, and examination. Prerequisite, permission.

451 Introduction to Clinical Medicine (8) W
HILLMAN

Instruction in history taking and interviewing techniques; continuation of the physical examination previously taught by organ systems; and introduction to clinical and laboratory diagnosis. Prerequisite, permission.

460 Basic Hospital Clerkship (18) Sp
FINCH

Hospital routine and staff interrelationships, developing basic skills in history-taking, physical and laboratory examination and diagnostic synthesis; acquainting student with specific but limited variety of clinical problems; fundamentals of clinical pharmacology and therapeutics. Prerequisite, permission.

MEDICAL PRACTICE

411 First Aid (1)

Given during the orientation week for entering medical students.

475 Advanced Externship in General Practice (*) AWSpS
LEIN, ROBERTSON

A period of two to twelve weeks of work with a selection of family physicians to give firsthand views of the interests and problems presented in medical practice. Open to medical students having completed Human Biology 460 (2, 4, 6, or 12 weeks).

MEDICINE

401 Samples of Clinical Medicine (*) Sp
WILLIAMS

Elective course in which select patients will be shown to illustrate problems in clinical medicine and to demonstrate the importance of basic medical sciences in diagnosis and treatment. First-year medical students.

430 Basic Science Aspects and Introduction to Clinical Endocrinology (*) Sp
WILLIAMS (University Hospital)

Elective course in which patients with outstanding manifestations of endocrine and metabolic disturbances are selected for presentation. Many of the classic aspects of the more common clinical disorders are presented. Discussions are given of the mechanism for the development of the symptoms and signs and for the diagnosis and management of the disorder. Prerequisite, second-year medical student; Human Biology 434 recommended.

431 Human Genetics (*) AWSp
FIALKOW, MOTULSKY

Weekly seminar dealing with a variety of topics in medical genetics given by staff of the Division of Medical Genetics and related departments and divisions. Open to medical students with a good foundation in genetics, others by permission.

432 The Blood Group Systems (*) Sp
GIBLETT

Elective course giving lecture and laboratory work including individual projects which apply to the general problems related to blood transfusion. Prerequisite, Human Biology 434.

433 Cardiology Statistics (*) WSp
BRUCE

Informal conferences and laboratory work in the examination and evaluation of techniques for the mathematical approach to medical diagnosis. Prerequisite, medical students with previous interest in statistics and/or mathematics.

435 Basic Hematology (2)
FINCH

A physiological approach to the diagnosis of disorders of the red cell and coagulation systems. Emphasis is placed on a logical, systemized approach to diagnosis using case development problems. Prerequisite, Human Biology 451, may be taken concurrently.

465 Clinical Clerkships (*, max. 24) AW
CONN, EVANS, PETERSDORF, TURCK

Hospital patients are assigned to each student for a complete work-up. Ward rounds are held daily; lectures, clinics, and conferences weekly. Prerequisite, Human Biology 460. Six or twelve weeks, full-time.

477 Clinical Immunology and Allergy (*) AWSpS
VAN ARSDEL

Outpatient experience at University Hospital in diagnosing and managing allergic disease, clinical conferences and hospital rounds on hypersensitivity and immunology, and allergy research seminars. Prerequisite, Human Biology 460.

478 Clinical Dermatology (*) AWSpS
ODLAND (University Hospital)

Participation in dermatology clinics and inpatient consultations at University Hospital, Harborview Medical Center, Veterans' Administration Hospital, and Children's Orthopedic Hospital and Medical Center. Journal club and clinical conferences each week with

entire staff and weekly Dermo-Pathology conference with Dr. Saezbiel. Monday and Thursday mornings are free for other electives. Prerequisite, Human Biology 460. (4 weeks; 2 weeks with special permission.)

479 Clinical Gastroenterology (*) AWSpS
VOLWILER (University Hospital)

Participation in consulting ward rounds, workshops, procedures, conferences, and selected clinics with full-time Divisional staff at University, Veterans and USPHS Hospitals and Harborview Medical Center, plus directed tutorial work. Prerequisite, 465 or Human Biology 460. (4-6 weeks full time, except that students taking 4-week program may have 2 mornings free for other electives.)

481 Advanced Clinical Endocrinology (*) AWSpS
PAULSEN (USPHS Hospital)

Full time inpatient-outpatient clerkship in clinical endocrinology at USPHS Hospital. Library review on selected topics in the field and participation in medical clinical research problems optional during this clerkship. Prerequisite, 465 or Human Biology 460. (4, 6, or 12 weeks.)

482 Clinical Cardiology and Electrocardiography (*) AWSpS
BRUCE (University Hospital), COBB (Harborview Hospital), KENNEDY (Veterans Administration Hospital), MC DONOUGH, WILLIS, (USPHS Hospital)

Clerkship in clinical cardiology—combined inpatient-outpatient assignments, ECG interpretation. At Harborview Medical Center special emphasis will be placed on operation of an acute cardiac care unit. Prerequisite, 465. (4 weeks.)

Fellowship in clinical cardiology—combined inpatient-outpatient assignments, ECG interpretation. Cardiovascular hemodynamics will be emphasized. Prerequisites, 465 and permission. (Special arrangements must be made in advance for admission to elective.) (12 weeks.)

483 Clinical Pulmonary Disease and Pulmonary Physiology (5 or 6 or 9) AWSpS
BUTLER (University Hospital)

Inpatient and outpatient experience in pulmonary disease at University and Veterans' Administration Hospitals and Harborview Medical Center. Methods of pulmonary function testing and interpretation of results will be taught. Students taking 4 week elective may have Monday and Wednesday mornings free for other electives. Prerequisite, 465 or Human Biology 460. (4 or 6 weeks.)

484 Clinical Hematology-Oncology (*) AWSpS
FINCH (University Hospital), HILLMAN (Harborview Medical Center)

ADAMSON (Veterans' Administration Hospital) HUFF (Virginia Mason Clinic), WRIGHT (Swedish Hospital), FUNK (USPHS Hospital)

- (a) University Hospital—4 weeks. AWSpS
- (b) Harborview Medical Center—4 weeks. AWSpS
- (c) Veterans Administration Hospital—4 weeks. AWSpS
- (d) Virginia Mason Clinic—2 or 4 weeks. AWSpS
- (e) Swedish Hospital—2 or 4 weeks. AWSpS
- (f) USPHS Hospital—4 weeks. AW

Outpatient and inpatient experience with hematologic disorders. The elective includes teaching rounds, conferences, and evaluation of laboratory work. Prerequisite, 465 or Human Biology 460. (2, 4, 6, or 12 weeks, full time.)

485 Clinical Genetics (*) AWSp

FIALKOW, MOTULSKY

Elective work with intensive study of genetic principles required in clinical work. May work in depth on a selected laboratory problem or get broader experience in working up a variety of clinical cases. Prerequisite, 465 or Human Biology 460.

486 Advanced Clinical Neurology (*) AWSp

P. SWANSON (University Hospital)

Inpatient and outpatient experience in clinical neurology at the University Hospital, Veterans' Administration Hospital, or Harborview Medical Center. Students work closely with staff, attend clinical conferences, present patients on attending rounds, participate in seminars on topics in clinical neurology, and become more familiar with diagnostic neurological procedures. In addition, students attend one clinic per week. Prerequisite, 465 or Human Biology 460. (4 weeks.)

487 Outpatient Clinic (*) AWSp

WALLACE (University and Harborview Hospitals)

Students will examine and institute diagnostic and therapeutic programs on patients coming to the outpatient clinics of University and Harborview Hospitals. Emergency room experience will be obtained at Harborview Hospital where each student will spend one night a week during the course. Students may elect to spend up to three half-days per week in specialty clinics of their choice, and a half-day a week in other health resource facilities within the community. By assuming first line responsibility for patient care under the supervision of an attending physician, students will learn the demands that long-term care places on a physician and develop professional personal resources needed to meet the demand. Prerequisite, 465 or Human Biology 460. (12 weeks.)

488 Elective Clerkship (*)

CONN (Harborview Hospital)

Students will act in capacity of interns on the medical wards under supervision of house staff and visiting physicians. They will attend all regular medicine rounds and conferences as their schedule permits. Prerequisite, 465. (6 or 12 weeks.)

489 Clinical Infectious Diseases (*) AWSp

KIRBY (University Hospital)

Students will participate in the consultation service throughout the hospital, attend daily plate rounds, conferences and seminars. Prerequisite, 465 or Human Biology 460. (2, 4, or 6 weeks.)

BEATY (Harborview Hospital)

The student's primary responsibility will be the care of patients with infectious diseases, but time will also be spent in tutorial sessions on selected bacteriologic topics. Prerequisite, 465. (4 weeks.)

492 Clinical Endocrinology and Metabolism (*)

GOODNER (Harborview Hospital) AW

Inpatient and outpatient experience in clinical endocrinology and metabolism. If students desire, participation in clinical research can be arranged. Prerequisite, 465 or Human

Biology 460. (4 weeks, daily except Monday and Friday afternoons.)

WOOD (University Hospital) AWSp

Participation in inpatient rounds, conferences and outpatient clinics at University, Harborview, Veterans', and USPHS Hospitals. Directed tutorial work in selected aspects of endocrinology and metabolism. Prerequisite, 465 or Human Biology 460. (4 weeks, full time with Wednesday and Friday mornings free for other electives.)

493 Problems in Fluid Balance and Kidney Disease (*) AWSp

SCRIBNER (University Hospital)

A nephrology/fluid balance clerkship on the blue service at University Hospital and the renal-electrolyte service at Harborview Medical Center. Students will work in the renal clinic and attend a series of fifteen one and one-half hour seminars on problems in fluid balance and nephrology. Prerequisite, 465 or Human Biology 460. (4 weeks.)

498 Undergraduate Thesis (*) AWSp

For medical students. Prerequisite, permission.

499 Undergraduate Research (*) AWSp

Case studies, with laboratory research. For medical students. Prerequisite, permission.

MICROBIOLOGY

101 The Microbial World (5) ASp

GROMAN

A course designed primarily for majors in the social sciences and humanities. Selected topics in microbiology are designed to illustrate the nature of scientific investigation and the development of some major biological concepts. Included are discussions of the nature of the bacterial cell, bacterial processes in nature, relationship of microbes to man and other living organisms, the nature of viruses and some aspects of modern microbiological research.

235 Microbiology for Students of Dentistry (5) A

VOGT

Lecture and laboratory introducing the student to the principles of microbiology. Infectious microorganisms and the flora of the mouth are emphasized. Required for second-year dental students. Students who have had previous training in microbiology may substitute a research problem for the laboratory work. Prerequisite, for non-dental students, permission. Laboratory credit: 1 for Core Program to 3 for Selective Program.

236 Microbiology Laboratory for Students of Dentistry (2) A

VOGT

Laboratory and demonstration course in medical microbiology designed to supplement the laboratory exercise given with Microbiology 235 and intended for second-year dental students with a special interest in microbiology. Prerequisite for non-dental students, permission.

301 General Microbiology (3 or 5) AWSp

NESTER

A one-quarter lecture and laboratory course designed to acquaint students in the physical and biological sciences with microorganisms and their activities. The understanding of basic biological concepts elucidated through investigations of microorganisms will be emphasized. Topics include microbial cell struc-

ture and function, metabolism, and microbial genetics as well as the relationship of these aspects of cell activity to disease, immunity, and other important applied areas. Laboratory exercises cover a variety of microbiological techniques, and experiments are designed to illustrate major concepts discussed in lecture. Prerequisite, two quarters of chemistry. A course in a biological science is desirable but not required. Lectures only, 3 credits.

320 Media Preparation (2) AWSp

PARKHURST

Practical work in the preparation of culture media and solutions. Nutritional requirements of microorganisms are considered. For students expecting to enter vocations involving laboratory work with bacteria. Prerequisites, 301 or equivalent and permission.

322 Applied Bacteriology (5) AWSp

SHERRIS, SCHOENKNECHT

Practical experience in a clinical or public health laboratory; fifteen hours per week. For students majoring in medical microbiology. Prerequisites, 445 and 446, or Human Biology 421, Microbiology 446, and permission.

400 Fundamentals of Bacteriology (3 or 6) A

DOUGLAS, ORDAL

Basic bacteriology; comparative morphology, taxonomy, physiology of bacteria. For students majoring in microbiology and others interested chiefly in the biological and chemical aspects of microbes. Required for students majoring in microbiology. Recommended for graduate students in biochemistry or biology. Prerequisites, 10 credits in organic chemistry, 10 credits in botany or zoology. Permission required for those students taking the course for 3 credits (i.e., lectures only).

430 Microbial Metabolism (3 or 5) W

DOUGLAS

The major patterns of fermentative and oxidative metabolism of yeasts and bacteria. For students majoring in microbiology or food science. Prerequisites, 400 or 301, and Chemistry 221 and 232. Lectures only, 3 credits.

444 Medical Mycology and Parasitology (3) W

SHERRIS

Consideration of medically important fungi and parasites, with emphasis on their biology in relation to disease and its laboratory diagnosis. For medical technology students, microbiology majors, and medical students as an elective. Prerequisites, Biology 210, 211, 212 or equivalent and permission.

445 Introduction to Medical Microbiology (5) A

EVANS, SCHOENKNECHT, SHERRIS, WEISER

The purpose of this course is to introduce students to immunology and to medical bacteriology and virology and, to a limited extent, mycology and parasitology. Designed for students in medical technology and graduate and undergraduate students in microbiology. Lectures and some conferences and demonstration periods. Prerequisites, 10 credits organic chemistry; 10 credits botany or zoology.

446 Medical Microbiology Laboratory (3) Sp

SCHOENKNECHT

A laboratory course for medical technology students, microbiology majors, and on an elective basis for medical students. Procedures used in the medical microbiology laboratory

for isolation and identification of pathogenic microorganisms and testing of their susceptibility to antibiotics. Selected reading assignments and a one-hour demonstration period each week. Prerequisites, 445 or Human Biology 421, and permission.

447 Fundamentals of Immunology (4) Sp
WEISER

Broad coverage in immunology with stress on fundamentals. For students in specialized areas of medicine and dentistry and various undergraduates and graduates with interests in areas requiring substantial knowledge in immunology. Occurrence and properties of antigens and haptens; synthesis, nature, fate, and activities of antibodies; antigen-antibody interaction; immunologic injury; tissue transplantation; blood groups and transfusion; tumor immunology; Rh diseases; allergic and autoimmune diseases; and immunity to parasites. Prerequisites, 10 credits of zoology or biology; 5 credits of organic chemistry, and upper-division standing; for medical students, Human Biology 421.

496 Undergraduate Library Research (2) AWSpS

An introduction to library research technique and to the microbiological literature. Staff members will assign a topic and supervise the project. Prerequisite, 400 or equivalent.

497 Honors Undergraduate Research (*) AWSpS

Specific problems in medical and general microbiology. Prerequisites, senior standing and permission from Drs. Groman or Nester.

498 Undergraduate Thesis (*) AWSpS

For medical students. Prerequisite, permission.

499 Undergraduate Laboratory Research (*) AWSpS

Specific problems in medical and general microbiology. Prerequisites, senior standing and permission.

Courses for Graduates Only

501 Research Techniques in Virology (*, max. 5) AWSp
GROMAN

An introduction to the basic experimental techniques in virology and their theoretical background. Prerequisite, permission.

502 Research Techniques in the Study of Microbial Enzymes (*, max. 5) A
WHITELEY

Cultivation of large quantities of bacteria; purification of proteins; enzyme kinetics; sedimentation properties; control of enzyme activity and synthesis; localization of enzymes in bacterial structures. Prerequisites, 400, Biochemistry 440, 441, 442, and permission.

503 Research Techniques in the Study of Nucleic Acids (*, max. 5) AW
WHITELEY

Techniques used in the study of the macromolecular composition of bacterial cells, and in the isolation and purification of several of these macromolecular components. Prerequisites, 400 or Biochemistry 440, and permission.

504 Research Techniques in Microbial Genetics (*, max. 5) AWSp
NESTER, DOUGLAS

The isolation of mutants and their characterization by biochemical and genetic techniques. Emphasis will be placed on the DNA mediated transformation system of *Bacillus subtilis*. Prerequisite, permission.

505 Immunochemical Techniques (*, max. 5) Sp
KRUEGER

Theory and use of current immunochemical techniques. Prerequisites, 551 and permission of Dr. Krueger.

510 Physiology of Bacteria (3) Sp
WHITELEY

Fundamentals of physiological and metabolic processes of bacteria with emphasis on the synthesis of cellular constituents, mechanisms, and energy-yielding processes. Prerequisites, 400 and Biochemistry 440, 441, 442, or permission. (Offered alternate years; offered 1970-71.)

520 Seminar (1) AWSp
May be repeated for credit.

530 Advanced General Microbiology (4) W
ORDAL

Enrichment, isolation, and comparative morphology and physiology of selected bacteria with distinctive developmental cycles. Prerequisite, permission.

540 Virology (3) Sp
GROMAN, VOGT

(Offered alternate years; offered 1971-72.)

550 Advanced Immunology (5) W
WEISER

Prerequisite, 445 or equivalent, and permission. (Offered alternate years; offered 1970-71.)

551 Immunochemistry (3) W

Discussion of the synthesis, structure, and reactions of antibody molecules. Prerequisites, 5 credits of biochemistry and permission of Dr. Krueger. (Offered alternate years; offered 1971-72.)

555 Advanced Clinical Microbiology (2½) AWSp

SCHOENKNECHT, SHERRIS
Attendance at daily plate rounds and the weekly journal club of the Division of Clinical Microbiology. This is designed to increase understanding of clinical microbiological work and its application to the care of the patient. Prerequisites, 445 or Human Biology 421, and permission.

556 Clinical Microbiological Training and Research (* max 12) S

RAY, SHERRIS, SCHOENKNECHT
Training in clinical microbiology and research. Attendance at daily laboratory rounds in addition to bench-side training and research. Prerequisite, Human Biology 421. For medical students only.

Conjoint 560 Tumor Biology (3)

Summer b Term
HAKOMORI, I. HELLSTROM, K. HELLSTROM, SMUCKLER, VOGT

This course is primarily designed for graduate students but may also be taken by interested medical students. It will be given as a combination of lectures and conferences. The general areas covered are the basis of carcinogenesis, tumor progression and metastasis, virus induced tumors, tumor genetics and tumor immunology. Offered conjointly by Departments of Microbiology and Pathology. Prerequisite, permission of either Department.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

702 Degree Final (3) AWSpS

800 Doctoral Dissertation (*)

NEUROLOGICAL SURGERY

428 Neurological Surgery Seminar (1) AWSpS
BLACK

A weekly seminar centered around neurological research topics with discussion by staff and students. Prerequisite, Human Biology 432.

477 Electroencephalography Laboratory (*) AWSp
CHATRIAN

For medical students who desire to acquire familiarity with the techniques, clinical applications, and basic interpretive criteria of electroencephalography. Prerequisites, Human Biology 432 and permission. (2, 4 or 6 weeks.)

479 Clinical Neurological Surgery (*) AWSpS
KELLY

Student serves clinical clerkship as active extern on neurological surgery ward at University Hospital or University affiliated hospital. Prerequisite, Human Biology 460.

480 Surgical Specialty Clerkship—Selective Elective: Neurological Surgery (*) AWSp

Student serves clinical clerkship as an intimate member of the staff, participating in in-patient and out-patient care, both pre- and post-operative, involving neurological surgery patients.

498 Undergraduate Thesis (*) AWSpS
OJEMANN

Prerequisite, permission.

499 Undergraduate Research (*) AWSpS
OJEMANN

Investigation of special problems as an intimate member of the research team in the neurological surgery laboratories. Research to lead to a thesis, if desired. List of projects available on request. Prerequisite, permission.

OBSTETRICS AND GYNECOLOGY

401 Understanding Human Sexuality (0)

A series of 1½-hour seminar discussions to be held monthly, presenting basic concepts underlying sex education. Scientific exploration of physiological, psychological, and cultural aspects of sexual development, expression, problems, and adjustments of youth and adults. Elective for first-year medical students. Prerequisite, permission.

465 Introduction to Obstetrics and Gynecology (*) AWSpS

Clinical clerkship in obstetrics and gynecology including preceptorial sessions and private office experience. Prerequisite, Human Biology 460.

479 Obstetric and Gynecologic Investigation (*) AWSpS

The investigation may cover any one of the following fields: uterine muscle physiology, toxemias of pregnancy, hormone assays in obstetrics and endocrinology, obstetric and gynecologic oncology. By arrangement.

480 Clinical Clerkships (*) AWSpS

The student spends two or more weeks as a clinical clerk on obstetrics and gynecology at the University Hospital, Harborview Medical Center, USPHS, or Madigan General Hospital. On the obstetrical service the student actively participates in the deliveries and closely follows the management of all obstetrics patients. In the gynecology service the

student makes ward rounds and actively participates in the medical or surgical management of the inpatient gynecologic patients. In addition, he is assigned to the obstetric and gynecologic outpatient clinics which afford him the opportunity to learn the office problems of the specialty. Prerequisite, 465.

484 Endocrinology of Reproduction (*)

HERRMANN

The biochemistry of steroids. Steroid metabolism as related to clinical problems. Diagnosis and treatment of endocrine disorders. Case studies with special emphasis on modern methods of investigation.

498 Undergraduate Thesis (*)

VONTVER

For medical students. Prerequisite, permission.

499 Undergraduate Research (*)

VONTVER

Discussion of methods used in obstetrics and gynecology research. Several specific projects relating to the most fascinating and intriguing problems of the specialty will be dealt with.

OPHTHALMOLOGY

481 Medical Ophthalmology (*) AWSpS

KUPFER (University and USPHS Hospitals)

Inpatient and outpatient diagnosis and treatment of eye disease combined with review of ophthalmic pathology and neuroanatomy teaching collection. Prerequisite, Human Biology 460. (4 weeks.)

498 Undergraduate Thesis (*) AWSpS

Thesis based on original research on the visual system conducted in the Department of Ophthalmology. Elective. Prerequisite, permission.

499 Undergraduate Research (*)

Laboratory or clinical research in physiology, anatomy, or biochemistry of the visual system. Elective. Prerequisite, permission.

ORTHOPEDICS

475 Preceptorship in Orthopedics (*)

AWSpS

ANDERSON, BURGESS, CALLAHAN, CLAWSON, GLOYD, STEWART

Student will follow a preceptor in all his work to better understand the pathophysiology and management of problems of the musculoskeletal system. Full time for either a two- or four-week period. Prerequisites, Human Biology 460 and permission of Department.

476 Clinical Orthopedic Clerkship (*)

STAHELI

An advanced clerkship of the diagnosis and management of orthopedic problems affecting infants and children, designed to meet the needs of those students entering pediatrics or general practice. Prerequisite, Human Biology 460. (4 weeks.)

477 Musculoskeletal Trauma (6)

AWSpS

GUNN (Harborview Medical Center)

Open to medical students who have completed the basic curriculum. Instruction at Harborview Medical Center, where a large amount and considerable variety of trauma to the musculoskeletal system are treated. Experience in the emergency room and trauma center, wards, and operating room,

and with outpatients will be available. Emphasis will be placed on the examination of the patient and eliciting of clinical signs. Prerequisite, Human Biology (4 weeks, full time.)

478 Pediatric Orthopedics and Musculoskeletal Trauma Combined (*) AWSpS

STAHELI, GUNN (Harborview Medical Center, Children's Orthopedic Hospital and Medical Center)

Open to medical students who have completed the basic curriculum. Time will be divided equally between Harborview Medical Center and Children's Orthopedic Hospital and Medical Center in order to provide limited exposure to both pediatric orthopedics and trauma. Prerequisite, Human Biology 460. (4 weeks.)

480 General Orthopedic Clerkship (6) AWSpS

AKESON, FRY (University Hospital, Veterans' Administration Hospital, USPHS Hospital)

Limited exposure to those problems commonly seen in orthopedic practice, e.g., infections of bones and joints, degenerative and rheumatoid arthritis, pediatric orthopedics, back syndrome, etc. Patients will be followed on the wards and in the outpatient department. Prerequisite, Human Biology 460. (4 weeks.)

481 Correlative Pathology of the Musculoskeletal System (½) A

AKESON, CONVERY

A review of the pathology of the musculoskeletal system as it involves common clinical problems. Prerequisite, Human Biology 460. Required course with 475, 476, 477, 478, or 480. No additional credit given with clerkships. One conference per week. (4 weeks.)

482 Correlative Anatomy of the Musculoskeletal System (½) AWSpS

CLAWSON

Designed as a review of gross anatomy in light of the clinical problems affecting the musculoskeletal system. An anatomic, clinical, and radiologic correlation of disease processes. Prerequisite, Human Biology 460. Required course with 475, 476, 477, 478, 480, or 481. No additional credit given with clerkships. (Two conferences per week, 4 weeks.)

483 Surgical Management of Joint Disease (1) ASp

CONVERY

An introduction to the principles and techniques of reconstructive surgery utilized in acute and chronic joint disease. Special emphasis will be placed on the diagnosis and evaluation of functional defects amenable to surgical reconstruction. Prerequisite, 478. (One conference per week, 4 weeks.)

498 Undergraduate Thesis (*) AWSpS

AKESON

Student will work directly with a preceptor in selecting a suitable area for laboratory or clinical research in the area of orthopedics, and will develop a thesis for recognition. Prerequisites, Human Biology 423 and permission of Department. (12 weeks.)

499 Undergraduate Research (*) AWSpS

AKESON

Investigation of problems pertinent to the study of musculoskeletal problems in the orthopedic laboratories as a participant in the research group conducting investigations in

histochemical and electronmicroscopic changes of cartilage, mucopolysaccharide changes in periarticular structure and cartilage associated with immobility and aging, tissue culture, and histochemical and x-ray diffraction studies of intervertebral disks subject to immobility and aging. Prerequisite, permission of Department. (12 weeks.)

521 Orthopedic Research Seminar (*) AWSpS

AKESON, FRY

Each week a current laboratory topic is discussed with members of the attending and resident staff. Active participation of the student is required. Prerequisites, Human Biology 460 and permission of Department. May be repeated for credit.

Conjoint 473 Musculoskeletal Pathology (2) Sp (See Conjoint Courses)

Conjoint 474 Advanced Musculoskeletal Pathology (2) Sp (See Conjoint Courses)

OTOLARYNGOLOGY

481 Otolaryngology Clerkship (*) AWSpS

DONALDSON (University Hospital)

Student will participate in evaluation and care of outpatients and inpatients at the University Hospital. In addition he will attend Department conferences and is expected to prepare a written report on an otolaryngologic problem of his choice. Maximum of one student. Prerequisite, Human Biology 460. (4 weeks, full time.)

482 Otolaryngology Externship (*) AWSpS

CAIN, MORRISON (USPHS Hospital)

Student serves externship in Otolaryngology in outpatient clinic where visits average 600 per month supplemented by inpatient assignments. Individual training provided, giving student opportunity to utilize his own diagnostic abilities; performs or assists instructor in all phases of patient work-ups and care; attends ward rounds and conferences. No ophthalmology included. Maximum of one student. Prerequisite, Human Biology 460. (4 weeks, full time.)

483 Otolaryngology Externship (*) AWSpS

HAYES, SEAGER (Madigan Hospital)

Individual externship training at outpatient clinic where visits average 1,200 per month, supplemented by inpatient assignments. Responsible for patient work-ups; follows assigned patient to operating room; participates in ward rounds and hospital conferences. No ophthalmology included. Students reside at the hospital during externship, using facilities of BOQ and Hospital mess. (Subsistence and quarters charges, approximately \$2.00 per day). Maximum of 2 students. Prerequisite, Human Biology 460. (2 or 4 weeks, full time.)

484 Otolaryngology Clerkship (4½) AWSpS

WALKE

Student will participate in evaluation and care of outpatients and inpatients at Harborview Hospital. He will assist in surgery. In addition, he will attend Department conferences both at Harborview and University Hospitals in conjunction with Department training. Prerequisite, permission.

485 Otolaryngology Externship (6) W

DONALDSON

To give medical students additional training in pediatric otolaryngology at Children's Orthopedic Hospital and Medical Center.

Students will assist in patient work-ups, surgery, post-operative care, and will study general otolaryngology problems with special emphasis in childhood disease entities. Prerequisite, Human Biology 460. Maximum of one student. (4 weeks.)

495 Otolaryngology Rounds (1) AWSpS

DONALDSON

To provide second-, third-, and fourth-year medical students with additional coverage of all otolaryngologic problems by presenting them with actual cases seen at all hospitals where otolaryngologic coverage is available. During these rounds, there is adequate time for discussion, diagnosis, etc. This course will also provide the medical students with more coverage of otolaryngology than is offered in the medical basic curriculum. Prerequisite, Human Biology 431 or equivalent.

496 Otolaryngology Seminar (1) AWSpS

DONALDSON

Advanced course on diseases of the ear, nose, and throat intended for those physicians interested in the field in more depth than that provided in the medical basic curriculum. Open to second-, third-, and fourth-year medical students. Prerequisite, Human Biology 431.

498 Undergraduate Thesis (*) AWSpS

DONALDSON

Student will work directly with department faculty in selecting a suitable area for laboratory or clinical research in the area of otolaryngology, and will develop a thesis for recognition. Prerequisite, permission.

499 Undergraduate Research (*) AWSpS

To offer research opportunities under direction in the area of otolaryngology. May be repeated for credit. (12 weeks.)

PATHOLOGY

110 Lectures in Medical Technology (1) W
Weekly lectures, demonstrations, and tours to familiarize students with subject matter and opportunities in medical technology. Prerequisite, sophomore pre-medical technology students.

310 General Pathology (2) A

WIEGENSTEIN

Study of causes, processes, and effects of important diseases. Lectures, demonstrations, and discussions. A reasonable knowledge of anatomy, histology, and physiology is required. For students of dental hygiene, physical therapy, and medical technology; others by permission.

320 Medical Technology (4) A

LE CRONE

Histotechniques: Course devoted to the principles and procedure of histological, histochemical, and electron microscopic tissue technic. (Not offered 1969-70.)

321 Medical Technology: Introductory Clinical Hematology (5) W

LE CRONE

Introductory hematology: Instruction in cellular morphology, coagulation, special instrumentation, and special hematological diagnostic studies.

322 Medical Technology: Introductory Clinical Chemistry (3) Sp

LE CRONE

Introductory clinical chemistry: This course

has been coordinated with Biochemistry 408. Lectures and laboratory are designed to instruct the student in the problems of the clinical chemistry laboratory. (Formerly Pathology 322-.)

419, 420, 421, 422 Medical Technology Seminar (2,3,3,3) S,A,W,Sp

LE CRONE, HAMMERNYIK

Lectures in the theoretical and practical consideration of standard and special medical laboratory procedures. Prerequisite, permission.

423 Medical Technology: Clinical Chemistry (12) AWSpS

LE CRONE, HAMMERNYIK

Clinical analysis of the biochemical products of body metabolism and training in the use of equipment incident thereto. Prerequisite, permission.

424 Medical Technology: Clinical Microbiology (12) AWSpS

LE CRONE, HAMMERNYIK

Clinical methodology in medical microbiology, mycology, and parasitology. Prerequisite, permission.

425 Medical Technology: Clinical Hematology (8) AWSpS

LE CRONE, HAMMERNYIK

Clinical methods for determining hematological measurements and analyzing activities of the blood cell. Prerequisite, permission.

426 Medical Technology: Clinical Diagnostic Procedures (12) AWSpS

LE CRONE, HAMMERNYIK

Clinical application of the principles of serological phenomena in the laboratory; technical methods in procurement of blood, blood typing, and cross matching; and coagulation, clinical microscopy, and radioisotope methodology. Prerequisite, permission.

427 Medical Technology: Advanced Studies in Laboratory Medicine (5) AWSpS

LE CRONE, HAMMERNYIK

Assigned advanced study in special problems, techniques, and methodology in the clinical laboratories. Prerequisite, permission.

444- General Pathology (5-) A

PAGE

A course for dental students.

-445 Systemic Pathology (-2) W

ROSS

A survey is made of pathologic processes affecting organs and systems of particular pertinence to the practice of dentistry. Lectures and demonstrations to present a coherent picture of systemic disease will be presented. For second-year dental students and graduate students by permission.

460 Autopsy Participation and Review (*) AWSpS

REICHENBACH

The course will introduce students to the autopsy and provide an opportunity for some anatomical dissection. Emphasis will be on pathologic anatomy, both microscopic and gross, and on regional and applied anatomy, and it will provide correlation between structure and function as related to clinical symptomatology. Maximum of four students summer quarter. Prerequisites, Human Biology 420 and permission; graduate students by permission.

461 Microscopic Autopsy Review (*) Sp

MARTIN

The slides from selected and particularly instructive autopsies will be reviewed by the students individually and then with the instructor. Clinical and basic science correlations will be stressed. Maximum of 10 students. Prerequisite, permission.

462 Cardiovascular Pathology Conference (*) AWSpS

REICHENBACH

This course consists of two parts, a laboratory review of gross and microscopic cardiovascular pathology of selected autopsied cases followed by a combined clinical (medical and/or surgical) radiology and pathology conference discussing these cases. Prerequisites, Human Biology 432 and permission.

463 Neuropathology (*) AWSpS

ALVORD

This course consists of three parts: (1) Combined neurology-neurosurgery-neuropathology conferences. (2) Gross and microscopic studies of selected autopsied cases with review of study sets. (3) Experimental projects in neuropathology. Prerequisite, permission.

464 Neuropathology Brain Modeling (4 or 8) S

ALVORD

Three-dimensional neuroanatomical relationships, critical for understanding neuropathology, can best be obtained in the construction of a model of the brain. Prerequisite, permission.

465 Surgical Pathology (*) AWSpS

GOLDENBERG

The objective is to study fresh gross surgical specimens and to review microscopic sections of diagnostic problems in general surgery. Prerequisite, Human Biology 460 or permission.

466 Pediatric Pathology (*, max. 10) AWSp

BECKWITH

Assignments by arrangement according to need and background. Prerequisite, permission.

467 Renal Pathology Conference (1-3) AWSpS

STRIKER

Light and electron microscopic study of human and experimental renal disease. Conference discussions and individual study. Prerequisite, permission.

468 Skin Pathology (1) AWSpS

SAGEBIEL

Developmental, inflammatory, neoplastic and degenerative diseases of the skin will be presented with an attempt to correlate the gross (clinical) with the microscopic changes. Prerequisite, permission.

469 Oral Pathology (1) AWSpS

SREEBNY, ROSS

To train the student to recognize and interpret clinical manifestations of diseases of the oral cavity, and to stimulate an intellectual curiosity regarding basic pathological mechanisms responsible for these conditions. Prerequisite, permission.

471 Neuroanatomic Pathology (2½) W

ALVORD, SHAW, SUMI

The particular diseases occurring in specific parts of the nervous system are considered in terms of the segmental (motor, sensory, and association plates), intersegmental (reticu-

lar formation), and suprasegmental (cerebellum, colliculi, and forebrain) components. Clinicopathologic correlations are emphasized. Prerequisites, Human Biology 432 and permission.

472 Neuropathologic Reactions (2½) A
ALVORD, SHAW, SUMI

The reactions of the nervous system, only more or less similar to those of other organs of the body as summarized in the course in general pathology, are considered in terms of congenital malformations, inflammations, vascular, traumatic, metabolic-toxic-degenerative, and neoplastic diseases peculiar to the nervous system as a whole. Clinicopathologic correlations are emphasized. Prerequisites, Human Biology 432 and permission.

