



University of Minnesota Bulletin

JANUARY 15, 1977

*Lake Itasca  
Biology Session*

Summer, 1977



UNIVERSITY OF MINNESOTA

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Maura Gage, M.S., Graduate Student, Department of Botany, representing the College of Biological Sciences

William Patterson, M.S., Graduate Student, College of Forestry

### University of North Dakota, Grand Forks

Lewis W. Oring, Ph.D., Associate Professor, Department of Biology

### University of Wisconsin, Madison

John W. Thomson, Ph.D., Professor, Department of Botany

### Department of Natural Resources, Minnesota State Parks

Merlyn L. Wesloh

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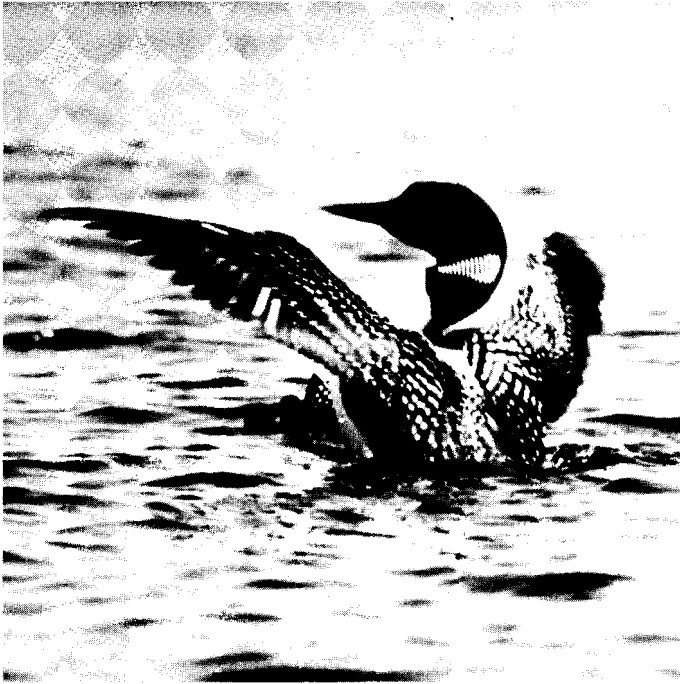
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January 15, 1977

### UNIVERSITY OF MINNESOTA BULLETIN

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*Lake  
Itasca  
Biology  
Session*

First Term June 12-July 16

Second Term July 17-August 20



# General Information

Sponsored by the Summer Session at the Lake Itasca Forestry and Biological Station, the Biology Session is a joint enterprise of various departments of the College of Biological Sciences, the College of Agriculture, and the College of Forestry. By agreement, the University of Wisconsin and the University of North Dakota participate in making policy for and planning the Biology Session through membership on the advisory committee.

The Lake Itasca Forestry and Biological Station is located on the east shore of Lake Itasca in Itasca State Park—just a mile from the headwaters of the Mississippi River in northwestern Minnesota.

## STATEMENT ON HUMAN RIGHTS

The Board of Regents has committed itself and the University of Minnesota to the policy that there shall be no discrimination on the basis of race, creed, color, sex, age, or national origin. In adhering to this policy, the University abides by the requirements of Titles VI and VII of the Civil Rights Act of 1964, Revised Order No. 4, Executive Orders 11246 and 11375, Sections 799A and 845 of the Public Health Service Act, and other federal regulations and pertinent acts of Congress.

It is also the policy of the University of Minnesota not to discriminate on the basis of sex in its educational programs, admissions, activities, or employment policies as required by Title IX of the Education Amendments of 1972.

Inquiries regarding compliance may be directed to Lillian H. Williams, Director, Office of Equal Opportunity and Affirmative Action, 419 Morrill Hall, 100 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455, (612) 373-7969, or to the Director of the Office of Civil Rights, Department of Health, Education, and Welfare, Washington, D.C. 20201.

## RESEARCH AND ACADEMIC OPPORTUNITIES

### THE ITASCA HABITATS

Itasca Park—an ecological area of national renown—embraces 50 square miles of forests traversed by a fine system of roads and trails. Within this area are located many lakes of different types, providing unusual field opportunities for work in limnology, phycology, aquatic insects, fungi, as well as related fields. The forests of the park are unique. Here the northern coniferous and deciduous types of the central hardwood region meet. In addition, the many bog areas provide a wide variety of plant communities for study. Itasca's forests have been protected for over a half century, and many have never been cut—here, truly, is an excellent array of virgin timber stands and communities developing into climax types.

Forty miles to the west a dramatic break from the forests to the prairies occurs where true prairie associations can be found on the bed of ancient Lake Agassiz. To the north lie the Red Lakes and immense expanses of northern bog types.

This meeting of the three great plant regions of the eastern United States provides for study not only varied ecosystems but also a singular range of fauna and flora with southern, northern, and western origins. Opportunities to observe birds closely during June and July are particularly outstanding. An abundance of interesting animals, such as nesting bald eagles, breeding loons, beaver, raccoons, and deer, affords many striking behavioral and ecological problems for study.

## INDEPENDENT INVESTIGATORS

Qualified investigators may arrange with the chairman to pursue research in various fields of terrestrial and freshwater biology during any season.

## COURSE WORK AND RESEARCH

The variety of courses available in both terms I and II allows opportunity to choose an entire summer of either intensive work in a particular field of interest or a sampling of several types of field experiences.

Graduate and undergraduate students in biology will find an excellent field laboratory for both research and course work. Graduate students may devote themselves exclusively to research problem work.

Students in forestry, plant pathology, soils, and fisheries and wildlife management will find course work closely related to their field as well as a broad spectrum of essential background courses in botany, entomology, and zoology.

For teachers of biology in high schools and colleges, the session offers opportunity for advanced study through course work or independent research. Training in conducting classes in the field is also provided.

Advanced students and research workers needing laboratory space and special equipment should make prior arrangements with the chairman.

## INSTRUCTIONAL FACILITIES

Eleven well-equipped laboratories are located in six buildings. Much of the instruction takes place in the field, where many varied habitats are within walking distance of the station.

A fine herbarium of the region and collections of insects, bird skins, and small mammal skins are available for study. Four complete sets of aerial photos of the park area, made in 1938, 1951, 1959, and 1966, are maintained at the station along with stereoscopic equipment.

The station equipment includes necessary compound and dissecting microscopes, collecting apparatus, various types of nets, rowboats, and launches, and other accessories for instruction and research.

The library has ample room for study and important journals and books basic to fieldwork. Other journals and books are available from the University Libraries.

## ADMISSION AND REGISTRATION INFORMATION

### ADMISSION

Courses are open to all qualified graduate and undergraduate students who have completed the usual preliminary course work in biological subjects. General rules for admission of undergraduates to the Summer Session apply to the Biology Session. Students are advised to review these regulations in the general *Summer Session Bulletin*.

**Summer-Only Students**—Students with previous college work who wish to attend the Summer Session only may do so without filing an application for admission to the University, provided they are in good standing and are not a candidate for a degree.

**Graduate Students**—Any student who holds a bachelor's degree and plans to use credits earned in Summer Session toward a graduate degree or expects to receive graduate credit for such work should apply for admission directly to the Graduate School. The application must be submitted complete in every detail—one official transcript from each college attended, the credentials examination fee (if required), and any required test results—at least 4 weeks prior to the opening of the summer term in which the student expects to register (Thursday, May 12, 1977, for first term; Thursday, June 16, 1977, for second term).

A student currently enrolled in an advanced degree program in a graduate school at another accredited college or university in the United States may request permission to register in the Graduate School of the University of Minnesota as a transient graduate student by completing Graduate School form 57. No credentials examination fee or supporting materials are required for the transient student form. Permission to register as a transient student will be granted, to the applicant who qualifies, for 1 summer session (terms I and/or II) or 1 academic-year quarter, and will not extend beyond that single summer session or quarter.

Requests for Graduate School application forms, including transient student forms, and all correspondence related to Graduate School admission should be directed to the Graduate School, 307 Johnston Hall, 101 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## SCHOLARSHIPS

The following awards are available for qualified students:

*Alexander P. Anderson and Lydia Anderson Fellowships*, at \$350 each, are available only to persons holding a degree from the University of Minnesota. For information and applications write to the Graduate School, University of Minnesota, Minneapolis, Minnesota 55455.

*Caroline M. Crosby Memorial Fellowship in Botany* provides for tuition, room and board, travel, and miscellaneous expenses up to \$400. Open only to students majoring in botany at the University of Minnesota. For information and applications write to the Graduate School, University of Minnesota, Minneapolis, Minnesota 55455.

*Josephine Herz Fellowship* is offered to encourage an outstanding student in ornithological research. For information and applications write to the Chairman, Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

*Fishery and Wildlife Management Summer Scholarships* are provided by the Minnehaha Chapter, Izaak Walton League, Question Club of Minneapolis, and the James R. Beer Memorial Scholarship of the Minnesota Student Chapter of the Wildlife Society. For information and applications write to the Chairman, Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

*University of North Dakota Biology Scholarship*, for tuition and fees, is open to any University of North Dakota student attending summer session term I or II. Students wishing to be considered should write to the Chairman, Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## RESERVATIONS

Since both the housing facilities and the enrollment size of each class are limited, early application for reservations is recommended. Students should complete the

Request for Reservation form found on page 23 of this bulletin and mail it to the Chairman, Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street, S.E., University of Minnesota, Minneapolis, Minnesota 55455. *This form must be accompanied by a recent transcript of the student's academic record, a listing of courses being taken at present, a deposit of \$40, and a letter of evaluation from the student's adviser or supervisor.* The deposit will be applied toward the tuition fee at the time of registration or will be returned to the student if space is not available.

Assignments to classes will be verified no later than April 10. They will be determined on the basis of need, date of application, prerequisites for the courses desired, scholarship, and letters of recommendation. Late applications will be accepted up to the day of registration (June 12 for first term and July 17 for second term), since openings occur from time to time even in those classes that usually close early.

## REGISTRATION

All courses offered at the station must be reserved. Class reservation cards will be held for students who have been notified of acceptance after submission of the Request for Reservation.

Class reservation cards may be picked up at 130 Coffey Hall in St. Paul during regular Summer Session registration periods. Whenever possible, students should complete their registration at the Office of Admissions and Records on the Twin Cities campus (either Minneapolis or St. Paul).

Registration by out-of-town students can be completed at the station on June 12 for first term or on July 17 for second term. The necessary cards will be held with the reservation.

Students registering for a full load have priority over those desiring a reduced load. A full load is defined as: two courses (10 credits); or one course (5 credits) and a research problem (1 to 5 credits); or either EBB 5815 or Zool 5834 (5-credit courses requiring a great deal of time).

## CHANGES IN REGISTRATION

Students accepted into the program who wish to enter courses that have filled early should place their names on the official waiting list. In the event of cancellations, those students on the waiting list will be accommodated first.

Changes in registration must be approved by the chairman and are strongly discouraged after registration day (June 12, first term; July 17, second term). No changes in registration are permitted after the second meeting of class. Dropping a course, for any reason, must be approved by the chairman, following consultation between the student and instructor.

## CANCELLATION

Late cancellations often result in vacancies in classes that earlier could have been filled by persons wishing to attend the Biology Session. Cancellation for any reason should be reported immediately to the chairman by phone, followed by a statement in writing.



# TUITION, FEES, AND OTHER COSTS

## ACADEMIC FEES

The following fees are payable each term by every regular registrant on or before June 12 or July 17.<sup>1</sup>

	<i>5 credits</i>	<i>10 credits</i>
Tuition .....	\$70.00	\$140.00
Student Services Fee .....	14.00	14.00
Laboratory Fee .....	<u>8.50</u>	<u>8.50</u>
	\$92.50	\$162.50

A \$40 deposit is required of all persons requesting reservations for course work during the Biology Session. This fee will be returned if written notice of cancellation is *postmarked* before May 1 for the first term, or June 10 for the second term. When registration is completed, the \$40 deposit will be applied to the tuition fee.

Persons registering at the University of Minnesota for the first time will pay a \$3 record service fee.

Students enrolled in the Graduate School who have completed all of their graduate work with the exception of the thesis will be allowed to register for thesis work only upon payment of \$69 tuition and the student services and laboratory fees per term.

Independent investigators will pay a research table fee of \$5 per week and the laboratory fee of \$8.50 per 5-week term.

## LATE FEES

Tuition and fees are payable at the time of registration: on or before June 12 for first term or July 17 for second term. Late fees will be charged as follows:

June 13-17 or July 18-22 .....	\$6
June 20-24 or July 25-29 .....	\$10
Thereafter .....	\$20

No registration will be accepted after June 12 or July 17 without the approval of the chairman of the Field Biology Program and payment of the late fee.

## ROOM AND BOARD COSTS

There is a service charge of \$25 per term for dormitory facilities. An initial payment of \$140 for board is payable to the Itasca Dining Club, which is run on an actual cost basis. These fees are payable at the beginning of each term.

## TRANSPORTATION COSTS

University vehicles are available for class field trips. A charge, determined on an actual cost basis, will be made to each student using them. Costs usually range from less than \$1 to \$15. Courses that commonly utilize University vehicles for long or frequent field trips are: Bot 5801, 5821, 8970; EBB 5814; PIPa 5102; Zool 5834.

<sup>1</sup>The tuition fee stated above was charged in the 1976 session. Final determination of tuition for the 1977 session had not been made at the time this bulletin was printed.

## **ON-CAMPUS ARRANGEMENTS**

### **TRANSPORTATION**

Public transportation is available by bus from Park Rapids or Bemidji or by air to Bemidji. The depots are 24 and 42 miles from the station respectively. Students will be met if prior arrangements are made with the chairman. State Highway 92 and U.S. Highway 71 provide easy access by car through the towns of Bagley, Bemidji, or Park Rapids.

### **CABINS**

There are ten cabins for men, each accommodating eight students, and seven cabins for women, each accommodating six students. Women's cabins are equipped with toilets and lavatories. A central bathhouse with laundry facilities is located near each of these groups of cabins.

### **MARRIED STUDENT ACCOMMODATIONS**

Married students who wish to bring their families may find accommodations off campus in one of the many resorts in the vicinity. A list of addresses of these facilities will be furnished upon request. The station maintains a tent and trailer camp area with a modern bathhouse and outlets for water and electricity but no outdoor cooking facility. Registered married students and their spouses and children have top priority for use of the campground. The weekly charge is \$5. Applications should be made well in advance of the session.

### **ACCOMMODATIONS FOR VISITORS**

There are no facilities at the station for accommodating guests of students. Students expecting guests must make arrangements for their housing off campus. It is possible to provide meals for guests at the Itasca Dining Club if meal tickets are purchased in advance.

### **MEALS**

Meals are served to both on-campus and off-campus students in an attractive dining hall located on the lakeshore. The kitchen is operated by the chairman for the students who form a cooperative Itasca Dining Club. Well-balanced meals are carefully planned and prepared by experienced cooks.

### **PERSONAL NEEDS**

Students must provide their own pillows, bed linen, towels, and blankets. Since the nights are often cool, it is suggested that students bring two or three wool blankets. Essential personal equipment includes serviceable clothing, especially shoes or boots for fieldwork, a warm jacket, rain gear, a swimming suit, flashlight, notebooks, pocket field manuals, and the equipment necessary for individual work in the field or laboratory.

## BOOKS

A branch of the University Bookstores is maintained at the station to make books and student supplies readily available. All texts should be purchased at Itasca.

## HEALTH SERVICE

Students will be furnished medical care and up to 15 days of hospitalization at the nearest medical facility in case of emergency illness or accident and on approval of the chairman. These benefits will not include such items as physical examinations, treatment of chronic conditions, or payment for drugs. A registered nurse will be on duty at the station.

## MAIL

Mail for students should be addressed to: Itasca Biology Session, Lake Itasca P.O., Minnesota 56460.

## RECREATION

Recreational opportunities such as swimming, fishing, canoeing, and hiking in the park are excellent. Volleyball, softball, and horseshoe equipment are available at the station. Evening social events may be planned by the students. Weekly evening lectures by staff members or visiting scientists and outstanding films on field biology will be scheduled.

## RULES OF CAMP

Rules of camp are kept at a minimum. Students are expected to keep their own quarters clean and orderly. Students may bring their own cars, but garages and repair services are not provided. Weekend absences and extended field trips must be reported in advance. Domestic pets are not allowed at the station.

Off campus and within park boundaries Minnesota State Park regulations govern. The State Park entry sticker (\$3) must be bought for private cars at the park entrance.



# Staff and Faculty

## Administrative Staff

### Office

David F. Parmelee, Director  
Robert O. Megard, Associate Director  
Arlene Fosdick, Principal Secretary  
Janet L. Bosanko, Summer Session Secretary

### Buildings and Grounds

Robert P. Boyle, Resident Manager

### Research

David M. Bosanko, Resident Biologist

### Library

Rose Mary Schaefer, Librarian

### Bookstore

Vera Boyle, Manager

### Infirmary

Marilyn Lancaster, Registered Nurse

## Summer Faculty

**Lewis Berner**, Professor of Zoology, University of Florida, has worked extensively with the ecology and systematics of mayflies in the southeastern United States.

**Eugene C. Bovee**, Professor, Department of Physiology and Cell Biology, University of Kansas, is an authority on the biomechanics of protozoan locomotion and the relationship of motile mechanisms to the taxonomy and systematics of amoebas and other Sarcodina. He has studied the feeding behavior of protozoa and the ecology and distribution of protozoa across the United States, and has described many new species of free-living and parasitic protozoa.

**Frank D. Bowers**, Assistant Professor, University of Wisconsin, Stevens Point, is currently studying the systematics and floristics of certain North and Central American bryophytes with a special interest in Wisconsin mosses.

**Edward J. Cushing**, Professor, University of Minnesota, is interested in the structure and composition of terrestrial ecosystems and the Pleistocene and recent history of plant communities.

**D. L. Deonier**, Associate Professor and Curator of Insects, Department of Zoology, Miami University, Oxford, Ohio, is studying the systematics and ecology of shore flies (Diptera: Ephydriidae) and is especially interested in competitive coexistence and evolution in aquatic leaf-mining shore flies.

**Norman L. Ford**, Associate Professor, St. John's University, Collegeville, Minnesota, is currently studying the ecology and behavior of several species of passerine birds.

**Donald E. Gilbertson**, Associate Professor, University of Minnesota, has conducted research on the metabolism and biochemical taxonomy of freshwater snails. He is also studying the factors leading to outbreaks of schistosome dermatitis.

**Eville Gorham**, Professor of Ecology and Botany, University of Minnesota, is concerned with chemical and other aspects of the ecology of lakes and wetlands, and is studying the influence of lake dimensions upon thermal stratification and summer anoxia in the Itasca region.

**David F. Grigal**, Associate Professor, University of Minnesota, is interested in plant community-soil interrelationships and in nutrient cycling in forest ecosystems.

**Donald A. Jenni**, Professor, University of Montana, studies the social behavior of birds, especially mating and types of social systems. He is especially interested in the application of quantitative techniques to field studies.

**Austin J. MacInnis**, Professor of Cell Biology, University of California, Los Angeles. His principal areas of research have included identification of chemical attractants for helminth larvae; active transport; DNA, RNA and protein synthesis, *in vitro* culture, circadian rhythms, behavior of larval parasites. His current projects include chemical attraction of molluscan hosts and the molecular mode of action of anthelmintics.

**Robert O. Megard**, Associate Professor and Associate Chairman of the Biology Session, University of Minnesota, is studying nutrients and the growth of algae in lakes. Previously he has done research on biostratigraphy and sedimentation in lakes.

**Gerald B. Ownbey**, Professor, University of Minnesota, has made extensive studies of the vascular plants of the Upper Midwest and Rocky Mountain regions and specializes in the cytotaxonomy of several genera of higher plants.

**David F. Parmelee**, Professor and Chairman of the Field Biology Program, University of Minnesota, specializes in the distribution, ecology, and behavior of arctic and antarctic birds.

**Harold E. Schlichting, Jr.**, President of the BioControl Company of Port Sanilac, Michigan, is also associated with the University of Oklahoma Biological Station where he teaches phycology. His research interests lie in the dispersal of microorganisms and biological monitoring of water quality.

**William D. Schmid**, Professor, University of Minnesota, is currently studying winter ecology and local distribution patterns of organisms in different habitats.