476 Clinical Pathological Conference (*)
AWSp
ALVORD

Interesting, unusual, or provocative cases principally from the University Hospital are presented for discussion by senior staff from the clinical and basic science areas. For medical students; graduate students by permission. May be repeated for credit.

480 Diagnostic Pathology Clerkship (*) AWSpS
CREIGHTON, BECKWITH, FERGUSON, MOTTET, VRACKO

Medical student participation in the dissection and study of autopsy and surgical pathology cases. Each student is responsible for the work-up of cases assigned to him under the direction of a senior staff member. The student presents his cases at conferences and seminars and may participate in laboratory teaching. Clerkships are available at the University Hospital, Veterans Administration Hospital, Harborview Medical Center, and Children's Orthopedic Hospital and Medical Center. Prerequisites, Human Biology 420 and permission. (4 or 6 weeks.)

498 Undergraduate Thesis (*) AWSpS
Elective. Prerequisite, permission.

499 Undergraduate Research (*) AWSpS
Elective. Prerequisite, permission. May be repeated for credit.

Courses for Graduates Only

500 Principles of Pathology (6) AW
This course introduces the student to the basic pathologic processes such as inflammation, neoplasia, etc. Lectures, laboratory exercises, and demonstrations of human pathologic materials are used to teach the basic concepts of pathology which are important in medical and biologic research. A suitable knowledge of gross anatomy, histology, physiology, and biochemistry is required. Prerequisite, permission.

501 Cellular and Subcellular Response to Injury (2) W
SMUCKLER

Lecture-seminar. Considerations of current concepts of cellular and subcellular reactions to injury as studied by modern techniques of cell biology. Prerequisite, permission. (Offered alternate years; offered 1970.)

502 Inflammation and Repair (2) Sp
ALVORD, ROSS

Lecture-seminar: A systematic examination of the processes involved in inflammation and repair of injury. Prerequisite, permission. (Offered alternate years; offered 1971.)

503 Topics in Genetic Pathology (2) Sp
MARTIN

Seminar: An analysis of selected pathologic processes (neoplasia, inborn errors of metabolism, congenital anomalies, ageing) from the point of view of modern genetic theory. Prerequisite, permission. (Offered alternate years; offered 1970.)

507 Ultrastructural Pathology (2) S
ROSS, BULGER

Lectures and reading on techniques for electron microscopy including fixation, embedding, staining, histochemistry, autoradiography, photographic technique, microtomy, interpretation of micrographs, and maintenance and operation of the electron microscope. Prerequisite, permission. May be repeated for credit.

508 Ultrastructural Pathology (4-6) WSpS
ROSS, BULGER

Instruction in techniques of electron microscopy. Prerequisite, permission. May be repeated for credit.

510 Anatomical Analysis of Disease (*, max. 30) AWSpS
KOHEN

The anatomical features of human disease as revealed at surgery or postmortem by gross examination and light microscopy are correlated with chemical and physiologic changes. Prerequisite, permission.

520 Experimental Pathology Seminar (1) AWSpS

Review of current problems by members of the Department and visiting scientists. Prerequisite, permission of chairman. May be repeated for credit.

551 Experimental and Molecular Pathology (2-5, max. 20) AWSpS

An introduction to experimental pathology. A tutorial course introducing the beginning graduate student to selected methods and problems through literature surveys and/or laboratory experience. Emphasis is on cellular and molecular aspects of experimental pathology. Prerequisite, permission of chairman. May be repeated for credit.

552 Clinical Pathology (2-5, max. 20) AWSpS

A study of the principles and methods of the usual clinical chemical diagnostic laboratory procedures. The precision and accuracy of the various procedures is stressed, as is the interpretation of the results obtained. Topics in hematology, clinical chemistry, and microscopy are discussed. For pathology residents, fellows, and trainees. Prerequisite, permission. May be repeated for credit.

Conjoint 505 Histochemical and Cytochemical Methods (3) Sp
LAGUNOFF, KASHIWA
(See Conjoint Courses.)

Conjoint 560 Tumor Biology (2)
K. E. HELLSTROM, E. SMUCKLER
(See Conjoint Courses.)

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

PEDIATRICS

402-403-404 Human Growth and Development (1½-1½-1½) AWSp
DEISHER

Provides an opportunity to observe growth and development, and to participate in the pediatric health supervision of selected families in a multidisciplinary setting. Principles of development, child care, and their implications in child rearing will be discussed. Maximum of 8 medical students. Prerequisite, permission.

405 Environmental Influence on Child Health and Development (1) AWSp
SMITH

Students will come to the pediatric ambulatory care unit at Harborview Hospital to see pediatric patients under the care of a staff physician. Environmental factors influencing the health experience of one or two patients each session will be identified and discussed after observing the patient care. Open to min. 3/max. 3 medical students. Prerequisite, permission.

407 Research in Pediatric Endocrinology and Metabolic Diseases (*) AWSp
KELLEY

Clinical and basic research performed so that students may learn techniques of laboratory evaluation of children with classical endocrinopathies, abnormal growth pattern, abnormal sexual development and/or differentiation, and metabolic diseases. Techniques available include chromatography (paper, thin-layer, glass-fiber, column, gas-liquid), urinary 17 ketosteroid fractionation, identification of specific plasma and urinary hydroxylated steroids, fluorometry, and cytogenic techniques. Open to 3 medical students. Prerequisite, permission.

Conjoint 410 Study of Interdisciplinary Evaluation and Management of Handicapped Children (3)

Multidisciplinary study of handicapped children, including identification of children with problems, clinical assessment by a multidisciplinary team, formulation of plans for management, and reassessment in terms of progress made. The primary emphasis in this course will be on the mentally handicapped child. Prerequisite, permission. (Course offered cooperatively by Dentistry, Education, Home Economics, Nursing, Pediatrics, Psychiatry, Psychology, Social Work, and Speech.)

411 Community Night Clinics (2) AWSpS
DEISHER

Students will attend at least two night clinics per week for youth and young adults with medical and social problems. Treatment and rehabilitation will be emphasized. Facilities for young drug users (Fry Hotel Rehabilitation Program and urban Indian Center medical clinics) are examples of some of the resources utilized. Prerequisite, Human Biology 460. (Formerly 410)

440 Pediatric Infectious Diseases (1) AWSpS
DAVIS

Course will consist of a syllabus and a lecture series on tape (illustrated by slides), and/or seminars combined with clinic and laboratory experience. Emphasis will be placed on diagnosis and management of infectious diseases in children. Minimum of one student. Prerequisites, Human Biology 420, 421, and Microbiology 446.

451 Pediatric Electrocardiography (1) Sp

GUNTHEROTH

Theory and practice of electrocardiography will be reviewed in seminars. Electrocardiograms from children will be read by the student and reviewed with the appropriate faculty member. Maximum of 15 students. Prerequisite, Human Biology 440.

452 Fetal and Neonatal Physiology (1) W

HODSON

Lecture reviews the normal and abnormal physiology of the developing mammalian fetus and postnatal physiology including adaptation to extrauterine life. Prerequisites, Human Biology 422 and 440.

465 Pediatric General Clerkship

(* , max. 16) AWSpS

SMITH

General inpatient and outpatient pediatric clerkship, including experience with newborn babies. Besides his clinical experience, the student will have a faculty preceptor and attend seminars on major pediatric subjects. The 12-week clerkship will be broader and allow for more individual selection of rotations. Prerequisite, Human Biology 460.

469 Neonatal Pediatrics Clerkship (*)

OLIVER

Participation in the activities in the newborn and premature divisions; ward rounds, seminars, conferences and familiarization with certain laboratory techniques; particularly those relating to acid-base balance. Prerequisite, 465.

470 Pediatric Infectious Diseases and Immunology (*) AWSpS

DAVIS (University Hospital) AW

RAY (Children's Orthopedic Hospital and Medical Center) AWSpS

Elective dealing with the development of immune mechanisms and diagnosis and treatment of infectious diseases and immunologic defects in children. Opportunity for experience in clinical research and laboratory techniques will be provided. Prerequisite, Pediatrics 465 or permission.

472 Clinical Experience in Child Growth and Development (*) AWSpS

WENNER

Experience at the Clinical Training Unit in the common problems met in clinical practice among children from infancy. Emphasis is on normal development and behavior. Prerequisite, Human Biology 460. (Formerly 481).

473 Office Practice (*) AWSpS

BERGMAN, ROBERTSON

Opportunity to observe and function in the private office settings of a number of clinical pediatric faculty and accompany pediatricians as they pursue their daily activities in the community. Open to three fourth-year medical students. No withdrawal after registration. Prerequisite, permission.

476 Pediatric Clerkship—Fircrest School for the Mentally Handicapped (*)

AWSpS

HAYDEN

Total care involvement with mentally handicapped patients; incorporating general pediatric knowledge of mental retardation and neurology.

479 Clinical Problems in Mental Retardation and Related Handicaps (*) AWSpS

HOLM, GODE

Experience in multidisciplinary evaluation of

the handicapped child and study of the management of the problem. Open to one student. Prerequisite, 465. (Formerly 485.)

480 Pediatric Clinics (*) AWSpS

OLIVER

Elective part- or full-time experience in pediatrics and subspecialty clinics for 12 weeks. From one to ten half-day sessions may be elected each week in the following areas: general pediatrics, endocrinology, neurology, immunology, arthritis, cardiology, congenital defects and retardation, well-child, teratology, adolescent medicine, allergy, cystic fibrosis, hematology, and prematurity. Prerequisite, Human Biology 460.

482 Congenital Defects (*) AWSpS

SHURTLEFF

An advanced course in pediatrics providing experience in the clinical diagnosis and management of structural and metabolic congenital defects. Prerequisite, 465. (Formerly 488.)

483 Pediatric Endocrinology and Metabolic Diseases (*) AWSpS

KELLEY, RUVALCABA

This program can be oriented to the special interest of the individual student so that principal emphasis may be placed on clinical, laboratory, or both clinical and laboratory areas. Intensive clinical experience will be provided in classical endocrinopathies, abnormal sexual differentiation and/or development, abnormal growth, renal diseases, mesenchymal diseases, steroid therapy, diabetes and related disorders, and general metabolic disorders in children. Students also may perform some clinical and/or basic research in the various clinical conditions noted here. Techniques available include chromatography (paper, thin-layer, glass-fiber, column, gas-liquid), urinary 17 ketosteroid fractionation, identification of specific plasma and urinary hydroxylated steroids, fluorometry, and cyto-genetic techniques. Prerequisite, permission.

486 Pediatric Cardiology (*) AWSpS

BAUM, GUNTHEROTH, MORGAN

The student will do the admission work-up on all pediatric cardiology inpatients and on one outpatient per week. He will read all electrocardiograms with the Fellows, and assist in interpretation of pressure and oxygen content data from catheterization studies, in addition to assisting during the performance of catheterizations and angiocardiograms. During open-heart surgery, the student will observe and participate in the post-operative management, including fluid and electrolyte balance, medication, schedules, etc. Prerequisite, 465.

487 Pediatric Neurology (*) AWSpS

CARLSON

An advanced course in neurology emphasizing neurological disease in children. Both inpatient and outpatient experience will be included. Open to two medical students. Prerequisite, 465.

488 Adolescent Development (*) AWSpS

HAMMAR

An advanced pediatric clerkship dealing with special problems of the adolescent. Senior medical students are offered an experience in a multidisciplinary clinic at University Hospital. Prerequisite, 465.

491 Advanced Pediatric Elective Clerkship (*) AWSpS

OLIVER

Ward and/or outpatient experience with direct responsibility for patient care. The student

will work under the supervision of residents and attending physicians, having the same responsibilities for patient work-up, diagnosis, and care as an intern. This externship type of experience can be obtained at any one, or combination of the hospitals in the affiliated program. Students interested in this opportunity should make arrangements well in advance of registration. May be repeated for credit. Prerequisite, 465. (Formerly 475.)

498 Undergraduate Thesis (*) AWSpS

WEDGWOOD

For medical students. Prerequisite, permission.

499 Undergraduate Research (*) AWSpS

WEDGWOOD

An opportunity to gain research experience through participation in various clinical or basic research programs in progress. Prerequisite, permission.

Course for Graduates Only

505 Physical Growth of the Well Child (2) W

WEDGWOOD

Nine weekly seminars (18 hours). Presentation by departmental staff of relationships between growth and development and diseases as they pertain to dental health. For twenty graduate students in dentistry. (Offered alternate years; offered 1971-72.)

PHARMACOLOGY

234 General Pharmacology (3) Sp

Lectures and demonstrations concerning the action of drugs on physiological and pathological processes with special emphasis on agents of special importance in the practice of dentistry. For dental students.

235 Introduction to Dental Research (1) Sp

In depth research experience with members of staff of the Department of Pharmacology. For dental students with specific interest in dental pharmacology.

300 Principles of Drug Action (3) W

Current concepts of the actions and effects of therapeutic and toxic chemicals. Prerequisites, Chemistry 231, 232, Biology 101-102 or Zoology -112, or permission.

301-302 General Pharmacology (4-5) W,Sp

VINCENZI

Emphasis is placed upon the rational therapeutic use of drugs. Contra-indications for interactions and toxic effects of drugs are delineated and their sites and mechanisms of action stressed. Laboratory experiments and demonstrations are designed to illustrate these phenomena. For pharmacy students. Prerequisites, Physiology and Biophysics 360 and Pharmaceutical Chemistry 239.

441 Orientation and General Principles of Drug Action (2) A

HORITA

An introduction to pharmacology including historical aspects; the role of career pharmacologists in modern society; drug development and regulations; and a guide to the scientific literature. Fundamental principles of drug action with emphasis on receptor theory, dose-response relationships and factors involved in the absorption, fate, and distribution of drugs. Prerequisite, permission.

442 General Pharmacology (3) W

DYER, VINCENZI

A study of drugs acting on the autonomic nervous and cardiovascular systems. Empha-

sis will be placed on physiological and biochemical mechanisms, and consideration of their therapeutic and adverse effects will be discussed. Prerequisite, 441 or Human Biology 441.

443 General Pharmacology (2) W

DAVIS

Lectures and discussions on the pharmacology of the kidney, gastrointestinal tract, endocrine system, and chemotherapy of parasitic, microbial, and neoplastic disease. Prerequisite, 441 or Human Biology 441, or permission.

444 General Pharmacology (3) Sp

HALPERN

Advanced elective neuropsychopharmacology as a basis for therapeutic applications of drugs for use in neurology, psychiatry, and anesthesiology. Neuropsychopharmacological and psychopharmacological correlates will be presented with clinical demonstration material, where applicable and available, in an attempt to understand drug choice, efficacy, and mechanism of therapeutic effectiveness. Prerequisite, 441 or Human Biology 432, or permission.

498 Undergraduate Thesis (*) AWSp

For medical students. Prerequisite, permission.

499 Undergraduate Research (*) AWSp

Participation in departmental research projects. For medical students. Prerequisite, permission. May be repeated for credit.

Courses for Graduates Only

507 Pharmacology Seminar (1) AWSp

Presentation of comprehensive reports on recent medical and scientific literature in fields of current importance. Research progress reports, and reports on results of completed research. Prerequisite, permission. May be repeated for credit.

510 Current Topics in Pharmacology (2) W

Recent progress in pharmacological research. Considered areas will include renal pharmacology, polypeptides, and selected aspects of toxicology. Prerequisite, permission. (Offered alternate years; offered 1971-72.)

511 Special Pharmacological Techniques (3) W

A laboratory treatment of biochemical, biophysical, and surgical approaches employed in pharmacological investigation. Prerequisites, 301-302 or 234, or permission.

525 Cardiovascular Pharmacology (2) Sp

VINCENZI

Consideration of basic drug action on electrical and mechanical events in the heart and vascular system with clinical correlation. Prerequisites, 442, 301-302 or 234, and permission. (Offered alternate years; offered 1970-71.)

526 Autonomic Pharmacology (2) W

HORITA

An advanced treatment of pharmacologic effects on storage, release, and action of autonomic transmitter substances. Prerequisites, 442 or 301-302, or 234, and permission. (Offered alternate years; offered 1970-71.)

527 Biochemical Pharmacology (2) A

DIXON

Biochemical considerations of the mechanisms of action, structure-activity relationships, and metabolism of pharmacologic agents. Prerequisites, 301-302 or 234, or permission. (Offered alternate years; offered 1971-72.)

528 Neuropsychopharmacology (2) A

HALPERN

The pharmacology of the central nervous system. Prerequisites, 444 or 301-302 or 234, and permission. (Offered alternate years; offered 1971-72.)

532 Essentials of Toxicology (2) Sp

LOOMIS, WEBER

A study of harmful effects and various factors that influence the harmful effects of chemicals on biological tissue. Prerequisites, 301-302 or 234 or permission. (Offered alternate years; offered 1970-71.)

533 Methods of Toxicology (2) Sp

LOOMIS, WEBER

A combined laboratory demonstration and didactic consideration of chemical, physical, and biological methods involved in studies of harmful effects of chemicals on biological tissue. Prerequisites, 301-302 or 234 or permission. (Offered alternate years; offered 1971-72.)

600 Independent Study or Research (*)

AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

PHYSICAL MEDICINE AND REHABILITATION

107 Introduction to Occupational Therapy

(1) AW

JOHNSON

Orientation to occupational therapy as a paramedical specialty. Elementary concepts of treatment through activity and their application in various disability areas. Relationship of occupational therapy to allied health specialties. (Formerly N107.)

290 Pre-Occupational Therapy Clerkship (2)

AWSp

Supervised observations and work with patients in local occupational therapy clinics concurrent with lectures on professional ethics and on elementary techniques of occupational therapy. Prerequisite, permission.

320-321 Medical Science (4-4) W,Sp

Staff of Departments of Medicine, Obstetrics and Gynecology, Orthopedics, Pediatrics, Physical Medicine and Rehabilitation, Psychiatry, Radiology, Surgery

Lectures in medical science fields related to: general surgery, obstetrics and gynecology, internal medicine, neurology, physical medicine and rehabilitation, orthopedics, psychiatry, rheumatology, and roentgenology. Required for occupational therapy students and physical therapy students, others by permission. Offered to rehabilitation counseling students; others by permission.

332 Pathologic Physiology for Physical

Therapists and Occupational

Therapists (5) A

HARRIS

Emphasis on normal and pathologic physiology of the circulatory, respiratory, central nervous, and musculo-skeletal systems as basis for treatment in occupational therapy and physical therapy. Required for occupational therapy students and physical therapy students, others by permission. Prerequisites, Biological Structure 301, Zoology 208.

380 Occupational Therapy Theory—Professional Relationships (2) W

JOHNSON

Study of fundamentals applicable to all areas of occupational therapy; relationships of physical therapy, occupational therapy, nursing, rehabilitation counseling, social service, and other allied services in carrying out the team concept of a complete rehabilitation program. Prerequisite, third year in occupational therapy.

408 Tests and Measurements in Physical Therapy (4) Sp

HERTLING

Methods of performing, recording, and interpreting test procedures used in physical therapy; measurement of joint motion, evaluation of muscle strength through manual tests, and posture evaluation. Laboratory. Required for physical therapy students.

414 Psychological Aspects of Disability (3) W

FORDYCE

Psychological processes underlying adjustment to disability; application of conditioning techniques in patient therapy management; effects of intellectual and perceptual deficit on neuromuscular re-education. Required for physical therapy students, others by permission. Prerequisite, Psychology 100.

415 Undergraduate Seminar for Physical Therapy Students (1-2-1) AWSp

MC MILLAN

Basic principles of medical ethics; history, scope of physical medicine and rehabilitation; relationships of physical therapy, occupational therapy, nursing, rehabilitation counseling, social service, and other allied services. Required for physical therapy students, others by permission.

416 Principles of Physical Therapy Administration (2) W

TROTTER

Professional organizations and obligations of a physical therapist, and administration of a physical therapy department. Required for physical therapy students.

442 Advanced Kinesiology (4) Sp

LEHMANN

Study of joint motion and muscle function in relation to both the normal and abnormal state. Analysis is made of specific techniques employed in the field of physical medicine and rehabilitation. Required for occupational therapy and physical therapy students, others by permission.

444-445 Function of the Locomotor System (3- or 4-)(-3 or -4) A,W

LEHMANN

Functions of musculo-skeletal system as applied to normal and pathologic patterns of motion. Emphasis on upper extremity, shoulder girdle, lower extremity, and trunk. Anatomy of peripheral-vascular and peripheral-nervous system. Required for occupational therapy students and physical therapy students, others by permission. Prerequisites, Biological Structure 301, Zoology 208.

446, 447 Anatomy Laboratory for Occupational Therapists (1,1) A,W

LUCCI

Study of musculo-skeletal, peripheral-vascular, and peripheral-nervous systems from projected material. Concurrent with 444-445. Required for occupational therapy students, others by permission. (Formerly 444L, 445L.)

451 Anatomy Dissection for Physical Therapists (3) Sp

TROTTER

Dissection of musculoskeletal, peripheral-vascular, and peripheral-nervous systems. Required for physical therapy students, others by permission.

453 First-Year Clinical Elective in Physical Medicine and Rehabilitation (3) AWSp

Emphasis on comprehensive evaluation of the patient, his disability, and the interaction of the patient and his disability with his environment. Experience in the use of physical therapy for various disabilities, discussion of the psychological aspects of disability, and the evaluation of the patient for ability to function will be included. (10 weeks.)

454 Second-Year Clinical Elective in Physical Medicine and Rehabilitation (*) WS

Special emphasis on the technique of eliciting historical and physical evidence of ability of the patient to function in his environment. Topics will include transfer abilities, normal and abnormal gait, reambulation, communication disorders, modalities in physical medicine, psychological aspects of disability, learning aspects in chronic disease, vocational evaluation, principles of physical and occupational therapy, educational problems of the disabled, neuromuscular electrodiagnosis, braces, and prosthetics. Patients with stroke, amputation, spinal cord injury, arthritis, and multiple injuries will be followed. Patient-care responsibilities will be assumed by the student appropriate with his level. Prerequisites, Human Biology 423, 432. Not open to students who have completed 453.

455 Neuromuscular Electrodiagnosis (2) AWSpS

DELAETUR

Lecture-demonstration of fundamentals of electromyography and peripheral nerve stimulation followed by student participation in clinical electrodiagnosis examinations. An effort will be made to develop in the student an awareness of the usefulness of these tests so that he will, in the future, know when such procedures are indicated for his patients and will be able to interpret the results rather than to develop proficiency in performing these examinations. Prerequisite, Human Biology 460.

456 Clinical Biomechanics and Kinesiology (3) AWSpS

LEHMANN

The physical and mechanical properties of the musculoskeletal system will be discussed. Mechanical principles used in the functional replacement using ambulation aids, braces, and prosthesis will be reviewed. Emphasized will be the basic understanding of the biomechanical principles involved, as well as discussion of the clinical application, as they relate to normal and abnormal patterns of motion. The development and correction of deformities is discussed. Prerequisite, Human Biology 460.

457 Operant Methods in Management of Chronic Disease and Chronic Pain (3) A

FORDYCE

Demonstrates the place of learning concepts in understanding chronic disease and disability, review operant theory and methods, and provide limited practicum in their application. Prerequisite, Human Biology 460 or fourth-year medical student.

460- Beginning Physical Therapy Procedures (2-) A

BERNI, HERTLING

Introductory principles and concepts related to clinical physical therapy. Laboratory and clinical practice of basic physical therapy procedures in hydrotherapy. Application of physiological principles to clinical procedures. Prerequisite, physical therapy student.

-461 Beginning Physical Therapy Procedures (-2) W

HERTLING

History of massage, methods of application, indications and contraindications, and physiological effects on various systems of the body. Laboratory. Required for physical therapy students.

463 Modality Treatments (4) W,Sp

Theory, technique, demonstration, and practice in the use of the physical agents employed in physical therapy which include thermotherapy, actinotherapy, hydrotherapy, low-frequency and high-frequency currents. Required for physical therapy students.

466-467 Advanced Biophysical and Physiological Effects of Modalities (2-2) A,W

LEHMANN

Biophysical principles of equipment employed in physical therapy, physiological effects produced. Required for physical therapy students, others by permission.

468 Therapeutic Activities I (1-4) A

REED

Laboratory study of therapeutic media as they are used in occupational therapy. Includes the study of types of materials, procedures and techniques of utilization and sources of supply. Teaching methods as applied in patient treatment are emphasized. Prerequisite, fourth year in occupational therapy.

469 Therapeutic Activities II (1-3) W

JOHNSON

Laboratory study of special skills in occupational therapy. Adjusted to meet the needs of the individual student. Prerequisite, fourth year in occupational therapy.

470-471-472 Therapeutic Exercise (3-5-2)

A,W,Sp

TROTTER

Methods of application, physiologic and therapeutic effects of exercises commonly used for treatment purposes in physical therapy. Opportunities are provided for supervised clinical practice of skills, and special attention is given to correlation of technics to appropriate age level and handicap. New developments from the field are analyzed and evaluated. Required for physical therapy students.

473 Occupational Therapy Theory—Administration and Supervision (3) A

REED

Designed to introduce principles of organizing an occupational therapy department, its basic administrative principles and procedures, and an understanding of the functions of supervision.

474 Pre-Vocational Evaluation and Exploration (2) W

REED

The study of various types of pre-vocational programs; evaluation techniques, training procedures, and other considerations pertinent to job placement. Prerequisite, fourth-year student in Occupational Therapy.

475 Physical Restoration (4) A

HERTLING

Instruction in theory and methods of physical restoration of the severely handicapped patient. Laboratory demonstration, practice, and supervised clinical practice in: selection, care and use of wheelchairs, crutches, canes, walkers, and other assistive devices; special problems in the area of activities of daily living. Required for physical therapy students.

476 Prosthetic and Orthotic Evaluation and Use (2) A

SIMONS

477 Group Techniques (2) W

REED

Experience in knowledge and understanding of self, group, and organizational behavior through participation in a learning group and through observation of patient groups. Focal point will be directed around the use of activities. Prerequisite, fourth-year student in Occupational Therapy.

479 Physical Medicine and Rehabilitation Information for Speech Pathology (3) A

CARRELL

Orientation information for speech pathology students on rehabilitation principles and techniques. Offered jointly with the Department of Speech as Speech 452. (Formerly 479J.)

481 Occupational Therapy Theory—Psychiatry (5) Sp

REED

Preparation for evaluating, planning and administering an effective treatment program in psychiatric occupational therapy. Theories, treatment methods and media, and current research are explored. Clinical observations and practice under supervision required. Prerequisite, fourth year in occupational therapy.

482 Occupational Therapy Theory—Pediatrics (3) W

JOHNSON

A study of the application of occupational therapy in clinical conditions in pediatrics, including perceptual-motor dysfunction, cerebral palsy, mental retardation, blind, deaf, and emotional disturbance. Laboratory sessions provide experience in the observation, evaluation, and treatment of handicapped children. Prerequisite, third year in occupational therapy

483,484 Occupational Therapy Theory—Physical Disabilities (4,3) Sp,A

Emphasizes the total rehabilitation of the physically disabled patient. Includes laboratory demonstrations, and practice in assessment techniques, prosthetics, orthotics, and activities of daily living. New developments from the field are analyzed and evaluated. Prerequisite, third year in occupational therapy.

486 Basic Physical Medicine and Rehabilitation (*) AWS

STOLOV

A combined outpatient, inpatient, and consultation experience, where the human organism is studied as a social "being." The concept of disease is broadened to include the external environment. The student will learn the functional consequences in the environment of disease and impairment, the need for modifying the environment to support maximal function, and the impact of the illness or disability on the people around the patient, in his environment. The concern is with the relationship of disability to work, social functioning, and leisure time. Prerequisite, Human Biology 460.

487 Physical Medicine and Rehabilitation Clerkship—Medical (9) W

A clerkship experience for medical students in the specific rehabilitation approaches for the various "nonsurgical" diseases. Designed primarily for those interested in the medical, i.e., nonsurgical, specialties, and tailored to the individual student's requirements. Prerequisite, Human Biology 460.

488 Physical Medicine and Rehabilitation Clerkship—Surgical (9) AWS

A clerkship experience in the specific rehabilitation approaches for the various surgical problems. Designed primarily for those interested in the surgical specialties and tailored to the individual student's requirements. Prerequisite, Human Biology 460. (6 weeks.)

489, 490, 491 Clinical Clerkships in Physical Therapy (2,3,4) A,W,Sp
TROTTER

Observation, instruction, and supervised practice in treatment of patients in diverse clinical settings. Emphasis is given to the application of previously learned material and skills to specific clinical problems. Required for physical therapy students.

492 Occupational Therapy Clinical Internship—Physical Disabilities (6) AWSpS
LUCCI

Three months of directed and supervised clinical practice in Occupational Therapy Clinics of the University Hospital or other affiliated hospitals. Required for occupational therapy students.

493 Occupational Therapy Clinical Internship—Pediatrics (2) AWSpS
LUCCI

Two months of directed and supervised clinical practice in occupational therapy clinics. Required for occupational therapy students.

494 Occupational Therapy Clinical Internship—Psychiatry (1-6, max. 6) AWSpS
LUCCI

Three months of directed and supervised clinical practice in Occupational Therapy Clinics of the University Hospital or other affiliated hospitals. Required for occupational therapy students.

495 Clinical Affiliation in Physical Therapy (5) S
TROTTER

Twelve to fifteen weeks with 600 minimum working hours. Clinical application of physical therapy techniques under supervision in affiliated hospitals. Required for physical therapy students.

498 Undergraduate Thesis (*)
Prerequisite, permission.

499 Undergraduate Research (*) AWSpS
(a) Research for undergraduate medical students. Participation in clinical and basic research projects in the department; (b) research projects with special reference to modality treatment and physical therapy techniques, for physical therapy students; (c) research projects with special reference to occupational therapy applications for occupational therapy students. Prerequisite, permission.

Courses for Graduates Only

510 Somatopsychology: Psychological Aspects of Disability (3) Sp
FORDYCE

Psychological adjustment to disability; techni-

ques of milieu management; application of conditioning techniques to treatment structuring; effects of intellectual and perceptual deficit; rehabilitation team management. Elective for majors.

520 Seminar (1-5)

Conferences, seminars, discussions of advanced physical medicine and rehabilitation topics for residents and postdoctoral fellows in physical medicine and rehabilitation. Lectures, discussion, and laboratory work in selected aspects of occupational therapy appropriate to elected area of study for candidates for Master of Occupational Therapy degree. May be repeated for credit.

522 Neurophysical Basis for Neuromuscular Reeducation (2) Sp

HARRIS

A review of traditional neurophysical concepts and an exposition of recent advances in neurophysiological research related to the practice of physical medicine. The mechanisms underlying facilitation techniques and other techniques used in neuromuscular reeducation will be explained, and various techniques will be compared and evaluated. Prerequisites, resident M.D. status and permission.

530 Medical Aspects of Vocational Counseling (3) A

PALMER

Introduction to vocational implications of physical and emotional disabilities. Methods, counseling techniques, therapeutic modalities, community resources used in producing vocational assistance for the handicapped. Prerequisite, resident in physical medicine and rehabilitation.

532 Clinical Affiliation for Rehabilitation Counselors (5-6) A

Under the general preceptorship of the rehabilitation counseling professional staff, the student counsels patients who have severe physical and/or emotional problems, arranges for vocational testing and placement on job stations, and works with community resources in planning for vocation placement after followup. Prerequisite, permission.

535 Physical Medicine and Rehabilitation Administration (2-5) AWSpS

Comprehensive analysis of the development of administrative processes in rehabilitation medicine. Theory and application in administrative and supervisory principles. Introduction of practical experience in clinical and academic situations. Offered to residents and postdoctoral fellows in physical medicine and rehabilitation. Offered to Master in Occupational Therapy degree candidates.

540 Application of Measurement Systems (2) AWSp

Introduction to, and clinical application of, basic measurement concepts, pertinent to rehabilitation therapy. Prerequisite, permission.

543 Biomechanics Basic to Therapeutics in Physical Medicine (3) Sp

LEHMANN, SIMONS

The physical and mechanical properties of the musculo-skeletal system will be discussed. Mechanical principles in the functional, replacement, using ambulation aids, braces, and prosthesis, will be reviewed. Emphasis will be on basic understanding of the biomechanical principles involved, as well as on detailed discussion of clinical application at the level of residents and academic trainees. Prerequisite, resident in physical medicine and rehabilitation, others by permission.

546 Rehabilitation Nursing Seminar I (3)

Analysis of selected theoretical components underlying rehabilitation and utilization of scientific rationale in clinical nursing studies, with emphasis on prevention and maintenance. Library research and field study are required. Offered jointly with the School of Nursing as Nursing 546. Prerequisite, graduate standing.

547 Rehabilitation Nursing Seminar II (3)

Reconceptualization of theories of rehabilitation through study of patients with a variety of disabilities, with emphasis on supportive aspects. Library research and field study are required. Offered jointly with the School of Nursing as Nursing 547. Prerequisite, 546.

548 Rehabilitation Nursing Seminar III (3)

Assessment of the nursing problems and direction of nursing therapies for groups of patients with a variety of disabilities, with special emphasis on restorative needs. Library research and intra- and inter-disciplinary conferences will be included. Offered jointly with the School of Nursing as Nursing 548. Prerequisites, 546 and 547.

549 Rehabilitation Nursing Seminar IV (6)

Evaluation of nursing therapies used for rehabilitative problems in a variety of settings. Communication of pertinent rehabilitation nursing interventions. Library research and field study are required. Offered jointly with the School of Nursing as Nursing 549. Prerequisites, 546, 547, and 548.

550 Electromyography for Occupational Therapists (3) S

Introduction to clinical electromyography methods as a research tool through lectures, demonstrations, and practice sessions. Prerequisite, permission.

568 Biophysics as Applied to Physical Medicine (2) A

LEHMANN

Propagation and absorption characteristics of physical forms of energy used for treatment in physical medicine. Physiologic effects basic to prescription of the physical therapy modalities. Prerequisite, resident in physical medicine and rehabilitation, others by permission.

596 Electromyography and Electrodiagnosis (3) S

JEBSEN

Elective work in clinical electromyography and other electrodiagnostic methods, with lecture-demonstrations involving selected cases in the laboratories. Prerequisite, permission.

597 Electromyography and Electrodiagnosis Laboratory (2) A

JEBSEN

Elective work in clinical electromyography and other electrodiagnostic methods. Prerequisite, permission. (Formerly 596L.)

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

PHYSIOLOGY AND BIOPHYSICS

Conjoint 316, 317-318 Introductory Anatomy and Physiology (2, 5-5) A,W,Sp
(See Conjoint Courses.)

360 General Human Physiology (5) A

Lecture, laboratory, and laboratory conference instruction in the basic principles and basic laboratory techniques of physiology. For students of pharmacy; others by permission. Prerequisites, Zoology -112, Pharmaceutical Chemistry 239, Physics 115 and 118, Microbiology 301.

Conjoint 400 Human Anatomy and Physiology (6 or 9) A
(See Conjoint Courses.)

405 Human Physiology (5 or 7) W

Intensive coverage of advanced physiology through lectures, laboratories, and demonstrations. Required for first-year dental students; graduate students and others by permission.