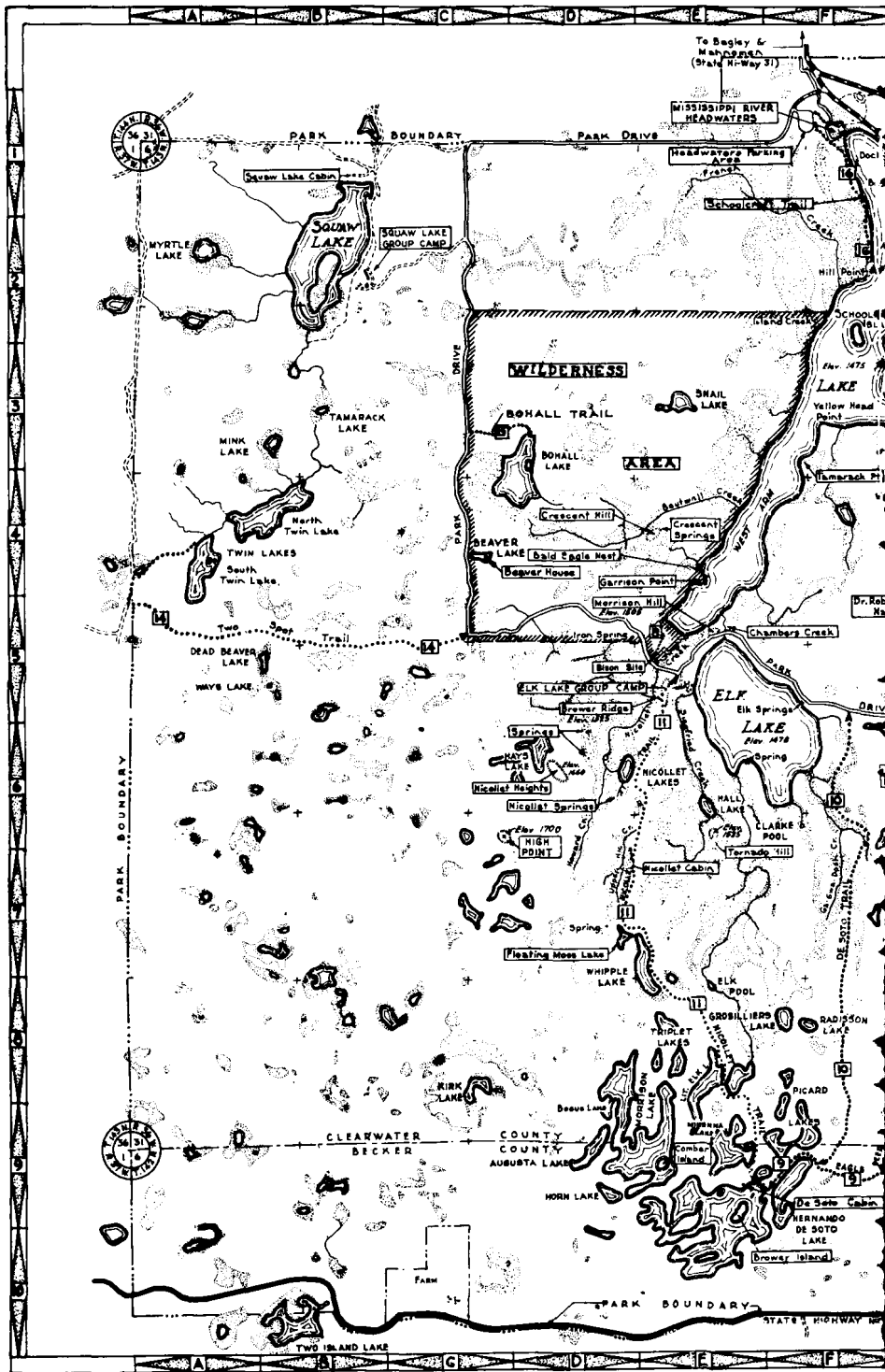
**Elwin L. Stewart**, Assistant Professor of Plant Pathology, University of Minnesota, has specialized in the taxonomy and ecology of mycorrhizal hypogeous fungi and worked on fungi isolated from decaying wood products. He is currently involved in mycorrhizae research.

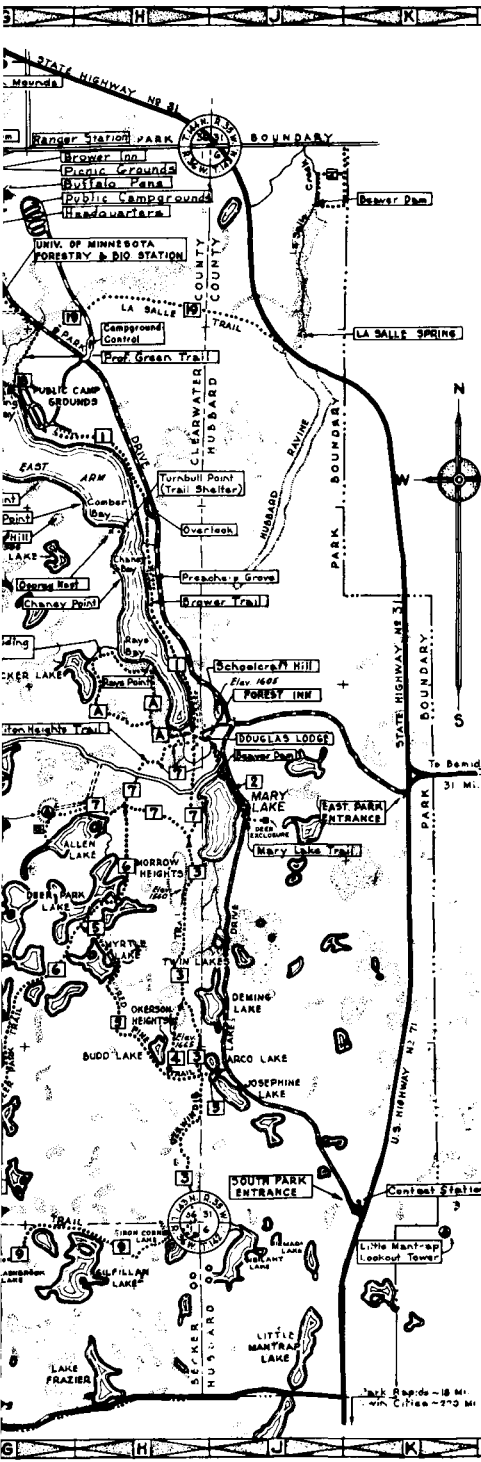
**John W. Thomson**, Professor, University of Wisconsin, specializes in research on the taxonomy and ecology of lichens of North America and the Arctic and also teaches higher plant taxonomy. He has published in the field of higher plant taxonomy as well as in lichenology.

**Warren H. Wagner, Jr.**, Professor and Curator of Pteridophytes, University of Michigan, specializes in comparative biology of the ferns and other homosporous vascular plants.

**Dwain W. Warner**, Professor and Curator of Birds, University of Minnesota, is engaged in research on the systematics and ecology of birds, especially the behavioral ecology of migrants at their breeding grounds, at migratory stopover sites, and in tropical wintering areas.

**John C. Wright**, Professor of Zoology, Montana State University, is a limnologist whose research interests lie chiefly in the productivity of lakes and reservoirs and zooplankton population dynamics.





**MAP LEGEND**

- High Type
  - All Weather Intermediate Type
  - Maintained Gravel Road
  - Not Maintained Dirt Road
  - Foot Trails
  - Trail Number 2
  - All Weather Gravel Road
- TRAILS**

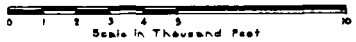
**SELF GUIDING NATURE TRAILS**

No.	TRAIL NAME	LENGTH MI.	LOCATION
A	Dr. Roberts	1.8	SH

**HIKING TRAILS**

No.	TRAIL NAME	LENGTH MI.	LOCATION
1	Brower	2.2	SH-3H
2	Mary Lake	0.5	6J
3	Ozwindib	2.3	6H-9H
4	Okerson Heights	0.5	8H
5	Red Pine	1.5	8J-7H
6	Deer Park	3.1	6H-9F
7	Aiton Heights	2.6	5H-6E
8	Big Pine	0.2	ES
9	Eagle Scout	2.5	9F-9H
10	De Soto	3.0	5F-9F
11	Micollat	3.4	5F-9F
12	Headwaters	0.1	1F
13	Allen Lake	0.2	6G
14	Two Spot	3.2	5C-4B
15	Bohall	0.5	3C
16	Schoolcraft	1.1	1F-2F
17	Professor Cheney	0.8	2E-1E
18	Professor Green	0.6	3G-2G
19	La Sella	1.5	2E-2J
20	Beaver	0.6	1H

STATE OF MINNESOTA  
**ITASCA STATE PARK**  
 OPERATED BY  
 DEPARTMENT OF CONSERVATION  
 DIVISION OF STATE PARKS



# Courses of Instruction

¶ Means "concurrent registration"  
# Means "consent of instructor is required"  
Classes begin at 8:00 a.m. and continue all day

## BIOLOGY (Biol)

- 5870. ITASCA SEMINAR.** (Cr ar; prereq #) Staff  
Topic selected and scheduled by interested staff and students during registration.
- 5890. RESEARCH PROBLEMS AT ITASCA IN ECOLOGY AND BEHAVIORAL BIOLOGY; OR ENTOMOLOGY, FISHERIES, AND WILDLIFE; OR PLANT PATHOLOGY; OR SOIL SCIENCE; OR ZOOLOGY.** (Cr ar; prereq #) Staff  
Undergraduate and graduate students may develop a short-term research project in any departmental area listed above during one or both terms.

## BOTANY (Bot)

- 3990. RESEARCH PROBLEMS.** (1-5 cr; prereq #) Staff  
Individual research for undergraduates.
- 5801. SUMMER FLORA OF MINNESOTA.** (5 cr; limited to 20 students; prereq course in taxonomy; WS; I term) Thomson  
Survey of the summer flowering plants and ferns of the state with particular reference to local flora. Identification by technical keys; important plant families; field recognition of common species; habitat preferences; collecting methods; literature; taxonomic methods. Text: Gleason and Cronquist, *Manual of Vascular Plants of Northeastern United States*.
- 5805. AQUATIC FLOWERING PLANTS.** (5 cr; limited to 20 students; prereq course in taxonomy; MTh; R II term) Ownbey  
The higher plants of aquatic and marsh habitats. Identification and collection; association of species; relations to the habitat; adaptive morphology and food value to wildlife. Text: Fassett, *Manual of Aquatic Plants*.
- 5811. FRESHWATER ALGAE.** (5 cr; limited to 20 students; prereq 10 cr botany, biology, or zoology; TF; I term) Schlichting  
The taxonomy and morphology of freshwater algae as related to ecology. Culturing techniques and identification of field collections, and utilization of this information in teaching and research emphasized. Text: Prescott, *The Algae: A Review*. Also keys by Prescott and Whitford and Schumacher.
- 5815. BRYOPHYTES.** (5 cr; limited to 20 students; prereq 10 cr biology or #; TF; II term) Bowers  
Field and laboratory study of the mosses and liverworts of Minnesota with emphasis on their local ecology and taxonomy. Text: Crum, *Mosses of the Great Lakes Forest*.
- 8970. SPECIAL TOPICS: BIOLOGY OF THE FERNS.** (5 cr; limited to 20 students; prereq #; undergraduates should enroll in Bot 3970; MTh; I term) Wagner  
Field and laboratory study of the lower vascular plants including the ferns, horsetails, club mosses, and quillworts, their evolution, classification, morphology, and ecology. Emphasis on field exploration for rare taxa, including natural hybrid forms, and life cycles.
- 8990. GRADUATE RESEARCH PROBLEMS.** (Cr ar; prereq #) Staff



## ECOLOGY AND BEHAVIORAL BIOLOGY (EBB)

- 5812. AQUATIC ECOLOGY.** (5 cr; limited to 20 students; prereq 15 cr biology, 5 cr chemistry; WS; I and II term) Wright, Megard  
General limnology of lakes with emphasis on the biology of lakes in the Itasca region as related to their physical and chemical stratification in summer. Team projects in field research.
- 5814. COMMUNITY STRUCTURE AND FUNCTIONING.** (5 cr; limited to 20 students; prereq course in ecology; WS; II term) Cushing  
Communities represented in Itasca Park and vicinity and their dynamic relationships. Relationships of local communities to the flora and fauna of Minnesota as a whole. Use of modern methods of community analysis and measurement.
- 5815. FIELD ETHOLOGY.** (5 cr; limited to 15 students; prereq course in behavior or ecology; TF; I term) Jenni  
Field course emphasizing the methods of studying behavior of wild animals. Quantitative techniques; sound recording, motion picture photography, sound tape and film analysis, capturing and marking techniques. An individual research project and term paper on the social behavior of one species is required. Individual projects require considerable outside time.
- 5817. VERTEBRATE ECOLOGY.** (5 cr; limited to 15 students; prereq course in ecology; TF; II term) Ford  
Field studies on populations and their relationships to local environments; habitat analysis and ecological research methods. Individual and team research projects, field trips, and lectures. Reports and complete data analysis required on two research projects.
- 5820. WETLAND ECOLOGY.** (5 cr; limited to 15 students; prereq 15 cr biology, introductory chemistry, course in plant identification or Biol 3041 recommended; WS; II term) Gorham  
Nature, origin, and development of the lake, marsh, swamp, and bog ecosystems; environmental control and productivity.

## ENTOMOLOGY (Ent)

- 5020. FIELD ENTOMOLOGY.** (5 cr; limited to 15 students; prereq introductory biology; MTh; I term) Deonier  
Insect fauna in various natural habitats of the park and surrounding areas. Field trips, collection and identification of insects, and studies of general morphology, life histories, and habitats of local species. Text: Borror and DeLong, *An Introduction to the Study of Insects*.
- 5130. AQUATIC ENTOMOLOGY.** (5 cr; limited to 15 students; prereq Ent 3175 or 5020 or equiv or #; MTh; II term) Berner  
Taxonomy and biology of aquatic insects in all stages with emphasis on relationship of structure and behavior to function; aquatic communities. Field trips, research projects, and lectures. Text: *Aquatic Insects of California*.

## PLANT PATHOLOGY (PIPd)

- 5102. INTRODUCTORY MYCOLOGY.** (5 cr; limited to 15 students; prereq 6 cr botany; MTh; II term) Stewart  
Survey of the major groups of fungi, including slime molds, with emphasis on their life histories, habitats, and relationships with human affairs. Field collecting and identification stressed.

## SOIL SCIENCE (Soil)

- 5532. SOILS AND THE ECOSYSTEM.** (5 cr; limited to 20 students; prereq course in ecology; MTh; I term) Grigal  
Functional and structural aspects of soils as a compound of the ecosystem. Interrelationships of soil and vegetation on the landscape.

## ZOOLOGY (Zool)

- 5146. EXPERIMENTAL PARASITOLOGY.** (5 cr; limited to 12 students; prereq introductory course in parasitology; TF; I term) MacInnis  
Introduction to the use of parasites in experiments concerning basic biological problems and to problems of parasitism. Field and laboratory investigations.
- 5807. PROTOZOOLOGY.** (5 cr; limited to 15 students; prereq Biol 1106 or equiv; TF; II term) Bovee  
Morphology, classification, growth, development, physiology, genetics, ecology, and distribution of protozoa. Laboratory emphasizes local protozoa and their habitats.
- 5814. NATURAL HISTORY OF INVERTEBRATES.** (5 cr; limited to 20 students; prereq Biol 1106 or equiv; WS; I term) Gilbertson  
Advanced taxonomic and ecological survey of the local fauna and independent ecological studies of several taxonomic groups. Texts: Eddy and Hodson, *Taxonomic Keys of the Common Animals of Minnesota*; Pennak, *Freshwater Invertebrates of the United States*.
- 5819. NATURAL HISTORY OF VERTEBRATES.** (5 cr; limited to 20 students; prereq Biol 1106 or equiv; TF; II term) Schmid  
Taxonomic survey of local vertebrates, exclusive of birds. Emphasis on collection, identification, and preservation of fish and mammal specimens. Individual field projects dealing with natural history of vertebrates in local habitats. Texts: Eddy and Underhill, *Northern Fishes*; Burt, *Mammals of the Great Lakes Region*.
- 5834. FIELD ORNITHOLOGY.** (5 cr; limited to 15 students; prereq Biol 1106 or equiv; TF; I term) Warner  
Emphasis on the breeding season, biology, and behavioral ecology of birds in the Itasca Park region. Field trips are taken to a variety of habitats to learn bird identification and observe and practice techniques for conducting field studies. Laboratory sessions investigate family distinctions and species identification. Individual field projects. Texts: Pettigill, *Ornithology in Laboratory and Field*, 1970; Robbins, et al., *Birds of North America*, 1966.

## PROPOSED COURSE PROGRAMS

In order that students may plan more effectively to utilize the academic resources of the Biology Session, the following projected program of courses is presented. Changes in the projected schedule may be made to take advantage of especially competent staff members or to meet enrollment needs.

### Annual Course Offerings

Bot 5801, 5805, 5811  
EBB 5812, 5814, 5815, 5817  
Ent 5020, 5130  
PIPa 5102  
Zool 5814, 5819, 5834, 5843

### **Proposed Courses for 1978**

Lichens  
Fire Ecology  
Quantitative Ecology  
Quaternary Ecology  
Physiological Ecology  
Regional Ecology  
Topics in Limnology

### **SPRING TERM**

A number of courses are offered at the Forestry and Biological Station during spring quarter. Most of these courses commence on the Twin Cities campus and move to Itasca on about May 1 for a 5-week period of intensive fieldwork during an attractive time of year. Interested persons should contact the Chairman of the Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

#### **Proposed Courses for 1977 Spring Term**

Biol 3041. Ecology  
Biol 3950. Seminar  
Bot 5205. Flora of Minnesota  
EBB 5817. Vertebrate Ecology  
FW 5105. Basic Wildlife Biology  
Zool 5121. Ichthyology  
Zool 5814. Natural History of Invertebrates  
Zool 5819. Natural History of Vertebrates  
Zool 5834. Field Ornithology

### **HERZ LECTURE**

Mr. and Mrs. Malvin E. Herz of Minneapolis sponsor a lecture series in ornithology during the first summer term of the Lake Itasca Biology Session. The 1976 lecture, entitled "Kirtland's Warbler, Vulnerable Host of the Cowbird," was presented by Harold Mayfield. Plans for the 1977 lecture will be announced at a later date.

# Recent Research Publications

- BROOK, A. J., A. L. BAKER and A. R. KLEMER. The use of turbidimetry in studies of the population dynamics of phytoplankton populations with special reference to *Oscillatoria agardhii* var *isothrix*. Contribution to Int. Limnol. Assoc. Symposium, September 1970.
- HODGES, C. S., JR., GLORIA M. WARNER and CLARK T. ROGERSON. A new species of *Penicillium*. *Mycologia*, LXII(6):1106-1111. 1970.
- KINGSBURY, PHYLLIS J. Calanoid copepods from the forest to prairie transition in the Itasca Park region of Minnesota. *Iowa Acad. Sci.*, 77:223-227. 1970.
- OGLE, THOMAS F. Changes in thermal conductivity of the integument in nonhibernating 13-lined ground squirrels (*Spermophilus tridecemlineatus*) in relation to ambient temperature. *Physiol. Zool.*, 43(2):98-108. 1970.
- ROSS, BRUCE A., J. R. BRAY and W. H. MARSHALL. Effects of long-term deer exclusion on a *Pinus resinosa* forest in north-central Minnesota. *Ecology*, 51(6):1088-1093. 1970.
- SANGER, J. E. and E. GORHAM. The diversity of pigments in lake sediments and its ecological significance. *Limnol. and Oceanogr.*, 15:59-69. 1970.
- TESTER, J. R., M. A. EWERT and D. B. SINIFF. Effects of ionizing radiation on natural and laboratory populations of Manitoba toads, *Bufo hemiophys*. *Radiation Research*, 44(2): 379-389. 1970.
- UTTER, J. M. and E. A. LEFEBVRE. Energy expenditure for free flight by the purple martin (*Progne subis*). *Comp. Biochem. Physiol.*, 35:713-719. 1970.
- BAKER, A. L. and A. J. BROOK. Optical density profiles as an aid to the study of microstratified phytoplankton populations in lakes. *Archiv fur Hydrobiol*, 69(2):214-233. 1971.
- BENTON, A. H., O. R. LARSON and B. A. VENHUIZEN. Siphonaptera from Itasca State Park region. *J. Minn. Acad. Sci.*, 37:91-92. 1971.
- FISHBECK, D. W. and J. C. UNDERHILL. Distribution of stripe polymorphism in wood frogs, *Rana sylvatica* LeConte, from Minnesota. *Copeia*, 2:253-259. 1971.
- GOOD, R. E. and N. F. GOOD. Vegetation of a Minnesota prairie and a comparison of methods. *Amer. Midl. Nat.*, 85(1):228-231. 1971.
- GORHAM, E. and R. H. HOFSTETTER. The penetration of bog peats and lake sediments by tritium from atmospheric fallout. *Ecology*, 52:898-902. 1971.
- HEDEEN, STANLEY E. Growth of the tadpoles of the mink frog, *Rana septentrionalis*. *Herpetologica*, 27(2):160-165. 1971.
- MEYER, RICHARD L. The life history and systematic position of *Derepyxis* (*Chrysophyceae*). *J. Phycol.*, 7:66. 1971.
- MEYER, R. L. and A. J. BROOK. Freshwater algae from Itasca State Park, Minnesota. IV. Cyanophyta, Rhodophyta, Chloromonadophyceae and Cryptophyceae. *Nova Hedwigia*, 22:649-658. 1971.
- PARMELEE, DAVID F. Nesting of ring-billed gulls on Leech Lake, Cass County, Minnesota. *Loon*, 43(3):72-74. 1971.
- SHAFFER, ELLEN. Incidence of trematode infection of snails in a small Minnesota lake. *J. Minn. Acad. Sci.*, 37(1):27-30. 1971.
- SHAY, C. T. The Itasca bison kill site: an ecological analysis. *Minnesota Historical Society*. 1971.
- THIERET, JOHN W. Observations on some aquatic plants in northwestern Minnesota. *The Michigan Botanist*, 10:117-124. 1971.
- UTTER, J. M., E. A. LEFEBVRE and J. S. GREENLAW. A technique for sampling blood from small passerines. *Auk*, 88(1):169-171. 1971.
- MORLEY, T. Deciduous trees of Minnesota; a winter key. *J. Minn. Acad. Sci.*, 38:27-36. 1972.
- PARMELEE, DAVID F. and RICHARD J. OEHLENSCHLAGER. Connecticut warbler nest in Hubbard County, Minnesota. *Loon*, 44(1):5-6. 1972.
- SCHMID, WILLIAM D. Nocturnalism and variance in ambient water vapor pressure. *Physiol. Zool.*, 45(4):302-309. 1972.
- TARAPCHAK, STEVE. Studies on xanthophyceae of the Red Lakes wetlands, Minnesota. *Nova Hedwigia*, 23:1-45. 1972.
- WEAVER, MARGARET G. and ROBERT L. SHAFFER. Higher fungi of Minnesota. II. *J. Minn. Acad. Sci.*, 38:46-52. 1972.
- BROWN, ERNEST B. III. Changes in patterns of seasonal growth of *Microtus pennsylvanicus*. *Ecology*, 54(5):1103-1110. 1973.
- ORING, LEWIS W. and M. L. KNUDSON. Monogamy and polyandry in the spotted sandpiper. *Living Bird*, 12:59-73. 1973.
- ROLLINS, LOUISE A. Poriferan fauna of a Minnesota pond. *J. Minn. Acad. Sci.*, 38(2):83-85. 1973.
- WIGGINS, GLENN B. A contribution to the biology of caddis flies (Trichoptera) in temporary pools. *Royal Ontario Museum, Life Sciences Contribution #88*. 1973.
- BOERNKE, W. E. Natural variations in hepatic and kidney arginase activities in Minnesota anuran amphibians. *Comp. Biochem. Physiol.*, 47B:201-207. 1974.
- MCINTYRE, JUDITH W. Territorial affinity of a common loon. *Bird Banding*. 1974.
- PARMELEE, DAVID F. The nest of the northern parula. *Living Bird*, 12:197-199. 1974.
- SCHLICHTING, H. E., JR. Ejection of microalgae into the air via bursting bubbles. *J. Allergy and Clinical Immunology*, 53(3):185-188. 1974.
- SCHLICHTING, H. E., JR. Survival of some freshwater algae under extreme environmental conditions. *Trans. Amer. Microsc. Soc.*, 93(4):610-613. 1974.
- SCHLICHTING, H. E., JR., G. N. PRENDEVILLE and M. D. GUIRY. New techniques for biological monitoring of water quality. *Biocontrol Techniques*, 1(1):1-3. 1974.
- WALSBY, A. E. and A. R. KLEMER. The role of gas vacuoles in the microstratification of a population of *Oscillatoria agardhii* var. *isothrix* in Deming Lake, Minnesota. *Arch. Hydrobiol.*, 74(3):375-392. 1974.