406 Physiology and Biophysics Laboratory (1) W

GORDON, KENNEDY

Experiments drawn from areas of muscle, neurophysiology, cardiovascular, respiratory, renal and endocrine physiology; performed by students working in small groups. Discussion of techniques, data analysis, and results. Prerequisite, permission.

410 Nerve and Muscle Physiology (3) A
WOODBURY

Detailed consideration of the active ion transport, nerve-impulse conduction, neuromuscular synaptic transmission, excitation-contraction coupling and contraction coupling and contractile processes of vertebrates. Aim is to convey the concepts of excitable, synaptic, and contractile phenomena. Prerequisite, permission.

411 Neurophysiology (3½) W
PATTON

Functioning of the central nervous system: somatic and visceral; special senses: audition, vision, vestibular; descending systems: cortical and subcortical; cerebellum, hypothalamus; behavior and neurophysiology; comparative neurophysiology. Prerequisite, permission.

412 Cardiovascular and Respiratory Physiology (3½) W

HORNBEIN, SCHER, WIEDERHIELM

Detailed study of the cardiovascular and respiratory systems and their interactions. Topics: functions of the heart, electrical, and mechanical; regulation of cardiac output, circulation to special regions, exercise physiology. Mechanics of respiration, gas exchange; acid-base; regulation of respiration; respiratory function tests. Prerequisite, permission.

413 Physiology of Transport Organ Systems (2½) Sp

BROWN, STIRLING

Functions of organ systems primarily devoted to active transport. Principles of transport: passive forces and active transport processes, models of active transport. Renal system: fluid dynamics, tubular transport, integration and regulation of tubular functions. Body fluids: volume compartments, cerebrospinal fluid. Gastrointestinal system: motility, secretions, absorption, transport regulation. Prerequisite, permission.

414 Physiology of Chemical and Metabolic Regulation (3½) Sp
BRENGELMANN, GALE

Energy metabolism and control of temperature: intermediate metabolism, heat production, thermal exchange, temperature regulation. Control functions of endocrine system: pituitary, hypothalamus, target organs, thyroid adrenal cortex and medulla, pancreas; parathyroid, reproduction physiology; physiological control systems. Prerequisite, permission.

415 Physiology Special Research Projects (1-4) AWSpS
PATTON

Small group or individual research projects in

physiology. The student may choose topic involving laboratory and/or library research. Prerequisite, permission.

418 Biological Instrumentation (4) S
BRENGELMANN, WOODHULL

Principles of biological instrumentation systems, transfer relations, transient and frequency response of simple systems, noise, feedback and control systems, analog computation. Oriented toward biology, medical, and premedical students. Prerequisite, beginning calculus or permission.

419 Biological Instrumentation Laboratory (2) S
BRENGELMANN

Laboratory to illustrate and extend material presented in 418. Prerequisite, permission.

420 Quantitative Methods in Physiology and Biophysics (3) A
FUCHS

Selected areas in physiology are to be presented where applications of physics and mathematics are useful and necessary to analyze biological function. Prerequisite, differential equations or permission.

430 Mathematical Methods of Physiology and Biophysics (3)
STEVENS

Selected mathematical methods particularly useful in physiology and biophysics are developed. Emphasis is on deriving mathematical descriptions, usually in the forms of ordinary or partial differential equations, for physiological systems. Topics covered will usually include solution of differential equations using the Laplace transform linear approximation of nonlinear systems, transfer function, and Green's function description of physiological systems. Prerequisite, permission.

431, 432 Biological Control Systems (3, 3)
W,Sp
BROWN

Application of feedback and control system theory to the analysis of physiological regulation. Review of appropriate mathematical techniques. Discussion of applications to cardiovascular, respiratory, and temperature regulation, and to nervous and endocrine systems. Prerequisite, permission.

437 Computer Programming for Biological Research (3) S
KEHL

Application of procedure-oriented languages to biological research. Stress is placed on programming in Fortran IV, ALGOL, and digital-analog simulator. Programming practice on various computers is assigned with term-program written at conclusion of course. Prerequisite, permission.

470 Selected Topics in Endocrinology and Metabolism (3) A
GALE

Reading and discussion of current literature with emphasis on regulatory mechanisms in mammals. Prerequisite, permission. May be repeated for credit.

475 Renal and Gastrointestinal Physiology (4) W
STIRLING

Provides advanced training in renal and gastrointestinal physiology. Seminar discussions of selected papers from the literature and performance of related experiments. Discussions will usually include body fluid com-

partments, glomerular filtration, tubular transport of electrolytes and nonelectrolytes, smooth-muscle properties, gastric secretions and small-bowel absorption. Experiments will generally encompass clearance, stopped-flow, radio-labeled tracer and electrical recording techniques. Prerequisite, permission.

492 Selected Topics in Physiology and Biophysics (2) AWSpS

Seminars or research in collaboration with a faculty member on topics selected by individual arrangement. Medical students; graduate students and others by permission. May be repeated for credit.

494 Neurological Study Unit (2) AW

Faculty and student discussion of neurological topics illustrated with clinical cases or demonstrations include the following: physiology, neuroanatomy, neurology, neuropathology, neurosurgery, and psychiatry. Prerequisite for medical students, Human Biology 432; graduate students by permission. May be repeated for credit.

498 Undergraduate Thesis (*) AWSpS

For medical students. Prerequisite, permission. May be repeated for credit.

499 Undergraduate Research (*) AWSpS

For medical students. Prerequisite, permission.

Courses for Graduates Only

515-516-517 Physiological Proseminar (7-7-7)
A,W,Sp

A guided survey of the experimental literature of major topics in physiology. Course conducted as seminar with oral analysis of assigned papers and topics. Prerequisite, permission.

519 Membrane Biophysics Seminar (1)
AWSpS

Detailed discussion and study of current topics in cell membrane function and structure. May be repeated for credit.

520 Physiology Seminar (*) AWSpS

Selected topics in physiology. Prerequisite, permission. May be repeated for credit.

521 Biophysics Seminar (*) AWSpS

Selected topics in biophysics. Prerequisite, permission. May be repeated for credit.

522 Pulmonary Mechanics and Gas Exchange (2-5) A
YOUNG

Viscous and elastic properties of chest-lung system; flow of gases in tubes. Generalized alveolar air equations. Gas transport. Prerequisite, permission.

523 Heat Transfer and Temperature Regulation (2-5) S
BRENGELMANN, BROWN

Thermal exchange between the body surface and the environment. Heat production and distribution within the body. Properties of cutaneous and deep temperature receptors. Neural integration and homeothermy. Prerequisite, permission.

524 Advanced Membrane Potentials (3) A
WOODBURY

Quantitative analysis of electrical activity in nerve. Active sodium-potassium transport. Ionic flux equations. Conductance changes. Calculations of the action potential. Prerequisite, permission.

525, 526, 527 Readings in Advanced Physiology and Biophysics (*,*,*) AWSpS, AWSpS, AWSpS

Guided study of the experimental literature of physiology and biophysics. Essays are written and discussed with the staff. Emphasis is placed on critical analysis, accuracy of expression, bibliographical technique, and other factors of good scholarship. Prerequisite, permission. Each course may be repeated for credit.

528 Advanced Physiological Control Systems (2-5, max. 10) A YOUNG

Theories of nonlinear mechanics and their applications to physiological control systems. Prerequisite, permission. May be repeated for credit.

529 Motoneuron Physiology (4) W CALVIN

Electrical properties of surface membrane; excitatory and inhibitory reactions and their ionic mechanisms; properties of the spike potential; interaction of synaptic responses. Prerequisite, permission.

530 Synapse and Reflex Seminar (4) A PATTON

A guided survey of the literature pertaining to reflex and synaptic physiology. Course is conducted as seminar with students giving oral reports on assigned topics. Prerequisites, 515 and permission.

531 Biophysics of Circulation (3) A SCHER, WIEDERHIELM

Study of cardiovascular physiological areas where quantitative models have been seriously proposed: dynamic models of arterial circulation, characteristics of microcirculation, transport across capillary wall. Prerequisite, permission.

535 Operative Techniques in Neurophysiology (2-5) S PATTON, SMITH

Deafferentation, decerebration, and Sherrington reflex preparation, osteoplastic bone flap, Horsley-Clarke apparatus, and reconstruction of lesions; primate colony and operating room management. Prerequisite, permission.

536 Behavioral Techniques in Neurophysiology (2-3) Sp LUSCHEI, SMITH

Study and use of behavioral methods applicable to nervous system studies, quantification of activity and physiological variables, interpretation of neural lesions and chronic electrode implants. Prerequisite, permission.

537 Real-Time Computer Systems (3) W KEHL

Use of digital computer as an instrument in biological experimentation. Includes real-time analog-digital conversion, digital-analog conversion, interrupt processing from the "real" world, display and analysis of data. Prerequisite, permission.

540 Neurophysiology of Learning (3) W LUSCHEI, SMITH

Consideration of the literature relating to brain mechanisms of learning. Prerequisite, permission.

545 Physiology of Vision (3) Sp STEVENS

Selected readings from recent literature on visual systems. Emphasis is placed on studies

of single neuron discharge, but other topics, such as biochemistry of visual pigments and optical properties of the eye, are usually included. Prerequisite, permission. May be repeated for credit.

549 Properties of Neurons (3) Sp
Offered in alternate years with 545. Selected readings from recent literature comparing properties of neurons from different regions of the vertebrate central nervous system. Emphasis is on the critical evaluation of data obtained by intracellular recording. Prerequisite, permission.

550 Cortical Potentials (4) Sp TOWE

Properties of continuous and evoked potentials and their interactions. Relationship of cortical unit activity to cortical potentials. Prerequisites, 515, 529, and permission.

551 Physiology of Cerebellum (3) Sp KENNEDY

Function of cerebellum and its afferent and efferent systems; discussion of current physiological literature. Prerequisite, permission.

559 Integrative Neurophysiology (3) Sp TOWE

Interpretation of neurophysiological phenomena from comparative, biophysical, and evolutionary standpoints. Prerequisite, permission.

560 Contraction of Skeletal Muscle (3) GORDON

Structure and properties of skeletal muscle leading to contraction theories. Length-tension relations. X-ray diffraction, and fine structure studies. Sliding filament hypothesis. Mechanical properties. Heat and chemical studies. Excitation-contraction coupling. Prerequisite, permission.

580 Special Topics in Physiological Control Systems (*) AWSpS

Selected physiological control systems will be covered in detail. A literature survey of pertinent papers will be used as a basis for indicating the direction of future research. Prerequisite, permission. May be repeated for credit.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

PREVENTIVE MEDICINE

323 Introduction to Public Health Principles and Practices (3) AWSpS WILKEY

A survey of principles, practices, and the agencies concerned. This basic course is required of all preventive medicine majors.

410 Principles of Communicable Disease Control and Biostatistics (2) AWSp FOY, KRONMAL

Vital statistics, measures of central tendency and dispersion, introduction to interpreting statistical data, and control of communicable disease. Required of senior nursing students in the basic nursing curriculum. Prerequisite, 323.

420 Principles of Epidemiology (3) A PETERSON

Descriptive, analytic, and experimental epidemiology as presented in examples from

infectious and chronic noninfectious disease. Includes descriptive statistics as applicable in epidemiology. Prerequisites, 323, Microbiology 301 or permission, or graduate standing.

422 Introduction to Environmental Health (3) W HATLEN

Relationship of man to his environment, how it affects his physical well-being, and what he can do to influence this environment for the protection of his health. Emphasis on environmental factors involved in transmission of communicable diseases and hazards due to exposure to chemical and physical materials in our environment.

424 Public Health Programs (3) Sp HALL

Current problems and programs of major concern in the following areas: maternal and child health, accident prevention, mental health, chronic diseases, and medical economics. Prerequisite, 323 or 461.

426 Field Training in Health Education (5) S MILLS, REEVES

Four and one-half weeks of full-time supervised work experience in the health education division of a local official health agency. Offered jointly with the College of Education as Education Curriculum and Instruction (EDC&I) 426. Prerequisite, permission.

440 Water and Waste Sanitation (4) A HATLEN

Advanced study of the sanitary control of water supplies and sewage and refuse disposal, with emphasis on the knowledge and skills utilized by the sanitarian.

441 Milk and Food Sanitation (4) W HATLEN

Advanced study of the sanitary control of the production, processing, and distribution of milk and food.

442 Vector Control and General Sanitation (3) Sp HATLEN

Advanced study of the control of rodents and arthropod vectors of disease; the control of environmental utilities, including plumbing, swimming pools, bathing beaches, recreation areas, housing, schools, and other topics of general sanitation.

450 Measurement and Control of Air Pollution (2) A BOVEE, BREYSSE

Description of methods for air pollution research and control, including field survey techniques, stack sampling, continuous monitoring, and use of control equipment. Administrative problems are also discussed.

453 Industrial Hygiene Techniques (3) W BOVEE, BREYSSE

Field and industrial laboratory testing procedures for chemical and physical hazards as employed by industrial health workers.

455 Control of the Industrial Environment (3) Sp BREYSSE, HIBBARD

Principles of control of the industrial environment including control of nonionizing radiation, heat, and hazardous chemicals with special emphasis on exhaust ventilation.

456 Laboratory Management and Safety

(1) W
BREYSSE, HIBBARD

Designed for laboratory management safety to consider chemical and physical hazards, their control and management.

461 School and Community Health Programs (5) AWSpS

MILLS, REEVES

Organizational structure, function, and services of official and nonofficial community and school health agencies, with particular attention to the interrelated roles of teachers, physicians, nurses, and sanitarians. Prerequisite, junior standing.

472 Applied Statistics in Health Sciences (3) AWSp

BENNETT

Application of statistical techniques to biological and medical research; design and interpretation of experiments.

474 Statistical Methods in Dentistry (2) Sp

BENNETT

Application of statistical techniques to dental research; design and interpretation of clinical and laboratory studies.

476 Sample Survey Techniques (3-5) Sp

BENNETT

Methods appropriate for conducting and analyzing results of sample surveys. (Offered when demand is sufficient.)

477 Statistical Methods in Biological Assay (3) A

BENNETT

Methods appropriate to estimation of the dose-effect relationship; biological standardization; microbiological assay; design of experiments. (Offered when demand is sufficient.)

478 Practice of Epidemiology (*)

AWSp

Participation in the field investigations of important or unusual disease outbreaks. Prerequisite, Human Biology 460 or permission.

480 Public Health Problems (*, max. 6) AWSpS

HATLEN, REEVES

Special assignments in the field of public health. Prerequisite, permission.

482 Field Practice in Public Health (2-6) AWSpS

HATLEN

An assignment to a local health department for supervised application of public health practices. Prerequisite, permission.

483 Field Practice in Public Health (6) AWSpS

HATLEN

An assignment to a local health department for practice in program planning. Prerequisite, permission.

484 Field Practice in Public Health (3) AWSpS

HATLEN

An assignment to a local health department for training in the utilization of community resources. Prerequisite, permission.

490 Public Health Administration (3) Sp

BASSETT

Public health administration, including philosophy, legal aspects, program and fiscal

planning, personnel management and public relations. Prerequisites, 420, 422, 424, or permission.

492 Problems in International Health (2) A

EMANUEL

Seminar to acquaint students with the unique political, cultural, social, anthropologic, and economic characteristics of underdeveloped areas of the world, and to relate disease occurrence and health care solutions to these characteristics. Prerequisite, permission.

498 Undergraduate Thesis (*) AWSpS

For medical students. Prerequisite, permission.

499 Undergraduate Research (*) AWSpS

Prerequisite, permission.

Courses for Graduates Only

506 Mammalian Cell Culture as a Tool for Virus Research (*, max. 3) W

KENNY

General concepts and techniques of cell culture as applied to problems of virus isolation and propagation. Prerequisites, 5 credits in microbiology, 5 credits in biochemistry, and permission.

507 Antigenic Analysis of Microorganisms (*, max. 3) A

KENNY

Theory and techniques for antigenic analysis of micro-organisms (bacteria, mycoplasmas, and viruses). Prerequisites, 5 credits each in microbiology and biochemistry, and permission.

519 Principles of Epidemiology (3) A

FOX

Lectures and discussions covering evolution and meaning of epidemiology, concepts of disease causation, basic epidemiologic methods and descriptive, analytic, and experimental epidemiology. A term paper on the epidemiology of an assigned disease will be required. Prerequisite, permission.

520 Epidemiology of Acute Diseases (3) W

ALEXANDER

A study of the principles and practice of epidemiology as derived from a study of communicable diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

521 Epidemiology of Chronic Diseases (3) Sp

LEE

A study of the principles and practice of epidemiology as applied to the noncommunicable diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

522 Advanced Epidemiology (*, max. 3) AWSpS

Seminar on current research and epidemiological studies of communicable and chronic diseases. Prerequisites, M.D., or Ph.D. in medical science and permission.

523 Epidemiology Reading Seminar (1) AWSpS

FOX

Objectives are to promote critical reading of scientific papers and increase knowledge and understanding of principles and methods in epidemiology. Required of all fellows and residents in Preventive Medicine. Prerequisite, permission.

530, 531 Medical Biometry I, II (3,3) A,W

KRONMAL, BRESLOW

The application of mathematical and statistical techniques to the problems of advanced medical and epidemiological research. Prerequisite, M.D., or Ph.D. in medical science or permission.

533 Computer Applications in Medical Research and Biostatistics (3) W

KRONMAL

A course designed to acquaint the medical researcher and biostatistics student with both the potentialities and the use of the digital computer in medicine. Prerequisite, permission.

535-536-537 Stochastic Models in Biology and Medicine (3-3-3) A,W,Sp

PERRIN

The application of techniques of advanced probability and statistics to problems in health sciences, with emphasis on the role of stochastic processes in biology and medicine. Prerequisite, permission.

540 Environmental Medicine (3) Sp

MCCARROLL

Air and water pollution, industrial toxicology, and physical environmental factors affecting health. Prerequisites, M.D., or Ph.D. in medical science and permission.

580 Medical Care (2) Sp

BERGMAN

An interdisciplinary seminar designed to survey factors affecting the delivery of medical care. The subject will be viewed by representatives of medicine, sociology, economics, and political science. Offered jointly with the Graduate School of Public Affairs as Public Policy 580. Prerequisite, graduate standing or permission.

591, 592, 593 Special Topics in Advanced Biostatistics (3, max. 6, 3, max. 6, 3, max. 6) A,W,Sp

PERRIN

Multivariate analysis, clinical trials, health survey design and analysis, Bayesian procedures, regression and classification techniques, applications of contagious distributions in ecology, and other advanced statistical methods will be covered.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

800 Doctoral Dissertation (*)

PSYCHIATRY

267 Preventive Methods for Mental Health (2) Sp

PATTISON

Explores the concepts of mental health and mental illness and the factors that produce each, with analysis of methods of primary, secondary, and tertiary programs, including psychological, social, and cultural factors. For nonmedical students.

440 Physiology of Emotions (*) WSp

HOLMES

Seminar based on discussion of selected reading of original articles from psychophysiology and psychosociologic literature. Designed to orient and interest students for participation in current or future research projects. Medical students only. Prerequisites, Human Biology 433 and permission.

441 Psychological Testing and Measurements (2) AWSp

BECKER

Principles of individual and group testing, with particular reference to the problems of reliability and validity. Designed to orient students toward research design and methodology in psychiatric research. Medical students only. Prerequisites, Human Biology 433 and permission. May be repeated for credit.

442 Culture and Illness (*) Sp

Examination of several social systems with regard to the manner in which patterns of illness are developed, maintained, or modified by cultural elements. A lecture-discussion course with guided reading. Medical students only. Prerequisite, permission. May be repeated for credit. (Offered 1970-71.)

444 Medical Aspects of Sexual Problems (2) W

HAMPSON

Lecture-discussion format, covering a body of information on sexual behavior, both normal and disturbed, with particular focus on the pertinence to medical practice. Elective open to medical students. Prerequisite, permission.

445 Sensitivity Training Group (1) A

SEVERINGHAUS

An unstructured small-group experience in which the participants learn from experience about group functioning and increase their awareness to group interaction and feedback of themselves and their perception of others. Prerequisite, permission.

447 Problems and Dynamics of Families and Small Groups (2) Sp

CARLIN

Discussion of the dynamics of family and small-group functioning will include cross-cultural data, the structure of communication, leadership, influence and attitude change, cohesiveness, modeling, role assignment, and the relationship of poverty to family style, with particular focus on the pertinence to medical practice. Medical students only. Prerequisite, permission.

448 Social Problems in Aging (2) Sp

PRESTON

The psychosocial conditions for the aging in Western societies. Consideration will be given to types of living arrangements including retirement communities, health care plans, self-actualizing activities, and death. Medical students only. Prerequisite, permission.

449 Principles of Research in Psychopathology (2)A

BECKER

Review of current literature on selective aspects of personality deviation. Theoretically relevant research on the functional psychoses will be stressed. Open to medical students and advanced undergraduate students with the equivalent of an introductory or abnormal psychology course. Prerequisite; permission.

451 Principles of Personality Development (2) W

HEILBRUNN

Consideration will be given to the physiologic, psychologic, and cultural factors from maturity through old age. For nonmedical students. Prerequisite, permission.

452 Clinical Psychiatry (2 or 3) Sp

SCHER

An overview of the practice of clinical psychiatry with emphasis on the etiology, diag-

nosis, and treatment of psychiatric illnesses. For nonmedical students. Quiz section required for Occupational Therapy students; optional for other students. Prerequisites, 267, 451, or permission.

455 Psychoanalytic Theory (1) AW

RIPLEY

The basic concepts of psychoanalysis including the psychology of errors, dreams, the meaning of symptoms, transference and the libido theory will be considered. Medical students only. Prerequisite, permission.

456 Classical Readings in Psychiatry (2) W

RIPLEY

Selected readings from writings of leading contributors to psychiatric theory. Among them are Janet, Freud, Adler, Jung, Sullivan, Meyer, and Erickson. Medical students only. Prerequisites, Human Biology 433 and permission.

457 Theory of Learning and Behavior Modification (2) W

CARR, ARMSTRONG

The theory and technique of behavior modification as they are applied to behavioral adjustment problems of adults and children. Medical students only. Prerequisites, Human Biology 433 and permission.

459 Interviewing Techniques (1) W

SEVERINGHAUS

Practice with interviewing psychiatric patients followed by discussion of the technical and clinical aspects. Medical students only. Prerequisite, permission.

460 Community Psychiatry (3) AWSp

PATTISON

An introduction to the theoretical and practical aspects of community psychiatry, including network of services, community organization, consultation and education, and preventive mental health programs. Open to medical students or graduate students. Prerequisites, Human Biology 433 and permission.

461 Workshop on Suicide and Crisis Intervention (1) W

SPOERL

After a presentation of current theories on crisis, suicide, and crisis intervention, students will have an opportunity to learn and to practice various techniques of intervention at the emergency room of Harborview Medical Center. Open to medical students or graduate students. Prerequisites, Human Biology 433 and permission.

462 Principles of Hypnosis (2) Sp

RIPLEY

The history and theory of hypnosis. Induction techniques. Application to the treatment of illness. Prerequisites, Psychology 100 or Human Biology 433, and permission.

465 Clinical Clerkships (*, max. 8) AWSp

Four weeks of closely supervised experience on a psychiatric inpatient service. The student is responsible for diagnostic evaluations of patients with a variety of psychiatric disorders at the University Hospital, King County Hospital, and Veterans Administration Hospital. He is introduced to the principles of the use of psychologic tests, ward milieu management, group psychotherapy, and the physical and pharmacologic treatments. Clinical conferences with discussion of psychoses, psychoneuroses, and psychosomatic disorders are held. Lectures are given throughout the year. Medical students only.

470 Chemical Aspects of Behavior (2) W

MASUDA

Behavior from the point of view of biochemistry and physiology, e.g., some genetic aspects of behavior, aberrant biochemistry and disease, brain biochemistry, learning and biochemistry, brain substances and drugs, and behavior. Open to third- and fourth-year Basic curriculum medical students only. Prerequisite, permission.

475 Psychiatric Externship (*) AWSp

HOLMES

Opportunity to learn, from first-hand experience and active participation, the methods used in caring for seriously ill patients at a state psychiatric hospital. Elective open to medical students. Prerequisite, 465.

480 Clinical Diagnosis and Treatment (*, max. 6) AWSp

HAMPSON, WIMBERGER

This elective offers the opportunity of an individually supervised outpatient experience with adults, adolescents and children at the University Hospital. Emphasis is placed on the understanding of the psychodynamics of minor emotional problems, therapeutic interaction between doctor and patient, and a variety of methods of counseling and psychotherapy, including crisis intervention, group therapy, behavior therapy, conventional psychotherapy and pharmacotherapy. Exact details of the program will be tailored to the student's interest. There is the possibility of participation in the psychotherapy seminars and involvement as a co-therapist in the family therapy program. Students may work in outpatient clinics one to ten half-days per week throughout the quarter at University and Harborview Hospitals and in child psychiatry. Maximum number of students is limited; students must coordinate with department. (12 weeks.)

490 Advanced Clinical Psychiatry (*) AWSp

HAMPSON

This elective offers a variety of clinical experiences in psychiatry, arranged to accommodate the particular interests of the students. The program includes seminars and conferences by the psychiatric staff. The following specific choices may be selected:

- Experience on the Adult and Child Day Care Units (W,Sp, 4 or 6 weeks),
- Inpatient, Outpatient and Consultation Experience at University or Veterans Hospitals (AWSpS, 4, 6, or 12 weeks);
- Experience in Acute Psychiatric and Social Problems at Harborview Hospital (AWSpS, 4, 6 or 12 weeks); and
- Community Mental Health (AWSp, 12 weeks).

Depending on the student's interests, it is possible to work in the following Psychiatry courses during this elective: 440, 441, 448, 449, 455, 456, 457, 461, 470. Prerequisite, Human Biology 460.

491 Seminars and Conferences in Psychiatry (*) AWSpS

Special seminars and conferences on a variety of topics can be arranged to accommodate the particular interests of students. Prerequisite, permission. Elective open to medical students. May be repeated for credit.

492 Behavioral Science Study Unit (*) AW

MASUDA

A variety of topics will be presented under the sponsorship of the Department of Psychiatry, with participation of faculty members from the Departments of Neurological Sur-

gery, Pediatrics, Pharmacology, Physiology and Biophysics, Psychology, and Sociology. When practicable, selected patients will illustrate topics presented. Medical students only. Prerequisite, permission. May be repeated for credit.

498 Undergraduate Thesis (*) AWSpS

Opportunity to complete work on psychiatric research projects or pursue a specific psychiatric topic in depth, for instance through library research. Prerequisite, permission. May be repeated for credit.

499 Undergraduate Research (*, max. 15) AWSpS

Opportunities are available for participation in a wide variety of ongoing research in the behavioral sciences and clinical psychiatry, or for the development of an individual investigative project under the supervision of a faculty sponsor. Prerequisite, permission. May be repeated for credit.

Courses for Graduates Only

553 Psychodynamics and Psychopathology (2) A

HEILBRUNN

General psychopathologic phenomena and their defense reactions are traced to the developmental history of the individual with due attention to constitutional and organic causes. The general phenomena are applied to the most important psychiatric syndromes. Relevant case illustrations are offered as basis for therapeutic intervention for medical students. Prerequisites, 267, 450, 451, or permission.

559 Child Psychiatry (2) Sp

KAUFMAN

Series of discussions and lectures dealing with psychopathology of children, including a discussion of the fundamentals of psychotherapy with children. For nonmedical students. An interview with a child is essential for receiving credit. Prerequisites, 267, 451, or permission.

565 Biological Foundations of Psychiatry (2) S

HEILBRUNN

Anatomical and physiological factors involved in various forms of psychopathology. For nonmedical students. Prerequisite, permission.

RADIOLOGY

460 Basic Radiology Clerkship (1) Sp

A basic clerkship in both diagnostic and therapeutic Radiology designed to familiarize the student with clinical radiology and to expand and demonstrate application of knowledge acquired in the basic curriculum. Prerequisite, Human Biology 420.

480 Nuclear Medicine Technique, Physics, and Instrumentation (2) WS

NELP

The course provides a familiarization with basic nuclear phenomena and instrumentation coupled with a laboratory application—instrument operation, sample counting, and isotope identification. Prerequisite, Radiology 460.

481 Tracer Kinetics and Radiolabeled Techniques (½) AWSp

NELP

Four-week seminar covering the principles of absorption, transfer, and compartmentalization of biologically important radionuclides. The

principles of gastrointestinal absorption, renal excretion, organ localization, and metabolic turnover will be discussed. Prerequisite, permission.

482 Nuclear Medicine: Pathophysiologic Principles and Case Presentations (½) AWSp

NELP

Discussion of practical applications of isotope procedures to specific patients' disease processes. Red cell survival, blood volumes, tumor localization, and reticuloendothelial sequestration of isotopes. Prerequisites, 481 and Human Biology 420 (may be taken concurrently).

487 Radioactive Tracer Techniques

The use and behavior of radioactive tracers, with particular attention to the dynamics of the distribution of trace elements after their introduction into the system under analysis. Analyzation of current models and application to examples from both living and non-living systems. Offered jointly with the Department of Nuclear Engineering as Nuclear Engineering 487. Prerequisite, permission.

494 Clerkship: Diagnostic Radiology (*) AWSp

TROUPIN (University Hospital),
PHILLIPS (Harborview Hospital)

Observation, instruction, and supervised participation in clinical fluoroscopy, radiography, film interpretation, and x-ray conferences. Prerequisite, Medicine 465 or Human Biology 460, or permission.

495 Clinical Cancer Management (*) AWSp

PARKER (University Hospital)

Observation, instruction, and supervised participation in clinical radiation therapy including clinical examination, treatment planning and administration, and conferences. Prerequisite, Human Biology 460 or permission. (2 or 4 weeks.)

496 Nuclear Medicine Clerkship (3, or 6, or 9) A

NELP

The student will participate daily in the Radioisotope Clinical Laboratory from 8:00 a.m. to 5:00 p.m. where diagnostic studies of various types are performed. The student will have some responsibility for examining patients and will assist in the procedures. He will also be expected to assist in examination and consultation of referred patients, attend daily clinical report rounds, and participate in the clinical ward rounds of the division. Prerequisite, Human Biology 460. (2, 4 or 6 weeks.)

497 General Radiology Clerkship (6) AWSp

TROUPIN (University Hospital)

Combined experience in diagnostic radiology, radiotherapy (Dr. Parker) and nuclear medicine (Dr. Nelp). Prerequisite, Human Biology 460 or permission. (6 weeks.)

498 Undergraduate Thesis (*)

The student may write a thesis in either therapeutic or diagnostic phases of radiology. For medical students only. Prerequisite, permission.

499 Undergraduate Research (*) AWSp

FIGLEY

An opportunity to gain research experience through participation in original or ongoing investigations. Prerequisite, permission.

501-502 Biological Effects of Ionizing Radiation (2-2) A,W

JACKSON

Effects of ionizing radiation at the molecular, cellular, organ, and organism levels with emphasis on mammalian systems. Required for radiological science students. Prerequisite, permission.

503-504 Laboratory in Radiation Biology (1-1) A,W

CHRISTENSEN

Laboratory study of the biological effects of ionizing radiation. Required for Radiological Science students. Prerequisite, permission.

505 Radiological Physics (2) Sp

WOOTTON

Application of physical concepts methodology and instrumentation in the study, production, and mensuration of ionizing radiations and their interactions with biological materials.

507 Radiation Hazards Analysis and Control (1) Sp

BALTZO

Emphasizes methods and procedures rather than facility or equipment design.

510 Special Topics in Radiation Biology (2) Sp

CHRISTENSEN

A detailed study of current research of special significance to the development of radiation biology.

515 Chemical Mechanisms in Radiation Biology (2) A,Sp

CHRISTENSEN

Discussion of radiation-induced chemical reactions and their contribution to biological radiation damage including alterations in enzymes, viruses, bacteria, and mammalian cells.

517 Radiation Dosimetry (4) Sp

ROESCH, GLASS

The measurement of radiation energy loss relationships in gases and solids, detection techniques and circuits, units, consideration of human exposure limits. Prerequisite, permission.

520 Seminar (2)

May be repeated for credit.

540 Topics in Bionuclear Engineering I (3)

Investigations into various aspects of the interaction of radiation with biological material. Included may be topics in the analysis of radiation fields, dosimetry, shielding, biological response to radiation, mathematical modeling, etc. Some experiments may be designed and carried out as part of the course. The course will be conducted on a seminar basis with the discussion not limited to material which is already described in the literature. Original research is not excluded. Offered jointly with Nuclear Engineering as Nuclear Engineering 540. Prerequisite, permission.

541 Topics in Bionuclear Engineering II (3)

Continuation of 540. Offered jointly with the Department of Nuclear Engineering as Nuclear Engineering 541. Prerequisite, permission.

550 Field Practice in Radiological Health (*, max. 6) S

CHRISTENSEN

The student rotates through laboratories engaged in radiological health and radiation safety work to gain experience in the problems encountered in practice.

599R Special Topics (3)

HUNGATE

Radiation and tumor induction, energy transfer from charged particles, hit theory, genetic consequences of radiation, macromolecules, metabolized isotopes and permissible limits, feedback control, air pollution and inhalation. Prerequisite, graduate standing or permission.

600 Independent Study or Research (*)

SURGERY

465 Clinical Clerkships (*, max. 16)

The student will gain experience in both inpatient and outpatient care of the patient seen on the surgical service. The experience will include: (1) complete initial workup; (2) routine laboratory studies; and (3) day-to-day participation in patient care. Operating room experience and instruction in surgical pathology will be included. Elective for medical students. Prerequisite, Human Biology 460.

481 Peripheral Vascular Disease (4½) AWSp

STRANDNESS, FOLSE

An intensive, in-depth look at peripheral arterial and venous problems. This will include: (1) methods of clinical evaluation; (2) new diagnostic procedures; and (3) the available methods of treatment. The emphasis will be on active student participation in patient workup, performance of diagnostic studies, and presentation of case material to the staff. Two seminars will be held weekly with the staff to discuss the pathophysiology of vascular disease. Texts will be provided on a loan basis to the students. These will cover the entire field and should serve as useful source material for the student. Prerequisite, Human Biology 460.

482 Externship in General Surgery (*)

AWSpS

BAKER, BELL, CANTRELL, MERENDINO, SPEIR, WEST

Students assigned inpatient cases on general surgery services. Responsible for patient work-ups, follow assigned patients to operating room. Participate in ward rounds, and surgical conferences. Selected hospitals. Prerequisite, Human Biology 460.

483 Pediatric Surgery (9) AWSp

STEVENSON

Students participating in the elective clerkship of pediatric surgery will be based primarily at Children's Orthopedic Hospital and Medical Center. Instruction will stress surgical conditions peculiar to the particular age group. There will obviously be a preponderance of various congenital and neoplastic conditions which are amenable to surgical treatment. It is desirable, therefore, that students who plan to take this elective prepare themselves by acquiring a reasonable background of knowledge in human embryology and genetics. Prerequisite, 465.

484 Trauma and Emergency Care (*) AWSp

FOLSE

Students who have completed the basic clinical clerkship will be assigned full time (five 8-hour periods per week) to either the Harborview Hospital or the University Hospital Emergency Department. Patients with acute illnesses or trauma will be evaluated or treated in the initial evaluation and emergency room. Weekly seminars with the surgical faculty will cover the subjects of resuscitation,

shock, trauma, and major and minor surgical emergencies. Reading reference material and programmed self-instructional material will be provided. Prerequisite, Human Biology 460.

485 Cardiovascular Surgery (*) AWSpS

DILLARD, MERENDINO, WINTERSCHIED

Students actively engage in the care and treatment of inpatient and outpatient surgical cardiovascular cases. They will work closely with the cardiovascular team on preoperative diagnostic studies, in the operating room, and postoperative patient care. Prerequisite, Human Biology 460.

486 Plastic Surgery Clerkship and Preceptorship (*) AWSpS

DEVITO

Students will function intimately, as externs in all activities of plastic surgery service and staff at University Hospital and affiliated services. This will include patient workups, case presentations, operating room experience, and patient contact in the clinic. Prerequisite, Human Biology 460.

498 Undergraduate Thesis (*) AWSpS

Offered to those students who have engaged in summer research in the Department of Surgery. Provides time for extension of such projects and opportunity to study and prepare for completion of thesis on selected surgical subjects. Prerequisite, permission.

499 Undergraduate Research (*) AWSpS

Prerequisite, permission.

Courses for Graduates Only

520 General Surgery Seminar (5) AWSpS

DILLARD, FLETCHER, MARCHIORO, MERENDINO, STEVENSON, WINTERSCHIED

Conferences, seminars, and round-table discussions of advanced surgical topics, related sciences, and recent literature in the field. Prerequisite, medical student or graduate student. May be repeated for credit.

525 Seminar in Plastic and Maxillofacial Surgery (*) AWSpS

DEVITO

One two-hour session per week will be devoted to a discussion of principles, practice, and scope of plastic and maxillofacial surgery. Elective for senior medical students and graduate students. Prerequisite, permission of Department.

Conjoint 585 Surgical Anatomy (1-3, max. 12) (See Conjoint Courses.)

590 Surgical Experimental Techniques (5) AWSpS

DEVITO, DILLARD, FLETCHER, MARCHIORO, MERENDINO, STEVENSON, WINTERSCHIED

Basis for graduate research and advanced thesis work including supporting laboratory techniques. Prerequisite, medical student or graduate student. May be repeated for credit.

600 Independent Study or Research (*) AWSpS

700 Thesis (*) AWSpS

UROLOGY

460 Introduction to Fluid Mechanics of the Urinary Tract (1) W

ZINNER

A ten-hour lecture-demonstration course in

the fundamentals of fluid properties and mechanics and how they apply to the function of the urinary system in particular and biological systems in general. Mathematical background not required. Prerequisite, Human Biology 451. (10 weeks.)

475 Urology Preceptorship (*) AWSp

MC ROBERTS

Students will follow a preceptor in all of his work in order to better understand the pathophysiology and management of the problems of the urogenital system and to become acquainted with the office management of urological problems. Two or four weeks. Prerequisite, Human Biology 460.

480 Urology Clerkship (*) AWSpS

MC ROBERTS

Student participates in the full activities of the clinical service, which includes both out- and in-patients, principally the latter. Basic principles of urology are emphasized: infection, obstruction, trauma, tumors, stones, male fertility, renovascular hypertension, and pediatric urology. In addition to participation in seminars during the first two weeks, at the end of the clerkship the student will give a ten-minute talk on a urologic subject of his choosing. (4 weeks.)

498 Undergraduate Thesis (*) AWSpS

MC ROBERTS

Provides an opportunity for medical students to write theses in the area of urology. Prerequisite, permission of sponsor and Department.

499 Undergraduate Research (*) AWSpS

MC ROBERTS

The student participates in current urologic research projects under supervision of full-time staff. Certain specific problems may be elected by the student. Elective for medical students. Prerequisites, permission of sponsor and Department.

598 Seminar in Urology (*) AWSpS

ANSELL, CHAPMAN, MC ROBERTS, MILLER, ZINNER

Problems in the field of urology discussed by various visiting members of the faculty of urology and of other departments to provide a well-rounded basic scientific and clinical presentation. Prerequisite, permission of Department.

SCHOOL OF NURSING

Courses for Undergraduates (Majors only)

227 Nursing Fundamentals (2) A

BIRUM, FITZGERALD, HARLOW, HEINEMANN, SAXON, ZIMMERMAN

Introduction to nursing, the nurse's role, and the possible effects of illness and hospitalization on the patient. Introduction of concepts of medical asepsis and basic human needs with emphasis on selected physiological needs. Concomitant nursing skills are learned with application of body mechanics and work organization. Two hours lecture-demonstration, two hours laboratory weekly. Prerequisite, sophomore standing.

228 Nursing Fundamentals (2) WBIRUM, FITZGERALD, GOHRKE, HARLOW,
HEINEMANN, SAXON, ZIMMERMAN

Effects of illness on the person. Selected basic nursing skills to meet the needs of the sick person. Concepts from the social and natural sciences serve as a foundation for learning the selected nursing activities of this course. Nursing knowledge gained in N227 and in this course is applied in nursing care activities with the noncritically ill and convalescent hospital patient. Two hours lecture-demonstration, three hours clinical laboratory weekly. Prerequisites, 227, Conjoint 316, Chemistry 101, 102.

229 Nursing Fundamentals (3) SpBIRUM, FITZGERALD, HARLOW,
HEINEMANN, SAXON, ZIMMERMAN

Continued development of the role of the nurse in meeting patients' needs, including selected technical, interpersonal, and therapeutic nursing activities. Previously learned concepts, principles, and skills are applied throughout the course. Two hours lecture-demonstration, six hours of clinical laboratory weekly. Prerequisites, 227, 228, Conjoint 316, 317-, Microbiology 301, Chemistry 101, 102.

260 Scientific Principles Basic to Nursing (2) Sp

HOSHAW, TATE

Basic principles of pathologic change and implications for nursing. Major units of the course are: introduction to homeostasis in health and disease; circulatory disturbances and resultant body responses; inflammatory response to injury; cellular responses to stress; neoplasms and the body's response; and neuroendocrine response to stress. Prerequisites, sophomore standing in School of Nursing, organic and inorganic Chemistry 101, 102, Microbiology 301, Conjoint 316, 317 (taken concurrently with -318).

298 Introduction to Normal Growth and Development (2) WS

Basic concepts and theories related to the physical, emotional, social, and cognitive development of children from infancy through preschool are considered. The student is directed to apply basic developmental knowledge to observation and assessment of children with concurrent implications of care-taking, and/or child health supervision stressed. Prerequisite, junior standing. Taken concurrently with 368 or 370.

299 Introduction to Normal Growth and Development (2) ASp

Basic concepts and theories related to significant physical, emotional, and environmental factors in the developmental period from school age to young adulthood are emphasized. The student is introduced to major developmental deviations associated with learning and behavior. Prerequisites, junior standing, and 298.

301 Principles of Patient Teaching (3) AW

HEINEMANN

Designed to provide the nursing student with some fundamental concepts of the learning and teaching processes as they apply to nursing practices. The laboratory sections are utilized to assist students in applying the concepts to the planning for teaching patients, family members, or auxiliary nursing personnel. One hour laboratory weekly.

351 Changing Concepts of Professional Nursing (4) ASp

CARNEVALI

An exploration of current concepts of nursing and nursing education including present and potential roles, responsibilities and required competencies of professional nurses in our society. Prerequisite, junior year in the registered nurse curriculum pattern.

353 Scientific Basis for Nursing Actions (3) WS

BIRUM

Homeostasis, particularly as related to fluid and electrolyte balance, is used as an organizing concept in determining nursing actions in preventing, correcting, and controlling disease. Prerequisites, 351, and junior year in the registered nurse curriculum pattern.

354 Comprehensive Maternal-Child Nursing (4) AS

ROSE

Current theories, concepts, and principles applicable to maternal-child nursing. Emphasis on application of relevant principles from the humanities, natural and social sciences, and psychiatric nursing. Prerequisites, junior year in the registered nurse curriculum pattern, and 353. Six hours clinical laboratory weekly.

356 Comprehensive Medical-Surgical Nursing (4) WS

CARNEVALI

Theories, concepts and principles in assessing, planning and evaluating the nursing care of selected adult medical-surgical patients. Emphasis on prevention, rehabilitation, continuity of care, and application of science principles. Six hours of clinical laboratory weekly. Prerequisites, junior year in the registered nurse curriculum pattern, and 351 and 353, or 353 concurrently.

358 Psychiatric Concepts for Nursing Actions (4) ASp

AANDERUD, MINCHIN

Theory and clinical experience in application of selected concepts in interactions with patients with specific emotional problems. Course serves as transition from technical to professional education in application of interpersonal concepts in nursing interventions. Builds on student's knowledge of personality development, psychopathology, and psychodynamics of human behavior including interpersonal relations and communication skills. Student's responsibility for nursing diagnosis and action in meeting the emotional needs of patients is emphasized. Six hours of clinical laboratory weekly. Prerequisites, junior year in the registered nurse curriculum pattern, and 353.

367 Family-Centered Maternal and Infant Nursing (4) AWSpS

WILLIAMS

Basic concepts and nursing principles in family-centered maternity care of women before, during, and after childbirth, and infants in the neonatal period. Prerequisites, junior year in the basic nurse curriculum pattern and 368 taken concurrently.

368 Laboratory in Maternal and Infant Nursing (5) AWSpS

REINBRECHT, SEBREY, WILLIAMS

Utilization of basic concepts and nursing principles in providing family-centered nursing for women before, during, and after childbirth, and for infants in the neonatal period. Fifteen hours laboratory experience per week. To be taken concurrently with 367.

369 Family-Centered Nursing of Children (4) AWSpS

PONTLIANA

Basic concepts and nursing principles in family-centered care of children. Emphasis on health needs of children and families from infancy through adolescence. Includes health supervision and common illnesses and disabilities. Prerequisites, junior year in the basic curriculum pattern and 370 taken concurrently.

370 Laboratory in Nursing of Children (5) AWSpS

NAKAO, OGDEN, PONTLIANA

Utilization of basic concepts and nursing principles in providing family-centered nursing for children in health supervision and during illness and disability. Fifteen hours laboratory experience per week. To be taken concurrently with 369.

371 Principles of Medical-Surgical Nursing (4) WS

BOOZER

Understanding of the scientific and nursing facts and principles that can be used to identify appropriate nursing interventions when caring for patients with selected medical and surgical conditions. Prerequisites, junior year in the basic curriculum pattern, 229, 260, and basic science courses, or permission. To be taken concurrently with 372.

372 Medical-Surgical Nursing Practice (5) WSAULD, BOOZER, GRIFFITH
KLOCKE, WARE

Application of scientific and nursing principles to the care of adult medical and surgical patients. The problem solving approach is used with the major emphasis placed on helping the student learn how to analyze and interpret information she obtains from her own observations and other sources, decide on a course of action, carry out the plan, and evaluate the outcome. Patient care and clinical conferences are selected to coordinate with the content of 371. When feasible, patients are assigned for a number of days so that changes may be observed and the effect of care evaluated. Three weeks' experience in the operating room in this course or in 374. Prerequisites, junior year in basic curriculum pattern and 371 taken concurrently.

373 Principles of Medical-Surgical Nursing (4) ASp

BOOZER, GRIFFITH

Understanding of the scientific and nursing principles essential to effective nursing care of patients with selected medical and surgical conditions. The major emphasis is placed upon using knowledge about the patient, his illness, and his treatment to determine actions that can be taken to help the individual patient. Prerequisites, junior year of the basic curriculum pattern, 371 and 372, or permission. To be taken concurrently with 374.

374 Medical-Surgical Nursing Practice (5) ASpAULD, BOOZER, CRAVEN, GRIFFITH,
KLOCKE, WARE

The broad aim is to help the student apply scientific and nursing principles to the care of adult medical and surgical patients. The identification of common elements and significant differences in the care of complex medical-surgical patients is stressed. The problem-solving approach is continued. Patient care and clinical conferences are selected

to coordinate with the content of 373. Three weeks' experience in the operating room in this course or 372. Fifteen hours weekly clinical laboratory. Prerequisites, junior year in the basic curriculum pattern, 371 and 372, or permission. To be taken concurrently with 373.

409 History and Trends of Nursing (3)

AWSp
GRAY, SHARP

History of nursing from antiquity to the present with emphasis on the trends influencing nursing and including study of the professional nurse and her responsibilities in the modern world. Prerequisite, senior standing in the School of Nursing.

412 Scientific Principles in Nursing Care (3)

AWSpS
BRANDT, FITZGERALD, MANSFIELD

An undergraduate seminar devoted to critical analysis of selected nursing situations, with identification of the natural and behavioral science principles which guide nursing actions. Prerequisite, senior standing in the School of Nursing.

413 Principles of Psychiatric Nursing (5)

AWSp
GEORGE, SCHEIDEMAN, ESTES, WITT

Concepts and principles of psychiatric-mental health nursing used in planning care of mentally ill patients. Psychological and sociocultural dynamics of mental illness. Nursing approaches and interviewing techniques. The classification of mental illness, the signs and symptoms, and the treatment approaches are presented. Prerequisites, senior standing in the School of Nursing, and 414 taken concurrently.

414 Psychiatric Nursing Practice (5) AWSp

GEORGE, SCHEIDEMAN, WITT

Application of psychiatric-mental health principles and skills in the care of selected psychiatric patients. Fifteen hours clinical laboratory weekly. Prerequisites, senior standing in the School of Nursing and 413 taken concurrently.

415 Community Health Nursing Principles (3) AWSpS

PENNER, SPANGLER

Concepts and principles of community health nursing used in analyzing and implementing health programs in family and community settings. Prerequisites, senior standing in the School of Nursing and Preventive Medicine 323.

416 Community Health Nursing Practice (5) AWSpS

JONES, PENNER, SPANGLER, STANDEVEN

Application of community health nursing principles and skills in family and community health situations. Problem-solving and interpersonal relationship skills emphasized. Prerequisites, senior standing in the School of Nursing and 415 taken concurrently. Fifteen hours a week, including two hours of conference.

420 Special Fields of Public Health Nursing (3-8) A

COBB

Practicum devoted to nursing responsibilities in special fields such as school health nursing or occupational health nursing. Emphasis and credit of course varies with the interest and needs of the student. Weekly conference. Nine to twenty-four hours, including two hours of conference. Prerequisites, 415, 416, or equivalent, post-baccalaureate standing in the School of Nursing.

421 Nursing Leadership

AWSp
LITTLE

Major focus is directed toward the student's understanding of the leadership role of the professional nurse as a beginning practitioner in organized health care services. The leadership role of the professional nurse, changing trends in organized health care services in our society, and the change agent's role of the professional nurse are emphasized. Prerequisites, senior standing in the School of Nursing, and 422 taken concurrently.

422 Senior Clinical Nursing (6) AWSp

GOHRKE, HEINEMANN, HOSHAW, JOHN, SHARP, SPAULDING

Experience in providing care for a group of patients with complex nursing care problems. Planning, directing, guiding, implementing and evaluating nursing care as an individual and as a team leader. Eighteen hours clinical laboratory weekly. Prerequisites, senior standing in the School of Nursing, and 421 taken concurrently.

425 Current Literature in Nursing (2) AWSpS

JONES

Analysis of current literature and research findings related to a selected clinical area of interest. Prerequisite, senior standing in the School of Nursing.

429 Nursing Functions in Gerontology (2)

AWSp
GUNTER

Aging as a normal developmental process; the problems of the aged; the community resources available; and the derivation of implications for nursing care of aged persons from gerontological concepts. Prerequisite, senior standing in the School of Nursing.

499 Undergraduate Research (1-5, max. 5) AWSp

Supervised individual research on a specific nursing problem. Prerequisites, junior-year standing in the School of Nursing, cumulative grade-point average of 3.00 or better, and permission of instructor.

Courses for Graduates Only

430 Field Study in Maternal-Child Nursing (3) W

DISBROW, VANDEMAN

Guided clinical experience in maternity nursing or in nursing of children with emphasis on the family. Includes diagnosing nursing problems, applying theoretical concepts, and evaluating results. A minimum of seven hours' guided experience weekly.

431 Field Study in Maternal-Child Health Nursing (3) Sp

DISBROW, VANDEMAN

The experience may be a continuation in the clinical area chosen in 430 or may be the alternate area. A minimum of seven hours' guided experience weekly.

438 Practice Teaching in Maternal-Child Health Nursing (3) S

Guided experience in selected teaching-learning situations in clinical nursing. Identification, analysis, and solution of teaching-learning problems in clinical nursing. A minimum of seven hours' guided experience weekly. Prerequisites, 430, 530, 524.

440 Advanced Field Work in Medical-Surgical Nursing (3) AW

CROWLEY, MANSFIELD

Guided experience in diagnosing nursing problems, identifying rationales for implementing

nursing therapy, and evaluating results in selected situations in the clinical specialty. The general aim is to develop abilities in critical analysis of nursing problems of patients, in the design and implementation of plans of care, and systematic evaluation of outcomes of nursing actions. A minimum of seven hours' guided experience weekly.

441 Advanced Field Work in Medical-Surgical Nursing (2) WSp

GIBLIN, MANSFIELD

Continuation of 440. Guided experience in selected situations in area of clinical interest. A minimum of seven hours' guided experience weekly. Prerequisite, 440 or permission.

446 Practice Supervision in Nursing Service (3) S

Guided experience in supervisory functions. Identification, analysis, and solution of selected supervisory problems in clinical nursing.

448 Practice Teaching in Medical-Surgical Nursing (3) Sp

CARNEVALI

Guided experience in selected teaching-learning situations in nursing, in both classroom and clinical situations. Identification, analysis, and solution of teaching-learning problems in clinical nursing. A minimum of seven hours' guided experience weekly.

450 Advanced Field Work Community Health Nursing (2) W

PITTMAN

Guided experience in identifying nursing problems, identifying rationales for implementing nursing therapy, and evaluating results in selected situations in community health nursing. An application of core concepts presented in 523. A minimum of four hours' guided experience weekly. Prerequisite, 523.

451 Advanced Field Work Community Health Nursing (2)

PITTMAN

Continuation of 450, built on concepts from 550. Guided experience in selected situations in community health nursing. Course is planned jointly with students and focuses on the nurse role in community action for health. A minimum of four hours of guided experience weekly. Prerequisites, 450 and 550 (to be taken concurrently).

455 Practice Supervision Community Health Nursing (3) S

PITTMAN

Guided experience in supervisory functions. Identification, analysis, and solution of selected supervisory problems in community health nursing. A minimum of seven hours of guided experience weekly. Prerequisites, 450 and 451.

456 Nursing Service Administration (3) W

GRAVES

Considers philosophies, purposes, and elements of administration as applied to organized nursing services. Concepts related to administrative behavior, the organization and delivery of services, and the management of personnel are explored. Emphasis on critical analysis of current literature and analysis of administrative problems in nursing. Prerequisite, 524.

458 Practice Teaching Community Health Nursing (3)

PENNER

Guided experience in selected teaching-learning situations in community health nursing. Identification, analysis, and solution of teaching-learning problems. A minimum of seven hours of guided experience weekly. Prerequisite, 450.

460 Advanced Field Work Psychiatric-Mental Health Nursing (3) W
LARSON

Supervised clinical experience in the nurse's therapeutic role with an individual psychiatric patient. Accompanying seminar and counseling. A minimum of 6 hours of guided experience weekly.

461 Advanced Field Work Psychiatric-Mental Health Nursing (2) Sp
LARSON, THOMAS

Seminar and supervised experience in the nurse's role in working with groups. Course is first of a two-quarter sequence. A minimum of 3 hours of guided experience weekly. Prerequisite, 460 or equivalent.

463 Personnel Guidance in Nursing (3)
Development of concepts and principles of interpersonal relations as applied in personnel guidance in nursing. Course provides the potential instructor or supervisor in nursing with a conceptual framework for counseling and guidance. Prerequisite, Educational Psychology (EDPSY) 447 or permission.

464 The Nurse in Mental Health (3) A
NAKAGAWA

Analysis of selected sociocultural concepts relating the person to nature, society, and culture. Relevance of these concepts to mental health nursing practice. A minimum of two hours of guided experience weekly.

465 Practice Supervision in Psychiatric-Mental Health Nursing (3) A
LARSON

Guided experience in practice supervision in psychiatric nursing. Opportunity to supervise a nurse-patient relationship with assessment and written evaluation of the nurse's performance in the relationship. Literature on nursing supervision and consultation. A minimum of six hours of guided experience weekly. Prerequisite, 460.

466 In-Service Education in Nursing (3)
GRAVES

Planning, developing, and evaluating in-service programs in various institutions and agencies, seen as a part of continuing education of all nursing personnel.

467 Evaluation of Performance in Nursing (3) Sp
METZ

Philosophy and rationale of evaluation of nurses with administrative, teaching, and supervisory responsibility in various health agencies. The purposes of evaluation as they relate to guidance of students or staff toward personal satisfaction and growth in one's work, and to improved patient care.

468 Practice Teaching in Psychiatric-Mental Health Nursing (3) A

Guided experience in selected teaching-learning situations in clinical nursing. Identification, analysis, and solution of teaching-learning problems in clinical nursing. Evaluation of progress. A minimum of 6 hours of guided experience weekly. Prerequisites, 460 and 464.

Courses for Graduates Only

501 Development of Nursing Procedures (2)
Nursing procedures as a basis for nursing service planning and as a teaching tool. Development of methods based on scientific principles; procedures analyzed and revised according to selected criteria.

502 Applied Group Development Principles (3) A

Evaluation of selected theoretical concepts re-

lating to dynamics operating in groups; analysis of process and development of skills to increase group productivity through class and laboratory sessions.

505 Seminar in Administration of Schools of Nursing (3)
GRAY

Application of principles of administration to schools of nursing. Case method with discussion and analysis of situations presented.

506 Seminar in Nursing Service Administration (3) Sp
GRAVES

Critical analysis of problems affecting the administration of nursing services. Intensive directed study of selected problems by small groups. Prerequisite, 456.

507 Nursing Seminar in Family Mental Health (3) Sp
NAKAGAWA

Theory and practice in family therapy. Emphasis upon family interaction process. Consideration of sociocultural context of family life. A minimum of 2 hours guided experience weekly. Prerequisites, 460, 464, and 508.

508 Seminar in Advanced Psychiatric Nursing (2) A
THOMAS

Individual development of a framework for psychiatric-mental health nursing process through analysis of both selected statements about nursing and selected theoretical formulations. Concurrent with 460.

510 Curriculum Development in Nursing Education (3) WSp
TJELTA

Theoretical rationale for curriculum development, study of curricular problems in nursing in relation to the elements of the curriculum as described in a curricular design. Includes developing a curricular plan in a simulated faculty group.

511 Psychosomatic Nursing (3) S
MINCHIN

Seminar and clinical experiences centering on interrelationships of physical and emotional aspects of illness and development of principles of nursing care. A minimum of four hours of guided experience weekly.

512 Advanced Fields in Psychiatric Nursing (3) AW
OSBORNE

Analysis of problems in the delivery of psychiatric mental health nursing services. Consideration of emerging roles implied by trends in mental health programs. Prerequisites, 461, 464, 507, 508, 513.

513 Field Experience in Mental Health Nursing (2) S
LARSON, THOMAS

Continuation of 461 or its equivalent in supervised clinical experience in the nurse's role with groups; accompanying seminar for discussion of concepts pertinent to working with groups. A minimum of three hours of guided experience weekly.

515 Topics in Nursing and Pharmacy (2) Sp
GRAVES, E. PLEIN

Readings and discussions of assigned topics of current interdisciplinary interest in the fields of nursing and pharmacy. Offered jointly with the College of Pharmacy as Pharmacy 515. Subject matter changes from year to year. Prerequisite, permission.

516 Seminar in Child Psychiatric Nursing (5)

Analysis of concepts relating to normal and

abnormal phenomena drawn from nursing, psychiatry, and social sciences, underlying nursing of the emotionally disturbed child and his family. Seminars, readings, participation, and observation with normal children. A minimum of 12 clinical laboratory hours weekly. (Not offered 1970-71.)

517 Seminar in Child Psychiatric Nursing (5)
Intensive therapeutic nursing relationship with the emotionally disturbed child and his family; analysis of nursing problems; implementation of nursing actions; study of research findings applicable. A minimum of 16 laboratory hours weekly. (Not offered 1970-71.)

518 Seminar in Child Psychiatric Nursing (5)
Continuation of 517 with major emphasis upon synthesis of a body of child psychiatric nursing knowledge. A minimum of 16 laboratory hours weekly. (Not offered 1970-71.)

519 Seminar in Child Psychiatric Nursing (5)
Planning and implementing therapeutic group relationships with disturbed and defective children in a children's treatment center. A minimum of 12 laboratory hours weekly. (Not offered 1970-71.)

520 Methods of Research in Nursing (3) ASp
BATEY, DISBROW, HOFFMAN

Research process as it applies to nursing. Use of the literature in building theoretical rationale. Selection of appropriate methods. Presentation of findings. A minimum of two laboratory hours weekly. Prerequisite, a course in statistics.

521 Methods of Research in Nursing (2) WS
BATEY, DISBROW, HOFFMAN

Continuation of 520, with emphasis on methods of research applied to the solution of problems in all fields of nursing.

523 Seminar in Therapeutic Nursing Process I (3) A
CROWLEY, PITTMAN

Analysis and synthesis of concepts relevant to therapeutic nursing based upon consideration of the dignity of man and selected aspects of theories related to the interaction process in nurse-patient relationships. Library research and field study and 2 laboratory hours weekly required.

524 Seminar in Nursing Leadership Processes (3) ASp
TJELTA

Dynamic processes involved in leadership roles assumed by the prospective teacher or administrator in nursing. Included in the course is the exploration of underlying relationships in the teacher-learner or other dyadic interactions as essential components in the attainment of health goals. A minimum of two laboratory hours weekly.

525 Seminar in Therapeutic Nursing Process II (3)

Analysis and synthesis of concepts relevant to therapeutic nursing based upon a consideration of responses to crises and factors in health and illness. Library research and field study and a minimum of two laboratory hours weekly required.

530 Theoretical Framework for Maternal and Child Nursing (4) A

The theoretical basis for understanding nursing problems is explored in depth. A rationale is developed for making a nursing diagnosis and for assessing the role and function of nursing in the maternal and child nursing field.

535 Nursing the Child with Handicaps: Evaluation (2) A
POWELL

Progression from assessing normal growth and development to detection of developmental handicaps of children. Observing and assessing family functioning are integrated. Library research, individual conferences, and intensive field study (a minimum of 4 hours weekly) are further means by which objectives are implemented. Enrollment limited.

536 Operant Techniques in Modification of Deviant Behavior (3) S

Designed to help graduate students in nursing and other disciplines understand the principles of operant behavior, and their application to the problems of retardation and other forms of deviant development. In addition to their class work students will spend a short time in the laboratory in the application of principles. Enrollment limited. Prerequisites, a minimum of four laboratory hours weekly and permission.

537 Nursing the Child With Handicaps: Care Processes (4) W
WORTHY

Strengthening of competencies in the design, implementation, and evaluation of the individualized nursing care of selected handicapped children and their families. Through the systematic study of case models and the analysis of specific case content, students seek to synthesize pertinent knowledge from sources in nursing, clinical medicine, and the behavioral and biological sciences, in order to formulate a frame of reference within which each can operate. Library research, individual conferences, and extensive field study (a minimum of eight hours weekly) are means by which objectives are implemented. Prerequisite, 535.

538 Nursing the Child with Handicaps: Family Reactions (4) Sp
NORRIS

Development of evaluation skills for more effective nursing practices with family of the handicapped child. The special problems and conflicts within these families and possible adaptations to their circumstances are studied through systematic observation, assessment and evaluation of family development, patterns of living and coping behaviors. The implications for nursing are derived from the student's clinical experiences as well as from theoretical content and relevant research findings. Library research, individual conferences, and extensive field study (a minimum of eight hours weekly) are required. Prerequisites, 535, 537.

539 Nursing the Child with Handicaps: Community (2) S
NORRIS

Seminar focuses on the reconceptualization of the nurse as a clinical specialist who innovates effective nursing practice, provides leadership, and evaluates change. The planning, implementing, and evaluating of nursing practices for individuals or family units are compared and contrasted with programming for groups. Nursing responsibility for evaluating available resources, improving existing services and for activating potential resources will also be examined. Library research, individual conferences, and intensive study (a minimum of four hours weekly) are required. Prerequisites, 535, 537, and 538.

540 Seminar in Medical-Surgical Nursing (3) AS
GIBLIN

Factors influencing the pathophysiology underlying selected manifestations of physical illness. Implications for nursing diagnosis and for nursing therapy.

542 Seminar in Cardiovascular Nursing (3) GIBLIN

Systematic inquiry into the influence of physical and emotional factors on pathophysiology underlying selected cardiovascular conditions. Implications for management. The course is designed for nursing instructors, supervisors, consultants, and clinical specialists. Prerequisite, 540.

543 Seminar in Nursing in Gerontology (3) SpS
GUNTER

Gerontological research findings applied to complex nursing problems in maintenance of health and maximum functioning in the aged. Prerequisite, permission.

546 Rehabilitation Nursing Seminar I (3) A
HICKS

Analysis of selected theoretical components underlying rehabilitation and utilization of scientific rationale in clinical nursing studies, with emphasis on prevention and maintenance. Library research and field study (a minimum of seven hours weekly) are required. Offered jointly with the Department of Physical Medicine and Rehabilitation as Physical Medicine and Rehabilitation 546. Prerequisite, permission.

547 Rehabilitation Nursing Seminar II (3) W
HICKS

Reconceptualization of theories of rehabilitation through study of patients with a variety of disabilities, with emphasis on supportive aspects. Library research and field study (a minimum of seven hours weekly) are required. Offered jointly with the Department of Physical Medicine and Rehabilitation as Physical Medicine and Rehabilitation 547. Prerequisite, 546.

548 Rehabilitation Nursing Seminar III (3) Sp
HICKS

Assessment of the nursing problems and direction of nursing therapies for groups of patients with a variety of disabilities, with special emphasis on restorative needs. Library research, field study (a minimum of seven hours weekly), intra- and interdisciplinary conferences will be included. Offered jointly with the Department of Physical Medicine and Rehabilitation as Physical Medicine and Rehabilitation 548. Prerequisites, 546, 547.

549 Rehabilitation Nursing Seminar IV (6) Sp
HICKS

Evaluation of nursing therapies used for rehabilitative problems in a variety of settings. Communication of pertinent rehabilitation nursing interventions. Library research and field study (a minimum of 14 hours weekly) are required. Offered jointly with the Department of Physical Medicine and Rehabilitation as Physical Medicine and Rehabilitation 549. Prerequisites, 546, 547, 548.

550 Advanced Community Health Nursing (3) W
COBB

Derivation of community health nursing concepts and principles. Identification of current and complex community health problems.

Role of the nurse in their solution. Prerequisites, 415, 416, or equivalent, and Preventive Medicine 323.

558 Seminar in Advanced Community Health Nursing (3)
COBB

Application of community health nursing concepts, principles, and research findings in analysis and solution of current and complex community health problems. Prerequisite, permission.

562 Implications of Concepts from Anthropology for Nursing (3) A
ATKINS

An examination of selected core concepts from anthropology and an assessment of the implications of these concepts for nursing research. Offered jointly with the Department of Anthropology as Anthropology 562. Prerequisite, permission.

563 Implications of Sociology for Research in Nursing (3) W
EMERSON

An examination of principles and concepts from sociology and their implications for nursing research. Prerequisite, permission.

564 Implications from Physiology for Nursing (3) A
BRENGELMANN

One field from following studied intensively: body temperature regulation, respiration, cardiovascular system, renal system, acid-base balance. Remaining areas considered more briefly. Emphasis on unifying aspects, modern research techniques, implications for nursing care. Prerequisite, permission.

565 Implications from Microbiology for Nursing (2) W
HELLSTROM

Examination of selected major fields from microbiology. Exploration of particular aspects of those fields and of current research progress in microbiology. Relevance for nursing. Prerequisite, permission.

566 Seminar in Associate Degree Nursing Education I (3) A
GEITGEY

Synthesis of teaching-learning theories affecting teaching of nursing in community colleges. Review of research, analysis of factors influencing teaching in relation to learning needs of students. The course is designed to assist the student to apply theoretical knowledge of the teaching-learning process in teaching ADN students. It is planned particularly for post-master's students who are having guided teaching experience or employment in a community college ADN program. Prerequisites, Higher Education (EDHED) 555 (which may be taken concurrently) and permission.

567 Seminar in Associate Degree Nursing Education II (3) W
GEITGEY

An examination of principles and concepts of curriculum development and their implications for associate degree nursing education. Utilization of knowledge and understanding of the ADN program and of concepts of curriculum development in constructing specific course designs for ADN programs. Effective utilization of disciplines other than nursing within the community college will be included. Both library study and field work will be required. The course builds on principles of curriculum construction and increases depth through specialized focus on

ADN curriculum construction. Prerequisite, 566 or permission.

568 Seminar in Associate Degree Nursing Education III (3) Sp
GEITGEY

Philosophy of and problems of design in conducting institutional research in associate degree nursing programs. Application of research findings to teaching. The last in a series of three seminars related to teaching in ADN programs. This seminar is designed to assist students to identify types of institutional research problems which are useful and consistent with the philosophy of the community college and the ADN program. Responsibilities for conducting such research and sharing findings are discussed. Students will be expected to conduct a research project related to teaching in ADN programs in an effort to maintain and support interest and ability in conducting research gained in their pre-master's study. Prerequisites, 567 and permission.

570 Seminar in Clinical Research in Nursing (3) Sp
HOFFMAN

Philosophy, problems of design; use of criterion measures in terms of patient care. Prerequisite, permission.

571 Seminar in Nursing and the Social Order (3)
HOFFMAN

Changing patterns of nursing service and education in contemporary society. Implications of personal value systems. Prerequisite, permission.

572 Theory Building in Nursing (3) S
DISBROW

Designed to help graduate students in nursing gain an increased understanding of the technique of theory construction, problems involved in theory testing, interdependence of theory and research, and implications of these for building a science of nursing. Prerequisite, permission.

600 Independent Study or Research (*)

700 Thesis (*)

COLLEGE OF PHARMACY

PHARMACEUTICAL CHEMISTRY

Courses for Undergraduates

237, 238, 239 Organic Pharmaceutical Chemistry (3,3,3) A,W,ASp
HUITRIC, MCCARTHY

The chemistry of the carbon compounds. Prerequisite, Chemistry 170.

248, 249 Organic Pharmaceutical Chemistry Laboratory (3,3) W,Sp
HUITRIC, MC CARTHY

Laboratory study of the reactions and the identification of organic compounds. Prerequisites, 238 for 248, which may be taken concurrently; 239 for 249, which may be taken concurrently.

325 Quantitative Pharmaceutical Analysis (5) A
KRUPSKI, MCCARTHY

Principles of volumetric and gravimetric analysis with special emphasis on medicinal compounds. Prerequisite, Chemistry 170.

326 Quantitative Pharmaceutical Analysis (4) W
KRUPSKI, MCCARTHY

Physicochemical and special methods used in pharmaceutical analysis. Prerequisite, 325.