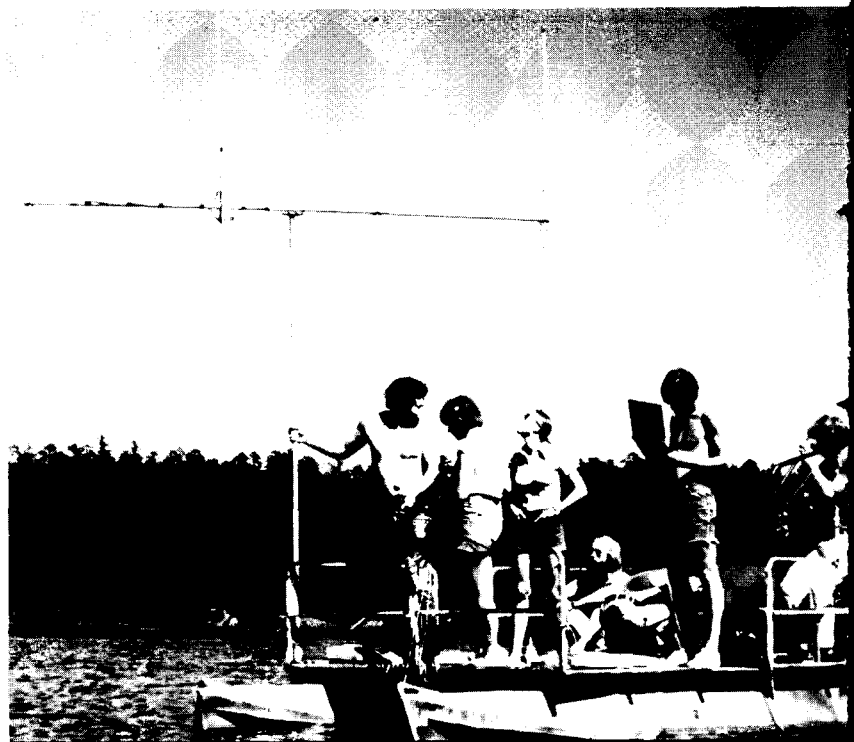
- WHITESIDE, M. C. Chydorid (Cladocera) ecology: seasonal patterns and abundance of populations in Elk Lake, Minnesota. *Ecology*, 55(3):538-550. 1974.
- BAKKO, EUGENE B. A field water balance study of gray squirrels (*Sciurus carolinensis*) and red squirrels (*Tamiasciurus hudsonicus*). *Comp. Biochem. Physiol.*, 51A:759-768. 1975.
- BUELL, MURRAY F. and HELEN F. BUELL. Moat bogs in the Itasca Park area, Minnesota. *Bull. Torrey Bot. Club*, 102(1):6-9. 1975.
- GILBERTSON, D. E. and L. SCHMID. Free amino acids in the hemolymph of five species of pulmonate snails. *Comp. Biochem. Physiol.*, 51B:201-203. 1975.
- GILBERTSON, D. E. and R. WEDLUND. Studies on schistosome dermatitis ("swimmer's itch") in Minnesota. *J. Minn. Acad. Sci.*, 41:28-30. 1975.
- LARSON, O. R. and W. C. SCHARF. New helminth records from Minnesota mammals. *Proc. Helminthological Soc. Wash.*, 42(2):174-175. 1975.
- SCHLICHTING, H. E., JR. Some subaerial algae from Ireland. *Br. Phycol. J.*, 10:257-261. 1975.
- WIGGINS, GLENN B. Contributions to the systematics of the caddis fly family Limnephilidae (Trichoptera). II *Can. Ent.*, 107:325-336. 1975
- HEIDEMANN, MERLE KNUDSON and LEWIS W. ORING. Functional analysis of spotted sandpiper (*Actitis macularia*) song. *Behaviour*, 56 (1-3):182-193. 1976.
- MOEN, AARON N. Energy conservation by white-tailed deer in the winter. *Ecology*, 57(1):192-198. 1976.
- PIVORUN, E. B. A biotelemetry study of the thermoregulatory patterns of *Tamias Striatus* and *Eutamias minimus* during hibernation. *Comp. Biochem. Physiol.*, 53A:265-271. 1976.
- SCHMID, WILLIAM D. Temperature gradients in the nasal passage of small mammals. *Comp. Biochem. Physiol.*, 54A:305-308. 1976.
- STARK, DONNA M. Paleolimnology of Elk Lake, Itasca State Park, northwestern Minnesota. *Arch. Hydrobiol.*, 50:208-274. 1976.
- AVERY, MICHAEL and LEWIS ORING. Song dialects in the bobolink, *Dolichonyx oryzivorus*. *Condor* (in press).
- BLACK, CHARLES and LEWIS W. ORING. Dump nesting in the spotted sandpiper. *Wilson Bull.* (in press).
- HALL, R. J., L. BERNER and E. F. COOK. Observations on the biology of *Tricorythodes atratus* McDunnough (Ephemeroptera: tricorythidae). *Proc. Ent. Soc. Wash.* (in press).





# Graduate Student Theses

- BREDAHL, EDWARD A. A study of water balance in hibernating and nonhibernating *Citellus franklinii*. Ph.D. Thesis, University of North Dakota. 1969.
- EWERT, MICHAEL ALLYN. Seasonal movements of the toads *Bufo americanus* and *B. cognatus* in northwestern Minnesota. Ph.D. Thesis. 1969.
- HOFSTETTER, RONALD H. Floristic and ecological studies of wetlands in Minnesota. Ph.D. Thesis. 1969.
- KURMIS, VILIS. Dynamics of advance reproduction in upland forest communities in Itasca State Park, Minnesota. Ph.D. Thesis. 1969.
- MOYLE, PETER B. Ecology of the fishes of an oligotrophic Minnesota lake, with special reference to the minnows (Cyprinidae): *Notropis volucellus*, *N. cornutus*, and *Pimephales notatus*. Ph.D. Thesis. 1969.
- WILLIAMS, PATRICK K. Ecology of *Bufo hemiophrys* and *B. americanus* tadpoles in northwestern Minnesota. M.S. Thesis. 1969.
- HEDEEN, STANLEY E. The ecology and life history of the mink frog, *Rana septentrionalis* Baird. Ph.D. Thesis. 1970.
- NELSON, DARBY M. Ecology of the cisco, *Coregonus artedii* in two Minnesota lakes. Ph. D. Thesis. 1970.
- ANTHONY, R. S. Mechanism of varve formation in Lake of the Clouds, Lake County, Minnesota. M.S. Thesis. 1971.
- BALL, I. J. Movements, habitat use, and behavior of wood duck (*Aix sponsa*) broods in north-central Minnesota as determined by radio tracking. M.S. Thesis. 1971.
- BLAND, R. D. The spatial distribution of desmids in certain northern Minnesota lakes. Ph.D. Thesis. 1971.
- BROWN, E. B. Some aspects of the ecology of the small, winter-active mammals of a field and adjacent woods in Itasca State Park, Minnesota. Ph.D. Thesis. 1971.
- GILMER, DAVID S. Home range and habitat use of breeding mallards (*Anas platyrhynchos*) and wood ducks (*Aix sponsa*) in north-central Minnesota as determined by radio tracking. Ph.D. Thesis. 1971.
- LANG, JEFFREY W. Overwintering of three species of snakes in northwestern Minnesota. M.S. Thesis, University of North Dakota. 1971.
- STARK, DONNA M. I. A paleolimnological study of Elk Lake in Itasca State Park, Clearwater County, Minnesota. Ph.D. Thesis. 1971.
- URBAN, RICHARD D. The psammon dynamics on bars and beaches of two small northwestern Minnesota streams. Ph.D. Thesis, University of North Dakota. 1971.
- BOERNKE, WILLIAM E. Adaptations of the amphibian ornithine-urea cycle enzyme, arginase. Ph.D. Thesis. 1972.
- BURGER, JOANNA. Breeding adaptations of Franklin's gull (*Larus pipixcan*) to a marsh habitat. Ph.D. Thesis. 1972.
- KNUDSON, MERLE L. Functional analysis of song in the spotted sandpiper, *Actitis macularia* (L). M. S. Thesis, University of North Dakota. 1972.
- STASIAK, RICHARD H. The morphology and life history of the finescale dace, *Pfrille neogaea*, in Itasca State Park, Minnesota. Ph.D. Thesis. 1972.
- SWAIN, PATRICIA C. An analysis of morphological differences among oaks in selected Minnesota stands of the *Quercus borealis-Q. ellipsoidalis*. M.S. Thesis. 1972.
- BAKER, ALAN L. Microstratification of phytoplankton in selected Minnesota lakes. Ph. D. Thesis. 1973.
- BAKKO, EUGENE. Comparative study of water balance of four sciurid rodents. Ph.D. Thesis. 1973.
- KLEMER, ANDREW R. Factors affecting the vertical distribution of a blue-green alga. Ph.D. Thesis. 1973.
- PIVORUN, EDWARD B. Studies on thermoregulation and metabolism of hibernating chipmunks. Ph.D. Thesis. 1974.
- HALL, RONALD J. Life history, drift, and production rate of the steam mayfly (*Tricorythodes athratus* McDunough) in the headwaters of the Mississippi River. Ph.D. Thesis. 1975.
- HAMAS, MICHAEL J. Ecological and physiological adaptations for breeding in the belted kingfisher (*Megasceryle alcyon*). Ph.D. Thesis. 1975.
- MCINTYRE, JUDITH W. The breeding biology and behavior of the common loon in relation to man-altered environments. Ph.D. Thesis. 1975.
- RUBBELKE, DONALD L. Distribution and relative abundance of potential prey of spotted sandpipers (*Actitis macularia* L.) on Little Pelican Island, Leech Lake, Cass County, Minnesota. M.S. Thesis, University of North Dakota. 1976.





# Condensed Course Schedule\*

## I TERM

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Bot 8970	Bot 5811	Bot 5801	Bot 8970	Bot 5811	Bot 5801
Ent 5020	EBB 5815*	EBB 5812	Ent 5020	EBB 5815	EBB 5812
Soil 5532	Zool 5146	Zool 5814	Soil 5532	Zool 5146	Zool 5814
	Zool 5834*			Zool 5834	

## II TERM

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Bot 5805	Bot 5815	EBB 5812	Bot 5805	Bot 5815	EBB 5812
Ent 5130	EBB 5817	EBB 5814	Ent 5130	EBB 5817	EBB 5814
PlPa 5102	Zool 5807	EBB 5820	PlPa 5102	Zool 5807	EBB 5820
	Zool 5819			Zool 5819	

\*Schedule only one course per day.

\*See registration, page 6.

## Request for Reservation — ITASCA BIOLOGY SESSION

Name \_\_\_\_\_ Date \_\_\_\_\_

Current Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone: Office \_\_\_\_\_ Home \_\_\_\_\_

Present Status: Grad, Adult Special, Freshman, Sophomore, Junior, Senior (circle one)

Status by Summer 1977: \_\_\_\_\_

University or College Now Attending: \_\_\_\_\_

If U of M, College in Which Last Enrolled \_\_\_\_\_ Year \_\_\_\_\_

Reserve a place in the following course(s) for me:

I Term: Dept. \_\_\_\_\_ No. \_\_\_\_\_ and Dept. \_\_\_\_\_ No. \_\_\_\_\_

II Term: Dept. \_\_\_\_\_ No. \_\_\_\_\_ and Dept. \_\_\_\_\_ No. \_\_\_\_\_

(See condensed course schedule to avoid conflicts)

I wish a reservation in a student cabin, a campground site, or a resort list (circle one). Enclosed find a \$40 deposit (check or money order payable to the University of Minnesota) to be credited to the tuition fee upon completion of registration. A letter of evaluation from my adviser or supervisor and a recent transcript of my academic record, including a listing of all courses being taken at present, are enclosed or will be sent directly (circle one).

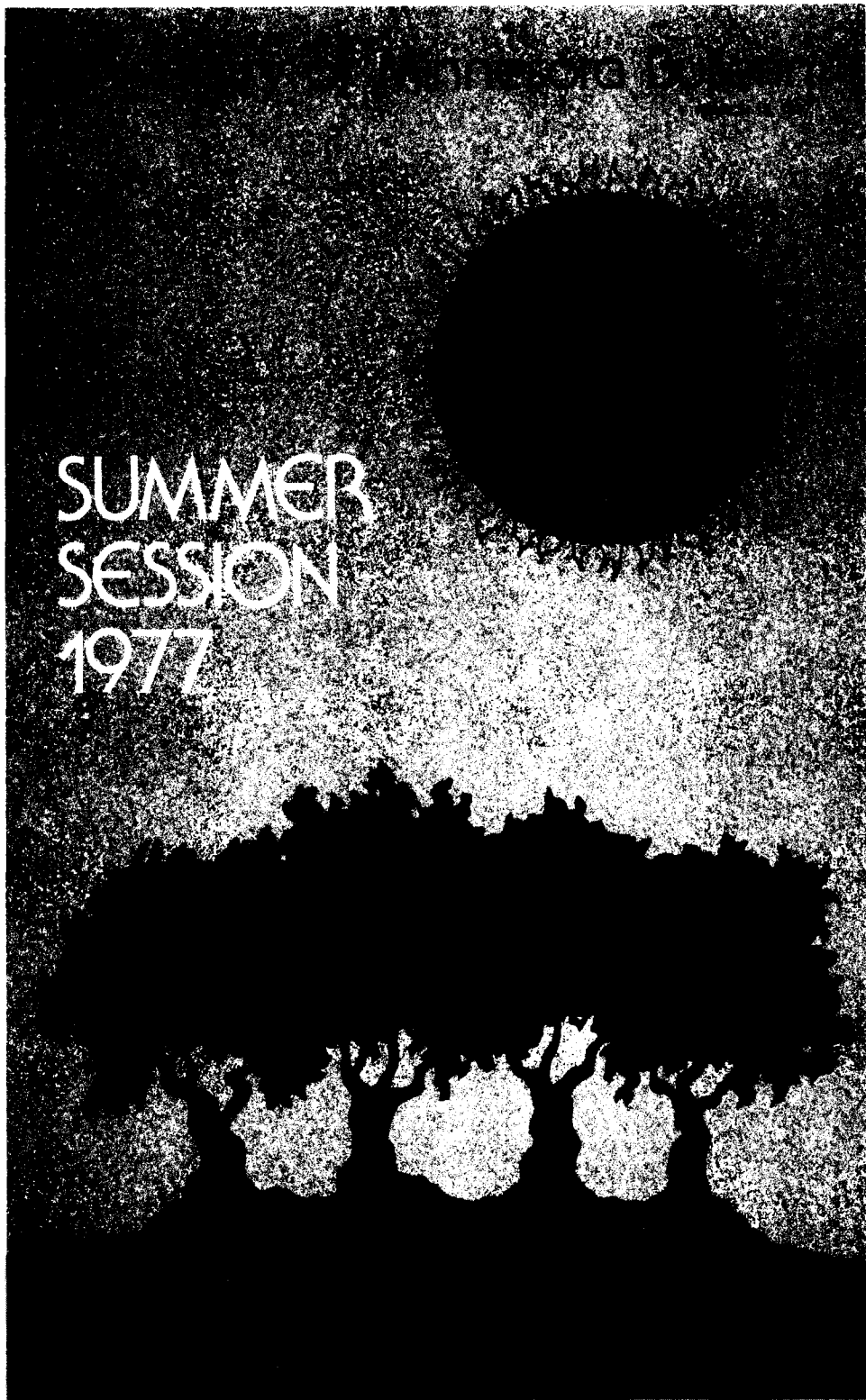
**IMPORTANT:** Applications will not be reviewed until all items listed above are received. Please mail this form to:

Chairman, Field Biology Program  
 349 Bell Museum of Natural History  
 10 Church Street S.E.  
 University of Minnesota  
 Minneapolis, Minnesota 55455



*Cover Photograph:* Bark of the red pine, Minnesota state tree.

SUMMER  
SESSION  
1977



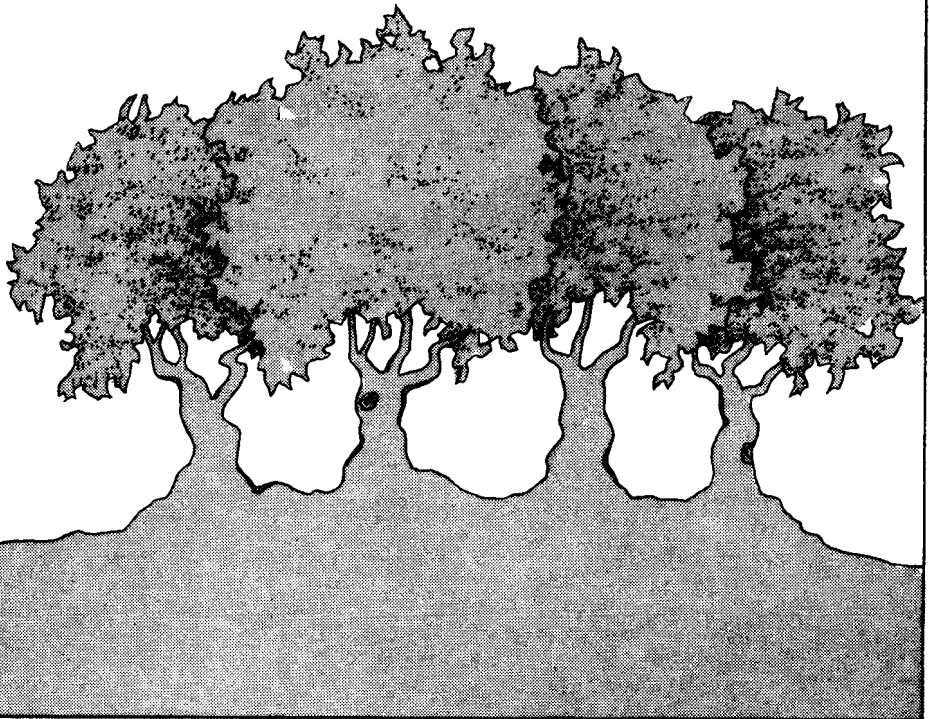
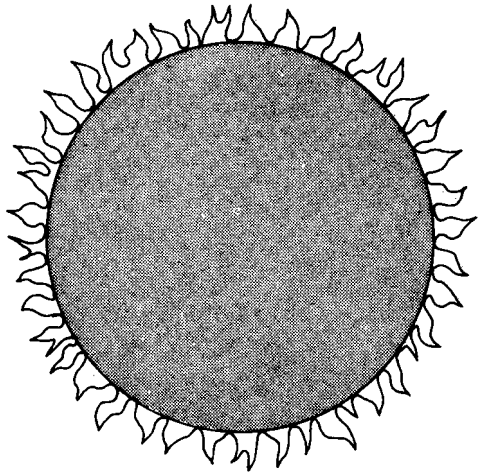
## *Board of Regents*

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**SUMMER  
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1977**



# Calendar

May 16	Graduate School application deadline for first term admission.
May 31-June 3	Registration period. Students may register for first term or second term or both terms at this time.
June 6-10	Registration closed.
June 10	Last day to pay graduation fees for first term.
June 13	Last day to register for first term and to pay fees without incurring late fee. Late fees assessed according to the following schedule: June 14-17           \$ 6 June 20-24           \$10 Thereafter           \$20
June 14	FIRST TERM CLASSES BEGIN.
June 15	Graduate School application deadline for second term admission.
June 17	Thesis registration deadline for graduate students.
July 4	Holiday.
July 13-15	Registration period for second term.
July 15	Last day of class for first term. Last day to pay graduation fee for second term. Final Oral Exam Report and all other forms due (graduate students only).
July 18	Last day to register for second term and to pay fees without incurring late fee. Late fees assessed according to following schedule: July 19-22           \$ 6 July 25-29           \$10 Thereafter           \$20
July 19	SECOND TERM CLASSES BEGIN.
July 29	Two bound copies of master's or doctoral thesis due.
August 19	Last day of class for second term.