430 Inorganic Medicinal Products (3) Sp
KRUPSKI, MC CARTHY, SPITZNAGLE

Classification, nomenclature, physical and chemical properties of inorganic medicinal compounds; and a discussion of radioactive products. Prerequisite, Chemistry 170.

440, 441, 442 Medicinal Chemistry (3,3,3) A,W,Sp
NELSON

Nomenclature, classification, synthesis, properties, structure, and activity of medicinal products. Prerequisite, 239.

460 Mechanism of Drug Action (3) A
NELSON

Consideration of factors concerning availability of drugs at active sites, e.g., transport, sites of loss, and drug latency; molecular mechanisms of drug action; topics in drug design. Prerequisites, 442, Biochemistry 442 or 406, Pharmacology -443 or -302, or permission.

480 Advanced Medicinal Chemistry Laboratory (3) A
HUITRIC

Synthesis of important medicinal products. Prerequisite, permission. (Offered alternate years; offered 1970-71.)

497 Toxicology (2) Sp
FISCHER

A study of poisons, their action, and the treatment of conditions produced by them. Prerequisite, 239.

499 Undergraduate Research (*, max. 6) AWSp
FISCHER, HUITRIC, KRUPSKI, MC CARTHY, NELSON

Research problems in pharmaceutical chemistry. Prerequisites, cumulative grade-point average of 2.50 and permission.

Courses for Graduates Only

511, 512 Advanced Pharmaceutical Chemistry (3,3) A,W
KRUPSKI

Chromatography, gas chromatography, ion exchange, and the use of various instruments for scientific investigations and vitamin determinations. (Offered every third year; offered 1970-71.)

520 Seminar (1, max. 5) AWSp

Graduate students attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

521, 522 Advanced Medicinal Chemistry (3,3) W,Sp
HUITRIC, NELSON

Application of integrated data from the physical and biological sciences to problems of chemotherapy, including transport of drugs to site of action, biotransformation of drugs, interaction of drugs with enzyme systems, and recent advances in drug design. Prerequisites, Chemistry 457, 531, and Biochemistry 442, or permission. (Offered alternate years; offered 1970-71.)

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

PHARMACOGNOSY

Courses for Undergraduates

405 Advanced Pharmacognosy (3) W

A laboratory course covering advanced techniques in pharmacognosy.

406 Medicinal Plants (2) ASp

Problems in drug plant cultivation and commerce, with considerable field work in the Drug Plant Gardens. Emphasis is placed upon alkaloid-, glycoside-, and oil-yielding plants. Weedicides and insecticides are included. Prerequisite, 414 or permission.

411 Hormones and Glandular Products (2) W
BRADY

An advanced study of pharmaceutical products derived from animal exocrine and endocrine glands, with emphasis upon hormones and their chemical and physiological role as drugs. Prerequisites, 414 and Physiology and Biophysics 360, or equivalent.

412, 413, 414 General Pharmacognosy (4,3,2) A,W,Sp
BRADY, MC LAUGHLIN

The study of natural products of plant and animal origin as important pharmaceuticals. Sources, processes of isolation and general fundamental properties are described. Prerequisites, Pharmaceutical Chemistry 239, Biology 212, Microbiology 445, Biochemistry, 406.

499 Undergraduate Research (*, max. 6) AWSp
BRADY, MC LAUGHLIN

Research problems in pharmacognosy. Prerequisites, cumulative grade-point average of 2.50 and permission.

Courses for Graduates Only

520 Seminar (1, max. 5) AWSp

Graduate students must attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

581 Topics in Pharmacognosy (1, max. 2) AWSp
BRADY

Discussions and readings of topics of current interest in the field of pharmacognosy. Subject matter changes from year to year. Prerequisite, reading knowledge of German.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

PHARMACY AND PHARMACY ADMINISTRATION

Courses for Undergraduates

204 Orientation and History (2) ASp
FISCHER

A study of the profession of pharmacy, its development and its literature.

205 Introductory Pharmacy Laboratory (1) A
FISCHER

Introduction to pharmaceutical techniques. Recommended for freshmen. For majors only. May be taken concurrently with 204. Prerequisite, permission.

310 Drugs in Our Society (2½) S

HAMMARLUND

A course designed to develop a general knowledge of drugs and an understanding of their proper use. Discussion of drug problems and methods for their control. For nonmajors only. (Offered Summer Quarter only.)

328-329-330 Pharmaceutical Calculations (0-0-1) A,W,Sp

HAMMARLUND

A study of the practical calculations used in pharmacy. Prerequisite, third-year standing.

331, 332 General and Physical Principles (4,4) A,W

HAMMARLUND

A study of pharmaceutical dosage forms including processes, physical principles and metrology involved in their preparation. Prerequisites, Physics 115 and 118 and Pharmaceutical Chemistry 239.

352 Fundamentals of Pharmacotherapeutics (4) Sp

J. PLEIN

Dosage forms and mathematics of drug administration; principles of pharmacology; pharmacologic and therapeutic classes of drugs; actions and uses of drugs in treatment of disease. For nursing students. Prerequisites, Chemistry 102, Conjoint (Medical) -318, (or taken concurrently), or permission.

362 Fundamentals of Pharmacotherapeutics (3) A

J. PLEIN

Dosage forms; principles of pharmacology; pharmacologic and therapeutic classes of drugs; actions and clinical uses of drugs, with emphasis on the use of drugs in dental patients. For dental hygiene students. Prerequisites, Chemistry 102, Conjoint (Medical) -318.

407, 408, 409 Pharmacy in Dispensing Practice (4,3,3) A,W,Sp

HALL

The dispensing of medication on prescription and on direct order of the consumer. Topics include specialized compounding techniques, biopharmaceutics, classification and evaluation of drug products. Prerequisites, 332 and Pharmacology-302.

410 Clinical Dispensing Pharmacy (1) AWSp

E. PLEIN

Compounding and dispensing of prescriptions originating in the Student Health Service (Hall Health Center) and University Hospital. Laboratory work is under direct supervision of Student Health Service pharmacist and University Hospital pharmacists.

412 Drug Products for Autotherapy (2) Sp

HALL

Self-medication as a public health problem. An analytical study of the use and abuse of non-prescription remedies by the general public. Prerequisite, 408.

420 Manufacturing Pharmacy (3) AW

E. PLEIN

A study of the techniques and equipment in preparing pharmaceutical products on a small plant scale basis. Prerequisites, 332 and fifth-year standing.

445 Radiopharmaceutics (3) W

SPITZNAGLE

The fundamentals of radioactivity; properties of radiation; instrumentation used in nuclear medicine; problems associated with the formulation, production, and use of radiopharmaceuticals; and radiopharmaceuticals currently

used for diagnosis and therapy. Prerequisite, 332.

450 Pharmacy Laws (3) A

RISING

A study of the laws regulating the practice of pharmacy. These include federal, state, and municipal laws, and professional ethics. Prerequisite, fifth-year standing.

451 Pharmacy Administration (3) W

RISING

The business and management aspects of pharmacy. Economic considerations in independent and chain operations. A study of third-party payment plans for financing pharmaceutical service, government programs, public relations, professional promotion and advertising. Sick room supplies, surgical and orthopedic appliances will be discussed. Prerequisite, 450.

452 Contemporary Problems (1) Sp

RISING

An examination of trends in the field of pharmacy as influenced by social and economic factors. The effect of changing patterns of health care on professional practice. Prerequisite, fifth-year standing.

465 The General Practice of Pharmacy (2, max. 4) AWS

HALL, KRUPSKI

A study of pharmacy in the community and urban setting. Students spend variable periods under the tutelage of a pharmacist in his day-to-day practice and meet for weekly discussions of their experiences. Prerequisites 332, Pharmacology 302, and permission.

483 Hospital Pharmacy (3-5) AWSp

E. PLEIN

Introduction to hospital pharmacy. Principles and techniques of hospital pharmacy operation. Laboratory work is conducted in pharmacies of University Hospital and affiliated hospitals. Prerequisite, permission.

485 Clinical Pharmacy (5) WS

E. PLEIN

The pharmacist on the health-care team. Lectures and conferences. Laboratories in various clinical areas of the hospital. Students associate observed symptomatology in patients with textbook descriptions of disease states, gain insight into problems of diagnosis and treatment planning, and relate disease states with complex drug therapy. Prerequisite, permission; 483 is recommended.

486 Clinical Pharmacy (4-10) SpS

E. PLEIN

The pharmacist on the health-care team. Lectures, conferences, and laboratories in various clinical areas of the hospital and outpatient clinics. Students relate complex drug therapy to disease states and treatment planning. Consideration of the pharmacist's responsibilities for inpatient and outpatient care. Prerequisites, 485 and permission.

499 Undergraduate Research (*, max. 6) AWSp

HALL, HAMMARLUND, E. PLEIN, RISING

Pharmaceutical research problems. Prerequisites, cumulative grade-point average of 2.50 and permission.

Courses for Graduates Only

510 Topics in Pharmaceutics (3, max. 6) Sp

HALL, HAMMARLUND, E. PLEIN

Reading, conference, and laboratory work in physical pharmacy and biopharmaceutics. Prerequisite, permission.

515 Topics in Nursing and Pharmacy (2) Sp

E. PLEIN, REGAN

Reading and discussions of assigned topics of current interdisciplinary interest in the field of nursing and pharmacy. Subject matter changes from year to year. Offered jointly with the School of Nursing as Nursing 515. Prerequisite, permission.

520 Seminar (1, max. 5) AWSp

Graduate students must attend seminars and make one formal presentation per year while in residence; 1 credit per year is allowed.

560 Manufacture of Sterile Pharmaceuticals (4) W

E. PLEIN

The technology of parenteral preparations, ophthalmic solutions and ointments, and specific problems in formulation of sterile pharmaceuticals. (Offered alternate years; offered 1971-72.) Prerequisite, permission.

570 Hospital Pharmacy Administration (5) Sp

E. PLEIN

The organization and administration of the hospital pharmacy and the responsibility of the director of pharmacy services in a hospital. (Offered alternate years; offered 1971-72.) Prerequisite, permission.

580 Advanced Manufacturing Pharmacy (5) E. PLEIN

A study of the methods of manufacture of pharmaceutical preparations on a semi-commercial scale. (Offered alternate years; offered 1970-71.) Prerequisites, Chemistry 457, which may be taken concurrently, and permission.

600 Independent Study or Research (*) AWSp

700 Thesis (*) AWSp

800 Doctoral Dissertation (*)

THE GRADUATE SCHOOL OF PUBLIC AFFAIRS

Courses for Graduates Only

PUBLIC ADMINISTRATION

501, 502, 503 The Administrative Process (3,3,3) A,W,Sp

KAGI, KROLL

An analysis of the administrative process relying primarily upon case materials and emphasizing policy formation, organization behavior, the nature of administrative roles, and the mechanism of responsibility. Same as Political Science 570, 571, 572.

511, 512, 513 Administrative Problems (3,3,3) A,W,Sp

SHIPMAN

Methods employed in the analysis of administrative problems, programs, organization, process, procedure, and staffing; the design of organizations and operations. Same as Political Science 576, 577, 578.

521, 522, 523 Public Management (3,3,3) A,W,Sp

LYDEN

Expression of public policy through program activity, program planning, programming and scheduling, budgeting, staffing, fiscal and other operating controls, evaluations of effectiveness. Same as Political Science 573, 574, 575.

541, 542, 543 Social Theory and the Public Policy Process (3,3,3) A,W,Sp

LYDEN

Theoretical and research approaches to systems of social interaction. Special emphasis on the role of complex organizations and goal-oriented actions in the public policy process.

551 Comparative Administrative Systems (3) Sp

KROLL

Methodological problems of research in comparative administration. Theoretical and substantive aspects of administrative systems in urban-industrial and developing nations. Same as Political Science 579.

552 Administrative Problems of Development (3) S

KROLL

Problems of administering developing nation-states and regions, including theoretical aspects of development administration, bureaucratic change, administrative-political interaction in policy making, organizational development, political impact of administering major programs. Prerequisites, Political Science 473, 474, or permission.

553 Comparative Urban and Regional Administration (3) S

WARREN

A comparative analysis of the organizational structure and administrative and political behavior within urban and regional governmental units and the relationships of these units to national governments. Prerequisite, permission.

600 Independent Study or Research (*, max. 15)

PUBLIC POLICY

500 General Seminar (*, max. 15) AWSp

532, 533 Policy Development and Administration: Foreign Affairs (3,3) W,Sp

DENNY

Foreign and defense policy formation and execution. Administration of national security programs: White House, Congress, State and Defense Departments, special problems and case studies. Prerequisite, Political Science 528.

561, 562 Policy Development and Administration: Urban Affairs (3,3) A,W

A two-quarter graduate course in the structures, functions, and processes of government in cities, with special emphasis on the origin, content, and implementation of public policies. Major focus is on the political process at the municipal level: the distribution of influence, the political actors, the decision-making machinery, and the policy outputs. Of special interest to graduate and professional students preparing for careers in urban government. Prerequisites, Public Administration 502 or Political Science 584, 585, or permission.

565 Seminar in Urban Public Policy Analysis (3) Sp

BISH

The use of methodology from public administration, political science, and economics to examine urban public policies. Emphasis on the relationships between research and public policy.

580 Medical Care (2) Sp

BERGMAN

An interdisciplinary seminar designed to survey factors affecting the delivery of medical

care. The subject will be viewed by representatives of medicine, sociology, economics, and political science. Offered jointly with the Department of Preventive Medicine as Preventive Medicine 580. Prerequisite, graduate standing.

583, 584, 585 Seminar in Science and Public Policy (3,3,3) A,W,Sp

WOLFLE

Issues and problems relating to the interaction of science and scientists with the public policy-making process and public policymakers. Nature and values of science versus the nature and values of political processes, and the continuing tensions between the two. The evolving interaction between scientific and technical knowledge and political power; scientific versus ethical judgments. Role of science in the establishment of national goals. Plans and proposals for increasing governmental competence to deal with public policy issues involving science and technology.

590, 591, 592 Midcareer Seminar (3,3,3) A,W,Sp

MILLER

Interdisciplinary seminar in public policy for midcareer executives. Open to National Institute of Public Affairs award winners and others by permission.

593, 594, 595 Policy Development and Administration: Natural Resources (3,3,3) A,W,Sp

CRUTCHFIELD, PEALY

Interdisciplinary research seminar in natural resources policy development and administration. Major concern is with the processes of natural resources policy formulation and analysis, and the role of various sectors in influencing policy development and administration. Open to graduate and professional students in varied disciplines who are emphasizing preparation in natural resources fields. Prerequisite, permission.

600 Independent Study or Research (*) AWSpS

604, 605, 606 Degree Project (2-6,2-6,2-6)

POLITICAL SCIENCE

528 Seminar in National Security Policy Formation (3) A

DENNY

The principal elements of national security. Constitutional, historical, theoretical, and administrative analysis of United States foreign and defense policy formation and execution. Prerequisite, permission.

580, 581, 582 Seminar in Metropolitan and Urban Planning Problems (3,3,3) A,W,Sp

The metropolitan community: nature, characteristics, functions, governmental structure; intergovernmental relationships. Urban planning: theory, law and administration, policy determination, and public relations. Methods and devices for plan implementation. Drafting local ordinances for planning, zoning, subdivision control, and urban renewal.

584 Approaches to Subnational Government (3) A

WARREN

An analysis of current approaches and concepts in the study of subnational government—urban, state, and regional public organization.

585, 586 Local, State, and Regional Politics and Administration (3,3) W,Sp

MINAR, WARREN

Exploration and analysis of political and or-

ganizational behavior at the local, state, and regional levels of government, with emphasis upon methodology and field research.

ECONOMICS

400 Fundamentals of Micro-Theory (3) A
Fundamentals of micro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if 300 has been taken for credit.

401 Fundamentals of Macro-Theory (3) W
Fundamentals of macro-theory with emphasis on applications to public policy. Designed primarily for graduate students majoring in fields other than economics. No credit if 301 has been taken for credit.

416 Urban Economics (5) A or Sp

BISH

Analysis of determinants of level of regional economic activity with special reference to the Pacific Northwest. Offered jointly with the Department of Geography as Geography 416. Prerequisite, 301 or equivalent.

435 Natural Resource Utilization and Public Policy (5) W

CRUTCHFIELD

Special emphasis on elements of economic theory relating to resource oriented industries. Case studies in the theory and practice of resource management dealing with both stock and flow resources. Benefit-cost analysis and the evaluation of multipurpose projects.

451 State and Local Fiscal Economics (5) W or Sp

BISH

The theory of public finance with special reference to nonfederal governments and particularly to the problems of the urban area. Prerequisite, 300 or equivalent, or permission.

516 Seminar in Urban-Regional Economics (3) Sp

BISH

Selected topics dealing with aggregative regional economic tools with special attention to empirical testability. Offered jointly with the Department of Geography as Geography 516. Prerequisites, 300 and 301.

550 Public Finance I (3) W

BISH

Theory of collective action: welfare economics with special emphasis on public goods and external effects; theory of property rights, constitutions, and nonmarket decisions. Prerequisite, 500 or permission.

553 Economic Analysis and Government Programs (3) Sp

MC CAFFREE

Application of economic analysis to public enterprises and programs. Prerequisites, 400, 401, or equivalent.

RESERVE OFFICERS TRAINING CORPS

AEROSPACE STUDIES

Courses for Undergraduates

101, 102, 103 Aerospace Studies 100 (1,1,1) A, W, Sp

Examines the role of United States military forces in the contemporary world, with particular attention to the United States Air Force, its organization and mission. The functions of

RESERVE OFFICERS TRAINING CORPS

strategic offensive and defensive forces, general purpose, and aerospace support forces are covered. One classroom hour and one hour of Corps Training per week.

211, 212, 213 Aerospace Studies 200 (1,1,1) A,W,Sp

Air Forces related to national defense policy, with respect to general and limited war, alliances, and strategies and policies of the United States, the Soviet Union, and China. An introduction to United States defense organization and decision-making processes and their contribution to national objectives. One classroom hour and one hour of Corps Training per week. Prerequisites, 103 or equivalent for 211; 211 for 212; 212 for 213.

321, 322, 323 Aerospace Studies 300 (3,3,3) A,W,Sp

A study of the history, growth, and development of Aerospace Power. Three classroom hours and one hour of Corps Training per week. Prerequisites, 213 or equivalent for 321, 321 for 322, and 322 for 323.

430 Flight Instruction Program Ground School (2) Sp

Ground school to supplement flight training for Air Force ROTC cadets in light aircraft; includes weather, navigation, and Federal Aviation Agency regulations. Prerequisite, permission.

431, 432, 433 Aerospace Studies 400 (3,3,3) A,W,Sp

A study of Air Force leadership and management. Includes professional responsibilities, military justice system, leadership theory functions and practices, management principles and functions, and problem solving. Three classroom hours and one hour of Corps Training per week. Prerequisites, 323 or equivalent for 431, 431 for 432, and 432 for 433.

MILITARY SCIENCE

Courses for Undergraduates

101, 102, 103 Military Science I—Basic (1,1,1) AWSp, AWSp, AWSp

A study of the history, organization, and mission of the United States Army and the ROTC program and the relationship of the program to the citizens' military and civilian obligation; to develop an understanding of the function and organization of the defense establishment of the United States and the interrelations among the services under the Department of Defense; background on the evolution of warfare to include the meaning and scope of the principles of war and the development of weapons and associated equipment utilized in warfare.

201, 202, 203 Military Science II—Basic (3,2,1) AWSp, AWSp, AWSp

Foundations in the principles of the art of warfare as they are exemplified in American military history. Tactical lessons and leadership techniques demonstrated in the most significant American campaigns and engagements. Fundamentals and techniques of small-unit tactics, emphasizing the importance of firepower, movement, and communications. Understanding of the duties, responsibilities, and methods of employment of basic military units. Use of maps, aerial photographs, and terrain factors to enable pursuit of study in other subjects requiring these skills.

301, 302, 303 Military Science III—Advanced (3,3,3) AWSp, AWSp, AWSp

Develops the student's proficiency in presenting and evaluating oral presentation; identifies and illustrates effective leadership traits. Provides the student with an understanding of the factors affecting human behavior; affords opportunities to apply leadership and management techniques. Roles of the various branches in the overall mission of the Army and their functions in support of field forces are explained. Explains the role of the leader in directing and coordinating individual and military units in the accomplishment of missions from squad- to battalion-size units; as well as principles of command control, leadership techniques, and communications systems used in the Army. Three classroom hours and one hour of Leadership Laboratory per week. Two weekend field trips and one academic substitute are required during the year.

401, 402, 403 Military Science IV—Advanced (2,3,2) AWSp, AWSp, AWSp

Examination of the factors influencing world change to provide a more informed analysis of the relations between the United States and other nations. The position of the United States in the contemporary world scene will be analyzed for its impact on leadership and management problems of the military service. A developmental study designed to provide an awareness of the personal responsibilities and official relationships of an army officer. A comprehensive study of the organization and functions of the command and staff relationships. The processes by which the administration, logistics, and planning are coordinated into successful military operations. An introduction to the basic concepts of the legislative and executive authority establishing the uniform Code of Military Justice. A comprehensive study of the problem-solving techniques employed by the small unit leader with emphasis on coordination and detailed planning by the junior officer. The process of planning successful military operations are analyzed and discussed. Two classroom hours and one hour of Leadership Laboratory per week in 401 and 403. Three classroom hours and one hour of Leadership Laboratory per week in 402. Two academic substitutes are required during the year.

NAVAL SCIENCE

Courses for Undergraduates

111 Naval Organization (3) A

General introduction to the Navy, its organization and operating methods.

112 Naval Management (3) W

General introduction to the systems and techniques employed in the Navy in managing its human, financial, and material resources.

113 Naval Ship Systems (3) Sp

A study of the varied ship systems operational in the Navy today, including the principles of characteristic propulsion systems and auxiliary machinery and the elements of ship stability and damage control. An introduction to nuclear propulsion.

211 Naval Science Practicum (1) A

An introduction to naval aviation.

212 Naval Science Practicum (1) W

An overview of naval communications.

213 Naval Science Practicum (1) Sp

Seminar-type discussions of the role of sea-power in world affairs.

311 Navigation (3) A

Comprehensive study of the science of terrestrial navigation, including dead reckoning, piloting, and electronic means. Theory and practice of celestial navigation.

312 Navigation and Naval Operations (3) W

Continuation of celestial navigation and the complete "day's work" of the navigator; introduction to naval operations, tactical communications and the rules of the nautical road.

313 Fleet and Task Force Operations (3) Sp

Employment of naval forces, naval tactics, formulation of operation plans and orders; employment of detection equipment; and meteorology.

411 Naval Weapons Systems (3) A

The concept of weapon systems and the systems approach, the techniques of linear analysis of ballistics and weapons, and the dynamics of basic components of weapon-control systems are investigated. The tools are provided for understanding the basic principles that are involved in all modern naval weapon systems.

412 Naval Weapon Systems (3) Sp

Continuation of 411.

413 Naval Weapon Systems (3) Sp

Principles of selected phases of the weapon-control problem, including propulsion, trajectories, and damage criteria. Solution of weapons-control problem. Review design and testing of weapons components, including fuses, warheads, and control mechanisms. Procedures for evaluating weapon-system effectiveness. Prerequisites, Mathematics 126 and Physics 123, or equivalents.

414 Naval Weapon Systems (3) Sp

Descriptive course presented as an alternate to 413. Offered only for students who have not completed the mathematics and physics prerequisites.

MARINE CORPS OPTION COURSES

321 Evolution of the Art of War (3) A

Introduction to the art of war; the evolution of warfare from the earliest recorded battles through the Mexican War.

322 Evolution of the Art of War (3) W

Continuation of 321 through World War II.

323 The Study of Modern Basic Strategy and Tactics (3) Sp

Introduction to the basic strategy and tactics employed by the United States Marine Corps. Resumé of United States foreign and military policy. Marine Corps organization.

421 Amphibious Warfare: Pacific Theater, World War II (3) A

A historical review of the amphibious campaigns conducted in the Pacific Theater during World War II.

422 Amphibious Warfare: European Theater, World War II, Korea (3) W

A study of subject campaigns. Planning for amphibious operations, including staff organization, command relationships, task organization, and other aspects.

423 Military Justice and Marine Corps Leadership (3) Sp

The administration of discipline under the

Uniform Code of Military Justice. The concepts, objectives, characteristic qualities, and practical techniques of leadership as exercised by the Marine Corps officer.

SCHOOL OF SOCIAL WORK

Courses for Undergraduates

391 Supervised Study (2-6, max. 6) AW BERLEMAN, DUPLICA

Specialized academic and field study in agencies of selected social welfare problems. Emphasis is on the nature of the clientele and their problems, the kind of services offered to them, and the place of these services in total community programs. Prerequisite, 400 or permission.

400 Field of Social Welfare (5) ASp BERLEMAN, DUPLICA

The origin, development, and present status of social service programs, with particular emphasis on the relationship of program resources, human needs, and the methods through which services are provided. Prerequisite, upper-division standing.

401 Principles of Interviewing (2) AWSpS

The interview as a basic method in helping people. Analysis of case records with objective of identifying processes and techniques of skillful interviewing; ways in which purpose and setting of the interview influence its nature and course. Prerequisite, upper-division standing.

Courses for Graduates Only

502, 503, 504 Social Welfare Organization (2,2,2) A,W,Sp ANDERSON, DEAR, DUPLICA, PARSONS, PATTI, SMITH

Historical origins of concepts, policies, and social welfare institutions; critical analysis of current public and private programs at all jurisdictional levels; use of social welfare concepts in planning.

508 Integrative Seminar (2) WS

A sixth-quarter course designed to help the student integrate knowledge and values from the several areas of the professional curriculum. Major emphasis is placed on ethical problems contained in current issues and the social worker's role in resolving them.

509 Readings in Social Work (*) AWSpS Prerequisite, permission.

510 Social Casework (2) A ABRAHAMSON, LEIGH, MUNDT, REISS, SCHMIDT

The casework process studied from a conceptual and value base together with generic principles which form the foundation of the methodological process. Consideration is also given to basic interviewing principles and the use of understanding concerning the motivations in human behavior as these apply to the casework process and its goals.

511 Social Casework (2) W ABRAHAMSON, LEIGH, MUNDT, REISS, SCHMIDT

Continuation of generic casework theory, with emphasis on diagnosis and casework treatment. Prerequisite, 510.

512 Social Casework (2) Sp ABRAHAMSON, LEIGH, MUNDT, REISS, SCHMIDT

Elaboration and intensification of basic casework concepts and their application in practice to various types of agencies. Prerequisite, 511.

515 Field Instruction (4-8, max. 12) AWSp Prerequisite, permission.

520 Seminar (*, max. 6) AWSp Prerequisite, permission.

521 Social Group Work (2) AW

Introduction to social group work as a method of social work. Special emphasis upon a beginning understanding of factors involved in helping individuals with their problems in the group.

522 Social Group Work (2) W

The social group worker's helping role in problem solving. Special emphasis upon the study and appraisal of individuals within the group and their total psycho-social-cultural developmental background. Study of formulating a working diagnosis on individual clients and the formulation of treatment goals. Prerequisite, 521.

523 Social Group Work (2) Sp

The social group worker's activity in utilizing group processes and structure to treat individuals within a group. Integration of study, diagnosis, and treatment in the processes of providing social work services. Prerequisite, 522.

524 Advanced Social Group Work (2) A MAIER

The use of programming as a means of diagnosis and treatment in the practice of social group work. The analysis and purposeful use of program media. Prerequisite, 523.

525 Advanced Social Group Work (2) W MAIER

The application of the social group work method with an emphasis upon differential treatment of individuals with psycho-social problems. Social group work within the context of a group living setting. The use of marginal interview. Collaborative and team work with other disciplines. Prerequisite, 524.

526 Advanced Social Group Work (2) Sp MAIER

The continuum of treatment with a review of beginning, central, and terminal phases of social group work. History and current trends in social group work. Prerequisite, 525.

527 Social Work Practice With Groups (2)

Study of service of clients within a social work group; especially adapted for students specializing in either social casework or community organization. Prerequisites, 521 and second-year standing.

530 Advanced Social Casework (2) A ABRAHAMSON, HUNT, MILLER, REISS

Intensive study of the casework process to deepen and broaden the caseworker's knowledge and understanding of the dynamics of human behavior and to enable him to develop greater skill in interviewing. Prerequisite, 512.

531 Advanced Social Casework (2) W ABRAHAMSON, HUNT, MILLER, REISS

Continuation of intensive study of case material, with particular emphasis on worker-

client relationship reactions as these affect the diagnostic and treatment processes. Prerequisite, 530.

532 Advanced Social Casework (2) Sp ABRAHAMSON, HUNT, MILLER, REISS

Intensive drill in case analysis, seeing the case as a whole, achieving a balanced perspective on the relationship between inner and outer forces, and planning appropriate treatment. Prerequisite, 531.

533, 534 Trends in Social Work Practice (2,2) AWS,AWs

HERRICK, HUNT, LEIGH, REISS, STIER
Generic and differential factors in understanding and utilizing various administrative settings in social work practice. Study of developments and trends in social work practice. Prerequisite, permission.

535 Advanced Field Instruction (4-8, max. 12) AWSp Prerequisite, 515.

550, 551, 552 Human Growth and Behavior (2,2,2) AWSp,AWSp,AWSp FARBER, HERRICK, PEPPER, RESNICK, SCHMIDT, TAKAGI, WASSER

The study and examination of man's social functioning through analysis of selected aspects of physical, emotional, social, and cultural influences upon normal growth and behavior. Prerequisite, permission.

570 Administration of Social Agencies (2) AW PARSONS, PATTI

The importance of social work administration to social work practice; administrative behavior as it affects practice. Administrative organization and techniques which permeate all levels of staff, including pressures from within and without the social agency. Prerequisite, permission.

572 Social Community Organization (2) AWSp BARTLESON, ELLIS, PETERSON, STIER

Understanding the social forces of the community, the process of community organization, and the role of the social worker in implementing community organization. Prerequisite, permission.

573 Advanced Social Community Organization (2) A ELLIS, STIER

Intensive study of community action situations involving social welfare program development, community welfare planning, and neighborhood citizen action to deepen the student's capacity for problem-solving in the community context. Prerequisites, 572 and permission.

574 Advanced Social Community Organization (2) W ELLIS, STIER

Study of traditional and newer planning and financing mechanisms for linking programs at the various levels: neighborhood, metropolitan area, state, national. Appropriate methods for effecting change in social conditions through the use of these mechanisms will be studied. Prerequisite, 573.

575 Advanced Social Community Organization (2) Sp ELLIS, STIER

Intensive study of the methods for: assessing resistant and supportive forces, creating action systems representative of appropriate segments of the community, sustaining a relationship with an action system over a period from

SOCIAL WORK

identification of a problem to action, and evaluation of the outcome. Prerequisite, 574.

587 Law and Social Welfare (2) W

GRONEWOLD

The basis of law, its philosophy and development, its broad principles, and the procedure by which it operates; specific aspects of law pertinent to social work orientation, including law in relation to the family, children, guardianships, and acts against society, and property laws. Prerequisite, permission.

590 Social Work Research (2) AWSp

DIGHTMAN, HERRICK, JAFFEE,
R. NORTHWOOD, PEPPER, RESNICK,
SEABURG

An introduction to the logic of scientific method with reference to techniques used in social research. Examples drawn from problems and practices in social work and social welfare.

591 Group Research Project (2, max. 6)

Field practice in a group project in lieu of an individual thesis (except for students in the special program). Includes development of research design, collection of data, tabulation and analysis, and report writing. Prerequisite, 590 or its equivalent.

592 Organization and Administration of Applied Research (2)

HERRICK, NORTHWOOD

Theories, methods, and strategies for conduct of social welfare research involving conceptualization, design, funding, administration, publication, integration, with practice. Prerequisite, 590.

593 Field Research Practicum (8) S

HERRICK, NORTHWOOD

Research techniques and strategies employed in social work are examined in seminar and through specialized, supervised training in

agencies and programs engaged in such work. For the Special Program in Social Work Research apply to Dean, School of Social Work. Implementation of the application is dependent upon the availability of resources. Stipends for the summer study may be available. Prerequisite, permission.

594-595 Advanced Social Work Research (2-2)

NORTHWOOD

The sequence describes (a) specific research techniques and (b) how they are applied in social work. Each technique is placed in methodological and theoretical context by the examination of published research monographs, which show its use and limits. Prerequisite, 590 or its equivalent.

700 Thesis (*) AWSp

702 Degree Final (3)



RULES AND REGULATIONS

The University and its colleges and schools reserve the right to change the fees, rules, and calendar regulating admission and registration, instruction in, and graduation from the University and its various divisions, and to change any other regulations affecting the student body. Changes shall go into force whenever the proper authorities so determine, and shall apply not only to prospective students but also to those who at that time are matriculated in the University. The University also reserves the right to withdraw courses at any time.

It is the University's expectation that a student will follow University Rules and Regulations as they are stated in the catalog. In instances where no appeal procedure is spelled out and the student is persuaded that a special set of circumstances makes appeal reasonable, he may appeal the application of specific rules or regulations to the Office of the Dean of the School or College in which he is enrolled in the case of an academic matter, or to the Office of Student Affairs in the case of a nonacademic matter. These offices will render a decision on the appeal, arrange for a hearing where appropriate, or refer the student to the proper office for a decision.

University Policy on Student Records

All student records will be treated in a responsible manner and with due regard to the personal nature of the information they contain. The records of students held by the University are the property of the University. The practice of the University Registrar, however,

is to honor a student's written request that the transcript of his official academic records not be released or information contained in these records not be disclosed.

Student Identification

Each student may obtain, without cost, a photo-identification card at the time of his first registration at the University. This card will be the student's means of establishing entitlement to the rights and privileges which normally accrue to students.

The student photo-identification card may be required by any University agency offering services, activities, or facilities wherein a student priority is to be maintained.

Lost or destroyed photo-identification cards may be replaced by making a request for replacement at the University Cashier's Office and upon payment of a \$5.00 replacement fee. Replacement of cards made invalid by changes in students' names or of cards rendered unusable by normal wear and tear, shall be done free of charge, upon return of the original card.

Cards which have been tampered with or misused may be confiscated by the University agency or department involved; the incident may be referred to the Office of Student Affairs for appropriate University action.

Financial Obligations

The Comptroller is authorized to place a hold (Administrative) on the records of any student who fails to promptly pay amounts due the University.

Until this hold is cleared, the University (1) will not release the student's record or any information based upon the record, (2) will not prepare transcripts, (3) will deny registration for a subsequent quarter, as well as graduation from the University.

In cases of serious financial delinquency, the Comptroller may order that the student's registration be cancelled, with privileges of attendance withdrawn, effective immediately on notice.

Administrative Hold or cancellation may also occur when a student has not complied with other University rules, procedures, or obligations. The hold may be placed on the student's record by the authorized University office responsible for enforcement of the rule, procedure, or obligation involved. The student will not be permitted to register for any subsequent quarter or obtain a transcript of his record except on the written release of the office which placed the hold.

DEFINITIONS OF GENERAL UNIVERSITY TERMS

Admission, Enrollment, and Registration

Admissibility is determined by examination of the applicant's credentials against the University's scholastic standards and requirements. *Admission* is offered to a person when his qualifications meet the criteria and when a student vacancy that can be assigned to him exists in the school or college in which he plans to follow a course of study.