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## **DO YOU HAVE QUESTIONS ABOUT SUMMER SESSION? YOUR ANSWER MAY BE HERE...**

### **How do I register?**

Register according to the step-by-step procedures described on pages 16-17.

### **When do I register?**

May 31-June 3 and June 13 for either or both terms; July 13-15 and July 18 for second term. Students in residence spring quarter or some previous quarter should check with their college office for early registration dates.

### **Where do I register?**

Register in one of the college offices listed on page 16. *All teachers are requested to register through the College of Education, regardless of the course(s) they wish to attend.*

### **Can I attend summer session even though I am not a regularly enrolled University of Minnesota student?**

Yes, you can attend as a summer-only student. For a description of summer-only status, see page 15.

### **Is there an application form?**

Not for summer-only students.

### **Can I register by mail?**

No.

### **Can someone else register for me?**

Yes. They should have full information on the course(s) you want to take (and choice of alternate courses), plus your address, social security number, proof of health insurance, and similar personal information.

### **Can I reserve courses before registration starts?**

No. Reserving a course is part of the registration procedures, which must be carried out in the order described on pages 16-17.

### **When do classes begin?**

First term classes begin on Tuesday, June 14. Second term classes begin on Tuesday, July 19. A few classes have a Monday starting date. Check the course descriptions.

### **Must I pay the student services fee? Must I pay all of it?**

Students registering for 3 or more credits per term must pay the student services fee. Students enrolled in workshops lasting less than a full 5-week term will pay the fee on a prorated basis. If classes are held entirely off campus, the student services fee is waived. Students who have adequate health care coverage may apply for a partial exemption from the health service portion of the student services fee (see page 21). Be sure to bring proof of coverage with you when you register.

### **How much does it cost to audit a course?**

Auditors pay tuition at the same rate as students enrolled for credit.

### **How can I make arrangements to live in a residence hall?**

See information on page 26.

**I'm a high school student. Can I attend the summer session?**

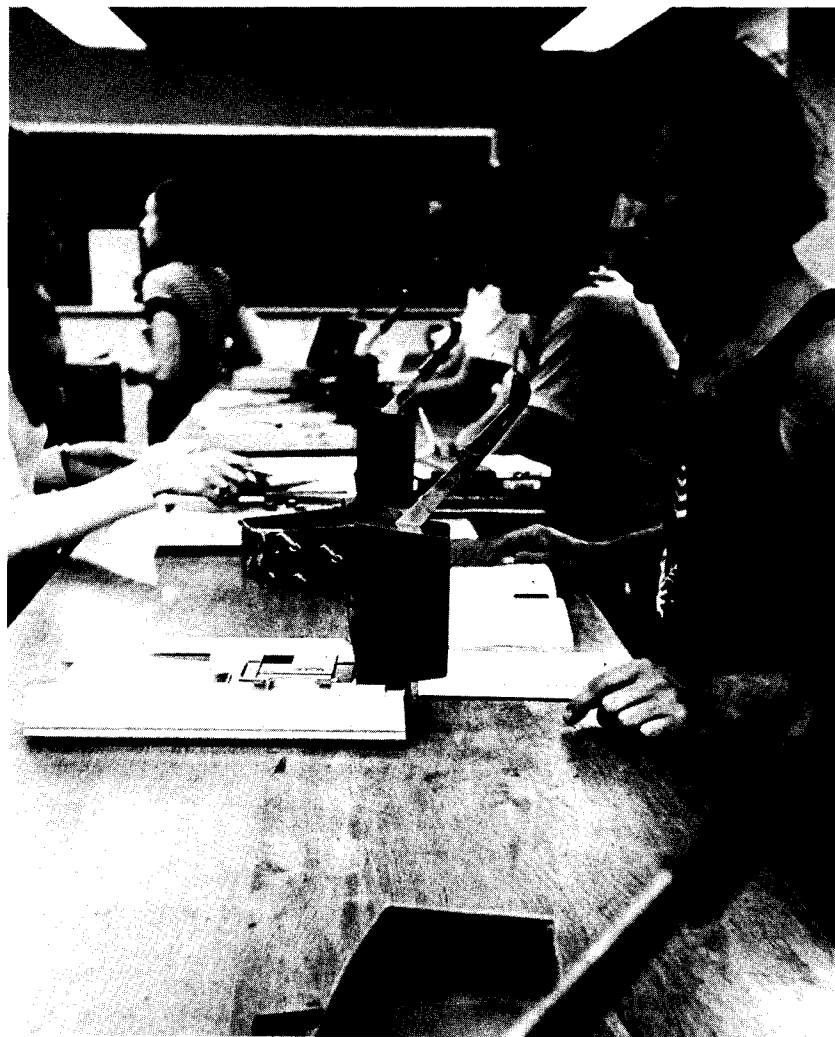
Yes. High school students may take University courses. See page 14 for special admission procedures.

**I'm a senior citizen. Do I pay tuition?**

Senior citizens are invited to audit classes tuition-free after tuition-paying students have been accommodated. Details are explained on page 16.

**Can I transfer credits earned at the University to another school?**

The college or university must approve courses for transfer.



**-IMPORTANT-**

Compliance with the regulations stated in this bulletin is expected of each student. This is particularly true with respect to fees, cancellations, and refunds.

Please note that first term classes begin on TUESDAY, JUNE 14, and second term classes on TUESDAY, JULY 19, EXCEPT where a Monday starting date is specified.

All students not regularly enrolled spring quarter 1977 must be prepared to show their United States Social Security numbers.

The Board of Regents has committed itself and the University of Minnesota to the policy that there shall be no discrimination on the basis of race, creed, color, sex, or national origin. In adhering to this policy, the University abides by the requirements of Titles VI and VII of the Civil Rights Act of 1964, Revised Order No. 4, Executive Orders 11246 and 11375, Sections 799A and 845 of the Public Health Service Act, and other federal regulations and pertinent acts of Congress.

It is also the policy of the University of Minnesota not to discriminate on the basis of sex in its educational programs, admissions, activities, or employment policies as required by Title IX of the Education Amendments of 1972.

Inquiries regarding compliance may be directed to Lillian H. Williams, Director, Office of Equal Opportunity and Affirmative Action, 419 Morrill Hall, 100 Church Street S.E., Minneapolis, Minnesota 55455, (612) 373-7969, or to the Director of the Office of Civil Rights, Department of Health, Education, and Welfare, Washington, D.C. 20201.

# A Guide to the Summer Session Bulletin

**Symbols**—The following symbols are used throughout the course descriptions in lieu of page footnotes:

- \* Courses in which graduate students may prepare Plan B projects.
- † All courses preceding the dagger must be completed before credit will be granted for any quarter of the sequence.
- § Credit will not be granted if the equivalent course listed after the section mark has been taken for credit.
- ¶ Concurrent registration in the course listed after the paragraph mark.
- # Consent of instructor must be obtained.
- Δ Consent of division, department, or school offering course must be obtained.
- \*\* A special fee is charged. See section on Course Fees.

Following each course title is a parenthetical statement of credits, class limits, prerequisites, class hours, days of the week the class meets, location of the class, and course instructor.

**Prerequisites**—Entrance into certain courses requires that the student have completed or be concurrently enrolled in other specified courses, or possess particular qualifications or class standing. If no prerequisites are listed, there are none, except insofar as the course number indicates a class standing requirement.

Class standing requirements, unless otherwise noted, are indicated by the course number as follows:

- 0000 to -0998 no credit
- 1000 to 1998 for freshmen and sophomores
- 3000 to 3998 for juniors, seniors, and fifth-year students
- 5000 to 5998 for juniors, seniors, fifth-year students, graduate students, and professional students
- 8000 to 8998 for graduate students only

A minimum of prerequisite information is shown. For example, when courses that must be taken in sequence are prerequisites, only the last course of the sequence is listed.

When no abbreviated departmental prefix precedes the course number listed as a prerequisite, that prerequisite course is in the same department as the course being described.

Example: "prereq 1011 or 1017 and Psy 1002" (you must have had either course 1011 or 1017 in the same department and Psychology 1002).

Work equivalent to a prerequisite course (having the same content) is ordinarily accepted in lieu of that prerequisite. Instructors may also, at their discretion, waive prerequisites.

**Hours and Days**—Class hours are identified by roman numerals and continue for 50 minutes after the beginning times shown below:

Minneapolis (East and West Banks) and St. Paul	I	II	III	IV	V	VI	VII	VIII
	8:00	9:05	10:10	11:15	12:20	1:25	2:30	3:35

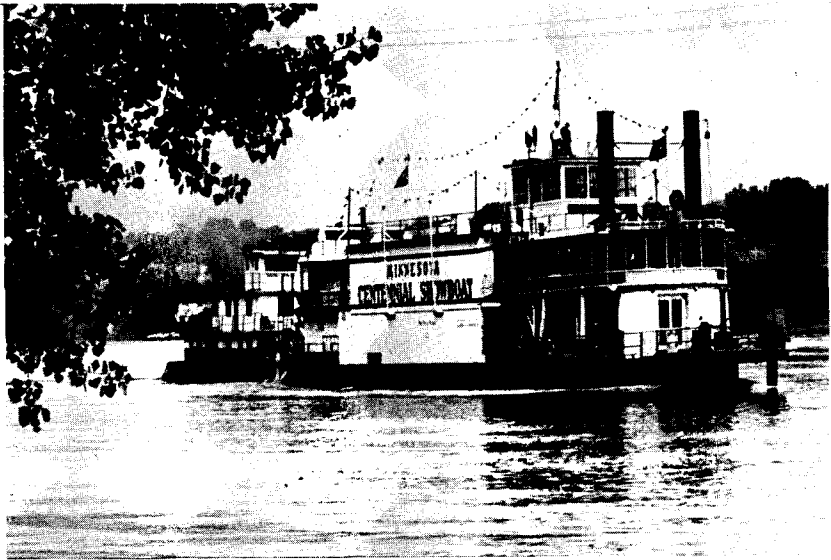
A class listed I-III TTh meets the first *through* third hours Tuesdays and Thursdays; the hyphen always indicates "through." A class listed I, III meets the first *and* third hours; the comma always indicates "and." Days of the week are abbreviated M, T, W, Th, F, S.

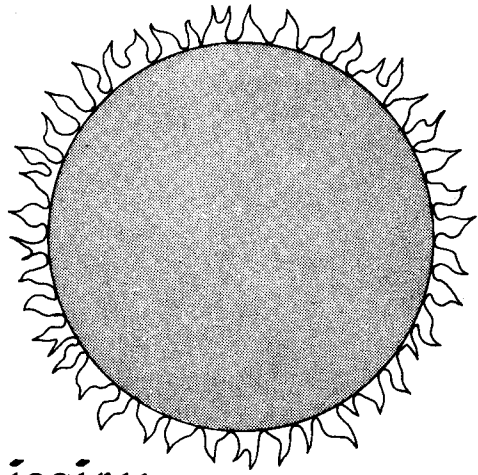
Many courses, especially those in the College of Business Administration, meet for longer than the regular 50 minutes; these extended periods are indicated in the course description. To avoid conflicts, check such listings carefully before registering.

**Reserved Courses**—Courses with limited enrollment must be reserved in the college office listed with each department. Registration instructions may be found in the next section of this bulletin.

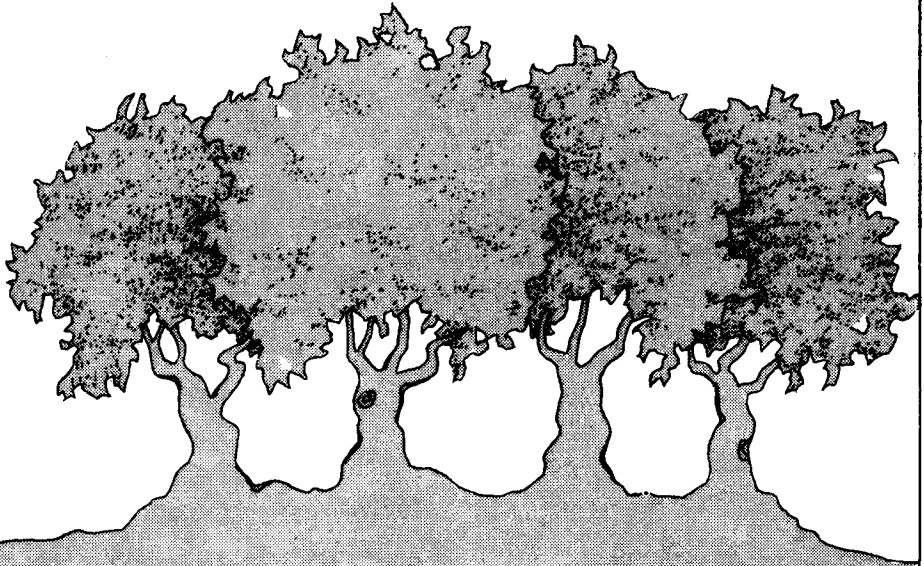
**Missing Information**—When hours, days, or places of meeting are not listed, consult the instructor or department offering the course.

Changes made subsequent to publication of this bulletin are published in supplements to the *Summer Session Bulletin*.





*Summer Admission  
and Registration*



## **DATES OF SUMMER SESSION**

The summer session consists of two 5-week terms—June 13 through July 15 and July 18 through August 19. Students may register for subjects of their choice in either or both terms.

Payment of fees for the first term without assessment of late fees must be made by 3:30 p.m. on Monday, June 13. First term classes in Minneapolis (East and West Banks) and St. Paul begin Tuesday, June 14, at 8:00 a.m.

Payment of fees for the second term without assessment of late fees must be made by 3:30 p.m. on Monday, July 18. Second term classes begin Tuesday, July 19.

Most individual courses are planned for completion in a single term.

# Admission

Summer session courses are open to high school graduates, students with previous college work, and high school students with special abilities and interests that can be satisfied by attending college before high school graduation. In addition to regularly admitted students beginning or continuing in degree programs of University of Minnesota colleges, Summer Session registration is open to other high school graduates and college students through summer-only status.

## SUMMER-ONLY STUDENTS

Summer-only enrollment indicates that you are not currently pursuing a degree from the University of Minnesota and allows you to register in the simplest possible manner. Attendance as a summer-only student is open to:

1. High school graduates.
2. Former University of Minnesota students who are not now pursuing a degree from the University (including Minnesota graduates).
3. Students with college work at a school other than the University of Minnesota (Twin Cities campus) who do not plan to obtain a degree from the University or who have not been admitted as a degree candidate for summer session 1977.
4. Others who have the approval of the Office of Admissions.

Attendance as a summer-only student does not guarantee admission to a regular degree program at the University of Minnesota.

## ADMISSION TO DEGREE PROGRAMS FOR THE SUMMER SESSION

Any student who expects to receive a degree from the University of Minnesota must file an application, any necessary credentials, and a \$10 credentials examination fee (\$15 for the Graduate School) in order to gain regular admission to a college of the University. Summer-only registration by itself will not qualify a student for entry into a University degree program.

Prospective applicants should consult the *General Information Bulletin* for detailed requirements governing admission and granting of degrees. This bulletin and specific college bulletins and brochures may be obtained by writing to the Office of Admissions and Records, 231 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455. Zip codes MUST accompany requests for bulletins and brochures.

## Entering Freshmen

Summer session offers high school graduates an opportunity to begin college work without the usual summer delay. All colleges that admit freshmen to their



programs will accept high school graduates for admission in either term of the summer session.

The General College, College of Business Administration, Institute of Technology, and College of Liberal Arts do not admit new students to begin degree programs in the summer. Individuals who plan to enter a degree program in one of these units should apply for fall quarter admission. They may take summer courses under summer-only status and apply them for degree credit upon admission to the unit and registration in a regular quarter of the academic year. These students attend the orientation-registration program with other students entering the unit fall quarter.

To be assured full consideration in time for admission to a degree program (for all colleges except GC, CBA, IT, and CLA) and registration for Summer Session, the freshman application must be received by the Office of Admissions and Records by May 1. All freshman applicants are required to present a completed application form, transcripts from the last high school and all colleges attended, and a \$10 credentials examination fee. Most colleges require ACT or PSAT test scores, and some have other special admission requirements (see the *General Information Bulletin*).

## **Applicants With Previous College Work**

Students with previous college work may be admitted to degree programs of most colleges and schools of the University of Minnesota during the summer session. EXCEPTIONS are some professional and paraprofessional programs that begin course sequences during a specified term, the General College, the College of Business Administration, the Institute of Technology, and the College of Liberal Arts. Individuals who plan to enter a degree program in one of these units apply for fall quarter admission and register under summer-only status. Courses completed satisfactorily during the summer will be accepted for degree credit when the student is admitted to the unit and has registered for one of the regular quarters of the school year.

May 1 is the last date for application with assurance of full consideration for summer admission. Applications, with the \$10 credentials examination fee and the necessary credentials, should be sent to the Office of Admissions and Records (see the *General Information Bulletin*).

## **GRADUATE STUDENTS**

The Graduate School offers opportunities for advanced study and research in many fields. It brings together in a single academic unit graduate programs and offerings of all units of the University. Degrees offered include the master of arts, master of science, doctor of philosophy, doctor of education, doctor of musical arts, and the specialist certificate in education and in library science.

Any student with a bachelor's degree or its equivalent from a recognized college or university may apply to the dean of the Graduate School for admission. Applicants with the necessary background for their chosen major field, an excellent scholastic record from an approved college or university, and appropriate professional qualifications may be admitted for graduate work on recommendation of the graduate faculty in the proposed major field and approval of the dean of the Graduate School.

Acceptance for a summer institute offering course work at the graduate level does not, in itself, establish permission for registration in the Graduate School. Normal procedures for admission to the Graduate School must still be followed.

## **Admission and Registration**

Students planning to use credits earned in summer session toward a graduate degree or who expect to receive graduate credit for such work should apply for admission directly to the Graduate School. Applications must be submitted *complete in every detail*—one official transcript from each college attended, the credentials examination fee, and test results if required—by May 16, 1977 for first term admission and June 15, 1977 for second term admission. Application forms and Graduate School bulletins may be obtained from the Graduate School, 307 Johnston Hall, 101 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

Students with a bachelor's degree who are not interested in earning graduate credit do not register in the Graduate School. Instead they may apply for admission as an adult special student or register as a special summer-only student. If they subsequently decide to apply for admission to the Graduate School, they may transfer *only their first two consecutive terms' work as an adult special or summer-only student* to their graduate program. Only courses of graduate level taught by members of the graduate faculty may be transferred.

It should be noted that courses numbered 8000 and above are open only to students registered in the Graduate School.

## **Candidacy for a Degree**

Admission to the Graduate School does not admit a student to candidacy for a degree. Admission to such candidacy is contingent upon the judgment by members of the graduate faculty that the student shows sufficient promise to be permitted to proceed toward a degree.

Following registration for at least 1 term, the student who expects to obtain a master's degree must present the program and thesis title (for Plan A) or program (for Plan B) for the adviser's recommendation and for transmission to the Graduate School for action by the appropriate unit committee. Approval by the Graduate School confirms the student's admission to candidacy for the degree.

## **Requirements for Advanced Degrees**

For information concerning requirements for graduate degrees, refer to the current *Graduate School Bulletin*.

## **Deadlines for Summer Session Graduation**

Theses of all graduate degree candidates must be completed and registered in the Graduate School, final degree examinations must be passed, and required forms must be submitted by the following dates for graduation at the close of the summer session:

Thesis registration—June 17, 1977

Final Oral Examination Report and all other forms due—July 15, 1977

Two bound copies of the master's (Plan A) or doctoral thesis—July 29, 1977

Degree date (no ceremony)—August 19, 1977

## HIGH SCHOOL STUDENTS

Outstanding high school students who have special interests that can be satisfied by attending college before high school graduation may apply for summer session admission to take work between their junior and senior years in high school. Registration is usually restricted to courses at the 1xxx level. Credits earned will be counted toward graduation if the student later enrolls in the University.

Interested students must apply through the Office of Admissions by June 1. Applications must be accompanied by a copy of the high school transcript and a written recommendation from the high school counselor.



# Registration, Fees

In order that the short summer session terms may prove of maximum value and that late entrants will not disrupt courses in progress, students are expected to complete their registration during the specified registration periods. All students not regularly enrolled during spring quarter 1977 must be prepared to show their United States Social Security number.