A person admitted to the University becomes *enrolled* when he gives firm evidence of his intention to attend and to pursue a course of study. If he does not comply with the procedures specified by the University in order to give such evidence of his intention to attend, his admission may be withdrawn and another person admitted to take his place.

Registration is the process whereby a student who has previously been *admitted* and *enrolled* is assigned to one or more courses for one quarter. The time periods during which registration takes place are published by the Registrar.

A Summary of Current Enrollment Procedures

A. Currently, at the University of Washington, a person offered admission for a quarter of the academic year enrolls by making a nonrefundable \$50.00 advance payment on his tuition and fees. He remains enrolled for that quarter unless he either fails to register for courses or fails to complete payment of the tuition and fees by the prescribed deadline.

B. Matriculated students who continue from one quarter to the next succeeding quarter (excluding Summer) by completion of Advance Registration are by so doing automatically *enrolled* for the succeeding quarter.

C. Continuing students who do not complete Advance Registration lose their *enrolled* status, and must re-enroll in order to be eligible to participate in In-Person Registration for the succeeding quarter.

D. A student who fails to register for at least one course by the tenth day of instruction in a given quarter loses his *enrolled* status.

College

The University is made up of seven colleges, each of which offers a curriculum (sequence of courses) leading to the Bachelor of Arts or Bachelor of Science degree. A college may include a number of schools, departments, and divisions. The College of Arts and Sciences, for example, includes six schools, twenty-four departments and several divisions.

School

Within the University are two types of schools, independent units (*i.e.*, Business Administration, Dentistry, Law, Medicine, Nursing, Social Work) offering professional training to students who may be required to complete a period of preprofessional study, and units within colleges which offer semiprofessional training in single fields of study (*i.e.*, Art, Communications, Drama, Home Economics, Music, Physical and Health Education).

The Graduate School coordinates the work of students who have already obtained a bachelor's degree, and have been admitted to the School for advanced work toward the master's or doctor's degree.

Department

The unit of instructional organization in a particular science or art is called a department (*e.g.*, History). The department differs from the semiprofessional school in its tendency to place less emphasis on the application of subject matter.

Division

When a field of study includes work offered by several of the more specialized units of the University, it is sometimes called a division. In such cases, a committee of departmental representatives plans and coordinates the program.

Institute

The primary function of an institute is research and advanced study. The institute is usually associated closely with related departments because its staff is



largely composed of the department's faculty members who divide their time between teaching and research. The Far Eastern and Russian Institute, for example, is associated with the Department of Far Eastern and Slavic Languages and Literature.

Course

A course is a quarterly unit of study in a particular subject. Each course is listed by number and title under *Description of Courses*.

Hyphenated Course

Course numbers separated by hyphens (*e.g.*, French 101-102) indicate courses for which no credit is given until both terms have been completed.

Prerequisites

Courses to be completed or conditions to be met before one is eligible to enroll in a more advanced course are called prerequisites (*e.g.*, Introductory English 101 is prerequisite to 102).

Credit

A credit is a measurement of curricular work completed satisfactorily. Ordinarily, 1 credit is given at the University of Washington for one class attendance a week for a period of one quarter. However, in some courses, such as laboratory courses, two or three "clock hours" of attendance a week are required to earn 1 credit. A specified number of credits must be earned for a degree.

Colleges and universities which operate on a "semester basis," that is, divide the academic year into two parts exclusive of a summer session, give semester credit. Quarter credits multiplied by two-thirds equal semester credits. Semester credits multiplied by one and one-half equal quarter credits. For example, a student attending the University of Washington who earns 45 quarter credits during an academic year would have earned 30 semester credits at an institution operating on the semester plan.

Curriculum

The pattern or sequence of courses a student takes in earning his degree is a curriculum. Curricula are outlined in this catalog.

Prescribed and Elected Curricula

In the professional schools and colleges and in most of the schools in the College of Arts and Sciences, the curriculum offered is a prescribed one. Professional training requires intensive study over a long period with few courses in unrelated elective areas. In the less professionalized departments, the elective curricula

provide a broad educational background. Therefore, students majoring in these fields of study are given more freedom in choosing their elective credits.

Lower-Division Courses

The four-year program of study is divided into lower division (freshman and sophomore) and upper division (junior and senior). Lower-division courses are given numbers below 300.

Upper-Division Courses

Junior and senior courses which are given 300 and 400 numbers, respectively, are considered upper-division courses.

Graduate Courses

Courses numbered 500 and above are open to graduates only.

Undergraduate

This term is applied to a student who has not yet received his bachelor's degree.

Graduate

A student who has received his bachelor's degree and who is taking advanced work is a post-baccalaureate student. Professional schools usually adopt their college title such as medical student, law student, etc. The term "Graduate Student" is applied to a student who has been officially admitted to the Graduate School to take advanced work toward a master's or doctor's degree in the Graduate School.

Premajor

The premajor category is provided in certain colleges for those students in the first or second year who have not made a definite choice of major in the college. These students may select, in consultation with an adviser, a program of studies which will meet the broad general requirements of the college and at the same time provide an experimentation and exploration in the subject areas of the college. Each program is planned according to the individual student's needs.

Major

A major indicates the particular curriculum which a student has selected to follow toward a degree. The term *nonmajor*, which frequently appears in the description of courses, indicates a course designed primarily for students who are not specializing in that subject.

Adviser

A member of the college faculty or staff who is appointed to assist students in both educational and personal plans is an adviser.

Bulletin

A bulletin is an official publication issued by the University giving detailed information about such subjects as admissions policy, academic personnel, courses, fees, etc.

Residence (Resident)

This term has two meanings, neither of which refers to living on campus or at home while in attendance:

1. A "resident" is a student whose home, as defined by state law, is in Washington and therefore not subject to the additional fee required of nonresident students. (See *Appendix B*.)
2. A student "in residence" is enrolled in regular University classes as opposed to extension classes or correspondence study. Students regularly admitted to the University of Washington are considered to be "in residence" when registered in either day or evening classes.

DEFINITIONS OF STUDENT CLASSIFICATIONS

Classes

Credits are computed on the basis of the 180 minimum credits required for graduation, exclusive of the credits in physical education activity and lower-division ROTC courses. For general purposes, the following apply.

Freshman: 1-44 quarter credits

Sophomore: 45-89 quarter credits

Junior: 90-134 quarter credits

Senior: 135-180 or more quarter credits

Graduate: A student with a bachelor's degree who has been granted admission to the Graduate School.

Probation

New Students

Students with unsatisfactory scholastic records in their previous schools are occasionally admitted when special circumstances justify individual consideration by the Board of Admissions. Such students do not enter on probation. They must, however, maintain a cumulative grade-point average of at least 2.00 in all work completed at the University of Washington and, in addition, transfer students must present a graduation grade-point average of at least 2.00 in *all* courses, whether completed at the University of Washington or elsewhere.

Other Students

See *Scholastic Standards Required for Graduation* in this section.

Matriculated

A matriculated student is one who has been formally admitted to the University and who will register, presumably, in a program of studies leading to a degree or certificate.

Nonmatriculated

A nonmatriculated student is one who will be permitted to register for credit, on a space-available basis, but who has not been formally accepted into a program of studies leading to a degree or teaching or administration credential. Acceptance as a nonmatriculated student implies no commitment on the part of the University regarding regular admission at some later time. However, credits earned while in the nonmatriculated classification may apply toward requirements for the baccalaureate degree should a student later be accepted for a degree program. At least 45 credits must be earned in a matriculated status to meet graduation requirements.

Except for Visiting Graduate Students, whose admission and enrollment is authorized by the Dean of the Graduate School, nonmatriculated students may not enroll for courses numbered 500 and above.

Enrollment with nonmatriculated standing for the Summer Quarter is routinely available for currently employed school teachers and administrators with the understanding that credits earned in this classification may not apply toward a teaching or administrative credential. This arrangement also serves graduating high school seniors who would qualify for matriculated standing and other undergraduate students in good standing (grade-point average of 2.00 or above) at other colleges and universities seeking neither a degree nor certification from the University of Washington. For complete information, please consult the *Summer Quarter Bulletin*.

Enrollment during other quarters of the school year is at the discretion of the Board of Admissions. Applicants for nonmatriculated standing are considered individually and permitted to enroll on evidence of their probable success in achieving their limited educational objectives to the extent University facilities are available. Applicants with previous records of unsatisfactory scholarship are not ordinarily accepted as nonmatriculated students.

Students may audit certain nonlaboratory courses or the lecture part of laboratory courses for no credit, provided they have the consent of the dean of the college and permission from the instructor concerned. Students wishing to audit only, ordinarily enroll with nonmatriculated standing and pay the same fees as other students. This classification is open to mature individuals with



the understanding that auditors may not take an examination in or obtain credit for audited courses except by taking the course later as a regular student and satisfying all of the requirements for credit.

Students who have been dropped for low scholarship or new applicants who do not qualify for admission may not register as auditors until they have been reinstated or accepted as regular students by the University.

ADMISSION

Admissibility

Admissibility is determined by examination of the applicant's credentials against the University's scholastic standards and requirements. *Admission* is offered to a person when his qualifications meet the criteria and when a student vacancy that can be assigned to him exists in the school or college in which he plans to follow a course of study.

A person admitted to the University becomes *enrolled* when he gives firm evidence of his intention to attend and to pursue a course of study. If he does not comply with the procedures specified by the University in order to give such evidence of his intention to attend, his admission may be withdrawn and another person admitted to take his place.

Registration is the process whereby a student who has previously been *admitted* and *enrolled* is assigned to one or more courses for one quarter. The time periods during which registration takes place are published by the Registrar.

A Summary of Current Enrollment Procedures

A. Currently, at the University of Washington, a person offered admission for a quarter of the academic year enrolls by making a nonrefundable \$50.00 advance payment on his tuition and fees. He remains enrolled for that quarter unless he either fails to register for courses or fails to complete payment of the tuition and fees by the prescribed deadline.

B. Matriculated students who continue from one quarter to the next succeeding quarter (excluding Summer) by completion of Advance Registration are by so doing automatically *enrolled* for the succeeding quarter.

C. Continuing students who do not complete Advance Registration lose their *enrolled* status, and must re-enroll in order to be eligible to participate in In-Person Registration for the succeeding quarter.

D. A student who fails to register for at least one course by the tenth day of instruction in a given quarter loses his *enrolled* status.

Correspondence regarding admission to any division of the University and the transfer of credit from another collegiate institution should be addressed to the Office of Admissions. (See sections on *Undergraduate Education* or *Graduate Study* for admission requirements and procedures.)

The Board of Admissions has been delegated to interpret and administer undergraduate admission regulations established by the University faculty. In general, admissibility is determined according to the applicant's scholastic standing and the adequacy of his preparation for University study while in high school or another collegiate institution, with preference given, as necessary, to those with the greater probability of success in completing a degree program.

In determining the adequacy of an applicant's preparation, 5 quarter credits of elementary course work at the college level is considered equivalent to 1 high school unit in a given subject. The foregoing equivalency is used for purposes of admission only and a student who has not completed all of the high school courses specified for admission will be expected to select college-level courses which will provide a breadth of intellectual experience at least equivalent to that indicated by the subject matter criteria. The courses and number of credits to be allowed shall be determined by the student's college adviser after consideration of recommendations by the department in the University which presents courses in the subjects not included in the high school study.

Explanation of Terms Associated with Admission

For purposes of admission, an applicant's scholastic achievement in secondary or higher schools is determined by a grade-point average computed on a 4.00 system. In determining the acceptability of transfer students, the University considers grades received in all college-level courses attempted which are appropriate for a baccalaureate degree.

The University recognizes diplomas awarded by high schools accredited by their respective regional accrediting associations, their state departments of public instruction, or their state universities. Recognition is given to degrees awarded by colleges and universities which are fully accredited by their regional accrediting associations.

An applicant who has not fulfilled the criteria specified for admission or whose education was received in an unaccredited school may request individual consideration by the Board of Admissions, Scholastic Standards, and Graduation. In such cases, the Board may require scores on tests of the College Entrance Examination

Board or other evidence of probable success in a university program. Students accepted by the Board are expected to comply with any specifications outlined by the Board at the time of admission.

College Entrance Examination Board

Scores on the Scholastic Aptitude Test of the College Entrance Examination Board are required of all out-of-state students applying for admission as freshman students. Arrangements for taking the test may be made by writing to the Educational Testing Service, Princeton, New Jersey. In making these arrangements, the applicant should request that the scores be sent to the University of Washington Office of Admissions. In addition, the Office of Admissions should be informed as to when the tests will be taken in order that it may anticipate the arrival of the test scores.

Scores on other tests offered through CEEB, while not required in many cases, receive individual attention in terms of admission, placement, and/or credit.

Allowance of Transfer Credits

a. The University of Washington reserves the right to accept or reject credits earned at other collegiate institutions. In general, it shall be the University's policy to accept credits earned at institutions fully accredited by their respective regional accrediting associations, provided that such credits have been acquired through university-level courses appropriate to the student's degree curriculum at the University of Washington.

b. The advanced standing for which an applicant's training appears to fit him shall be granted tentatively on admission. Definite advanced standing shall not be determined until the end of the student's first quarter in residence.

c. Transfer of credit from institutions accredited for two-year programs only (community and junior colleges) shall apply on the University freshman and sophomore years only. A student who has completed a portion of his freshman and/or sophomore years in a four-year college may not transfer junior college credit in excess of that necessary to completion of the first two years in the University. In no case shall the transfer of junior college credit to the University exceed 90 quarter credits, exclusive of physical education activity credits.

d. The University reserves the right to accept or reject credits earned in educational programs sponsored by the Armed Forces. In general, careful consideration will be given to work completed according to recommendations made by the American Council of Education and other appropriate agencies and in terms of University degree requirements.

The maximum number of credits obtainable through completion of such programs shall be 30.

Such credits, when accepted, shall be included in the 90 extension credit maximum allowed toward the baccalaureate degree.

Within a given field of study, no student shall receive credit in subject matter more elementary than that for which he has previously received credit.

If a student repeats a course taken through the Armed Forces which was accepted for credit, the University credit shall be honored and the other canceled.

e. Course work completed in unaccredited institutions may be validated or certified for credit through examinations described in the section, *Examinations and Tests*, or through an examination or other appropriate means to be determined by the chairman of the University's subject matter department concerned. The fee for this service shall be the same as that charged for the other examinations. Consult the Office of Admissions in regard to the appropriate procedure.

Veterans and Children of Deceased Veterans

Veterans and children of deceased veterans who wish to inquire about their eligibility for benefits, should contact the regional office of the Veterans' Administration or the University Veterans' Division.

Correspondence Study

Correspondence Study courses are available to all who can pursue the work with profit to themselves regardless of previous academic accomplishment. See other sections in this catalog or consult the appropriate office for information regarding eligibility for course work, registration procedure, and regulations governing the application of correspondence credit toward a degree.

REGISTRATION

No person, other than faculty members attending informally with the approval of the instructor, may attend a University course in which he has not been registered.

The only authority for an instructor to enroll a student in his class is the student's name on a class list or an official class card from the Registrar's Office.

Auditors

a. With the consent of the instructor, and to the extent that space is available after regular students have been accommodated, a student may register as an auditor in a nonlaboratory course or the lecture part of a laboratory course.

b. The instructor may cancel the audit registration of any student whose attendance is not satisfactory.



c. No person who audits a course may participate in class discussion or laboratory work, take an examination in the course, or obtain credit therefor except by taking the course later as a regular student and satisfying all the requirements for credit.

d. The fee for auditing a course shall be the same as if the course were taken for credit.

Announcements

Registration dates and procedures are announced to students in residence via posters placed on campus bulletin boards, in official and informal notices in the *Daily*, in various University bulletins, and in the quarterly *Time Schedule*. Students should watch these sources for instructions for completing their registration.

New students, and returning students (those who have been out of school for one quarter or more), should familiarize themselves with the registration procedures contained in the various forms and bulletins available to them from the Office of Admissions and the Registrar. (See also the *Academic Calendar* in this Catalog.)

Addresses of Students

The student will be held responsible for keeping his address up to date in the Registrar's Office by filling out a Change of Address card at the Information Window, Administration Building. *Delivery of official mail to the last address on record constitutes official notification to a student.*

Methods of Registration

Advance Registration, requiring no registration appointment, is a modified form of mail registration and is required of and open only to currently enrolled matriculated students. This would include all matriculated students registered Spring Quarter who wish to register for Summer Quarter and/or Autumn Quarter.

All matriculated students currently in school who plan to register for the following quarter must register by Advance Registration and pay fees by the deadline stated on their fee card. Registration will be cancelled if fees are not paid on time. Students who do not complete Advance Registration (including payment of fees by the date stipulated on their fee card) will not be guaranteed enrollment.

Currently enrolled matriculated students who have applied for admission in another category, i.e. Unclassified-5, Graduate School or the Schools of Law, Medicine, or Dentistry, will be considered for admissions purposes to be in the "new student" registration quotas established for the respective categories. If the student is notified of his admissability to the new category before Advance Registration for the coming quarter, he

may participate in Advance Registration. If notified after Advance Registration and the student has not advance registered, he must apply for an In-Person Registration appointment by following the instructions enclosed with the letter of admissability.

Students whose Advance Registration is cancelled for nonpayment of fees must apply for an In-Person Registration appointment. Students in this category lose their guarantee of a place in the University and will be considered, subject to quota limitations, along with other former matriculated students.

Students who complete Advance Registration, including payment of fees, but whose registration is cancelled when they are dropped for low scholarship will be issued an In-Person Registration appointment if they are subsequently reinstated for the same quarter.

Students who withdraw during or after the first day of the quarter may participate in Advance Registration for the next quarter.

To register in advance, a student leaves his approved Official Program in the Registration Office, second floor, Schmitz Hall, according to posted instructions (engineering students leave their programs in 353 Loew Hall) within the specified dates. His schedule of assignments is made in his absence. Every effort is made to comply with a student's request. If a course is closed, an alternate course, which has been approved by his adviser, is substituted. A copy of his assigned program and his fee card are mailed to him. His enrollment is completed when he pays his fees by mail by a stated deadline and turns in all Information Cards as directed.

More detailed instructions for registration are given in each quarter's *Time Schedule*.

A service charge of \$15.00 will be assessed when a student, eligible for *Advance Registration* for the succeeding quarter, fails to participate, and is subsequently granted an *In-Person Registration* appointment for that quarter.

In-Person Registration is required of all new students and former students returning after an absence of one or more quarters, Summer Quarter excepted. New and returning students must apply by the application deadline. A registration appointment is required, on which date the student takes his approved Official Program to the Registration Office. (See "Registration Appointments" in this section, and "Admission Procedure" in the *Undergraduate Education* section.) In-person Registration appointments may not be available to all eligible returning students. Registration appointments will be issued only to the extent University enrollment quotas permit.

Advising for *In-Person Registration* takes place after *Advance Registration* is closed.

Late Registration

Permission to register late (on the first day of the quarter or thereafter) will be granted only at the discretion of the Registration Appeal Board. A service fee of \$15.00 will be assessed unless delay in registering is occasioned by officials of the University.

After the first seven calendar days of the quarter no student shall be permitted to register except with the consent of the dean of the college concerned and the written approval of the instructors whose classes he wishes to enter.

Concurrent Registrations

Extension Classes and Correspondence Study

A student registered for work in residence who wishes to receive credit for an extension or correspondence course in the same quarter shall register for such study with the Division of Evening and Extension Services or the Division of Correspondence Study.

No student in residence may take an extension course without the consent of his dean. This permission, on forms furnished for the purpose, shall be filed with the Division of Evening and Extension Services or the Division of Correspondence Study, whichever is appropriate to the request.

Concurrent Registrations at Other Collegiate Institutions

Courses taken concurrently at another collegiate institution while the student is in residence at the University of Washington may be credited toward his graduation from the University if approval is granted. (See "Allowance of Transfer Credits" in this section.)

Registration Appointments

New student applicants who are found admissible will be mailed a notice of their admissibility and will be requested to confirm their intention to attend the University by returning a \$50.00 advance fee payment. Permission to register and a registration appointment will be issued if space is available when the \$50.00 is received by the University; if space is not available the \$50.00 will be returned. The \$50.00 is not transferable to another person or quarter and will not be refunded if the student later elects not to attend the University. A detailed list of registration instructions will be included with the registration appointment. Additional directions are given each new student personally when he reports to the University.

Returning former students may request an Application for a Registration Appointment by writing or telephoning the Registrar's Office (206) 543-5920 or by apply-

ing in person. Application deadlines are listed in the Academic Calendar in this catalog. All eligible applicants may not be permitted to register if University enrollment quotas have reached capacity. A \$50.00 advance fee payment may be requested as a confirmation of the student's intention to attend. Permission to register and a registration appointment will be issued if space is available when the \$50.00 is received by the University; if space is not available the advance payment will be returned. The \$50.00 is not transferable to another person or quarter and will not be refunded if the student later elects not to attend the University.

Students in the Schools of Medicine, Dentistry, and Law are not exempt from these regulations.

Time Schedule

A *Time Schedule* listing all classes and sections offered is published prior to the registration period for each quarter. A copy of the current *Time Schedule* is available for each student at the Registrar's Office (engineering students at 353 Loew Hall). *Time Schedules* are also available for inspection in each adviser's office.

Special Approvals and/or Clearances Required

Before reporting for registration a student may have one or more of these other steps to complete:

1. Seniors who are registering for a graduate course (500 or above) must have the approval of the instructor of the class and the Dean of the Graduate School. These approvals must be written on the student's Official Program form.
2. Students in the College of Education must obtain approval of their programs from the Education adviser, regardless of their majors.
3. All private music lessons (applied music courses) must be approved by the School of Music. The class section is also assigned by the School of Music on the student's Official Program.
4. All librarianship courses, except course 100, must be approved in writing on the student's Official Program at the School of Librarianship, 111 Library.
5. Students registering for any course for which a permission signature is specified in the *Time Schedule* should have this signature on their Official Program.
6. All former students who have not been in residence for a period of one year must submit a medical examination form to the Health Center and obtain medical clearance.
7. Students registering for more than 13 credits must select an afternoon class meeting at 12:30 or after, if one is available. Only a daily class or two 2-hour



laboratories, except lower-division ROTC and physical education activity, will satisfy this afternoon class requirement. Waiver of the afternoon class requirement must be approved by the student's dean or his authorized representative.

Change of Program

Changes of program involving "adds" and "drops," or changes for the convenience of the University, will be accepted by Sections during each quarter's change of program periods.

Students finding errors on their programs should report to Sections for adjustment without waiting for the Change of Program period.

Any student listing alternates on his requested program and completing *Advance Registration* by paying his fees, who was assigned fewer credits than requested because of unavailable sections, and who wishes to increase his registered credits to the desired maximum, may add a course, without charge, during the stated change of program period.

No change of program involving entrance into a new course shall be permitted after the first seven calendar days of the quarter except with the consent of the dean of the college concerned and of the instructor whose class the student wishes to enter.

Service Charge

A service charge of \$5.00 will be assessed for each change of program, or change of section, or drop from a course, or any number of changes of program that are made at the same time, except when the change is made on the initiative of the University.

Change of Program Procedure

For Adding or Dropping a Course

1. Consult your adviser and secure signed Change of Program card.
2. Get course approval signatures for added courses where necessary.
3. Present signed Change card to the Registrar's Office, second floor of Schmitz Hall, to receive a Change of Program Appointment.
4. Go to Sections, 105 Schmitz Hall, on day and time of appointment. Engineering students go to 353 Loew Hall.

Change of College (including a change to or from the Schools of Law, Medicine, and Dentistry)

A student currently in school may initiate a change of college at any time by obtaining on the appropriate forms the signatures of the dean of the college in which

he is currently registered and the dean of the college that he wishes to enter.

Change of College forms may be obtained at the Registration Office, second floor of Schmitz Hall, or at the office of the dean of the college the student wishes to leave. The request must be filled in by the student and then submitted to the office of the dean of that college for signature. The next step is to present the request form to the office of the dean of the college to which he seeks admission, for written approval. After these steps have been accomplished the completed form must be left immediately at the Registration Office, second floor of Schmitz Hall.

Veterans and children of deceased veterans attending the University under Public Law 550, 894, or 634 must take certain other steps to ensure their continued entitlement to educational benefits. Consult Veterans' Division.

Change of Major

The procedure for changing a major varies from college to college. The student should contact his advisory office for change of major information.

Withdrawal from the University

Nonmilitary Withdrawal

1. To be official, a withdrawal from the University must be approved by the student's academic adviser. The withdrawal form is available at the student's advisory office or the dean's office.
2. After obtaining his adviser's approval, the student turns in the withdrawal form at the Registrar's Office.
3. Submission of a graduate on-leave application does not constitute official withdrawal from the University.
4. Official withdrawals shall be entered on the student's record as follows:
 - a. During the first 15 calendar days of the quarter: date of withdrawal only.
 - b. After the first 15 calendar days of the quarter:
 - (1) If the student's work in a course is satisfactory at the time of withdrawal, a grade of PW.
 - (2) If the student's work in a course is not satisfactory at the time of withdrawal, a grade of EW.
5. Withdrawals accomplished by any other method are not official, and result in the entry of the grade E in each of the courses for which the student is registered in the quarter.
6. Veterans attending school under P.L. 550 (Korean), 894 (Korean Disabled), 815 (Peace Time Disabled),

or children of deceased veterans attending school under P.L. 634 should notify the campus Veterans' Division of their withdrawal.

7. The student with a scholarship or loan awarded through the University should notify the Scholarship and Loan Fiscal Office of his withdrawal.

8. The privilege of military withdrawal will be granted only to students whose induction or enlistment is for extended active duty, not for short-term National Guard or Reserve duty or annual active-duty requirement.

Refund of Fees

All Autumn, Winter, and Spring Quarter fees (except those indicated as not subject to refund) will be refunded less an enrollment service charge of \$50.00 if complete withdrawal is made prior to the sixth day of instruction; one half of said fees less a \$25.00 enrollment service charge will be refunded if withdrawal is made during the first thirty calendar days, except for Air Force or Army ROTC uniform deposits. At least two weeks must elapse between payment and refund of fees, if payment was made by check. Unless specific instructions are received by the Cashier's Office regarding the fees refunded, all properly authorized refunds will be made to the student involved in the registration.

Military Withdrawal

If a student is inducted or enlists in the Armed Forces, he may take advantage of military withdrawal from the University under the following conditions:

1. A student who withdraws will be granted some academic credit for courses in which he has a C or better grade, and/or a refund of fees, under the following schedule:

a. Withdrawal during the first third of the quarter: No credit. Full refund.

b. Withdrawal during the second third of the quarter: One-half academic credit, without letter grade, and with courses unspecified. Unspecified credit may later be converted to credit and grade by credit examination. One-half refund.

c. Withdrawal during the last third of the quarter: Full academic credit, without letter grade, and with courses specified. (If withdrawal occurs during the last five days of the quarter, letter grades may be granted at the discretion of the instructors.) Letter grade may later be earned by credit examination. No refund.

2. If a student is in his last quarter before obtaining a degree from the University, he will be granted the degree provided:

a. That at the beginning of the quarter his cumulative grade-point average is high enough for graduation.

b. That his degree has been approved by his department chairman and dean.

c. That his grades for the completed portion of the quarter are C or better in each course necessary for graduation.

This third proviso may be waived if the withdrawal occurs so soon after the beginning of the quarter that determination of a grade is impossible.

3. The student will be expected to attend classes and withdraw no more than fifteen calendar days before his date to report for duty.

4. The provisions of military withdrawal apply to students enrolled in extension classes as well as to those in residence.

5. Should the foregoing provisions conflict with standards imposed upon a professional college or school by accrediting or licensing agencies, the dean or chairman of the college or school shall approve the conditions of military withdrawal.

Dropping a Course

A drop from a course is voluntary severance by the student of his connection with the course.

Drops from courses accomplished by any method, except those set forth in paragraphs 1. and 2. below, are unofficial and the grade for the course shall be entered on the student's record as E.

1. During the first 15 calendar days of the quarter: To drop a course the student should obtain his adviser's approval on the yellow Change of Program Request form obtainable at the advisory office. He should present the form at Sections and pay the \$5.00 change fee.

Courses dropped officially during this period are not entered on the student's record.

2. After the first 15 calendar days of the quarter: To drop a course, the student should obtain his adviser's approval on the yellow Change of Program Request form obtainable at the advisory office. The signature of the instructor, with the appropriate grade for the course, must also be obtained. The student should then present the form at Sections and pay the \$5.00 change fee.

If the student's work is satisfactory at the time of the drop, a grade of PW will be entered on his record; if the student's work is unsatisfactory at the time of the drop, a grade of EW will be entered on his record.



3. No official withdrawal may be made during the final examination period.

GRADES

The following system of grades is in effect at the University, subject to certain exceptions in the Schools of Medicine, Dentistry, and Law.

	GRADE POINTS PER REGISTERED CREDIT
A—Honor	4
B—Good	3
C—Medium	2
D—Poor (low pass)	1
E—Failed, or unofficial withdrawal	0
I—Incomplete	0
N—Without grade (hyphenated course)	0
S—Passing grade for courses taken on a pass/fail basis, and for courses numbered 500 and above, and for certain specified undergraduate courses	0
PW—Official Withdrawal after the first fifteen calendar days of a quarter if student's work is satisfactory at the time of withdrawal	0
EW—Was doing failing work at the time of official withdrawal after the first 15 calendar days of the quarter. Computed as E.	
X—Grade not received from the instructor	0

Optional Pass/Fail Grading System

A student may participate in an optional pass/fail grading system under the conditions and restrictions of his school or college. Questions regarding any aspect of the pass/fail system should be directed to the student's adviser.

Failures

The grade of E shall be final. A student receiving the grade of E in a course may obtain credit for it only by re-registering for the course and repeating it, as prescribed in *Repeating of Courses* in this section.

Incompletes

An Incomplete shall be given only in case the student has been in attendance and has done satisfactory work to within two weeks of the end of the quarter and has furnished proof satisfactory to his instructor that he cannot complete his work because of illness or other circumstances beyond his control. A written statement of the reason for the giving of the Incomplete, listing the work which the student will need to do to remove it, must be filed by the instructor with the head of the department or the dean of the college in which the course is given.

In order to obtain credit for the course a student must convert an Incomplete into a passing grade no later than the last day of his next quarter in residence. This rule may be waived by the dean of the college in which the course was offered only if the nature of the uncompleted work is such as to make the fulfillment of this requirement impossible. In no case can an Incomplete be converted to a passing grade after a lapse of two years or more. A fee of \$2.00 per course will be assessed for the removal of each Incomplete, whether it is removed by examination or other means.

Grade of N

The grade of N may be given only in thesis, research, and hyphenated courses in which the grade is dependent upon the work of a subsequent final quarter. When the grade of N is given in a course it may indicate that the work has been completed to the end of the quarter in which the N is given. It shall carry with it no credit or grade until a regular grade is assigned. The use of the N grade shall be optional.

Grades of PW, EW

Students making an official withdrawal during the first fifteen calendar days of a quarter shall be given no grade. Students who officially withdraw after the first fifteen calendar days of a quarter and are doing satisfactory work (D or better) in a course shall be given the grade of PW, which will count neither as registered hours nor as grade points. Students who withdraw after the first fifteen calendar days of a quarter and who are doing unsatisfactory work at the time of withdrawal, shall be given the grade of EW. An EW is computed as an E on the student's record.

Change of Grade

Except in cases of error, no instructor may change a grade which he has turned in to the Registrar. If a student finds omissions or possible errors in his grade report, he must make application to the Registrar for a review of his record not later than the last day of his next quarter in residence, and in no case after a lapse of two years. Time spent in military service will not be counted as part of the two-year limitation.

SCHOLARSHIP RULES

Once an "S" grade is given to a student, it continues as the permanent grade and will not later be changed into an A, B, C, D, or any other grade.

If a student believes he has been improperly graded, he will first discuss the matter with his instructor. If he is not satisfied with the instructor's explanation, he may submit a written appeal to the chairman of the department (in a nondepartmentalized college, the dean).

with a copy of the appeal sent to the instructor, and the chairman (or dean) will consult with the instructor to ensure that the evaluation of the student's performance has not been arbitrary or capricious.

Once a student submits a written appeal, this document and all subsequent actions on this appeal will be recorded in written form for deposit in a department (or college) file.

Repeating of Courses

Schools of Medicine, Dentistry, and Law are excepted.

Any courses may be repeated regardless of the grade received. All grades for repeated courses will be computed in grade-point averages, but credit will only be allowed once for successful completion of a course.

School of Medicine

The system of grades for the School of Medicine shall be the same as prescribed for the University, except:

Medical student achievement in each course is reported by the Dean's Office to the Registrar as H (Honors), P (Pass), or E (Failure).

E signifies that the work is of failing grade. Students who receive an *E* in one major subject may be permitted to take additional work and a re-examination, if permission is granted by the instructor in the course, the Dean, and the Executive Committee. If the additional work and re-examination are satisfactory, the student's grade may be raised from *E* to *P* and promotion may be granted provided that the remainder of the work is satisfactory. If students receive *E* in more than one major subject in one year, they may not make up these deficiencies.

Each department keeps careful records of student work. At the end of each academic year the Executive Committee of the School of Medicine evaluates the accomplishment of the student during that year and determines his fitness for promotion. When general academic achievement is unsatisfactory in any year, the student is subject to dismissal from the School. Even though a student who has been dismissed from the School of Medicine may succeed in passing a medical school course which he has previously failed by taking it as part of his course in another school or college, this is not regarded as evidence that a student's abilities justify readmitting him to Medical School. Students who have been dismissed because of low scholarship can be readmitted only by action of the Executive Committee; those who are readmitted are on probation and must maintain a quality of work consistently above the minimum requirements. The faculty of the School of Medicine does not favor repetition of courses in cases of

low scholarship and will not permit a student to repeat a year of work except when illness or some other extenuating circumstance justifies an exception.

School of Dentistry

The School of Dentistry uses the University grade-point system: A = 4, B = 3, C = 2, D = 1, E = 0. Calculation of the grade-point average is made by multiplying the grade point received in a course by the number of credits earned in the course, totaling these values, and dividing by the total number of credits earned.

Students are notified of their grades at the end of each quarter.

A student who has less than a 2.00 grade-point average in the courses for which he is registered during any given quarter is referred to the Executive Committee of the School. If the work in a course is incomplete or inadequate, a grade of I may be given. This Incomplete must be removed before September 15 if the student is to advance into the next year's class.

School of Law

1. In lieu of the letters A, B, C, D, and E, the numerical scale shall be substituted for the letter grades as follows:

A—85-100 B—77-84 C—68-76 D—60-67 E—0-59

2. No grade points shall be assigned to Law School grades.

3. A cumulative numerical average of 68 in law courses is required for graduation.

Grade Reports

Grade reports are automatically mailed to all students, except those in the Schools of Law and Medicine, at the close of the quarter. The grade reports are sent to the permanent mailing address supplied by the student at the time of registration. To assure delivery of grades, any changes in this permanent mailing address should be reported to the Information Window of the Registrar's Office.

Copies of the quarterly grade reports are also distributed to each student's dean and major department.

Grade Reports to Parents

Parents desiring quarterly reports on the academic progress of unemancipated minor sons or daughters may request the Registrar's Office to place them on the parents' mailing list.