Students who plan to attend the first term and the second term should register for both terms at the same time.

Registration will not be open between June 6 and June 10.

## STUDENTS CURRENTLY OR PREVIOUSLY IN RESIDENCE AND DEGREE CANDIDATES

- Students in residence spring quarter should register on the dates announced in the *Minnesota Daily* and in their college office and should register through the college in which they were last enrolled. A registration permit is required.

- Students in residence some previous quarter(s) (exclusive of summer-only or Continuing Education and Extension registration) also may register on the announced dates through the college in which they were last enrolled. A registration permit from that college is required, and it may be obtained in Morrill Hall (Coffey Hall for St. Paul-based colleges).

- Students admitted to the University as a degree candidate effective either summer term should register according to instructions given by the college to which they have been admitted.

- Students transferring from one University of Minnesota college to another should follow the instructions received with the transfer approval.

## SUMMER-ONLY STUDENTS

Persons who should register under summer-only status are listed on page 11. They will register according to the following schedule:

### *First Term*

Dates: May 31 through June 3 and on June 13 (registration is closed June 6 through June 10).

Time: 8 a.m. to 3 p.m. (in-service teachers registering through the College of Education may register until 4 p.m., May 31-June 3).

Place: Register in the college in which most courses are taken. Teachers registering for any course and other persons taking professional education courses should register through the College of Education.

### *Second Term*

Dates: May 31 through June 3 and on June 13; July 13 through July 15 and on July 18 (registration is closed June 6 through June 10, and June 14 through July 12).

Time: See first term.

Place: See first term.

## **SENIOR CITIZEN EDUCATION PROGRAM**

Minnesota residents age 62 and over may attend University classes, subject to academic prerequisites, when space is available after tuition-paying students have been accommodated. Under the Senior Citizen Education Program, courses may be audited free of charge or may be taken for credit at \$2 per credit. (Auditors prepare daily assignments and participate in class discussions but do not take examinations or receive a grade, and no record is kept of their work.) Senior citizens do not pay the student services fee but must pay laboratory or materials fees when required for particular courses.

Registration for the Senior Citizen Education Program will be held on June 15 for first term courses and on July 20 for second term courses. Persons who wish to register should come to 106 Morrill Hall and should bring identification to verify age and Minnesota residency.

## **COLLEGE REGISTRATION OFFICES**

Agriculture, 130 Coffey Hall (St. Paul)

Biological Sciences, P190 Kolthoff Hall

Business Administration, 225 Business Administration Building (West Bank)

Dental Hygiene, Health Sciences Unit A 5-164

Dentistry, Health Sciences Unit A 15-106

Education, ECDO, 1425 University Ave. S.E. (Burton Hall on June 14)

Forestry, 130 Coffey Hall (St. Paul)

General College, 20 Nicholson Hall

Graduate School, 316 Johnston Hall

(Students registered in the Graduate School in spring quarter 1977 may obtain registration materials in the office of their major department. All students planning to register in the Graduate School should see page XX for information.)

Home Economics, 130 Coffey Hall (St. Paul)

Institute of Technology, 105 Lind Hall (formerly Main Engineering)

Liberal Arts

Regular students: college offices

Summer-only students: Johnston Hall, first floor lobby

Medical Technology, 5307 Powell Hall

Medicine, 13g Owre Hall

Military Science, 108 Armory Building

Mortuary Science, 114 Vincent Hall

Nursing, 3320 Powell Hall

Pharmacy, 100 Appleby Hall

Physical and Occupational Therapy, 271 Children's Rehabilitation Center

Public Health, 1360 Mayo Memorial Building

University College, 105 Walter Library

Veterinary Medicine, 130 Coffey Hall (St. Paul)

## **REGISTRATION PROCEDURE**

1. Obtain registration permit.

Students in residence spring quarter: at your regular college office.

Students in residence some previous quarter (exclusive of summer-only or

Continuing Education and Extension registration): in Morrill Hall (Coffey Hall for St. Paul-based colleges), at the window of the college you last attended.

Summer-only students: no registration permit required.

2. Obtain registration material at college registration office.

3. Obtain approval of study program at college office.

4. Obtain class reservation cards for reserved courses (see list of reserved courses, below, and Course Descriptions section). *This cannot be done until you have completed the three steps listed above.*

5. Turn in registration blanks and class reservation cards and obtain fee statements in Morrill Hall. (On June 13 College of Education graduate and undergraduate students may obtain fee statements in Burton Hall.)

*Exceptions:* Students in the Colleges of Agriculture, Forestry, Home Economics, Biological Sciences, and Veterinary Medicine as well as Graduate School students whose majors are based in St. Paul turn in their registration blanks and class reservation cards and obtain their fee statements at 130 Coffey Hall

6. Pay fees at the Bursar's Office (in the new Bookstore/Admissions and Records Building); the West Bank Bursar's Office; the Cashier's Office, Coffey Hall; or by mail. The hours are 8:15 a.m. to 3:30 p.m. If mailed, fees must be paid or post-marked no later than Monday, June 13, for first term, or Monday, July 18, for second term.

## CHANGES IN REGISTRATION

After a student's registration has been accepted by the University Records Office, any change must be approved by the college office through which the student is registered. Forms for changing registration may be obtained in the college office. *Only in exceptional cases will any change be made after classes have begun.* (Graduate students should refer to the *Graduate School Bulletin* for information on the Graduate School's policy.)

## RESERVED COURSES

As part of the registration process, students must obtain class reservation cards for the courses listed below. Cards are available at the offices specified in the departmental course listings. They must be attached to the student's registration form when it is turned in for a statement of fees.

Ten-week courses are listed under first term.

### ITASCA BIOLOGY SESSION—FIRST TERM

Botany 5801, 5811, 8970—CofH 130  
Ecology and Behavioral Biology 5812, 5815—CofH 130  
Entomology 5020—CofH 130  
Soil Science 5532—CofH 130  
Zoology 5146, 5814, 5834—CofH 130

### ITASCA BIOLOGY SESSION—SECOND TERM

Botany 5805, 5815—CofH 130  
Ecology and Behavioral Biology 5812, 5814, 5817, 5820—CofH 130  
Entomology 5130—CofH 130  
Plant Pathology 5102—CofH 130  
Zoology 5807, 5819—CofH 130

### SUMMER SESSION—FIRST TERM

Accounting—All courses reserved in 225 BA except where noted  
1050, 1051—12 JohH

Aerospace Engineering and Mechanics—all courses reserved in 105 LindH

Agricultural Education 5041, 8001—130 CoFH

American Studies 1102, 8203—12 JohH

Architecture—all courses reserved in 105 LindH

Art Education 3001, 5001—1425 University Avenue S.E.

Art History—all courses reserved in 12 JohH

Biology 1011—12 JohH or 130 CoFH  
3011, 3012—P190 Kolth

Business Education 5103, 5106, 5112, 5114, 5116—1425 University Avenue S.E.

Business, Government and Society 3001—225 BA

Business Law 3058, 8158—225 BA

Chemical Engineering 5901-5902-5903—105 LindH

Chemistry 1001—12 JohH  
1004, 1006—130 CoFH for Ag, For, HE; 105 LindH for IT; JohH 12 for others  
3101, 3301, 3305—105 LindH for IT; 12 JohH for others  
3499, 5520—105 LindH

Civil and Mineral Engineering 5097—105 LindH

Communication 1001—12 JohH

Communication Disorders 3100, 3101, 5900—12 JohH

Composition 1001, 1002, 1027—12 JohH

Computer Science—all courses reserved in 105 LindH

Counseling and Student Personnel Psychology 5101, 5110, 5130, 5300, 5310, 5620—1425 University Avenue S.E.

Design 1521, 3531, 5531, 5532, 5533, 5556, 5586—130 CoFH

Distributive Education 5325, 5400, 5600—1425 University Avenue S.E.

Ecology and Behavioral Biology 5041—P190 Kolth

Economics—all courses except 3970, 5152, 5970, 8990 reserved in 12 JohH

Education: Adult, Higher and Teacher—5103—1425 University Avenue S.E.

Educational Administration—all courses under 8270 reserved in 1425 University Avenue S.E.

Electrical Engineering—all courses reserved in 105 LindH

Elementary Education—all courses under 8916, except 3604, 5602, reserved in 1425 University Avenue S.E.

English 1012, 3851—12 JohH

Family Social Science 1001, 1025, 5001—130 CoFH or 12 JohH

Finance 3000, 3300, 3500, 8800—225 BA

Food Science and Nutrition 1602, 3472, 5790—130 CoFH

Forest Resources 5406—130 CoFH

French—all courses except 3970, 8970 reserved in 12 JohH

General College—all courses reserved in 20 NH

Geology and Geophysics—all courses reserved in 105 LindH

German—all courses reserved in 12 JohH

History and Philosophy of Education 3090—1425 University Avenue S.E.

Humanities—all courses reserved in 12 JohH

Industrial Education—all courses above 3900-3901-3902, except 8900-8901-8902, reserved in 125 PeikH

Institute of Technology 3501—105 LindH

Italian 1101-1102-1103—12 JohH

Journalism and Mass Communication 1101—12 JohH

Library 5101, 5221, 8402, 8411—12 JohH

Management 3001, 3002, 8006—225 BA

Management Information Systems 3098, 3099, 5101—225 BA

Marketing 3000, 3077, 3098, 8000, 8098—225 BA

Mathematics 0009, 1005, 1008, 1111, 1131, 1142, 5209—12 JohH  
3221, 3231, 5457, 5567—105 LindH

All other courses reserved in 12 JohH or 105 LindH

Mathematics Education—all courses except 5980, 8980 reserved in 1425 University Avenue S.E.

Mechanical Engineering—all courses except 3740 reserved in 105 LindH

Metallurgy/Materials Science—3400, 5481-5482-5483—105 LindH

Military Science 1014—108 Armory

Music 3791—12 JohH

Music Education 3011—1425 University Avenue S.E.

Physical Education—all courses under 5101, and 5620, 5740, reserved in 12 JohH

Physics 1031, 1275, 1285, 1295—105 LindH for IT students; 12 JohH for others

Portuguese 1001-1002-1003, 3603—12 JohH

Psychological Foundations 3380, 5110, 5120, 5121, 5305—1425 University Avenue S.E.

Psychology 1004—12 JohH

Public Health 3001, 3004—12 JohH  
3033, 5004, 5005, 5007, 5040, 5575—1360 Mayo

Quantitative Analysis 1050, 3055—225 BA

Recreation, Park, and Leisure Studies 3150, 5900—1425 University Avenue S.E.  
 Rhetoric 1147—12 JohH  
     1222, 1442, 3551, 3562—130 CofH  
 School Health Education 5402—1425 University Avenue S.E.  
 School Psychology 5300, 5514—1425 University Avenue S.E.  
 Secondary Education 5004, 5113, 5150, 5153, 5170, 5176, 5191, 5322,  
     5344, 5394, 5404—1425 University Avenue S. E.  
 Social Work 1001, 3984, 5010, 8250, 8901—12 JohH  
 Soil Science 5565—130 CofH  
 Spanish—all courses under 5732 reserved in 12 JohH  
 Special Education 5100, 5124, 5150, 5302, 5601, 5610, 5611—1425 University Avenue S.E.  
 Speech-Communication 1101, 3201, 3641, 5404, 5414—12 JohH  
 Studio Arts—all courses under 5320, and 5520, 5810, reserved in 12 JohH  
 Textiles and Clothing—all courses reserved in 130 CofH  
 Theatre Arts 1101, 1321, 1405H, 3311, 3312, 3326, 5803, 8311—12 JohH  
 Transportation 3054—225 BA  
 Vocational Education 5102, 5300—125 PeikH  
 Women's Studies—all courses reserved in 12 JohH

#### SUMMER SESSION—SECOND TERM

Accounting—1050, 1051—12 JohH; all other courses reserved in 225 BA  
 Aerospace Engineering and Mechanics—all courses reserved in 105 LindH  
 American Studies 1101—12 JohH  
 Architecture—all courses reserved in 105 LindH  
 Art Education 3009, 3010—1425 University Avenue S.E.  
 Art History—all courses reserved in 12 JohH  
 Biology 1011, 1103, 1106—12 JohH or 130 CofH  
     3041—P190 Kolth  
 Business Education 5111, 5112, 5116—1425 University Avenue S.E.  
 Business, Government and Society 3002—225 BA  
 Chemical Engineering 5901-5902-5903—105 LindH  
 Chemistry 1002—12 JohH  
     1005—130 CofH for Ag, For, HE; 105 LindH for IT; 12 JohH for others  
     3302, 3306—105 LindH for IT; 12 JohH for others  
     3499, 5126, 5133, 5521—105 LindH  
 Communication Disorders 3100, 3101—12 JohH  
 Composition 1001, 1002—12 JohH  
 Computer Science—all courses reserved in 105 LindH  
 Counseling and Student Personnel Psychology 5110, 5130, 5332, 5620—1425 University Avenue S.E.  
 Distributive Education 5105, 5106—1425 University Avenue S.E.  
 Economics—all courses except 3970, 5151, 5152, 5970, 8990—12 JohH  
 Educational Administration—all courses except 8270, 8271, 8272, 8273—1425 University Avenue S.E.  
 Electrical Engineering 3001—105 LindH  
 Elementary Education—all courses under 5602, except 3604—1425 University Avenue S.E.  
 English 1015, 1019, 3851—12 JohH  
 Family Social Science 5025, 5240—130 CofH or 12 JohH  
 Finance 3000, 3100, 3300—225 BA  
 Food Science and Nutrition 5404—130 CofH  
 French—all courses except 3970, 8970—12 JohH  
 General College—all courses reserved in 20 NH  
 Geology and Geophysics—all courses reserved in 105 LindH  
 German—all courses reserved in 12 JohH  
 History and Philosophy of Education 3090—1425 University Avenue S.E.  
 Humanities—all courses reserved in 12 JohH  
 Industrial Education 5100, 5101, 5102, 5103—125 PeikH  
 Journalism and Mass Communication 1101, 3121, 3241—12 JohH  
 Library 5401, 8223, 8224—12 JohH  
 Management 3001, 3004—225 BA  
 Management Information Systems 5100—225 BA  
 Marketing 3000, 3065, 3098, 8078—225 BA  
 Mathematics 0009, 1006, 1008, 1111, 1142—12 JohH  
     3221, 3231, 5458—105 LindH  
     All other courses reserved in 12 JohH or 105 LindH  
 Mathematics Education—all courses except 5980, 8980 reserved in 1425 University Avenue S.E.  
 Mechanical Engineering—all courses except 3740 reserved in 105 LindH  
 Metallurgy/Materials Science 5481-5482-5483—105 LindH  
 Military Science 1024—108 Armory  
 Music Education 3011—1425 University Avenue S.E.  
 Physical Education—all courses under 5134, and 5700, 5740—12 JohH  
 Physics 1032—105 LindH for IT students; 12 JohH for others



Psychological Foundations 3380, 5305—1425 University Avenue S.E.  
 Psychology 1005—JohH 12  
 Public Health 5032, 5300, 8002—Mayo 1360  
 Quantitative Analysis 1050, 3055—BA 225  
 Rhetoric 1147—JohH 12  
 1221, 1222, 3551, 5400—CofH 130  
 School Health Education 1500—1425 University Avenue S.E.  
 Secondary Education 5129, 5152, 5153, 5173, 5194, 5195, 5321, 5326, 5394—1425 University Avenue S.E.  
 Social Work 8407, 8902—JohH 12  
 Spanish—all courses under 5015 reserved in JohH 12  
 Special Education 5160, 5601—1425 University Avenue S.E.  
 Speech-Communication 1101, 3201, 3204, 5110—JohH 12  
 Studio Arts—all courses under 8110 reserved in JohH 12  
 Textiles and Clothing 3604/5600, 5628—CofH 130  
 Transportation 3604, 8264—BA 225  
 Vocational Education 5100, 5101, 5300—PeikH 125  
 Women's Studies—all courses reserved in JohH 12  
 Zoology 5052—Kolth P190

## TUITION AND INCIDENTAL FEES<sup>1</sup>

The following fees are payable each term by every full-time student (whether resident or nonresident) at the time of registration and must be paid before registration is complete:

### TUITION FEE (per term)

Per credit .....\$15.00

### STUDENT SERVICES FEE

Per term; not included in tuition fee .....\$26.00

Students taking 3 or more credits must pay the student services fee, which includes outpatient care at the Boynton Health Service. (Students with equivalent coverage may apply for an exemption of \$9.75—see page 21.) The student services fee does *not* include hospitalization benefits. Students who do not have private hospitalization must apply for this coverage at the time of registration, and an additional fee will be charged.

*Note*—Tuition fees for students in medicine, nursing, dentistry, and occupational therapy are the same as those during the regular academic year. Special tuition fees are collected for the Itasca Biology Session.

Summer tuition in the College of Veterinary Medicine will be calculated as follows:

1977—55% of academic year tuition

1978—78% of academic year tuition

1979—100% of academic year tuition

Graduate students who have passed their preliminary oral examinations and have been accepted for candidacy for the Ph.D. degree may register for 6 credits or less or for thesis-only for \$60 per summer term. The student services fee is optional with this category of registration; it may be paid to maintain required continuous registration.

Summer Session staff members are entitled to the same fee privileges in the summer as during the academic year.

For additional fee information, refer to the *General Information Bulletin*.

<sup>1</sup>Fees are subject to change.

## **Students With Coverage for Outpatient Direct Personal Health Services**

Students who are members of a plan that guarantees comprehensive outpatient direct personal health services on a prepaid basis, such as Group Health Plan, Inc., may apply for an exemption of \$9.75 per summer term from the student services fee. Students who qualify for and accept this exemption or who get a refund for this portion of the fee waive all outpatient benefits offered by the Boynton Health Service. Proof of coverage must be presented to the cashier in room W220 of the Health Service prior to registration. The Health Service cashier will complete a Partial Fee Exemption form indicating the amount of the exemption. This form, along with the student's registration blank, must be presented at the appropriate college window when registering. Students who fail to apply for the exemption prior to registration may apply for a refund during the first week of classes each term.

Health insurance that pays for medical care costs limited by deductible and coinsurance features cannot qualify for this exemption.

## **Minnesota Public Interest Research Group (MPIRG)**

MPIRG is a nonprofit, nonpartisan, student-controlled corporation representing student interests in areas such as environmental quality, consumer protection, resource planning, health care delivery, occupational safety, community housing problems, race and sex discrimination, corporate and governmental agency review, and similar matters of urgent and long-range concern.

A fee of 50¢ per term is charged to support MPIRG programs and operations. A student may decline to pay the fee at the time of registration or may obtain a refund at a location and date that will be announced in the college newspaper (Duluth, Morris, and Twin Cities campuses).

## **COURSE FEES**

*(All fees are charged per term unless otherwise indicated)*

Students will pay the following course fees in addition to tuition:

### **HEALTH SERVICE** (field trips and foreign study)

Required of students on University field trips such as those in anthropology, civil engineering, geology, mines, etc.  
—\$13 per summer term  
Students in University-sponsored foreign travel groups are required to sign up for University-sponsored hospital insurance if they do not have such coverage privately.

### **ITASCA BIOLOGICAL STATION**

Laboratory Fee—\$8.50  
Research Table Fee—\$5 per week<sup>1</sup>

### **MATHEMATICS**

Math 0009—\$75 plus student services fee

### **MODERN LANGUAGES**

German—\$275 for program in Munich, Germany

<sup>1</sup>In lieu of tuition. Researchers must also pay the \$8.50 laboratory fee.

## **MUSIC<sup>1</sup>**

Courses in applied music carry 2 credits (minimum of 5 hours of private lessons) per summer term. Fees for non-music majors are based on individual lessons: \$80 (0-2 credits). Music and music education majors at the 12xx or 13xx level in their major instrument pay \$55 per 2 credits. Music and music education majors at the 32xx or 33xx level in their major instrument (prerequisite 12 credits of 12xx or 13xx and qualifying exam) are eligible for a reduced rate of \$25 per 2 credits. M.F.A. and D.M.A. students taking applied music at the 83xx level also are eligible for the reduced rate of \$25 per 2 credits.

## **PHYSICAL EDUCATION**

PE 1205—\$20 per term

## **PUBLIC HEALTH**

PubH 5755 (Administrative Residency)—\$150

## **SOIL SCIENCE**

Soil 5565—\$25

# **SPECIAL FEES**

## **MUSIC PRACTICE ROOM**

5 hours per week for 5 weeks—\$1.75 per term

10 hours per week for 5 weeks—\$3 per term (25¢ per hour for each additional hour per week) Organ—25¢ per hour

## **PHYSICAL EDUCATION<sup>2</sup>**

### **Cooke Hall**

Locker and Towel Fee—\$6

Gym Clothing Rental Fee—\$8

### **Norris Hall**

Locker and Towel Fee—\$6

### **St. Paul Gymnasium**

Locker and Towel Fee—\$6

## **SPEECH AND HEARING CLINIC—Nonstudents**

Speech Therapy (days)—\$2 per session

Speech Therapy (evenings)—\$2.50 per session

Consultation (outpatient)—\$5

Evaluation (outpatient)—\$20

## **SPEECH AND HEARING CLINIC—Students**

Special Clinical Treatment—\$5 per term

## **MISCELLANEOUS**

Foreign Student Aid Fee—\$2 per term (required of all noncitizens)

Credentials Examination Fee—\$10 (\$15 for Graduate School, School of Dentistry, Law School, Medical School, and College of Veterinary Medicine [\$5 if previously registered in a degree-granting program of the University])

Graduation Fee (each degree; includes small diploma)—\$10

Laboratory Fee—\$4 (required in certain laboratory courses)

Large Diploma—\$7.50

Master's Thesis Binding—\$5

Ph.D. Thesis Binding—\$30

Special Examination—\$20

Record Service Fee—\$3 (required of all new students)

Orientation Fee—\$5 (required of all new undergraduate and graduate students)

<sup>1</sup>The music fees are treated as course fees; i.e., the fees are applied *in addition* to tuition for all students in all quarters and summer terms.