Grade-Point Averages

The cumulative grade-point average includes only credits granted for courses taken in residence at the University



of Washington, and specifically excludes transfer and extension credits and credits earned by examination.

Effective Autumn Quarter 1967, the grade-point average for any regularly admitted student reflects all previous work taken at the University of Washington as either a matriculated or a nonmatriculated student.

Computation of Grade-Point Averages

Grade-point (GPA) averages for graduation are computed by dividing the total cumulative grade points by the total credits attempted (TCA).

Letter grades are weighted as follows in computing a grade-point average: A = 4, B = 3, C = 2, D = 1, E = 0, EW = 0. The number of credits is multiplied by the letter value of the grade to give the grade points for each course. The sum of the grade points is then divided by the total credits attempted. Courses elected on a pass/fail basis will be counted as follows: Satisfactory grades will be printed on the Permanent Record as an "S" and will not count in the quarterly or cumulative grade-point-average but will count in the earned column on the permanent record. Unsatisfactory grades (E or EW) will count in the quarterly and cumulative grade-point average but will not count in the credit earned column on the permanent record.

On the Quarterly Grade Report for students in the Graduate School all courses numbered 100 through 700 with grades earned are listed. In computing a student's grade-point average, *letter system grades* (and E grades obtained on the pass/fail system) are considered for 300-, 400-, and 500-level courses. However, S and N grades are not considered, nor are *letter system grades* (nor E grades obtained on the pass-fail system) for 100-, 200-, 600-, and 700 enrollments. Credits in these courses will be excluded from the quarterly and cumulative grade-point average, but with the exception of 100- and 200-level courses, will be included in the credit earned column on the permanent record.

EXAMPLE I: A TYPICAL GRADE REPORT

Autumn Quarter

COURSE	CREDIT	GRADE	GRADE POINTS
ENGLISH 101	3	C (2) =	6
GEOLOGY 101	5	B (3) =	15
SPEECH 100	5	A (4) =	20
GEOGRAPHY 258	2	B (3) =	6
TOTAL CREDITS ATTEMPTED (TCA)			47
GRADE-POINT AVERAGE = $47 \div 15 = 3.13$			

It should be emphasized that the total credits attempted and not the credits earned toward graduation are used in computing a grade-point average.

EXAMPLE II: A FAILURE AND AN INCOMPLETE

Autumn Quarter

COURSE	CREDIT	GRADE	GRADE POINTS
ENGLISH 101	3	C (2) =	6
GEOLOGY 101	5*	E (0) =	0
SPEECH 100	5	B (3) =	15
PHYS. EDUC. 114	[1]†	I	
TOTAL CREDITS ATTEMPTED (TCA)			21
GRADE-POINT AVERAGE = $21 \div 13 = 1.61$			

Credit by Examination

Credit by examination is not applicable to an advanced degree in the Graduate School.

Examinations for credit in courses offered by the University may be taken on work done by private study by a currently registered student who has been regularly admitted to the University. Credit examinations may also be taken to gain credit for courses taken in an unaccredited institution or in extended secondary programs after high school graduation at institutions which are authorized by the Washington State Board of Education. It is recommended that application for credit by examination for such work be made during the student's first quarter in residence.

No duplication of credit shall be permitted. No one may take an examination for a course in which he has received transfer credit or has been registered as an auditor or for credit at the University.

All credits secured by examination shall be counted as extension credits and shall be included in the 90 extension credit maximum allowed toward the bachelor's degree. No credit will be allowed by examination with a grade less than C.

Within a given field of study no student shall receive credit in subject matter more elementary than that for which he has previously received credit.

No student shall be permitted to repeat any examination for advanced credit.

No student shall receive credit by examination for lower-division courses in his native language.

Credit granted through examination is not included in the student's cumulative grade-point average. It will, however, be computed into the graduation grade-point average.

The procedure for authorizing, formulating, and conducting credit by examination shall be as follows:

1. A student who wishes to qualify for credit by examination shall apply to the Registrar for a certificate

* The 5 registered credits in Geology 101 for which no credit was received are included in the TCA.

† The 1 registered credit in Phys. Educ 114 in which an Incomplete was received is not included.

of eligibility. The student shall then present it for signed approval to an instructor responsible for the course in which the examination is to be taken, to the chairman of the department concerned, and/or to the dean of the college or school concerned. If such approvals are granted, the student shall then have the application approved and signed, and pay a charge of \$2.00 per credit to be gained by examination.

2. The department or school shall prepare appropriate examinations for credit and transmit them to the Registrar. The department or school shall submit with each examination any necessary list of authorized supplementary material. Each such list shall be issued to the examination proctors and to those taking the examination for which the list is prepared.

3. The chairman of the school or department giving the examination shall have the responsibility of approving it. In general, examinations shall be of sufficient scope to occupy the qualified student a minimum of three hours and a maximum of four hours in a test on a 3-, 4-, or 5-credit course; and a minimum of two and maximum of three hours in a test on a 1- or 2-credit course.

4. The Registrar shall designate a time in each quarter during which all approved examinations shall be given. Such examinations shall be supervised by the Bureau of Counseling and Testing.

5. No student shall be permitted to take in one day more than two examinations in 3-, 4-, or 5-credit courses, or more than three examinations in 1- or 2-credit courses. An additional day shall be permitted the student who takes more examinations. The student who requires this extra time shall make arrangements for it with the Testing Bureau.

6. Completed examinations shall be transmitted to the proper schools or departments for grading. Grade reports signed by the instructor and chairman or dean involved shall be sent to the Registrar for recording.

Credit examinations are given once each quarter. Applications may be filed two weeks after the opening of the quarter and must be filed not later than three weeks prior to the announced examination date. The date is announced through "Official Notices" in the *Daily* and the academic calendar. Interested students may obtain application forms and direction from the Graduations Department of the Registrar's Office, second floor of Schmitz Hall.

Certification or validation examination for work at unaccredited schools is explained elsewhere in this catalog.

Advanced Placement Credit

Upon application by the student on a petition especially prepared for this purpose and available in the Registrar's Office, and under the stated conditions, certain specified credits in foreign language and/or mathematics may be granted:

1. Credit for any elementary foreign language course which he has taken at the University without credit, except that the provisions concerning hyphenated courses still apply.

2. Any student who was placed in the third quarter of the second-year University language sequence may receive 5 credits of advanced credit for the second quarter of the second-year course, provided he has successfully completed the course in which he was placed. Similarly, a student whose high school study brought him to the level of the completion of the second year of University study will be granted 10 credits for the second- and third-quarter courses of the second-year sequence, provided he has successfully completed any upper-division course other than courses in translation.

3. Credit will be granted to any student who has been placed by examination at the level of Mathematics 125 or higher. If the student's first University mathematics course was 125, he will be given credit for Mathematics 124, and a student whose first mathematics course was 126 will be given credit for both Mathematics 124 and 125.

SCHOLARSHIP RULES

Academic Probation

Except as noted below, any undergraduate student shall be placed on academic probation when his cumulative grade-point average falls below 2.00. Such action will be recorded on the student's official academic record. Any undergraduate student whose grade-point average for the first quarter at the University falls below 2.00 shall be warned that his scholarship is unsatisfactory, and that if he fails to achieve a cumulative grade-point average of 2.00 by the end of the second quarter he will be placed on academic probation. The Registrar under delegated authority from the dean of the college in which the student is enrolled shall notify the student as soon as possible that either (a) his scholarship is unsatisfactory, or (b) he has been placed on scholastic probation. The student is reminded further that he should consult with his academic adviser immediately to discuss future academic plans.

Effect of Academic Probation

Academic probation is essentially a warning to the student that he must show improvement if he is to remain



in the University. University regulations regarding scholastic eligibility for participation in intercollegiate athletics and other student activities shall be recommended to the Senate by appropriate faculty committees.

Removal from Academic Probation

An undergraduate student on academic probation will be removed from probation at the end of any quarter in which his cumulative grade-point average reaches 2.00 or better.

Dismissal for Low Scholarship

Any undergraduate student on academic probation will be dropped (1) if he fails to attain at least a 2.00 for the following quarter's work, or (2) if he fails to attain a 2.00 cumulative average at the end of the two subsequent quarters. Any student dropped under this rule will be notified in writing of this action by the Registrar.

Reinstatement

Only under exceptional circumstances will a student dropped under low scholarship rules be readmitted to the University. Such a student will be readmitted only at the discretion of the dean of the school or college to which he seeks admission. A student readmitted after being dropped under these rules will enter on academic probation. Such a student will be dropped (1) if he fails to attain a 2.00 for the following quarter's work, or (2) if he fails to attain a 2.00 cumulative average at the end of the two subsequent quarters. He will be removed from probation at the end of the quarter in which his cumulative grade-point average reaches 2.00 or better.

Seniors in Final Quarter

A senior who has completed the required number of credits for graduation, but whose work in what would normally be his final quarter places him on probation will not receive a degree until he has been removed from probation. A senior who has completed the required number of credits for graduation, but whose work in his last quarter results in his being dropped for low scholarship, shall not receive a degree until he has been readmitted and removed from probation.

UNIVERSITY REQUIREMENTS FOR BACHELOR'S DEGREE

There are three types of requirements for the bachelor's degree. These are all-University, college or school, and departmental requirements. All-University requirements are listed here. Any college may make additional requirements for graduation. Those of colleges, schools,

and departments will be found in the section of the college or school concerned.

Educational Opportunity Program (previously "Special Education Program")

In recognition of the host of factors which may have interfered with the pre-college education of students from certain ethnic minorities as well as those coming from a background of severe poverty, the University administers the Educational Opportunity Program. These students are admitted under special admission standards which have been developed to afford them essentially the same opportunity for higher education as that available to others.

Since many of these students enter the University with significant academic deficiencies, the Program has been designated by the College of Arts and Sciences as a five-year curriculum leading to a baccalaureate degree. Special supportive services including "bridging" courses are also provided to help the student overcome scholastic deficiencies.

Catalog for Graduation Requirements

If less than ten years have elapsed since the date of a student's last entry into the school or college in which he is to graduate, he may choose to graduate under the requirements of either the catalog dated as of his last entry into the school or college, or that catalog covering his anticipated date of graduation. Catalog choice shall be subject to approval of the student's departmental chairman and dean.

If a student wishes to obtain a degree after a lapse of more than ten years from the last date of entry into the school or college in which he is to graduate, the catalog in effect at the date of his graduation will be used. These provisions do not apply to the requirements prescribed by the College of Education for Teaching Certificates.

Graduate students must satisfy the requirements for an advanced degree which are in force at the time the degree is to be awarded.

Credits Required

To be eligible for graduation from the University with the bachelor's degree, a student shall satisfy all other specific requirements and shall offer a minimum of 180 academic credits. Unless he is excused from physical education, a candidate for graduation shall also offer three required (additional) academic credits in physical education activity courses. No more than the required number of such credits may be counted for graduation. Physical and health education requirements are described elsewhere in this catalog.

Scholastic Standards Required

To be eligible for the bachelor's degree, a student must earn a cumulative grade-point average of 2.00 for all work done in residence at the University of Washington, and a 2.00 graduation grade-point average.

The *graduation* grade-point average is computed when the student has completed all work for his degree, and includes residence, transfer, extension, and credit-by-examination credits. Transfer, extension, and credit-by-examination credits cannot be used to raise the cumulative residence grade-point average above that required for graduation. However, the addition of these credits can prevent a student from graduating if, when they are computed into the graduation grade-point average, that average falls below 2.00.

Final-Year Residence

To be recommended for a first or subsequent bachelor's degree, a student must complete his final year of course work (at least 45 credits) as a matriculated student in residence at the University. Exceptions to this rule are the responsibility of the dean of the college or school awarding the degree.

Students in other colleges of the University who wish to receive simultaneously a degree from the College of Arts and Sciences, the School of Business Administration, or the School of Nursing must receive approval from the dean of the college or school concerned at least three quarters before completing the requirements for the desired degree.

Upper-Division Credits

Upper-division credits are those in courses with 300 and 400 numbers.

Transfer credits shall be accepted for upper-division credit *only* when earned at an accredited four-year, degree-granting institution. This rule shall apply to students who entered the University of Washington in the Autumn Quarter, 1958, or thereafter.

Duplication of Credit

A student may not receive University credit for repetition of work at the same or at a more elementary level, if credit has been granted in an earlier course. This rule applies whether the earlier course was taken in high school or college, and whether, in the latter case, course numbers are or are not duplicated, except that when continuation of previous study is involved (*e.g.*, foreign language), proper placement for credit in University courses shall be determined by the department which presents the subject.

Extension and Correspondence Study Credits

No more than 90 extension credits may be counted toward the bachelor's degree. No more than 45 credits

gained in extension courses earned at other institutions may be counted toward the bachelor's degree.

Degrees with Double Majors

Some colleges offer a bachelor's degree with double majors. The student's application for such a degree must show both majors and be approved by the major professors of both departments. Both majors will appear on the permanent record.

Two Bachelor's Degrees at the Same Time

Two bachelor's degrees, with different majors, may be granted at the same time, but the total number of academic credits shall reach a minimum of 45 credits in excess of the number normally required for a first bachelor's degree.

Second Bachelor's Degree

A second bachelor's degree may be granted, but there shall be required for this degree a minimum of 45 additional credits in residence (exceptions to the residency rule are the responsibility of the college or school awarding the degree), and the minimum number of additional grade points shall be 90.

Students working for a second bachelor's degree are not registered in the Graduate School but in the academic division of the University having jurisdiction over the degree sought. For purposes of registration they will be called "Unclassified-5."

Filing Applications for Bachelor's Degrees

A student should file with the Registrar a written application for his degree, in triplicate, four quarters before his expected date of graduation. Students transferring to the University with senior standing should submit their applications during their first quarter in school. Each application shall be filed in the Registrar's Office and notice shall be sent to the student by the Registrar of the acceptance or rejection of his application. Each quarter the Registrar shall transmit the accepted list of candidates for degrees and certificates to be conferred at the end of that quarter to the dean of the appropriate college or school for his faculty's approval and recommendation to the Board of Regents. The list as approved by his faculty shall then be forwarded by such dean to the Registrar with a recommendation to the Board of Regents that all who fulfill their outstanding requirements for graduation be awarded their respective degrees or certificates. No student shall receive a bachelor's degree, teaching certificate, or other certificate unless his name appears upon the list approved by the faculty of the appropriate school or college during the quarter in which the degree or certificate is to be granted.



It is the student's responsibility to file his application for a degree and/or certificate. Applications and diploma cards may be obtained at the Registrar's Office, or in the major department.

In filling out the application, with the assistance of his adviser, the student lists the courses for which he is registered during the present quarter and those he plans to take during each successive quarter. If he has requirements to be met, the specific courses must be listed on the application; elective courses may be entered as "electives, so many credits," without listing each specific course.

The signature of the department head or of an authorized faculty adviser must appear on the application in the space provided for "major professor." *A student in the College of Arts and Sciences* does not obtain his Dean's signature, but leaves the application for a degree along with the diploma card at the Registrar's Office after his adviser has signed it. The application is first approved by the Registrar; then it is sent to the Dean of the College for his signature. He returns it to the Registrar's Office for filing. *A student in any other college* leaves his application at his dean's office for his signature after obtaining the adviser's signature.

Upon the approval of the application, one copy is mailed to the student, one sent to his department or college office, and the third is retained in the Registrar's Office. Any required course listed on the approved application cannot be changed without submitting a petition for graduation properly signed by the department head. The petition form may be obtained at the Registrar's Office, or from the advisory office.

If the application is not approved, the Registrar's Office notifies the student of his deficiency so that he may make the necessary adjustment and re-submit his application.

Petitions

Waivers of college or all-University graduation requirements are obtained only by petitioning the college graduation committee, which then passes the petition on to the University Graduation Committee, if an all-University requirement is involved. These petitions are obtained from the Registrar's Office, or the advisory office, and should be filed with the application for degree or as soon as possible after the need arises. The University Graduation Committee meets only once each quarter; petitions should be filed as early in the quarter as possible. Directions for completing and obtaining the necessary signatures will be given at the time the petition form is handed to the student.

An exception from an all-University graduation requirement which is granted by the University Graduation Committee shall be void at the end of two calendar years from the date such exception is granted if all degree requirements have not been completed within that period.

Third- and Fourth-Year Military Training Courses

Some credits earned in third- and fourth-year military training may be counted in the basic 180 credits required for graduation if approved by the student's school or college.

Graduation Requirements for ROTC Students

Students accepted for the third- and fourth-year advanced ROTC program must, as a prerequisite for graduation from the University, complete the advanced program unless excused or dismissed from this requirement by regulations prescribed by the Secretary of the Army, the Navy, or the Air Force, whoever has the authority in the individual case.

Advanced Degrees

Information on and requirements for master's and doctor's degrees can be found in the *Graduate Study* section of this Catalog.

Physical Education Requirements

All students shall complete three quarters of physical education activity courses, except:

1. Students who enter the University as sophomores, juniors, or seniors
2. Students who are physically unable to participate and who arrange for exemption through the Hall Health Center
3. Students registered for 6 credits or less
4. Students who have attained the age of twenty-five (A student who attains the age of twenty-five during a quarter in which he is registered for a required physical education activity course shall be held responsible for the completion of that course.)
5. Veterans who have had one year or more of military service on active duty

Physical education activity credits are required in addition to the basic 180 credits necessary for graduation.

All students shall complete the required courses in the first three quarters of residence immediately following admission to the University. Students who present acceptable credits for physical education activity courses taken in other colleges or universities may be exempted from all or part of the requirements.

No student may register for more than one physical education activity course in a single quarter. However,

during the Summer Quarter a student may register for not more than one such course in each of the two terms of the Summer Quarter.

The physical education activity requirement may be waived for students who, because of physical condition, are exempted by the Graduation Committee upon the recommendation of the dean of the student's college or school.

Teaching Certificates

Persons seeking certification at the University of Washington must have been admitted to a baccalaureate degree program or as an Unclassified-5 or graduate student at the University of Washington. Requirements for teaching certificates shall be those prescribed by the College of Education at the time the certificate is to be granted.

Provisional Certificate

SPECIFIC REQUIREMENTS

Students expecting to apply for a Provisional Certificate should check immediately upon their arrival on the campus with the College of Education, 207 Miller Hall, for specific requirements. Questions concerning these requirements should be taken to the advisory office of the College of Education in 207 Miller Hall for clarification.

APPLICATIONS

Applications for all certificates should be made at the beginning of the senior year along with application for the bachelor's degree. Application forms and directions for completing them may be obtained at 207 Miller Hall.

Standard Certificates

PETITIONS

All fifth-year students working toward the Standard Certificate, the Standard General Certificate, the Standard Elementary Certificate, or the Standard Secondary Certificate should contact an adviser at 207 Miller Hall *their first quarter* and make the appropriate petition for this certificate.

COURSE APPROVAL

All candidates for the Standard General Certificate must consult an adviser at 207 Miller Hall each quarter to obtain approval on all courses before proceeding to Sections to complete registration.

COMMENCEMENT

Formal Commencement exercises shall be held only at the close of the Spring Quarter. Diplomas shall be issued at the end of each quarter to such candidates as have completed graduation requirements at that time.

June Commencement Exercises

Instruction to Participants

During April of each year a booklet of specific instructions is sent to all those entitled to participate in the coming Commencement exercises in June. Participants should follow instructions exactly and return any enclosed form by the deadline requested. Also, they should observe the directions for reserving caps and gowns.

Eligibility for Participation

BACHELOR'S DEGREES

All who earned bachelor's degrees the preceding December or March or who are candidates for degrees in June or the coming August are entitled to participate in the exercises. Only the names of those who received degrees the preceding August, December, or March, and the candidates in June are listed in the Commencement program. The names of candidates for bachelor's degrees who have been accepted for graduation the coming August will not appear in the program.

GRADUATE DEGREES

All Candidates of the Graduate School for master's and doctor's degrees in June and those to whom degrees were granted the preceding August, December, and March are urged to be present. Only those Candidates who have actually completed their requirements during the year are eligible to participate.

MEDICAL AND DENTAL DEGREES

All candidates for doctor's degrees in June in the Schools of Medicine and Dentistry are required to be present in person unless excused by their respective deans.

Graduation Announcements

The University Book Store handles official graduation announcements of the Senior Class.

Diploma Distribution

Diplomas are ready about six weeks after the end of the quarter in which they are earned. Recipients are notified as soon as the diplomas are ready for distribution at the Registrar's Office. Upon request, the diploma will be mailed to the student.

TRANSCRIPTS

University of Washington Transcripts

Official copies of student academic records at the University of Washington which bear the official seal of the University and the signature of the Registrar are known as transcripts.

Students may order transcripts (fee payable in advance) from the Transcript Department of the Regis-



trar's Office, second floor of Schmitz Hall. Except during the week following the end of each quarter, transcripts ordered before 10 a.m. Monday through Friday are made up and issued by 4 p.m. the same day. Those ordered after 10 a.m. are ready at 4 p.m. the next business day. (Service is slower for transcripts of work earned prior to Autumn Quarter, 1929.) *Grade sheets* (unofficial) may also be ordered at the Transcript Department, with advance payment.

Charges

A charge of \$1.00, payable to the cashier in advance, is made for each transcript. *Grade sheets* are 50 cents. Typewritten title transcripts for all records of students entering the University prior to Autumn Quarter, 1929, are \$2.00 for each original copy.

Transcripts from Other Schools

Transcripts covering a student's previous secondary and college education which have been submitted to the University as a requirement for admission become part of the official file and cannot be returned to the student. Any student desiring transcripts of his work earned elsewhere must order official transcripts from the institutions where the work was taken. The University of Washington does not issue or certify copies of transcripts from other institutions.

FEES AND CHARGES

Tuition, special fees, rentals, and service charges are payable in United States dollars upon demand.

All students will be required to give evidence of their intention to attend the University, which will consist of:

a. For continuing students who participate in advance registration, full payment of tuition and fees by the deadline prescribed for any given quarter.

b. For new and former students and continuing students who do not participate in advance registration, an advance partial payment of fees by the prescribed deadline for any given quarter. This advance fee payment is not transferable to another individual or quarter. It is nonrefundable but will be returned if registration is denied.

Tuition

The University reserves the right to change the following fees without notice. *All fees must be paid at the time of registration.*

There is no additional fee for nonresident students during the Summer Quarter (except for students in the School of Medicine).

* Registered for 6 credits or less, exclusive of *lower-division* ROTC.

<i>Resident students, full time, more than 6 credits</i>	
per quarter	\$133.00

<i>Resident students, part time*</i>	
per quarter 3½ to 6 credits	\$ 97.00
0 to 3 credits	\$ 56.00

<i>Nonresident students, full time, more than 6 credits</i>	
per quarter	\$293.00

<i>Nonresident students, part time*</i>	
per quarter 3½ to 6 credits	\$162.00
0 to 3 credits	\$ 81.00

World War I or II Veterans

Under certain conditions a veteran of World War I or II who is not eligible for Veterans' Administration benefits is fully or partly exempt from tuition charges.

Information concerning this exemption may be obtained from the campus Veterans' Division.

Auditors. There is no reduction in fees for auditors.

On-Leave Registration Fee. This fee of \$5.00, charged graduate students only, provides for a maximum on-leave registration period of four successive academic quarters or any part thereof, and is not refundable.

Miscellaneous Charges. A registration service charge of \$15.00 is assessed those students (1) who are eligible for Advance Registration but fail to participate or (2) who, after the established application deadline, are granted appointments to register by In-Person Registration by action of the Registration Appeal Board. A late registration charge of \$15.00 is assessed any student granted permission to register after the last scheduled day of registration. Waiver or refund of this service charge is made only at the discretion of the Registration Appeal Board.

A charge of \$5.00 is made for each change of registration or change of section, or number of changes which are made simultaneously, except that there is no charge when the change is made on the initiative of the University.

Additional Fees. The following courses require the payment of a fee in addition to tuition: Physical Education Activity quarterly fees—bowling, \$5.00; canoeing, \$3.00; golf instruction, \$5.00.

Athletic Admission Fee. A ticket which admits its owner to all athletic events during the quarter or quarters covered: Autumn, Winter, and Spring Quarters, \$8.50; Winter and Spring Quarters, \$5.00.

Graduation and Diploma Fee. Each student receiving a baccalaureate degree, an M.D. degree, or a D.D.S.

degree is required to pay a graduation fee of \$5.00. Each graduate receiving an advanced degree or second University of Washington bachelor's degree is also required to pay a graduation fee of \$5.00.

Publication and Thesis Binding Fees. Each recipient of a master's degree pays a fee of \$2.00 for the binding of one copy of his thesis. All doctoral Candidates pay a \$25.00 publication fee. This fee covers the binding of manuscript copies for the University Library and the microfilmed publication of the doctoral dissertation in full.

Certificate Fees. The fee for a certificate for postgraduate work in dentistry is \$5.00. The fee for a teaching certificate is \$5.00, and does not include a legal registration fee of \$1.00, which must be paid to the county school superintendent who first registers the certificate.

Transcript Fee. A charge of \$1.00, payable in advance, is made for each mechanically reproduced transcript. Grade sheets (unofficial) are 50 cents per copy. Type-written title transcripts for all records of students entering prior to Autumn Quarter, 1929, are \$2.00 per copy.

Replacement Fee. Duplicate diploma (with paper folder) \$5.00; duplicate diploma (with leather folder) \$7.00; teaching certificate (typed copy) \$1.00; replacement photo-identification card \$5.00.

Medical School Filing Fee. A fee of \$5.00 is charged a nonresident student for filing an application for admission to the School of Medicine.

Incomplete Removal Fee. A fee of \$2.00 is charged for the removal while in residence of an Incomplete whether by examination or by other means. A fee of \$2.50, payable to the University of Washington, care of the Department of Correspondence Study, is charged for removal of Incompletes *in absentia*.

Foreign Language Local Examination Fee (All languages except French, German, and Spanish). The fee for the foreign language examination is \$10.00.

Credit by Examination Fee. In order to obtain credit for independent study, students may take an examination prepared by the department concerned. The fee is \$2.00 per credit hour. Proper forms must be obtained from the Office of the Registrar.

Graduate Admission Application Fee. A fee of \$5.00 (payable in United States dollars) must accompany each application for admission to the Graduate School as a regular graduate student or as a visiting graduate student. The fee is not refundable nor may it be credited against any other fee charged by the University.

Office of School and College Placement Fee
Registration fee \$5.00

Certification of Credits from Unaccredited Schools Fee. Credits earned after high school graduation and based on credentials from unaccredited schools offering specialized instruction, or from schools of unknown standing, are accepted only after certification by the department examiner, the executive officer of the department, the dean of the college or school concerned, and the Registrar. Students seeking such certification must obtain the proper forms in the Admission Office and must pay a fee of \$5.00.

Parking Fees—Student's Quarterly Permits

Residence hall lots	\$24.00
Evening classes	9.00
For motorcycles and scooters	5.00
Daily Rate: Urban Renewal lots	.25
Montlake lots	.25

Washington Pre-College Testing Program. A fee of \$7.00 is charged those students who have not previously taken this grade-prediction test and who enter the University with fewer than 45 credits.

Laboratory Pre-School Fee. The fee for children in the Laboratory Pre-School for either the morning or afternoon program is \$81.00 per child per quarter.

Deposits and Rentals

Breakage Ticket Deposit. In certain laboratory courses a breakage ticket is required to pay for laboratory supplies and breakage of equipment. Tickets may be purchased at the Cashier's Office for \$1.00 and \$5.00. Unused sections of breakage tickets may be returned to the Cashier for refunds.

Military Uniform Deposit. A deposit of \$25.00 is required of students in Army and Air Force ROTC, which is refundable when uniform is returned in good condition.

Microscope Rental Fee. A microscope rental fee of \$7.00 per quarter must be paid by those students in the Division of Health Sciences who rent microscopes.

Pavilion Locker Fee (men). A fee of \$2.00 per quarter or 75 cents per Summer Quarter is charged students registered for physical education. Faculty members and students who are not registered for physical education also may obtain lockers upon payment of the same fee. This fee is paid at Edmundson Pavilion.

Refund of Fees

All Autumn, Winter, and Spring Quarter fees (except those indicated as not subject to refund) will be refunded less an enrollment service charge of \$50.00, if complete withdrawal is made prior to the sixth day of instruction; one-half of said fees less a \$25.00 enrollment service charge will be refunded if withdrawal is



made during the first thirty calendar days, except for Air Force or Army ROTC uniform deposit. At least two weeks must elapse between payment and refund of fees, if payment was made by check. Unless specific instructions are received by the Cashier's Office regarding the fees refunded, all properly authorized refunds will be made to the student involved in the registration.

Students withdrawing under discipline forfeit all rights to the return of any portion of the fees.

Applications for refund may be refused unless they are made during the quarter in which the fees apply.

Refund of ROTC Deposit

From the \$25.00 deposit there is a deduction of \$2.50 for cleaning returned uniforms. The balance, \$22.50, is refunded in full to those students who have completed one year or more of either the basic or the advanced Army ROTC courses when the uniform (with the exception of the shoes) is returned complete and undamaged. The shoes may be retained. Students not completing the first year of either the basic or the advanced courses may purchase the shoes at one half the current sales price, or return them along with the balance of their undamaged uniforms for a refund of \$22.50.

Residence and Nonresidence

1. *Residence* in the state of Washington is not necessarily the equivalent of *domicile*. Domicile connotes a present intention to maintain permanent residence, together with physical presence in the state, whereas residence may be of a temporary nature.

2. In determining a student's intent with regard to his Washington domicile, consideration is given to whether he is a registered voter of the state of Washington. If the student is a minor, consideration is given to the father's place of voting registration, as the father determines the family's domicile. Voting in person or by absentee ballot in the state of previous domicile is considered inconsistent with and contradictory of intention to establish legal domicile in this state.

3. Temporary residence in the state merely for the purpose of attending school, performing duties while in the military service, or for reasons of health and pleasure is not a basis for the establishment of legal domicile. A person stationed in the state of Washington in the performance of military duty may acquire a domicile only if he establishes a *bona fide* residence off his military post.

4. Conversely, a domicile in this state is not lost by temporary or occasional absence from the state to at-

tend school, to perform military or other government service, or to pursue health or pleasure.

5. When the parents of a minor are deceased, his domicile follows that of his legally appointed guardian. When the parents are divorced, the minor's domicile is determined by that of the parent to whom custody has been awarded by the court.

6. A minor who is married is free to establish his domicile separate and apart from that of his parents.

7. The domicile of a married woman is determined by that of her husband.

8. Ordinarily an alien cannot establish residence unless he holds a permanent visa.

9. The children and spouses of federal employees residing within the state, the children and spouses of military personnel assigned to the University of Washington, and children and spouses of staff members of the University are considered as residents for tuition purposes.

Veterans and Children of Deceased or Totally Disabled Veterans

Those students who qualify under the applicable federal laws established for their education in institutions of higher learning should consult the Veterans' Division Office on campus for complete information.

Veterans with disabilities may have available benefits. They should contact a training officer in the nearest Veterans' Administration office.

STUDENT CONDUCT AND DISCIPLINE

Regulations on student conduct and procedures for student discipline are subject to approval by the Board of Regents on the advice of the President of the University. In the formulation of these regulations and procedures, the President seeks the advice of the University Senate which, in turn, is advised by the Faculty Council on Student Affairs. In order to assure student involvement in the formulation of these regulations, the Faculty Council on Student Affairs looks to a Student-Faculty Joint Council on Student Conduct and Activities to either initiate changes or review changes suggested by others.

Section 1. Standards of Conduct

The University is a public institution having special responsibility for providing instruction in higher education, for advancing knowledge through scholarship and research, and for providing related services to the community. As a center of learning, the University also

has the obligation to maintain conditions which are conducive to freedom of inquiry and expression in the maximum degree compatible with the orderly conduct of its functions. For these purposes the University is governed by regulations and procedures which safeguard its functions, and which at the same time, protect the rights and freedoms of all members of the academic community.

Admission to the University carries with it the presumption that the student will conduct himself as a responsible member of the academic community. Thus, when he enrolls in the University, the student likewise assumes the obligation to observe standards of conduct which are appropriate to the pursuit of academic goals. Stated in general terms, the student has the obligation to:

- (a) Maintain high standards of academic and professional honesty and integrity.
- (b) Respect the rights, privileges and property of other members of the academic community and visitors to the campus, refraining from actions which would interfere with the University functions or endanger the health, safety or welfare of other persons.
- (c) Comply with the rules and regulations of the University and its schools, colleges and departments.

Specific regulations on student activities shall be in accord with these general standards.

Section 2. Disciplinary Actions

Most disciplinary proceedings will be conducted informally between the student and his academic dean in matters relating to the student's academic work and between the student and the Office of Student Affairs in other matters. (See below for jurisdiction.) More formal procedures are provided, however, including an impartial hearing before the University Disciplinary Committee; these procedures may be invoked either by the officer dealing with the case or by the student involved. In all situations, whether handled formally or informally, basic standards of fairness will be observed in the determination of 1) the truth or falsity of the charges against the student, 2) whether the alleged misconduct is in fact a violation of University standards of conduct, and, if so, 3) what sanctions should be imposed. The criteria for judging student misconduct shall be the general standards of conduct as stated in Section 1 or as modified and interpreted in accordance with the procedures specified in Section 10.

When questions of mental or physical health are raised in conduct cases, the dean, the Office of Student Affairs, or the University Disciplinary Committee may request

the student to appear for examination before two physician-consultants designated by the Dean of the School of Medicine. The physician-consultants may call upon the Student Health Center for any other professional assistance they deem necessary. After examining the student, and consulting with the student's personal physician, the physician-consultants shall make a recommendation to the referring agency as to whether the case should be handled as a disciplinary matter or as a case for medical or other treatment. Decisions based upon these recommendations are the responsibility of the referring agency. Such decisions may be appealed in accordance with the provisions of Section 6 and Section 8, sub-paragraph (1) below.

In the case of student conduct which involves an alleged or proven violation of law, the disciplinary authority of the University will not be used to duplicate the function of civil authorities. Disciplinary action may be taken if the conduct also involves a violation of University standards and the interests of the University community are distinct from those of the civil authorities.

A student who has been judged to have violated University standards of conduct will be subject to disciplinary sanctions, up to and including dismissal from the University for the most serious offenses. In the case of students who are unmarried minors, such sanctions may be reported to parents or legal guardians at the discretion of the officer or agency taking the action except that dismissal of a minor will always be reported to his parents or legal guardians.

Section 3. Disciplinary Sanctions

The following definitions of disciplinary terms have been established to provide consistency in the application of sanctions:

(a) *Disciplinary Warning*: Notice to a student, either verbally or in writing, that he has been in violation of University rules or regulations or has otherwise failed to meet the University's standards of conduct. Such warnings will include the statement that continuation or repetition of the specific conduct involved or other misconduct will normally result in one of the more serious disciplinary actions described below.

(b) *Reprimand*: Formal action censuring a student for violation of University rules or regulations or for failure to meet the University's standards of conduct. Reprimands are always made in writing to the student by the officer or agency taking action, with copies to the Office of Student Affairs. A reprimand will include the statement that continuation or repetition of the specific conduct involved or other misconduct will normally result in one of the more serious disciplinary actions described below.



(c) *Fines:* The Office of Student Affairs and the University Disciplinary Committee may assess monetary fines up to a maximum of \$25.00 against individual students for violations of University rules or regulations or for failure to meet the University's standards of conduct. Failure to pay such fines promptly will result in the cancellation of the student's registration and will prevent the student from re-registration.

(d) *Restitution:* An individual student may be required to make restitution for damage or loss to University or other property and for injury to persons. Failure to make arrangements to pay will result in cancellation of the student's registration and will prevent the student from re-registration.

(e) *Disciplinary Probation:* Formal action placing conditions upon the student's continued attendance for violation of University rules or regulations or other failure to meet the University's standards of conduct. The office placing the student on disciplinary probation will specify, in writing, the period of probation and the conditions, such as limiting the student's participation in extra-curricular activities. Disciplinary probation warns the student that any further misconduct will automatically raise the question of dismissal from the University. Disciplinary probation may be for a specified term or for an indefinite period which may extend to graduation or other termination of the student's enrollment in the University.

(f) *Dismissal:* Termination of student status for violation of University rules or regulations or for failure to meet the University's standards of conduct. Students may be dismissed only with the approval of the President of the University and on the recommendation of the dean of a college or school, the Office of Student Affairs, or the University Disciplinary Committee. Dismissal may be for a stated or for an indefinite period. The notification dismissing a student will indicate, in writing, the term of the dismissal and any special conditions which must be met before readmission. In the case of an unmarried student under 21 years of age, a copy of the notification of dismissal will be sent to the parents or the guardian of the student. There is no refund of fees for the quarter in which the action is taken, but fees paid in advance for a subsequent quarter are to be refunded.

Section 4. Jurisdiction

The dean of each college or school, including the Graduate School, is responsible for initiating disciplinary proceedings for infractions of the rules and regulations of that college or school or for misconduct in academic work (cheating, plagiarism, etc.). When a case involving academic misconduct is brought before the Univer-

sity Disciplinary Committee, that committee may consult the initiating dean on rules or standards of academic discipline within that school or college.

The initiation of proceedings for violation of University-wide regulations or for misconduct unrelated to the student's academic work is the responsibility of the Office of Student Affairs, except that jurisdiction may be transferred to the dean of the college or school in which the student is enrolled when the Office of Student Affairs and the dean of that college or school agree that the alleged misconduct bears upon the student's fitness to continue in the college or school.

Misconduct in academic work by a student enrolled in another college or school shall be reported to the dean of the college in which the student is enrolled through the dean of the college offering the course. The dean of the college in which the student is enrolled shall be responsible for taking or initiating appropriate disciplinary action. In the case of a nonmatriculated student, the dean of the college offering the course shall be responsible for taking or initiating appropriate disciplinary action.

The provisions of these sections do not apply to the evaluation of a student's academic performance, including the assignment of grades by instructors. Each college and school provides orderly procedures for the review of grades, if such review is requested by the student. (See Chapter IV, part K, Section 2.) An instructor need not give credit for work which is the product of cheating, plagiarism or other academic misconduct.

However, the lowering of a course grade is not appropriate as a disciplinary sanction; if disciplinary action is warranted by academic misconduct, it will be initiated by the provisions of this section.

An instructor has the authority to exclude a student from any class session in which the student is disorderly or disruptive. Should such disorderly or disruptive conduct persist, the instructor should report the matter to the dean of the school or college in which the student is enrolled. The dean may initiate disciplinary action as provided in section 5 below.

Special and more detailed rules and regulations regarding conduct in the residence halls may be promulgated by the Director of Student Residences subject to review and approval by the Office of Student Affairs. Authority to impose disciplinary sanctions for the violation of such rules and regulations is delegated to the Director of Student Residences by the Vice President for Student Affairs. Appeals from these actions of the Director will be addressed, in the first instance, to the Vice President

for Student Affairs or his designated representatives. The Office of Student Affairs reserves the right to remove students from the residence halls for disciplinary reasons. These actions may be further appealed to the University Disciplinary Committee.

Campus traffic regulations are under the general jurisdiction of the Security Division of the University. The University Traffic Court has jurisdiction to hear and decide cases involving alleged violations of such regulations.

Library borrowing and use regulations, including fines for late return of library materials and repair and replacement costs for damaged or lost materials are under the jurisdiction of the University Library. The Library Advisory Committee has jurisdiction to hear appeals from decisions of the Director of Libraries and to decide cases involving alleged violations of rules relating to borrowing and use of library materials, including fines for late returns and costs of repair or replacement.

Section 5. Disciplinary Authority of Deans and Office of Student Affairs

Except as otherwise provided in Section 4 above, all disciplinary proceedings will be initiated by either the dean of the college or school in which the student is enrolled or by the Office of Student Affairs. The deans and the Vice President for Student Affairs may delegate this responsibility to members of their staffs and to students; they may also establish student or student-faculty courts or hearing bodies to advise or act for them in disciplinary matters.

In order that any informality in disciplinary proceedings not mislead a student as to the seriousness of the matter under consideration, the student involved shall be informed at the initial conference or hearing of the various sanctions that may be involved for misconduct, as listed in Section 3 above.

After considering the evidence in the case and interviewing the student or students involved, the dean or Vice President for Student Affairs, or their duly empowered representatives, courts, or hearing bodies may take any of the following actions:

- (a) Terminate the proceeding, exonerating the student or students.
- (b) Dismiss the case after whatever counseling and advice may be appropriate.
- (c) Impose disciplinary sanctions directly subject to the student's right of appeal described below. The student shall be notified in writing of the action taken except that disciplinary warnings may be given verbally.

(d) Refer the matter to the University Disciplinary Committee for appropriate action. The student shall be notified in writing that the matter has been referred to the Committee.

In all cases the student shall be advised of his rights by reference to this part of University regulations. Should the student prefer a formal hearing before the University Disciplinary Committee in place of informal or semi-formal hearings by deans, the Office of Student Affairs, or their representatives, he shall so indicate to the initiating officer. In such circumstances, the case shall be referred immediately to the University Disciplinary Committee.

Section 6. Appeals

Any disciplinary action taken by the dean of a college or school or his representative, by the Vice President for Student Affairs or his representatives, or by the University Disciplinary Committee, may be appealed by the student to the next higher hearing body, with the following conditions:

- (a) If a student chooses to make an appeal, the appeal body may base its decision on the record of the proceedings in the initial hearing(s), or, if it chooses, may receive additional evidence, or rehear the case entirely. The appeal body may sustain, reduce, or vacate the penalty imposed by the group or individual originally hearing the case.
- (b) A student who has been disciplined by the deans or by the Office of Student Affairs or their representatives may appeal the case to the University Disciplinary Committee.
- (c) Cases brought before the University Disciplinary Committee, either for initial hearing, or for appeal, may be appealed to the Faculty Appeal Board. (See Section 9.)
- (d) All cases in which the sanction imposed by the University Disciplinary Committee is dismissal shall be automatically heard on appeal by the Faculty Appeal Board. Should the Faculty Appeal Board sustain the recommendation of dismissal, approval of the President of the University is required before the sanction takes effect.

A student wishing to appeal to either the Disciplinary Committee or the Faculty Appeal Board shall indicate his intention, in writing, and within five calendar days of the original decision, to the chairman of the group to which the appeal is made.

Section 7. University Disciplinary Committee

A standing University Disciplinary Committee, composed equally of student and faculty representatives,



will provide a hearing and will make decisions on all disciplinary cases referred to it by the deans or appealed to it by students who have been disciplined by the deans, or the Office of Student Affairs, or their representatives.

(a) The members of the committee and their terms of office shall be:

(1) A member of the faculty or administration designated by the President of the University, who shall act as non-voting chairman for a period of one year. Reappointment of the chairman is permissible.

(2) Four members of the voting faculty of the University holding the rank of Assistant Professor or higher, and who have been members of the faculty of the University for at least one year. These committee members shall serve for one year terms.

(3) Four full-fee-paying students in good standing to serve for one year terms. The student members will participate in each individual case at the option of the student defendant.

(b) Selection:

(1) Each of the four non-appointive faculty positions of the Disciplinary Committee shall be identified from a panel randomly selected from the eligible faculty in the order they were so selected, except that membership shall be limited to not more than one faculty member from each Senate Group.

(2) Each of the four student positions on the Disciplinary Committee shall be identified from a panel randomly selected from the entire full-time student body and in the order they were selected, except that membership shall include one student from the graduate or professional class standing and the other three students shall be limited to no more than one student from each class.

(3) Faculty and student panels of adequate size shall be maintained in advance of need, but the names included shall not be disclosed.

(4) Faculty or student members may be excused from service for the entire year, for a particular period of time, or after a particular case. Replacement of excused members of the Disciplinary Committee shall be made from the respective panels.

(5) Membership on the Disciplinary Committee terminates with the beginning of the Winter Quarter, except that cases in process shall be continued to decision.

(6) No member of the Disciplinary Committee shall participate in any case in which he is a defendant, complainant, or witness, in which he has a direct or per-

sonal interest, or in which he has acted previously in an advisory capacity. A committee member's eligibility to participate in the case may be challenged by parties to the case or by other committee members, but decisions in this regard shall be made by the Committee as a whole. Replacement shall be made from the appropriate panel, or by presidential appointment in the case of the Chairman.

(7) The new panels shall be identified by the outgoing Disciplinary Committee.

It is the responsibility of the Chairman of the Disciplinary Committee to insure that all procedural safeguards and guidelines specified in Section 8 below are followed, to take whatever steps are necessary during the hearing itself to insure that the hearing is conducted in a safe and orderly manner, to advise the members of the Committee concerning precedents and guidelines affecting the individual case, and to inform the student, in writing, of the action taken by the Disciplinary Committee following the hearing.

In reaching a decision in a specific case, the Disciplinary Committee shall take into consideration decisions and results of appeals in earlier cases of a similar type, as well as general or specific guidelines arising out of discussion in the Joint Council or in the Faculty Council on Student Affairs.

Decisions of the Committee as to the guilt or innocence of the student defendant, and as to the appropriate sanction to be applied, will ordinarily be made on the basis of mutual agreement after discussion of the evidence.

Section 8. Procedural Guidelines and Safeguards

The student has a right to a fair and impartial hearing by the University Disciplinary Committee on any charge of misconduct. His failure to appear at or participate in the hearing procedures, however, shall not preclude the Committee from making its findings of fact, conclusions and decisions as provided below.

(a) The Chairman of the University Disciplinary Committee shall give the student notice of the time and place of the hearing, the charges against him, a list of witnesses who will appear, and a description of any documentary or other physical evidence that will be presented at the hearing. This notice shall be given to the student in writing and shall be provided in sufficient time (one week minimum) to permit him to prepare his defense. The notice may be amended at any time prior to the hearing, but, if such amendment is prejudicial to the student's case, the hearing shall be rescheduled to a later date.

(b) The student shall be entitled to hear and examine the evidence against him and be informed of the identity of its sources; he shall be entitled to present evidence in his own behalf and to question witnesses testifying against him as to factual matters

(c) Only those matters presented at the hearing will be considered in determining whether he is guilty of the misconduct charged, but the student's past record of conduct may be taken into account in formulating the Committee's recommendation for disciplinary action.

(d) The student may be represented by counsel and/or accompanied by an adviser of his choice.

(e) No one will be required to give self-incriminating evidence.

(f) Hearings conducted by the Committee generally will be held in closed session except when the student requests that persons other than those directly involved be invited to attend. When a hearing has been opened to persons other than those directly involved, the Committee shall conduct the hearing in a room which will accommodate a reasonable number of observers. The Committee may exclude from the hearing room any persons who are disruptive of the proceedings, and may limit the number who may attend the hearing in order to afford safety and comfort to the participants and orderliness to the proceedings.

(g) All proceedings of the Committee will be conducted with reasonable dispatch and terminated as soon as fairness to all parties involved permits.

(h) An adequate summary of the proceedings will be kept. As a minimum, such a summary would include a tape recording of testimony.

(i) The student will be provided with a copy of the findings of fact and with the conclusions and the sanctions, if any, to be imposed. He will also be advised of his right to appeal the Committee's decision, within five calendar days, in a written statement to the Faculty Appeal Board.

(j) If there is no appeal to the Faculty Appeal Board, the sanctions shall be in effect at the end of the five day appeal period or at such other time as may be indicated by the Committee. If there is an appeal, imposition of sanctions shall be delayed pending the review provided in the preceding paragraph.

(k) Where, in the judgment of a majority of the Committee, proceedings will be expedited thereby, it may appoint a hearing examiner, who shall be a member of the faculty or a member of the bar, to conduct the hearing provided for in this action. Such examiner will conduct the hearing in accordance with the provisions

of this section and any rules of procedure adopted by the Committee, provided that a stenographic record of the hearing will be kept and a transcript of the hearing will be provided to the Committee prior to its rendering its decision. The Committee may, at its option, request the hearing examiner to provide his recommendations as to findings, conclusions and decisions, but such recommendations shall not be binding on the Committee, who shall make its findings, conclusions and decision based on the transcript of the hearing. The hearing examiner shall rule on all objections to evidence, but any such ruling may be appealed by an affected party to the Committee for final decision.

(1) Each report of the University Disciplinary Committee shall, upon approval of the student involved, be made available to members of the University community through the Office of Student Affairs.

Section 9. Faculty Appeal Board

The Faculty Appeal Board shall be composed of seven members of the faculty, to be appointed by the Chairman of the Faculty Senate in consultation with the Faculty Council on Student Affairs. One member of the Faculty Appeal Board shall be designated by the Chairman of the Faculty Senate as chairman of the Board. Individual cases may be heard by the entire Board, or by sub-groups of no fewer than three members.

The Faculty Appeal Board shall hear three types of cases:

(a) Appeals by the student defendant from the action of the Disciplinary Committee.

(b) All cases involving recommendations of dismissal.

(c) Appeals by the Vice President for Student Affairs, by a dean, or by their representatives. In the case where it is felt that the Disciplinary Committee has imposed too light a penalty, and where the student himself has not appealed to the Faculty Appeal Board, the dean or the Vice President for Student Affairs, or their representatives, may request an advisory review of the case by the Faculty Appeal Board. If, in the opinion of the Board, the complainant's view is correct, the sanction imposed on the student may not be increased in that specific case, but the Board may request that the issue be discussed by the Joint Council (see below), or that the Faculty Council on Student Affairs prepare additional guidelines for the Disciplinary Committee.

All procedural safeguards detailed in Section 8 for cases before the Disciplinary Committee shall hold for hearings before the Faculty Appeal Board.



Section 10. Student-Faculty Joint Council on Student Conduct and Activities

There shall be a Student-Faculty Joint Council on Student Conduct and Activities, to serve primarily as an advisory group to the Faculty Council on Student Affairs, composed of the following members:

(a) Five undergraduate students to be approved by a majority vote of the Associated Students of the University of Washington Board of Control. A list of nominees shall be prepared each year by the President of the ASUW, with the advice of the Faculty Council on Student Affairs.

(b) Three graduate or advanced professional students to be approved by a majority vote of the Executive Committee of the Graduate and Professional Student Senate. A list of nominees shall be prepared each year by the President of the GPSS, with the advice of the Faculty Council on Student Affairs.

(c) Five members of the faculty to be appointed by the Chairman of the Faculty Senate with the advice of the Faculty Council on Student Affairs. At least one faculty member appointed shall also be a member of the Faculty Council on Student Affairs.

(d) One representative of the Office of Student Affairs to be appointed by the Vice President for Student Affairs.

(e) One representative of the Office of the Provost appointed by the Vice President for Academic Affairs and Provost.

(f) The faculty chairman of the Disciplinary Committee who shall serve *ex officio*, without vote.

Each of the above persons shall serve for one year and may succeed himself, with terms of office to begin on the first day of Spring Quarter.

The Joint Council shall select by majority vote one of its members to serve as chairman for one year. Business of the Joint Council may be conducted informally, except as specified below.

The Joint Council shall maintain a continuous review of the general standards of conduct listed in Section 1 above, other rules and regulations on student activities, and procedures for student discipline as they affect both individual students and student organizations. In the course of this review, the Joint Council may solicit advice from the student body, the faculty and administrative officers of the University, the Disciplinary Committee and the Faculty Appeal Board. When it is felt that there is need for further definition, explication of change in the general standards, rules, regulations, or disciplinary procedures, the Joint Council

will proceed to formulate appropriate recommendations which will be forwarded to the Faculty Council on Student Affairs.

The Faculty Council on Student Affairs, after consideration of the recommendations of the Joint Council, may request further study of the issue to the appropriate group or individual. If the proposed change or modification requires Board of Regents' action, the recommendation shall be transmitted, through regular Senate procedures, to the President of the University for action by the Regents. Recommendations which do not require Senate or Regents' action will be transmitted to the appropriate office, agency, or committee after review by the Faculty Council on Student Affairs. Each transmittal specified above will be accompanied by a statement indicating concurrence, suggested modifications, or disapproval.

Students, student organizations, the Faculty Councils, the Disciplinary Committee or Faculty Appeal Board, or administrative officers of the University may request advisory opinions from the Joint Council with regard to interpretation of standards, formulation of regulations, or disciplinary procedures and disciplinary sanctions. In addition, specific interpretations or applications of rules, regulations, or disciplinary sanctions by the Disciplinary Committee, if called into question by the Faculty Council on Student Affairs, the Faculty Appeal Board, or the Joint Council, may be brought to the attention of the Joint Council. The issue may be discussed, but the case itself cannot be reopened. Advisory recommendations which may arise from such review shall be transmitted by the procedures outlined above.

Legislative or advisory recommendations in the area of student conduct and discipline may also originate in other existing advisory and legislative bodies within the University, including the Faculty Councils. However, the recommendations of the Joint Council, since they are based on combined discussion by student, faculty, and administration representatives, should carry considerable moral weight within the University community.

Section 11. Recording and Maintenance of Records*

Records of all disciplinary cases shall be kept by the office taking or initiating the action. Except in proceedings wherein the student is exonerated, all documentary or other physical evidence produced or considered in

* University policies regarding student records and disclosures therefrom are currently under study by an *ad hoc* committee, chaired by Associate Dean Walter Riley of the College of Arts and Sciences. This Committee's report may result in changes in this section.

disciplinary proceedings and all recorded testimony shall be preserved insofar as possible for at least five years. No record of proceedings wherein the student is exonerated, other than the fact of exoneration, shall be maintained in the student's file or other University repository after the date of the student's graduation.

The dean of a college or school shall report to the Office of Student Affairs, in writing, all cases in which disciplinary action is taken. He shall also inform the Registrar of any action affecting a student's official standing in the University.

The Office of Student Affairs shall notify the dean of the college or school in which the student is enrolled of any disciplinary action it takes and also shall notify the Registrar of any action affecting a student's official standing in the University. The Office of Student Affairs shall keep accurate records of all disciplinary actions taken by, or reported by, that office. All disciplinary actions will be entered on the student's record and may be removed at the time of graduation or earlier, at the discretion of the office initiating the action, if special terms and conditions have been met or if other circumstances warrant the removal. The office which initiated the action is responsible for ordering the removal of temporary notations of any disciplinary action on the student's record. A student may petition to that office for removal of such a notation at any time.

Disclosure of information contained in disciplinary records is governed by the following statement appearing under "Rules and Regulations" in the University of Washington *Bulletin: General Catalogue Issue*:

All student records will be treated in a responsible manner and with due regard to the personal nature of the information they contain. The records of students held by the University are the property of the University. The practice of the University Registrar, however, is to honor a student's written request that the transcript of his official academic records not be released or information contained in these records not be disclosed.

The University of Washington reserves the right not to release a student's records, or any information based upon the records, when the student has failed to discharge any obligation to the University.

[Basic Part D Revision: S-B 107, June 23, 1969]

ADDENDUM

Emergency Authority of the President of the University
Ordinarily, disciplinary sanctions of any kind will be imposed only after the appropriate informal or formal hearing has taken place, and after the student, if he so

chooses, has availed himself of his right of appeal. However, the President of the University and his authorized representative, by virtue of the authority delegated to them by the Board of Regents of the University, under conditions which the President or his authorized representative deems to be an emergency situation, may suspend students from participation in any or all University privileges, pending the application of University disciplinary procedures set forth elsewhere in this chapter, in order to protect the offenders or other members of the University community, or to assure the University's ability to function. In any case in which this provision is invoked, the student or students in question are entitled to an early disciplinary hearing by the University Disciplinary Committee, and the case takes precedence over other business pending before the Committee. [BR, June 27, 1969]

LEAVES OF ABSENCE FROM CLASSES

Students are responsible for maintaining regular attendance at classes or making arrangements satisfactory to their instructors.

Special situations:

1. A leave of absence from the University which involves excuse from classes may be granted by the dean of the college or school in which the student is enrolled, or in a manner to be determined by the dean.
2. Students anticipating absence from classes for participation in ASUW or intercollegiate athletic activities may be provided with certification regarding these absences by the Office of Student Affairs, on the recommendation of the Manager of ASUW Activities or the Director of Athletics. This certification constitutes a request to the instructor that the student be given an opportunity to make up work missed during his absence.

In all cases of absence, with or without leave, students must bear in mind that they are responsible for arranging with their instructors to make up work missed.

TUTORING

No person shall tutor for compensation in a course with which he has any connection as part of the teaching staff.

Approval for tutoring for compensation shall be secured from the head of the department concerned on a form provided, which shall include the names of the student or students and the tutor. If the tutor is of the



rank of instructor or higher the approval of the dean concerned shall also be secured.

Students wishing a tutor should apply to the department concerned for names of advanced students qualified to tutor in particular subjects.

STUDENT ACTIVITIES

Eligibility Rules

The following rules regarding eligibility for participation in student activities have been established by the faculty:

Major Activity

To be eligible to participate in any major activity a student shall:

1. Be regularly enrolled and not on academic or disciplinary probation.
2. Be enrolled for a minimum of 10 academic credits exclusive of credits in Extension Classes, in Correspondence Study, in basic ROTC courses, and in physical education activity.
3. Not have been declared ineligible by the dean of his college on the grounds that participation in the activity is detrimental to his scholarship.

Minor Activity

To be eligible for any minor activity, a student shall not have been declared ineligible:

1. By the dean of his college on the grounds that participation in the activity is detrimental to his scholarship, or
2. For disciplinary reasons.

The *Handbook for Student Organizations* contains a list of activities designated as "major" for purposes of academic eligibility.

Intercollegiate Athletics

No student shall represent the University of Washington in any athletic contest unless he meets the requirements of the Athletic Association of Western Universities eligibility rules governing intercollegiate athletics. A portion of these rules are that a student must:

1. Be registered in school and carrying at least 12 academic credits the quarter of participation.
2. Progress toward graduation—must have earned 36 degree quarter credits since the commencement of his last previous season of competition in his respective sport.

Additional information on intercollegiate athletic eligibility may be obtained from the Department of Athletics Office, 212 Tubby Graves Building.

Intramural Athletics

There are no academic restrictions on participation in intramural competition.

Student Publications

Only those publications approved by a committee appointed by the President of the University may use the good will of the University in soliciting advertising.

Permission to issue student publications shall be obtained from the President's Office.

The editor of any student publication shall be held responsible for all matter which appears in that publication. A correspondent of any other publication shall be held similarly responsible for all items contributed by him to that publication.

No edition of the *University of Washington Daily* by special editors shall be permitted except by express permission of the ASUW Publications Board.

USE OF CAMPUS AND BUILDINGS

General Policy

Because the University of Washington is an educational institution provided and maintained by the people of the state, its campus, buildings, properties, and facilities shall be reserved at all times for those activities which either are related directly to its educational mission or are justifiable on the basis of their contributions to the cultural, social, or economic development of the state.

Limitations of Use

Under the principle stated above, the campus buildings, properties, and facilities of the University, including those of the Associated Students of the University of Washington, may be used only for:

1. The regularly established teaching, research, or public service activities of the University and its departments or related agencies.
2. Cultural, educational, or recreational activities of the students or of the faculty or staff.
3. Short courses, conferences, seminars, or similar events, conducted either in the public service or for the advancement of specific departmental professional interests, when arranged under the sponsorship of the University or its departments.
4. Public events of a cultural or professional nature brought to the campus at the request of University departments or committees and presented with their active sponsorship and active participation.

5. Activities or programs sponsored by educational institutions, by state or federal agencies, by charitable agencies or civic or community organizations whose activities are of widespread public service and of a character appropriate to the University.

Primary consideration shall be given at all times to activities specifically related to the University's mission, and no arrangements shall be made that may interfere with, or operate to the detriment of, the University's own teaching, research, or public service programs. The use of exterior audio amplifying equipment is not permitted on the campus except for official University functions approved by the Office of President.

In general, the facilities of the University shall not be rented to, or used by, private or commercial organizations or associations, nor shall the facilities be rented to persons or organizations conducting the programs for private gain.

University facilities may not be used for commercial sales, advertising, or promotional activities except when such activities clearly serve educational objectives (as in display of books of interest to the academic community or in the display or demonstration of technical or research equipment) and when they are conducted under the sponsorship or at the request of a University department or office or of the ASUW.

University facilities may not be used for purposes of political campaigning by or for candidates who have filed for public office except for student-sponsored activities.

Activities of commercial or political nature will not be approved if they involve the use of promotional signs or posters on buildings, trees, walls, or bulletin boards, or the distribution of samples outside rooms or facilities to which access may be granted.

In accordance with the limitations imposed by the Constitution of the State of Washington, the facilities of the University may not be used for purposes of religious worship, exercise, or instruction. Recognized student religious organizations may use the facilities of the University for social, recreational, cultural, and educational

purposes, as may any other recognized student groups, subject to the limitations noted above.

University facilities are available to recognized student groups, subject to these general policies and to the rules and regulations of the University governing student affairs.

Noncommercial handbills, leaflets, and similar materials may be distributed by regularly enrolled students, by members of recognized student organizations, and by University personnel in campus areas outside University buildings and in meeting rooms that have been reserved for their use, so long as such distribution does not interfere with or operate to the detriment of the conduct of University affairs or the free flow of traffic. Such materials must bear identification as to publishing agency and distributing organization or individual.

Materials that may be dropped or left lying about must be promptly removed by the persons or organizations responsible for their distribution. Persons and organizations not connected with the University may not distribute handbills and similar materials.

Inquiries concerning the use of University facilities may be directed to the Advisory Committee on the Use of University Facilities, 400 Administration Building, Ext. 3-2560.

Making Room Reservations

Campus colleges and departments may make reservations directly with the Room Assignments Department, Registrar's Office.

Student groups desiring room reservations should apply to the ASUW Activities Office, 205 Student Union Building. The Program Secretary will clear the request and make reservations for required space.

Off-campus organizations requesting reservations for the use of University facilities may obtain forms for submission of such requests by calling the Room Assignments Department.

If an assigned room will not be needed, the Office that has made room assignments should be notified immediately.



FACULTY INDEX

The first date following a name indicates the beginning of service at the University. When two dates are given, the second, in parentheses, is the date of promotion to present academic rank. Members of the Graduate School faculty are designated by any asterisk.

All appointments shown are as of July 1, 1969.

A

AAGAARD, GEORGE N., 1954 (1967), *Professor of Medicine and Pharmacology*; B.S., 1934, M.B., 1936, M.D., 1937, Minnesota

AAGAARD, KNUT, 1968, *Research Assistant Professor of Oceanography*; A.B., 1961, Oberlin; M.S., 1964, Ph.D., 1966, Washington

AANDERUD, DALENE A., 1969, *Instructor in Psychiatric Nursing*; Diploma, 1956, General Hospital of Everett; B.S., 1967, M.N., 1968, Washington

AASHEIM, GEORDIS M., 1960 (1965), *Assistant Professor of Anesthesiology*; B.A., 1951, Saskatoon; M.D., 1955, Toronto

ABERNATHY, RUTH,* 1967, *Professor of Physical Education*; Chairman, Department of Physical Education for Women; A.B., 1929, Oklahoma; M.A., 1931, Ph.D., 1943, Columbia

ABRAHAMSON, ARTHUR CLARENCE,* 1956 (1963), *Professor of Social Work*; B.A., 1942, Augustana; M.A., 1947, Minnesota

ADAMS, ROBERT PARDEE,* 1947 (1966), *Professor of English*; B.A., 1931, Oberlin; Ph.D., 1937, Chicago

ADAMSON, JOHN W., 1967 (1969) *Assistant Professor of Medicine*; B.A., 1956, M.D., 1962, California (Los Angeles)

AFFLECK, JAMES Q.,* 1967, *Assistant Professor of Special Education*; B.A., 1955, Washington; M.A., 1963, San Francisco State; Ed.D., 1968, Columbia

AHLERS, ELEANOR E.,* 1966, *Associate Professor of Librarianship*; A.B., 1932, Washington; B.L.S., 1942, Denver; M.A., 1957, Washington

AHLSTROM, HARLOW G.,* 1962 (1966), *Associate Professor of Aeronautics and Astronautics*; B.S. in A.E., 1957, M.S. in A.E., 1959, Washington; Ph.D., 1963, California Institute of Technology

AKAMATSU, TOSHIO, 1963 (1966), *Assistant Professor of Anesthesiology*; B.A., 1955, M.D., 1959, Minnesota

AKERS, RONALD L.,* 1965 (1969), *Associate Professor of Sociology*; B.S., 1960, Indiana State; M.A., 1961, Kent State; Ph.D., 1966, Kentucky

AKESON, WAYNE H., 1961 (1965) *Associate Professor of Orthopedics*; M.D., 1953, Chicago

ALBERTS, WILLIAM W.,* 1967, *Associate Professor of Finance and Business Economics*; B.A., 1948, M.A., 1956, Ph.D., 1961, Chicago

ALBRECHT, ROBERT G.,* 1960 (1967), *Associate Professor of Architecture*; B.S. in C.E., 1956, Washington; M.S. in C.E., 1960, Massachusetts Institute of Technology

ALBRECHT, ROBERT WILLIAM,* 1961 (1966), *Associate Professor of Nuclear Engineering*; B.S. in E.E., 1957, Purdue; M.S. in N.E., 1958, Ph.D., 1961, Michigan

ALCOCK, JOHN, 1969, *Assistant Professor of Psychology*; B.A., 1965, Amherst; Ph.D., 1969, Harvard

ALDEN, DAURIL,* 1959 (1969), *Associate Professor of History*; A.B., 1950, M.A., 1952, Ph.D., 1959, California (Berkeley)

ALDEN, RICHARD S.,* 1961 (1969) *Associate Professor of Architecture*; B.Arch., 1957, Washington; M.Arch., 1960, Yale

ALDRICH, ROBERT A., 1956, *Professor of Pediatrics*; B.A., 1939, Amherst; M.B., 1943, M.D., 1944, Northwestern

ALEXANDER, DANIEL E., 1954 (1961), *Associate Professor of General Engineering*; B.S. in M.E., 1947, M.S. in M.E., 1954, Washington

ALEXANDER, EDWARD,* 1960 (1969), *Professor of English*; B.A., 1957, Columbia; M.A., 1959, Ph.D., 1963, Minnesota

ALEXANDER, E. RUSSELL,* 1961 (1969), *Professor of Preventive Medicine and Pediatrics*; Ph.B., 1948, S.B., 1950, M.D., 1953, Chicago

ALEXANDRO, FRANK JOHN, JR.,* 1964 (1968), *Associate Professor of Electrical Engineering*; B.E.E., 1956, M.E.E., 1959, Eng. Sc.D., 1964, New York

ALGEO, JAMES, 1967, *Assistant Professor of Spanish Language and Literature*; B.A., 1961, M.A., 1963, Ph.D., 1969, Wisconsin

ALLAN, GEORGE GRAHAM,* 1966, *Associate Professor of Fiber Science*; Dipl., 1951, Assoc., 1952, Strathclyde; B.Sc., 1952, Ph.D., 1956, Glasgow

ALLARD, FRANCIS X., 1968, *Assistant Professor of Germanic Languages*; A.B., 1964, Massachusetts; M.A., 1966, Ph.D., 1969, Stanford

ALLEN, ALLETHIA L., 1966, *Assistant Professor of Social Work*; B.A., 1947, Bennett; M.S.W., 1950, Boston

ALLEN, GERALD D.,* 1962 (1968), *Associate Professor of Anesthesiology and Oral Surgery*; M.B., B.S., 1948, Durham; F.F.A.R.C.S., 1959, London

ALLEN, ROBERT D., 1968, *Instructor in Operative Dentistry*; B.S., 1963, D.D.S., 1966, Washington

ALLENDOERFER, CARL BARNETT,* 1951, *Professor of Mathematics*; B.S., 1932, Haverford; B.A., 1934, M.A., 1939, Oxford; Ph.D., 1937, Princeton

ALLWINE, GAIL HARTLEY, 1968, *Instructor in General Engineering*; B.S. in E.E., 1961, M.S. in E.E., 1965, Washington

ALPS, GLEN EARL,* 1945 (1962), *Professor of Art*; B.A., 1940, Colorado State College of Education; M.F.A., 1947, Washington

ALVORD, ELLSWORTH C., JR.,* 1960 (1962), *Professor of Pathology*; B.S., 1944, Haverford; M.D., 1946, Cornell

AMBROZIAK, RUSSELL A., 1969, *Assistant Professor of Aerospace Studies*; B.S., 1963, Pennsylvania State

AMMERLAHN, HELLMUT H., 1968, *Assistant Professor of Germanic Literature*; Abitur, 1957, Königstein; M.A., 1960, Vermont; Ph.D., 1965, Texas

AMES, WILLIAM E.* 1957 (1963), *Associate Professor of Communications*; B.S., 1948, South Dakota State; M.S., 1952, Iowa State; Ph.D., 1962, Minnesota

AMOSS, HAROLD LINDSAY,* 1965 (1968), *Professor of Urban Planning*; Director, Bureau of Community Affairs; B.A., 1942, North Carolina; M.A., 1947, New Mexico; Ph.D., 1951, California (Berkeley)

ANCKER-JOHNSON, BETSY, 1963 (1969), *Affiliate Professor of Electrical Engineering*; B.A., 1949, Wellesley; Ph.D., 1953, Tuebingen (Germany)

ANDERSEN, CARMEN K., 1969, *Instructor in Home Economics*; B.S., 1964, Wisconsin State; M.S., 1969, Washington

ANDERSEN, JONNY,* 1967, *Assistant Professor of Electrical Engineering*; B.S. in E.E., 1960, Colorado; S.M. in E.E., 1962, Ph.D., 1965, Massachusetts Institute of Technology

ANDERSEN, NIELS H., 1968, *Assistant Professor of Chemistry*; B.A., 1963, Minnesota; Ph.D., 1967, Northwestern

ANDERSEN, WILLIAM R.,* 1964 (1967), *Professor of Law*; Associate Dean, School of Law; B.S.L., 1954, LL.B., 1956, Denver; LL.M., 1958, Yale

ANDERSON, ARTHUR G., JR.,* 1946 (1957), *Professor of Chemistry*; A.B., 1940, Illinois; M.S., 1942, Ph.D., 1944, Michigan

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- CARPENTER, ROY,* 1968, *Assistant Professor of Oceanography*; B.S., 1961, Washington and Lee; Ph.D., 1968, California (San Diego)
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- COON, MAX DENNIS,* 1967, *Assistant Professor of Civil Engineering*; B.Sc., 1960, M.Sc., 1963, Ph.D., 1965, Michigan
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