<sup>2</sup>Locker, towel, and gym clothing rental fees are for one or both terms.

## REGULATIONS GOVERNING GRANTING OF DEGREES

The Board of Regents will confer the degree appropriate to the course of study pursued, subject to the following conditions:

1. **Completion of Curriculum Requirements**—Certification by the University Records Office of the completion of all requirements of the course of study as outlined in the college announcement, or their equivalent as determined by the faculty of the college.

2. Recommendation by the faculty.

3. **Satisfaction of the Residence Requirement**—The student must earn at least 1 year's credit in residence at this University. If the term of residence is only 1 year, that year must be the senior year. In any case, the student must spend 2 quarters of the senior year in residence. This last requirement may be waived by individual colleges. In addition, special residence requirements must be met in several of the schools and colleges. Extension courses (not correspondence courses) may apply toward the residence requirement.

4. Payment or satisfactory arrangement of all financial obligations to the University.

5. Attendance at commencement is optional. Students planning to graduate during the summer may attend commencement in June or December.

6. Payment of Graduation Fee—each degree, \$10.

7. Payment of Placement Service Fee—required of candidates earning degrees from:

Duluth .....	\$10
College of Education (except nursing education) .....	15
Morris (optional) .....	10

## DEPOSIT CARDS

Deposit cards may be purchased from the bursar (or from the cashier, Coffey Hall, for biochemistry courses in the College of Biological Sciences). Chemistry and pharmacy cards are \$10; biochemistry (College of Biological Sciences and Medical School) and art cards are \$5.

Laboratory materials and breakage will be charged against the student's deposit card. Any unused balance will be refunded at the end of the course.

The student must present a deposit card to be assigned a laboratory desk. Veterans (Chapter 31) will receive information from their instructor concerning deposit cards and laboratory assignments.

## REFUND OF FEES

Students who cancel their Summer Session registration without attending class shall be allowed a 100 percent refund of fees. Students who cancel after having attended class will be granted a refund of fees on the following basis:

<i>Length of Term</i>	<i>80 Percent Refund for Attendance</i>	<i>60 Percent Refund for Attendance</i>	<i>No Refund for Attendance of More Than</i>
5 weeks	during 1st week	during 2nd week	2 weeks
4 weeks	1 to 4 days	5 to 8 days	8 days
3 weeks	1 to 3 days	4 to 6 days	6 days
2 weeks	1 to 2 days	3 to 4 days	4 days
1 week	1 day	2 days	2 days

## **AUDITORS**

Fees for auditors are the same as for students registered for credit. Permission to attend a class as an auditor may be granted by the dean of the college or school offering the course with the consent of the department concerned. The procedure for registration as an auditor is the same as for registration for credit, except that "auditor" should be indicated on the registration sheet in the credits column.

## **AMOUNT OF WORK**

A maximum of 10 credits is considered a full program for either term. Registration for more than 10 credits requires special permission from the Committee on Student Scholastic Standing or from the dean of the school or college in which the student is registered.

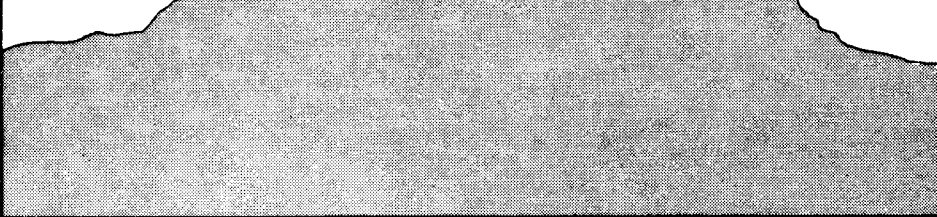
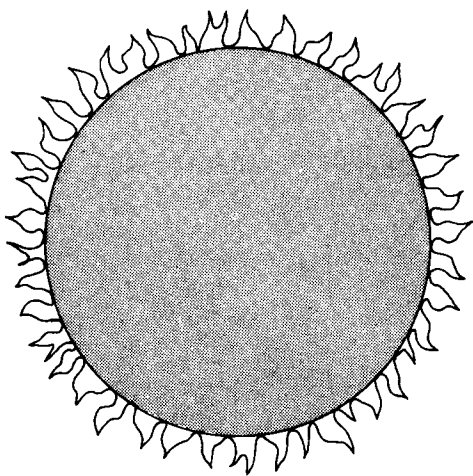
## **FINAL EXAMINATIONS**

Final examinations are normally held during the last scheduled class hour for each course.

## **GRADING**

Academic achievement of Twin Cities, Duluth, and Morris campus students is evaluated according to two grading systems: A-B-C-D-N and S-N; the N grade indicates no credit or no record. Students should check with their college office to find out which courses may be taken S-N and should indicate on their registration blank which type of evaluation is desired for each course. A good explanation of the system appears in the current *College of Liberal Arts Bulletin*. Graduate students should consult the *Graduate School Bulletin* section on grading.

*The University  
Services  
Cultural and  
Recreational  
Opportunities*



# Services

## HOUSING

### Minneapolis Residence Halls

Sections of Middlebrook Hall and Centennial Hall have been reserved for summer session students. Middlebrook is a coeducational air-conditioned residence on the West Bank that offers comfortable living in large double rooms with a 7-day (19-meal) food service program under the direction of a professional food manager.

Centennial is a coeducational non-air-conditioned residence on the East Bank that offers a wide variety of single rooms, and a limited number of double rooms, with a 7-day (19-meal) food service program under the direction of a professional food manager.

In both terms and in both halls the meal service begins on the first day of regularly scheduled classes.

Applications for residence will be filled in order of date received. To assure a choice of rooms, applications should be submitted as early as possible. For information and application forms write to: Housing Office, Comstock Hall, 210 Delaware Street S.E., University of Minnesota, Minneapolis, Minnesota 55455. The Housing Office telephone number is (612) 373-7542.

### St. Paul Residence Hall

Bailey Hall is an attractive coeducational residence hall offering comfortable accommodations in large double rooms. Spaces are available for summer session students and for conference participants.

A room and 7-day (19-meal) board contract will be offered for the first term only. Meals will be served beginning the first day of regularly scheduled classes. A room-only contract may be available for second term only. For application forms and information write to: Housing Office, Comstock Hall, 210 Delaware Street S.E., University of Minnesota, Minneapolis, Minnesota 55455. The Housing Office telephone number is (612) 373-7542.

### Off-Campus Housing—Private Residence

Rooms in private homes, rooming houses, fraternities, and sororities are available. Vacancy listings for all types of off-campus housing (including sublets, apartments, and houses) are available beginning in May.

Information about housing facilities and assistance in locating off-campus residence accommodations may be secured from the Housing Office, Comstock Hall, 210 Delaware Street S.E., University of Minnesota, Minneapolis, Minnesota 55455, for Minneapolis; or the Housing Office, 190 Coffey Hall, 1420 Eckles Avenue, University of Minnesota, St. Paul, Minnesota 55108, for St. Paul. The telephone number of the Minneapolis Housing Office is (612) 373-7542, and that of the St. Paul office is (612) 373-0822.

## **CAMPUS BUS SERVICE**

Detailed information about bus service to and from the Minneapolis and St. Paul campuses, East and West Banks, and Como Avenue parking complex is available at the main information center at the following locations: Coffman Union, West Bank Union, Morrill Hall, the St. Paul Student Center, Coffey Hall, the Housing Office in Comstock and Coffey Halls, and at the Transit Services Office at 2818 Como Avenue.

Information on city bus routes serving the University area, including express bus service between the campus and selected Twin Cities residential areas (Route 52), also is available at the above locations.

Schedules and fares are subject to change; call the Transit Services Office at 373-0374 for current information.

### **Intercampus Bus—Lines 13-A, 13-G, 13-J, and 13-U**

Free transportation between the Minneapolis and St. Paul campuses is available Monday through Friday on special buses labeled "Line 13—University of Minnesota."

During both summer terms, intercampus buses will leave Blegen Hall on the West Bank and the St. Paul Student Center simultaneously for the opposite campus, according to the following schedule:

7:05 a.m. to 1:25 p.m.—every 10 minutes  
1:25 p.m. to 5:25 p.m.—every 15 minutes

Buses that leave at 25 and 55 minutes after each hour between 7:25 a.m. and 4:55 p.m. will travel via University Avenue (Line 13-U).

Bus schedules may have changed since this bulletin went to press. Current schedules and route maps are available at the information centers listed above. Schedules also are posted at each bus stop along the route.

### **Route Key:**

Line 13-A: Travels from the St. Paul Student Center to Blegen Hall on the West Bank (and vice versa) via Como Avenue.

Line 13-G: Travels from the St. Paul Student Center to Blegen Hall on the West Bank (and vice versa) via Como Avenue ("Grove" bus).

Line 13-J: Travels *only* from the St. Paul Student Center to Jones Hall (and vice versa) via Como Avenue.

Line 13-U: Travels from the St. Paul Student Center to Blegen Hall on the West Bank (and vice versa) via University and Washington Avenues.

There is no charge to ride the intercampus buses, providing one boards and exits at on-campus stops. If one boards or exits at any off-campus stop, the fare is 30¢ or one punch of a special reduced-fare discount card. These discount cards, which allow 19 rides for \$5, can be purchased at any University bursar or cashier office.

### **East-West Bank Bus—Lines 13-A, 13-G, 13-U, and 24**

Free bus service also is available between the East and West Banks at 10-minute intervals between 7:05 a.m. and 1:25 p.m., and at 15- and 30-minute intervals



between 1:25 and 5:25 p.m., Monday through Friday. Lines 13-A, 13-G, and 24 travel between Blegen Hall and Jones Hall. Buses labeled "Line 13-U—University of Minnesota" travel between Blegen Hall and Lyon Laboratory.

## Como Avenue Remote Parking Complex

Free parking is available for over 700 cars at the Como Avenue parking complex, located near the intersection of Como and 29th Avenues S.E. (just a few blocks west of Highway 280). Follow the "U of M Parking" signs in the area. A 20¢ fare (40¢ round trip) is charged to ride the shuttle buses to or from the St. Paul or Minneapolis campus. Bus service to and from either campus is frequent: every 10 minutes between 7:10 a.m. and 1:30 p.m. and every 30 minutes the between 1:30 and 5:30 p.m. The bus trip to either campus takes approximately 5 minutes. For those not wishing to worry about having the correct change, bus fare cards offering 20 rides for \$4 can be purchased at any University bursar or cashier office.

## LOCKER RENTAL SERVICE

To rent a campus locker, purchase a locker deposit card for \$7 at any University bursar or cashier office and take it to one of the following locker rental offices:

For East Bank lockers: B-78 Coffman Union (376-3003)

For West Bank lockers: 110 Anderson Hall (373-0069)

For St. Paul campus lockers: 130 Classroom-Office Building (373-1021)

Rental rate (including padlock) is \$1 per summer term for full-size lockers and 60¢ per summer term for half-size lockers. Refunds for the unused portion of the \$7 deposit can be obtained when the locker is vacated.

### LOCKER LOCATIONS

#### East Bank

Aeronautical Engineering  
Appleby Hall  
Architecture Building  
Chemical Engineering  
Civil Engineering  
Electrical Engineering  
Fraser Hall  
Johnston Hall  
Lind Hall  
Murphy Hall  
Nicholson Hall  
Peik Hall  
Scott Hall  
Smith Hall  
Vincent Hall

#### West Bank

Auditorium Classroom Building  
Blegen Hall  
Rarig Center  
Studio Art Building  
Wilson Library

#### St. Paul

Agricultural Engineering  
Classroom-Office Building  
McNeal Hall

## UNIVERSITY POST OFFICE

Many post office services are available at the University contract stations located on the ground floor of Coffman Memorial Union in Minneapolis (telephone 373-2432) and in Coffey Hall in St. Paul (telephone 373-1612). Both locations are open Monday through Friday, 8:00 a.m. to 4:10 p.m. in Minneapolis and 9:00 a.m. to 4:15 p.m. in St. Paul.

All students registered in colleges located in St. Paul are assigned a post office box in which they will receive all mail, announcements, and University communications.

## **STUDENT COUNSELING BUREAU**

The Student Counseling Bureau, 101 Eddy Hall, offers counseling on a year-round basis to all students. This service is available to students in all of the University's colleges and schools at any stage of academic progress, from beginning freshmen to students at graduate and professional levels. The range of concerns brought to the Student Counseling Bureau is wide, including vocational choice, educational planning, reading and study skills improvement, interpersonal relationships, and personal development. Tests and inventories are often used to assist in the counseling process. Referrals are sometimes made to appropriate University and community resource organizations. There is no fee, and counseling and testing information is confidential.

Interested students should come to 101 Eddy Hall to see a counselor. Counselors are available from 8:00 a.m. to 4:30 p.m., Monday through Friday.

## **STUDENT EMPLOYMENT SERVICE**

The Student Employment Service, 30 Wulling Hall, will assist students seeking part-time work either on or off campus. Students should apply in person at the office after enrollment is completed and the class schedule is known. Chances of being placed depend on the supply of jobs and the student's qualifications and hours available. Frequently a job will provide valuable experience as well as financial assistance. Work for board and room is usually available.

## **BOYNTON HEALTH SERVICE**

The Boynton Health Service provides outpatient services during the summer session on a basis similar to that of any other quarter of the year. The same staff of physicians, dentists, and nurses is on duty. General outpatient services are provided without further charge to all students who have paid the student services fee. For certain services, such as dental work, prescription drugs, and eye glasses, special fees are charged.

The Health Service portion of the student services fee does *not* provide any hospitalization or surgical benefits. Instead, the Board of Regents requires that all students who pay the student services fee have hospital insurance protection. Students may purchase University-sponsored hospital-medical-surgical insurance during registration. Those who have adequate private hospital insurance or who are eligible for Medicaid or public assistance may apply for exemption from the University-sponsored hospital insurance fee. Students who qualify and wish to apply for this exemption must be prepared at the time of registration to supply the name of the insurance company through which they have coverage or to give their Medicaid or public assistance number.

A student who attends both summer terms is eligible for regular outpatient benefits without extra charge until Monday of Welcome Week in the fall.

For further information, visit the Business Office, room W226 of the Boynton Health Service, or call 373-3138.

## **LIBRARY FACILITIES AND SERVICES**

The University Libraries system, with over 4,000,000 volumes, is one of the ten largest of its kind in the United States. It provides the basic resources for the teaching

and research needs of the students and faculty of the University. The O. Meredith Wilson Library serves as the headquarters for the many units of the library system. The library handbook, *University of Minnesota Libraries, Twin Cities Campus: A Guide*, serves to direct the user to the correct location of specific materials and services.

### **O. Meredith Wilson Library**

This building contains the humanities and social sciences collections of the University Libraries. Located on the West Bank, it houses the general reference services, central technical services, and administrative offices of the library system.

Among the specialized collections housed in Wilson Library are: the Ames Library of South Asia; the James Ford Bell Library, which contains rare volumes dealing with exploration and trade from the sixteenth through the eighteenth centuries; the East Asian Library; the Middle East Library; and the Rare Books Division.

Offering specialized services and resources are the Reference Division, the Map Division, the Government Publications Division, the Business Reference Service, and the Listening Room, which houses a collection of spoken-word recordings.

### **Walter Library**

Until 1968 this building served as the University's central library. It now houses the Art Library; the Chemistry Library, including resources in science and technology; the College Library, primarily for undergraduate study; the Education Library, including psychology and library science materials; the Music Library; the Kerlan Collection of Children's Literature; the University Archives; and the Learning Resources Center.

### **Subject Libraries**

The needs of students in some of the specialized scientific and professional fields are generally met through the decentralized collections of various subject libraries. The Architecture; Bio-Medical; Engineering; Geology; Journalism; Law; Mathematics; Mines, Metallurgy, and Chemical Engineering; Natural History; Pharmacy; Physics; and Public Administration Libraries are located on the Minneapolis campus.

In St. Paul, the Social Welfare History Archives, 1925 Sather Street, and the Immigration History Research Center, 826 Berry Street, offer specialized resources in these two areas of study and research. The Manuscripts Division, 826 Berry Street, contains a variety of specialized manuscript collections.

### **St. Paul Campus Libraries**

The St. Paul campus is served by a central library that houses resources related to agriculture and home economics. Other departmental libraries serve the fields of Biochemistry, Entomology, Fisheries and Wildlife, Forestry, Horticulture, Plant Pathology, and Veterinary Medicine.

### **General Library Information**

For information about the Twin Cities campus libraries, call 373-2424 or inquire at the Reference Desk, first floor lobby, Wilson Library.

Summer session library hours are posted in each library or may be obtained by telephoning the library in question. Telephone numbers are listed in the *Student-Staff Directory*.

## **THE MINNESOTA UNION**

All Twin Cities campus students, through payment of the student services fee, become members of the Minnesota Union, an association of students, faculty, staff and alumni. The Minnesota Union Coordinating Board sets goals and allocates resources for the intellectual, cultural, social, and recreational services, programs, and activities offered by the member unions.

Three organizations comprise the Minnesota Union: Coffman Memorial Union, the West Bank Union, and the St. Paul Student Center.

### **Coffman Memorial Union**

Coffman Memorial Union (CMU) provides a diversified program that includes art exhibits, music performances, dances, film showings, lectures, and a comprehensive series of minicourses. Consult the Coffman Union Program Council calendar, the *Minnesota Daily*, or the summer recreation booklet, *Socially Speaking*, for specific program events, times, and dates.

Students are encouraged to join the Coffman Union Program Council (CUPC), a group of student volunteers and staff advisers who work together to plan and coordinate union programming. Stop in at the CUPC offices in room 220, or call 373-7600 for more information.

CMU facilities have been remodeled to make a wide range of leisure time activities available to the University community. Recreation and relaxation can be found in lounges on every floor, a games and recreation complex on the basement level, and an arts and crafts studio. Study carrels, a music listening center, a theatre/lecture hall, and art galleries offer places for the individual to spend quiet time in reflection or discussion with others.

Meeting and dining rooms as well as the Great Hall, Theatre/Lecture Hall, and Mississippi Room are available by reservation for group use. The U-YWCA, Twin Cities Student Association (TCSA), and many other student organizations have their offices on second floor.

Services are available at the Information Center, the MSA and MSA II student stores, the post office, newstand, lost and found/locker rental desk, and barber and beauty shops. Educational opportunities abroad can be explored through the International Study and Travel Center (ISTC).

For more information about programs, facilities, or services at Coffman Union, call 373-2403 during building hours of 7 a.m. to 10 p.m.

### **West Bank Union**

The West Bank Union (WBU) plans programs that offer learning experiences; interaction with students, faculty, and staff; and entertainment. Activities are organized by those interested, with assistance from an elected student board and staff advisers. Ideas and assistance in planning and presenting programs are welcomed—stop in at 110 Anderson Hall if interested.

West Bank Union facilities include common rooms in Anderson Hall for lounging, listening to music, reading, and playing table games; a common room for study, conversation, and playing chess in Blegen Hall; and the WBU Service Center (110 Anderson Hall) for program information, locker rentals, and general assistance.

The WBU Gallery exhibits artworks by University studio arts students and faculty members on the lower concourse of the Auditorium Classroom Building.

WBU Bijou films are shown weekly, once in the afternoon and once in the evening. The film schedule is available in the WBU office, 110 Anderson Hall.

## **St. Paul Student Center**

The air-conditioned St. Paul Student Center is open throughout the summer session from 7 a.m. to 10 p.m. weekdays. Complete information about the Student Center and campus activities may be obtained at the information desk of the center or by calling 373-1046.

Facilities include lounges, art galleries, a ballroom, a workshop, television sets, magazines, conference rooms, and a games area with bowling lanes, table tennis, and billiard tables. Outings equipment is available for rental and sale. Meeting rooms are available for groups.

The Rouser Room is open for breakfast, light lunches, and between meals snacks.

During 1977, construction of a substantial addition to the building will be under way. Every effort will be made to continue regular services despite the inevitable disruption that accompanies remodeling. The understanding and cooperation of the University community will be appreciated and eventually rewarded with expanded and improved facilities.



# Cultural and Recreational Opportunities

## RECREATION

The University of Minnesota, aware of the need for relaxation during the intensive accelerated summer academic program, plans a variety of recreational and cultural activities on campus at little or no cost to the student. Campus activities are listed—along with summer schedules for Twin Cities theatres, museums, and other groups—in *Socially Speaking*, a special publication for summer session students.

The location of the University makes accessible the resources of the many cultural and recreational facilities of a large metropolitan area. Lakes and lagoons... swimming beaches... picnic grounds in parks and along roadsides... evening concerts on lakeshores and in parks... art centers, museums, libraries... excellent stores for shopping and browsing... a wide choice of places for dining... as well as the many professional entertainments provided by a large city—all are within easy access by public or private transportation. Trips to the famous North Shore of Lake Superior or to one of the many lakeside resorts for fishing or relaxing are possible on weekends.

## CAMPUS SPORTS FACILITIES

Summer session students may participate in a variety of recreational activities such as golf, swimming, table tennis, softball, tennis, paddleball, and handball. Most of the activities are free, except for locker and towel charges.

University facilities include:

**Gymnasiums and swimming pools** for men and women in Cooke Hall, Norris Hall, and the St. Paul Gymnasium. Swimming pools in all three buildings are open for recreational swimming weekdays at scheduled hours.

**Baseball and softball diamonds** at Bierman Field.

**An 18-hole golf course, a 9-hole (par 3) golf course, and tennis courts** which may be used by regularly enrolled Summer Session students upon presentation of a fee statement and a nominal fee. The golf courses can be reached by intercampus bus.

Complete information on sports programs is available from the Cooke Hall Intramurals office, telephone 373-4200.

## CONCERTS AND LECTURES

Through the Department of Concerts and Lectures, Summer Session provides a variety of free entertainment. Blues, jazz, folk, opera, symphonic, modern, and chamber music as well as classical, modern, and folk dance are all part of the summer program. Many of these informal programs are held outdoors, and all are open to the public.

## **UNIVERSITY THEATRE**

Entertainment for all ages will be offered by the University Theatre this season. "The Black Crook," the first American musical comedy, will be performed on the Minnesota Centennial Showboat, located on the Mississippi River, beginning in mid-June and running for 10 weeks. Robert Moulton will direct.

Two Peppermint Tent productions for children will play in repertory at the Stoll Thrust Theatre in Rarig Center beginning the third week in June and running for 5 weeks.

"Romanoff and Juliet," by Peter Ustinov, will be presented at the Whiting Proscenium Theatre, also in Rarig Center, during July.

For information about any of the productions, call the Rarig Center ticket office at 373-2337.

## **BELL MUSEUM OF NATURAL HISTORY**

The James Ford Bell Museum of Natural History, 17th and University Avenues S.E., Minneapolis campus, features exhibitions of the wildlife of Minnesota, the Touch and See Room, the Jaques Gallery of natural history art, extensive research collections of birds, mammals, reptiles, amphibians, and fish, and the University's natural history library.

The museum's Touch and See Room is a special area that includes pelts, bones, and mounted heads of animals from all over the world. Everything is within easy reach of young children, and handling the items is encouraged. This air-conditioned part of the museum also contains a reading area where a wide collection of children's books is maintained by the Minneapolis Public Library Children's Department for parents and babysitters with young children.

The museum offers free admission and is open from 9 a.m. to 5 p.m., Monday through Saturday, until 9 p.m. on Wednesday, and from 2 to 5 p.m. on Sunday. Free guided tours are available to groups upon advance request. The museum has a wheelchair ramp and five wheelchairs and welcomes the handicapped and elderly. There is a bookstore in the lobby that also sells records of bird and animal calls, prints, and stationery. Call (612) 373-2423 for tour appointments or further information.

## **UNIVERSITY GALLERY**

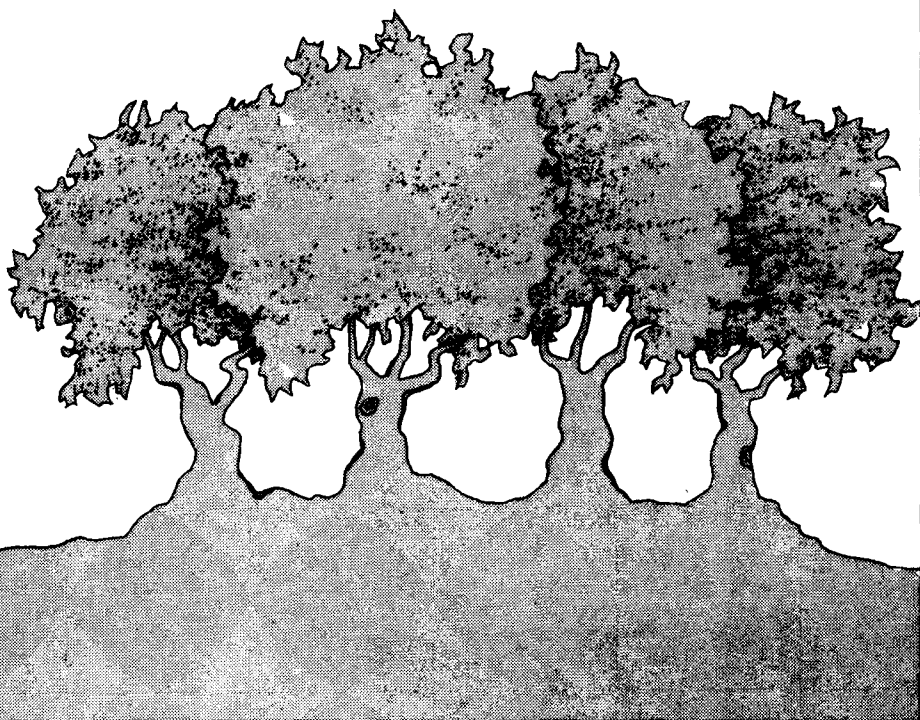
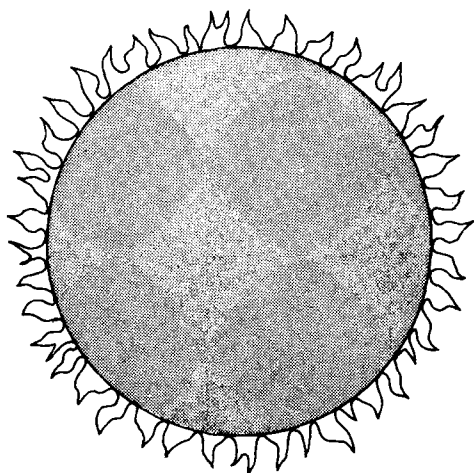
The University Gallery, located on the third and fourth floors of Northrop Memorial Auditorium, presents frequently changing exhibitions of photographs, paintings, sculpture, prints, and decorative arts.

Gallery facilities serve students to supplement classroom, studio, and library experience in the arts. Research and specialized materials from the Gallery's collection are available for study by appointment.

Framed original paintings and prints are available for rental to students and staff and for public display on campus. Call 373-5685 for rental information.

Gallery hours are 11 a.m. to 4 p.m. Monday through Friday and 2 to 5 p.m. on Sunday. Admission is free. The main office is located in 110 Northrop Memorial Auditorium (telephone 373-3424).

*Workshops,  
Institutes,  
and Other  
Special  
Programs*





# College of Education

## INSTITUTE OF CHILD DEVELOPMENT

The Institute of Child Development is one of the country's oldest and best known centers for research and training in child psychology. The institute offers graduate and undergraduate courses and conducts a nursery school for demonstration and research during the summer terms.

**Nursery School**—The Nursery School will be in session from 8:45 a.m. to 12 noon Monday through Friday, beginning June 15 and closing July 15. Applications for the enrollment of children will be accepted at the office of the Nursery School, 184 Child Development Building, 51 East River Road, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-9853. Tuition is \$63 for the term. Parents are responsible for the transportation of their children to and from the school.

## DEPARTMENT OF CURRICULUM AND INSTRUCTION

### Elementary Education

**Workshops in Art Education**—Two 2½-week sections of a techniques course are scheduled during first term. Section 1 of Art Media Techniques (ArEd 5001), June 14 to 24, will focus on bookbinding techniques and childrens' book designs with applications for general classroom use and examination of hardcover and Japanese binding techniques. Each participant will create a book intended for children.

The second section, June 27-July 8, will emphasize art appreciation and fostering art awareness in children. Participants will view works of art and reproductions, discuss art, and engage in studio art activities. The course is appropriate for elementary teachers who wish to develop learning units for use in the classroom.

During the second term, Improving Art Programs in the Schools (ArEd 5386) will meet August 8 through 12 for 7 class hours daily plus attendance at evening art events. Art teachers will learn skills, strategies, and practical principles for promoting and maintaining art programs as well as methods of communicating program goals to administrators, school board members, and the community. Prominent art educators from the University, State Department of Education, and national scene will provide expertise for strengthening the image of an art program.

For further information contact Professor Michael Day, 135 Wulling Hall, 86 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Elementary Science**—Elementary and middle school teachers may be especially interested in two first term offerings. Teaching Science in the Elementary School (Elem 5346) is a basic science methods course in which the methodology of process, inquiry, and discovery are explored. The course will include laboratory activities, curriculum material surveys, and pupil progress estimation. In Elementary School Science: Materials and Resources (Elem 5350), participants survey printed and visual

resources and learn how to use such items as microscopes, telescopes, cages, containers, display materials, and game and circuit boards in teaching science. Every effort will be made to adjust the content and activities of both courses to the background of the participants. The credits may be applicable to related area courses in an M.Ed. program in elementary education.

## **Secondary Education**

**Secondary Science Education**—Two secondary science workshops will be offered each term for teachers from all levels (see SeEd 5394). The workshops seek to improve instruction through direct experience with materials and methods of science teaching. They are scheduled to allow students to register for one or more of the four offerings. Credits may be applicable to advanced degree programs upon approval of the adviser.

During the first term, section 1 (June 14-24) will concentrate on materials and techniques for teaching environmental education in the classroom. Included will be laboratory work, field trips, and speakers on topics related to value questions concerning the environment. Students will design exercises and experiments for use in the classroom. The topic for section 2 (July 5-15) is Gaming in the Science Classroom. Students will construct simulations and learning games that could be used in teaching science and will evaluate such simulations and board games presently available to science teachers.

Secondary-level science workshops that will be offered during the second term are Teaching Weather (July 19-29) and Teaching Science Through Toys (August 2-12). In section 1, students will design, build, and use visuals and simple instruments of value in teaching and capable of duplication by their pupils, using principles of meteorology as course materials. Section 2 will show how to use toys in demonstration and laboratory exercises to gather data to derive science principles and to illustrate the application of basic principles of science.

**Second Languages and Cultures**—Three sections of a workshop (SeEd 5191) on teaching second languages and cultures are scheduled during first term to meet the needs of the in-service teacher. Section 1 is designed for curriculum directors, department chairpersons, and/or teachers in a school system. The course has two objectives: (1) to prepare educators for compliance with state legislation in developing plans for Planning, Evaluation, and Reporting (PER bill emphasis), of essential learner outcomes in a language program and (2) to give direction to the statewide effort to comply with the PER bill. Participants will identify ways of reaching and evaluating identified outcomes for each specified level of language work. The class meets during first term. For further information, contact the program director, who is also chairing the state committee, Professor Dale Lange, 228 Peik Hall, 159 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

Section 2 of the workshop meets June 13 through 28 and provides experience for American teachers of German in language, corrective phonetics, language teaching methodology, and modern German culture from a German point of view. Classes will be conducted in German, and participants will receive 6 graduate-level credits.

Section 3 of the workshop meets June 29 through July 15 and provides the same experience as section 2 for American teachers of the French language. All classes will be conducted in French by two professors from the Centre de Linguistique Appliquée, Université de Besançon, France. Participants will receive 6 graduate-level credits for the workshop.

For further information on sections 2 and 3 of the workshop, contact Professor Helen L. Jorstad, 230 Peik Hall, 159 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Language Arts**—Two workshops for secondary language arts teachers are scheduled during second term, from July 19 through August 9. English Language Arts Curricula in the Secondary School (SeEd 5194) will provide theoretical and thematic bases for development of curricula, examining historical patterns and current trends. The second workshop, Curriculum Development in Secondary School English Language Arts (SeEd 5195), will provide an opportunity to examine recent materials, exchange ideas, and plan courses and units for classroom use. Particular attention will be given to written composition and ways in which writing activities can be incorporated into the curriculum.

Also of interest during second term, July 19 through August 9, is Teaching Film (SeEd 5326), designed primarily for English, social studies, or art teachers who use film in instruction or teach aspects of film or television. Topics include methods for planning film/media units, critical response to film/television aesthetics and genres, film techniques, students' viewing interests, selecting or renting films, characteristics of documentary and animated films, media and society, and an introduction to Super 8 filmmaking. Participants will view 20 to 30 short films.

## **DEPARTMENT OF EDUCATIONAL ADMINISTRATION**

**Administrator Development Seminar**—Assessment and counseling, skill development, and contemporary issues in the field are the main topics of a program offered only in the summer to students in educational administration at the program entrance level. Applicants for admission to degree programs in educational administration are encouraged to participate.

Work in EdAd 5130, Administrator Development Seminar, is combined with EdAd 5139, Laboratory in Decision Making (see the Course Descriptions section for registration requirements). Participation in the full 6-credit block is mandatory. Preapplication is required; inquiries should be addressed to the Department of Educational Administration, 225 Health Service Building, 1518 N. Cleveland Avenue, University of Minnesota, St. Paul, Minnesota 55108.

**Laboratory in Decision Making**—EdAd 5139, section 2, will be offered for 3 credits from June 27 through July 8 to analyze the administrative decision making process through the use of a simulation and case study approach. The course depicts the nature, scope, source, and, to some extent, frequency of decision issues facing school principals.

**Legal Implications of Acts by School Boards, Administrators, and Teachers**—EdAd 8224 will be offered for 3 credits from July 1 through 15. The constitutional, statutory, and common law bases of education will be examined in six units of study: the curriculum and the law; constitutional rights of students; teacher-contract administration; school governance; tort liability of school districts and employees; and defamation and the handling of student and teacher records.

**Public School Personnel Programs**—EdAd 8227 will be offered for 3 credits from June 14 through 24, providing basic personnel administration background for teachers, administrators, and other educational personnel. Simulations and role play

exercises will be used to develop knowledge and skills in the selection, assignment, evaluation, and development of educational personnel. Other topics will include grievance processing, negotiations and collective bargaining, and salary and fringe benefit scheduling.

**Practicum in School Community Relations**—EdAd 5231 is offered for 3 credits from June 14 through 24 to help educators develop and use the tools necessary to become an effective role communicator within an ongoing school-community relations program. Faculty, consulting specialists, and students will deal clinically with internal and external communications, working with the news media, community organization, communicating with parents, establishing a building-level public relations program, and other topics. These themes will be developed in workshop periods, group critique sessions, idea exchanges, and individual consultation.

## **Educational Administration Two-Year Programs and Doctoral Programs**

Several pertinent courses, workshops, and seminars are available this summer for students pursuing advanced graduate programs leading to the specialist certificate in school administration: elementary and secondary school principals, superintendents, school business administrators, and superintendents of intermediate units.

The Department of Educational Administration also offers programs leading to the doctor of education (Ed.D.) and doctor of philosophy (Ph.D.) degrees for administrators in elementary and secondary schools and educational agencies. These programs emphasize a breadth of preparation in education and substantively related fields and include heavy concentration in the history and philosophy of education, social psychology, and curriculum and instruction.

Brochures describing the 2-year and doctoral programs are available from the Department of Educational Administration, 225 Health Service Building, 1518 N. Cleveland Avenue, University of Minnesota, St. Paul, Minnesota 55108.

## **SCHOOL OF PHYSICAL EDUCATION, RECREATION, AND SCHOOL HEALTH EDUCATION**

### **Physical Education**

In addition to the special offerings listed below, the following courses will be offered during the second term on a 2 hour per day, 3-week basis: PE 5134, Perceptual-Motor Development in Childhood; PE 5136, Psychology of Coaching; PE 5140, Biomechanics of Sport Safety; PE 5150, Teaching Elementary School Physical Education; and PE 5170, Foundations of Physical Education.

**Workshop: Dance in Education**—Students who take PE 5700, July 18 through August 5, register for 6 credits in an intensive workshop on modern dance as a creative activity and as a performing art. The workshop will be taught by the Contemporary Dance System and Anna Sokolow of New York; the company has performed and conducted workshops throughout the United States. Emphasis will be on modern dance technique, ballet, dance improvisation and composition, dance repertory theatre, movement for athletes, and movement for actors. Because enrollment is

limited to 145 students, those interested are encouraged to make early inquiry to Nadine Jette, 159 Norris Hall, 172 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Coaching of Individual, Dual, or Team Sports**—A concentrated 6-day offering on coaching soccer (PE 5740), open to men and women, is scheduled June 14 through 21. Instructors for the workshop are Richard Hunt, licensed FIFA soccer coach and president of the Minnesota State Officials Association; and March Krotee, coordinator of the University's Physical Activity Program, selected by the National Association of Intercollegiate Athletics as one of its top eight soccer coaches in 1975 and coach of the state of Virginia all-star teams from 1972 to 1974 and of the national soccer teams of Jamaica for 3 years. Emphases of the workshop will include the practical and theoretical applications of the techniques of coaching soccer. A written assignment and a final examination will be required.

**Physical Education Equipment**—A 3 credit workshop (PE 5112) on the manufacture, selection, purchase, and maintenance of physical education and athletic supplies is scheduled June 27 through July 15. Instructors for the course will be Eloise Jaeger and selected guest lecturers. Students will have an opportunity to explore design, materials, safety, use, and cost factors through demonstrations of equipment and a field trip to the 3M Company laboratories.

## **Recreation, Park, and Leisure Studies**

**Leadership in Outdoor Recreation**—Rec 3150 will deal with outdoor recreation programming and leadership with emphasis on organizing, guiding, and protecting groups of all ages in outdoor recreation settings. Topics will include expedition and group behavior, outdoor leadership, equipment, trip planning, administration of organized outdoor recreation programs, camping for conservation, and techniques for backpacking and taking canoe trips. The class is for people with a general interest and background in outdoor recreation as well as for those seeking specific training in outdoor leadership. Lectures will be weekday afternoons, June 21-July 5. Section 1 will go on a backpacking trip the weekend of July 1-3. Section 2 will go on a canoe trip the weekend of June 24-26. In addition to tuition, there will be a charge of approximately \$15 for equipment rental and food for the trips. Further information may be obtained from Leo McAvoy, 209 Cooke Hall, 1900 University Avenue S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Workshop: Contemporary Issues in Leisure Services**—An interdisciplinary approach to the programming of outdoor education concepts, ideas, and experiences, with emphasis on preparation for leadership in the field, will be presented June 13 through 17 in a variety of settings. Some formal classes will be conducted during evening sessions; however, most of the time will be devoted to direct outdoor field experience and field trips. Participants will live in semidormitory accommodations at Camp St. Croix, 30 miles from Minneapolis. The workshop, Rec 5900, will stress teaching and learning techniques best achieved through close association with natural resources of the outdoor laboratory environment. It is open to in-service teachers, recreation leaders, and college juniors, seniors, or graduate students. In addition to tuition, there will be a charge of \$35 for room, food, and mimeographed learning materials. Information is available from Elizabeth Griffin, 203 Cooke Hall, 1900 University Avenue S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## **School Health Education**

Two courses of particular interest to educational personnel are offered. In the first term, faculty from the School of Public Health and Department of Mortuary Science join faculty in school health education to present Hlth 5402, Death Education in Contemporary Society (co-listed as PubH 5040). Hlth 5400, Topics: Educational Aspects of Drug Use and Abuse, is scheduled in a concentrated, 3-hour class from July 25 through August 5.

## **DEPARTMENT OF PSYCHOEDUCATIONAL STUDIES**

### **Counseling and Student Personnel Psychology**

Staff members in counseling and student personnel psychology again will offer a 2-week workshop in career development for educational personnel working in school and college settings. Students register for 6 credits in CSPP 5300, Workshop in Counseling Psychology, offered June 18 through July 1. This course is designed to provide leadership training for personnel involved in programs related to career education, career development, and sex-role stereotyping. Registration is limited to 40 students, with preference given to teams of educators from institutions participating in Project BORN FREE. Course information and applications for admission are available from Professor L. Sunny Hansen, 139 Burton Hall, 178 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455; telephone (612) 373-0202.

### **Special Education**

**Teaching Children With Emotional Disturbances**—A 12-credit institute (SpEd 5302, section 1, and SpEd 5601, section 1) centering on course work and practica related to SLBP:ED certification will be offered from June 13 through August 5. Credits earned may be applied to SLBP:ED certification, the M.A. degree, or another graduate degree, with the consent of the student's adviser. Priority for enrollment is given to adult special and graduate students in special education seeking SLBP:ED certification. Teachers, administrators, and other professionals seeking knowledge and skills related to educational programming for disturbed children also will be admitted. The workshop includes an intensive practicum experience, extensive course work, individual assignments, and student-selected learning experiences. Requests for information and/or admission should be directed to Professor Robert W. McCauley, Special Education Programs, 106 Pattee Hall, 150 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Social Aspects of Special Education**—SpEd 5302, section 2, will be offered during first term and will include studies in the sociology of special education: social aspects of childhood disability, deviance, and delinquency; an historical approach to special education and services; disability, race, tracking and IQ; residential institutions; and law, public policy, and child advocacy. Requests for information should be directed to Professor Steven Taylor, Department of Social, Psychological, and Philosophical Foundations of Education, 203 Burton Hall, 178 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

**Teaching Exceptional Children (SLBP Resource or Clinical Teacher Sequence)**—The special education staff will offer practica related to SLBP:LD teacher certification in a training institute first term. The 6 credits earned in SpEd 5610 and SpEd 5611 may also be applied to graduate degrees by students admitted to the Graduate School. Institute participants will work with learning-disabled children, concentrating on the remediation of academic problems and the quality of interaction between teacher and learner. Enrollment will be limited to students who have completed SpEd 5110 and SpEd 5111 during the academic year 1976-77. Requests for information about the institute should be directed to Professor Virginia Bruininks, Special Education Programs, 109A Pattee Hall, 150 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## **DEPARTMENT OF SOCIAL, PSYCHOLOGICAL, AND PHILOSOPHICAL FOUNDATIONS OF EDUCATION**

### **Human Relations**

**Introduction to Human Relations**—PsyF 3380 fulfills one-half of the College of Education's human relations requirement for *undergraduate* students. It is designed to assist the student to respect human diversity and personal rights, to develop positive feelings toward all humanity, to more fully understand attitudes and behavior, and to become familiar with the major theoretical approaches that explain the processes of personality development. Scheduled in a lecture/laboratory format during each term, the course is open only to juniors and seniors in the College of Education.

**Workshop in Human Relations**—This 6-credit workshop, PsyF 5305, meets the state of Minnesota requirement (Edu 521) for course work and experience in human relations. It is intended to improve classroom and school learning climates and human communication by helping participants achieve learning goals: understanding the contributions and life-styles of the various racial, cultural, and economic groups in our society; recognizing and dealing with dehumanizing biases, discrimination, and prejudices; creating learning environments that contribute to the self-esteem of all persons and to positive interpersonal relations; and respecting human diversity and personal rights. The course is offered during each term and is *not* open to undergraduate students.

Questions about requirements and registration for either human relations course should be addressed to Professor Chester Oden, 206 Burton Hall, 178 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## **DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION**

VoEd 5300, Philosophy and Practice of Vocational Education, which is required for vocational certification in Minnesota, will be offered twice during the first term, June 14-24 and June 27-July 1, and once during the second term, August 1-12.

Two courses have been scheduled July 5-15 to meet the needs of current and potential vocational administrators. VoEd 5102, Special Topics in Administration: Planning Vocational Programs, will meet in the morning and VoEd 5500, Introduction to Vocational Education Administration, in the afternoon.

All vocational educators are facing the challenge of providing appropriate instruction to disadvantaged and handicapped students. VoEd 5100, Special Topics in Instruction: Working With Special Needs Students, will help teachers design instruction for special needs students within the regular classroom/laboratory setting. The course will be offered August 1-12.

New federal legislation requires local vocational programs to utilize advisory committees. Consequently, a 3-day workshop on this subject, VoEd 5102, Special Topics in Administration: Utilizing Advisory Committees, will be offered August 15-17 for laypersons and educators.

VoEd 5101, Special Topics in Curriculum: Small Business Management, is designed to prepare teachers to utilize curriculum materials, accounting procedures, and business analysis concepts in teaching small business management. The course will be offered August 1-5.

## **Distributive Education**

**High School-Postsecondary Distributive Education**—This workshop is designed to assist school personnel in planning a total distributive education program within a school district or districts, including curriculum planning, use of training stations, role of advisory committees, and orientation of students. Enrollment of at least one high school teacher-coordinator and one postsecondary distributive education person from the same school district is encouraged. Students enroll in DE 5400 and DE 5600, section 1, concurrently for a total of 6 credits. The workshop meets June 20 through July 8.

**Marketing Occupations for the Handicapped and the Disadvantaged**—This 3-credit course, DE 5325, will be offered July 11-15. Students will work with business personnel to determine opportunities and procedures for placement of handicapped and disadvantaged persons and implications for curriculum planning.

**Coordination Techniques**—Concurrent registration in DE 5105, 5106 (July 19-29) will combine study of coordination theory and principles with application to specific situations.

## **Industrial Education**

The Industrial Materials Laboratory for Nonmajors (Ind 5400) is designed for elementary teachers, recreation and park personnel, and occupational therapists interested in using projects in woods, metals, plastics, and printing in their work. Basic instruction includes planning, construction, and use of hand and power tools.

Those interested in fulfilling the work experience required for industrial arts or vocational certification may earn the equivalent of 2 hours of work experience for each 1 hour on the job through registration in Ind 5100, 5101, 5102, and 5103; 1 University credit is earned for each 100 hours of work. Individuals are responsible for securing their own employment and must have their work station approved by the program coordinator prior to registration. Information about the program is available from Stephen Miletich, 125 Peik Hall, 159 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455; telephone (612) 373-7791.



Two sections of Ind 5600, Instructional Materials Laboratory, are scheduled during second term. Section 1, July 19-29, will focus on topics of production, marketing, industrial relations, and financial affairs for development of instructional materials for teaching manufacturing. Section 2, August 1-12, is designed for secondary and postsecondary school advisers who work with the organization and operation of Vocational Industrial Clubs of America in schools.

## **COURSES OFFERED THROUGH OTHER COLLEGES**

Among courses and workshops offered outside of the College of Education specifically for teachers or in areas of importance to educators are the following: for teachers of forestry (FR 5406), aerospace engineering (AEM 5001), Minnesota history (Hist 5381), measurement and the metric system (I of T 3501); for advisers of high school yearbooks, newspapers, and magazines (Jour 5182).

## *College of Forestry*

**Forestry Workshop for Teachers**—The College of Forestry sponsors a 5-credit workshop for teachers at the Cloquet Forestry Center, Cloquet, Minnesota. The course, FR 5406, will be held for 2 weeks during the first term, June 13-24.

Forest ecosystems and forest management are studied by teachers in lecture and laboratory sessions. In field exercises, techniques and materials are developed for the teaching of principles of forestry in indoor and outdoor classrooms. Tours to forest and wildlife research and management units and utilization locations and discussions of contemporary forestry issues by guest lecturers are planned.

Objectives of the course are threefold: (1) to increase the student's understanding of the forest ecosystem and ability to communicate this understanding to others, (2) to convey to the student an appreciation of the various roles of the forest and the processes of forest management in modern society, and (3) to impart skills and techniques and develop materials usable in teaching about the forest ecosystem and forest management in indoor and outdoor classrooms.

## *College of Liberal Arts*

### **FOREIGN TRAVEL AND STUDY**

#### **SPAN Study Abroad**

SPAN, the Student Project for Amity Among Nations, sponsors foreign study with the goal of enhancing international friendship and understanding. The program is a cooperative effort of the University of Minnesota and 13 other Minnesota colleges. Its 1977 student groups will study in the Fiji Islands, Ireland, Greece, and Peru.

The SPAN program involves extensive preparation, 8 to 10 weeks abroad, and production of a research paper. Preparation, through the year preceding the summer abroad, includes study of the language, history, social and political ambience, and

culture of the area to be visited. Each "country group" of about a dozen students meets regularly with a faculty adviser. During their period of study abroad, students conduct interviews, visit appropriate institutions, use libraries and other research facilities, and often live with local families. Upon return, they complete their SPAN paper, a major academic report growing from their study at home and abroad. Upon satisfactory completion of the paper the student earns 12 quarter credits in the Foreign Studies Seminar, FS 5960.

Students must apply for SPAN appointments no later than the fall quarter preceding the summer abroad. Information about 1978 applications may be obtained from Professor Theofanis Stavrou, History Department, 652 Social Sciences Building, 267 19th Avenue S., or the SPAN Office, 103 Nolte Center, 315 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

### **Summer Term in Germany**

College students or high school graduates who have completed a basic course in German are invited to take part in a summer program at Ludwig-Maximilians-Universität in Munich, Germany, during first term. CLA credit courses to be offered (in German) include conversation and composition, contemporary Germany, and modern German literature. Permission of the German department is required. Consult the Summer Session office or Professor Frank D. Hirschbach, Department of German, 216 Folwell Hall, 9 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455, for further information.

### **Archaeological Excavation: Israel**

The Tel Aviv University Institute of Archaeology will conduct excavations at Tel Mikhal, Israel, July 3-29, under the direction of Dr. Zev Herzog. Participants may apply the 4 credits earned in Clas 5120 toward a major in ancient Near Eastern studies or in classics. For information about the program and its prerequisites and requirements, write to Professor William Coulson, Department of Classics, 310 Folwell Hall, 9 Pleasant Street S.E., Minneapolis, Minnesota 55455; or telephone Steven Derfler, (612) 373-0186.

### **Archaeological Method: Sicily**

A field school in archaeological method will be conducted by the Center for the Archaeological and Anthropological Research of the Belice Valley (Sicily) at the site of Castelazzo, July 2 through August 7. Four credits may be earned through Clas 5120 upon successful completion of the course. For further information write Professor Al Leonard, Department of Classics, 310 Folwell Hall, 9 Pleasant Street S.E., Minneapolis, Minnesota 55455; telephone (612) 373-3873.

## **FIELDWORK OPPORTUNITIES**

### **Field Experience Learning**

Students who have arranged a volunteer or salaried summer project in an appropriate setting may often register under a directed studies course number to receive credit for their work. Those with Urban Corps or Governor's Internship experience, as well as those who have planned a project or would like to do so, may

consult an adviser in the appropriate department or in the Office for Special Learning Opportunities (201A Wesbrook Hall, 373-7550) about planning such a project for credit.

Registration for these projects, when approved, is under departmental course numbers 3970 or 5970, or appropriate Interdepartmental Directed Studies number 3970 (see page 178).

## **Geography Field Session**

A field research seminar, Geog 5701, 5701X, and 8700, scheduled during the first term, will study in the area from the Twin Cities to the Snowy Range of southeast Wyoming and the Yellowstone River of Montana. The course will focus on present and former geographies of the northern grasslands. It will examine historical and prehistorical occupations and economics; the environmental record as seen through vegetation, soils, and landforms; and current land, water, and energy resource uses that are competing to alter the environment drastically.

Reservations must be made by June 8. For costs, details of the program, transportation arrangements, and information on field expense subsidy, consult Dwight Brown, Department of Geography, 533 Social Sciences Building, 267 19th Avenue S., University of Minnesota, Minneapolis, Minnesota 55455.

## **INTENSIVE LANGUAGE STUDY**

Beginning Arabic, Italian, Portuguese, Russian, and Spanish and third-year Japanese will be taught in intensive 10-week courses, each offered for 15 credits for the equivalent of 3 quarters of study.

For information on the language study and individual departmental requirements, see the Course Descriptions section of this bulletin or consult the appropriate department.

## **Ulpan Hebrew Language Course**

The "Ulpan" is a unique approach to teaching Hebrew. Developed in Israel at a time when a large adult immigrant population needed to acquire a working knowledge of Hebrew rapidly, the Ulpan was designed to create teaching techniques and instructional materials. The practical goal was to enable adults of widely differing educational experiences and ability, as well as diverse linguistic background, to quickly make a linguistic and cultural adjustment to a new environment.

The Ulpan Hebrew language course offered this summer will extend over the two terms, June 13 through August 19. It will provide intensive immersion in the language as well as learning experiences in Israeli culture. The program is designed for individuals who have not previously studied Hebrew. Students will spend 15 hours per week in class during the 10 weeks. In addition to more formal class sessions, special learning activities that involve active, natural and spontaneous use of Hebrew will include games and sports activities, Israeli folk dancing and singing, meeting with delegates of Israeli students from Rishon le'Tzion, and sessions with Israeli artists, musicians, and other professionals.

For further information, write Professor Jonathan Paradise, Program in Ancient Near Eastern and Jewish Studies, 178 Klæber Court, 320 16th Avenue S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## **OTHER SPECIAL OPPORTUNITIES**

### **Journalism and Mass Communication**

The annual 3-week Publications Workshop, June 14 through July 1, is designed principally for high school journalism teachers and newspaper, yearbook, and magazine advisers but open to others. The course, Jour 5182 (4 credits), is scheduled in the afternoon. The workshop has the cooperation of the National Scholastic Press Association (for secondary schools) and the Associated Collegiate Press.

The School of Journalism and Mass Communication (SJMC) offers courses in each term for undergraduate and graduate students interested in professional training. A number of the courses are open to majors in other fields who wish to study mass communication.

Workshops for high school newspaper, yearbook, and magazine staff members are offered by the SJMC July 18 through August 12. Details may be obtained from the MHSPA, 110 Murphy Hall, 206 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455. Those workshops do not offer college credit.

### **Media Generalist Certification Program**

The media generalist certification program is offered cooperatively by the College of Education and the Library School. Certified school teachers interested in media applications in schools who wish to apply for certification as a media generalist should write for program and application information to Robert D. Tennyson, Director, Media Generalist Program, College of Education, 117 Burton Hall, 178 Pillsbury Drive S.E., University of Minnesota, Minneapolis, Minnesota 55455.

### **Linguistics**

An intensive English language and orientation program will be offered July 22 through September 9. The program will focus on English language instruction and orientation to U.S. life and education. It will include 25 hours per week of classroom instruction in listening, grammar, reading, writing, and speech pronunciation; language laboratory practice; and field trips, out-of-state visits, and an American in-home experience.

Applications for the program can be obtained by contacting the Coordinator of Admissions, Intensive English Language and Orientation Program, 717 East River Road, University of Minnesota, Minneapolis, Minnesota 55455.

### **Minnesota History Workshop**

Designed for elementary and secondary school teachers, the Minnesota History Workshop (July 18-29) offers study of Minnesota historical materials and methods of using local history in the classroom. The workshop is held at the Minnesota Historical Society in St. Paul to introduce teachers to the society's collections. Those who have not enrolled in previous workshops, register for 5 credits in Hist 5381; first time "repeaters" may also take the workshop for 5 credits but should register for Hist 5970, section 2. Further information is available from the Summer Session office.

## **New Testament Studies**

A new coordinated program in the language and culture of the New Testament is expected to draw a national clientele of widely varied backgrounds. In the first summer term, accelerated introductions in beginning Greek as the language of the Bible (Grk 1101-1102 or 3051-3052) will be offered. In the second term, a reading course will study the New Testament and related texts in Greek (Grk 1103/3120/8120). Also in the second term, a course on New Testament thought, people, and scholarship (Clas 3072/5072) will be offered; knowledge of Greek is not required for the course, but students who read Greek (especially those concurrently enrolled in 1103/3120/8120) will be able to enrich their work by use of texts in the original. There will be a commons room for use by participants, visiting scholars, and discussion groups.

Though the courses will be coordinated, each may be taken separately; individual programs may be designed for one or both terms. For further information, write to Professor A. Thomas Kraabel, Department of Classics, 310 Folwell Hall, 9 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455; or telephone (612) 373-3912.

## **Philosophy of Modern Literature**

Philosophical ideas expressed in major works of modern literature will be examined in a course to be offered during the first term, Phil 5911. It is said that some novels "teach the reader how to live," and the emphasis of this course will be on the lessons of literature and the linguistic means by which they are conveyed.

## **Small Group Communication Workshops**

Direct experience as a teaching-learning device in leadership situations will be provided in Spch 5414. Experiences will deal with the nature of authority, power, and interpersonal and intergroup problems. The workshop will meet in small groups June 14-26 (see the course listing for a schedule).

An advanced section of 5414 (5110, Authority and Power in Task-Oriented Communication: prereq 5414) will meet in small groups July 19-30.

## **FOR HIGH SCHOOL STUDENTS**

### **High School Forensics Workshop**

During the first term, the Department of Speech-Communication will offer a forensics workshop for high school students interested in competitive speech activities. College speech students who wish to observe the work of high school students should apply to Barry Brummett or Steve Mudd, 404 Folwell Hall, 9 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

### **High School Music Project**

The Department of Music, in cooperation with the Minnesota Orchestra, will invite 160 specially qualified high school musicians to spend 4 weeks on campus to participate in the annual music project. The program, running from June 19 to July

17, will include intensive band, orchestra, and chorus rehearsals and concert performances; introduction to composition and "creative music"; music theory and literature; private applied vocal lessons; repertory and coaching sessions; chamber music rehearsals and orchestral repertory sessions with the Minnesota Orchestra; weekly solo recitals and chamber concerts; and social and recreational activities.

Auditions for admission to the program are open to all high school students in the Midwest. Information and application forms should be requested from Professor Richard E. Sieber, 320 Westbrook Hall, 77 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## Department of Military Science

### UNIVERSITY ARMY ROTC SUMMER PROGRAM

In addition to a baccalaureate degree in any major, University of Minnesota students have the opportunity to qualify for a commission as a lieutenant in the United States Army by enrolling in the University's Army ROTC program. The Department of Military Science will offer its World Military History (Mil 1014) and Foundations of National Power (Mil 1024) courses to interested students during the summer terms. No military obligation is incurred by students taking these courses. These preprofessional courses are offered for credit and are open to men and women.

For details, contact the Department of Military Science, 108 Armory, 15 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2212 or 373-2213.

## School of Public Health

Two courses, Death Education in Contemporary Society and Educational Aspects of Drug Use and Abuse, offered in cooperation with the College of Education, are listed under School Health Education in this section of the bulletin and in the Public Health and School Health Education course listings.

### EPIDEMIOLOGY

An intensive program in epidemiology will be offered by the School of Public Health and the Department of Conferences June 19-July 9. This program, which carries full graduate credit, is designed for, but not limited to, teachers of preventive medicine in medical schools. *Registration is limited and cannot be made through regular Summer Session channels.* Inquiries should be addressed to the Program in Epidemiology, School of Public Health, 1-117 Health Sciences Unit A, 515 Delaware Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## **INTERDISCIPLINARY TEAM BUILDING: INSTRUCTIONAL LABORATORY AND TEAM FIELD PROJECT**

A 10-credit course, PubH 5004, will be offered for students and community workers in the health sciences (social workers, nurses, therapists, health educators, pharmacists, administrators, planners, environmentalists, physicians, and dentists) who are interested in applying the interdisciplinary team approach to community health problems. Prerequisite is satisfactory completion in spring quarter 1977 of PubH 5008, Special Workshop in Team Building, which will focus on the development of team skills such as resource sharing and utilization, verbal and nonverbal communications, giving and receiving feedback, leadership roles and styles, negotiations, decision making and problem solving, conflict utilization, and process intervention. Interdisciplinary student teams will form and select their own summer projects during the spring workshop.

The 10-week summer program will begin with an intensive 1-day laboratory session focusing on the application of team skills to the selected summer field projects. The summer program will include two day-long laboratory sessions at the midway point of the course and will conclude with an intensive 3 to 4 day residential debriefing-reporting session involving students, faculty members, and agency personnel. For further information about the course and the prerequisite spring quarter workshop, contact Robert W. Schwanke, associate professor and director of interdisciplinary studies in the School of Public Health.

## *Institute of Technology*

### **AEROSPACE ENGINEERING WORKSHOP FOR ELEMENTARY AND SECONDARY SCHOOL TEACHERS**

This workshop for elementary and secondary school teachers, AEM 5001, will be held in Minneapolis from July 5 to 16. Offered under the cooperation of the National Aeronautics and Space Administration (Lewis Center), Civil Air Patrol Liaison Personnel (United States Air Force), Minnesota Department of Aeronautics, and the Department of Aerospace Engineering and Mechanics of the University of Minnesota, the workshop is designed to provide teachers with a background in recent discoveries in the space sciences that can be used as the basis for new or existing classroom programs. Enrollment will be limited to 30 participants. Further information may be obtained from the Aerospace Workshop Coordinator, 107 Aeronautical Engineering, 110 Union Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

See the listing under Aerospace Engineering and Mechanics for a description of the course content.

### **GEOLOGY FIELD STUDY**

Fieldwork in geology will be conducted at the Wasatch-Uinta Field Camp in Park City, Utah, and in Gunnison, Colorado, from mid-June through the end of July. Geophysics undergraduates have the option of attending the Colorado School of Mines. The course, Geo 5110, is sponsored through the Committee on Institutional Cooperation by the Twin Cities and Duluth campuses of the University of Minnesota, the University of Wisconsin at Madison, and the University of Iowa at Iowa City.

## *Committee on Institutional Cooperation*

The University of Minnesota cooperates with other universities through the Committee on Institutional Cooperation (CIC) to sponsor summer programs including field study in the biological and environmental sciences as well as studies in the arts and humanities. Interested students may consult a CIC catalog in the Summer Session office, 135 Johnston Hall.

Doctoral candidates interested in educational opportunities at other institutions may participate in the CIC Traveling Scholar Program by applying through the Graduate School.

## *Summer Arts Study Center*

The Summer Arts Study Center provides an environment for total involvement, intensive study, and creative activity in the arts and humanities. Faculty and students share ideas and discussions in the classroom and during free time.

The 2-month session, sponsored by Continuing Education and Extension in cooperation with the Grand Rapids Performing Arts Council, opens June 13 at Quadna Mountain Lodge in Hill City, Minnesota. Individual courses meet for 1 or 2 weeks.

Arts center workshops are planned for people with a general background in the arts as well as those seeking advanced work in a particular field with an expert. The workshops carry University of Minnesota graduate and undergraduate credit.

Among the courses to be offered during the 1977 season are: poetry and poetry writing, landscape painting, photography, classical guitar, children's theatre, fiber sculpture, pottery, needlepoint, silkscreen, jewelry making, acting, drawing, painting, and literature.

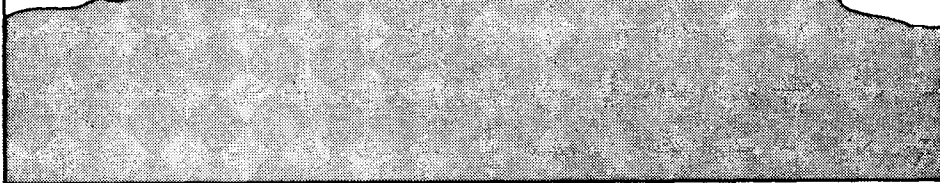
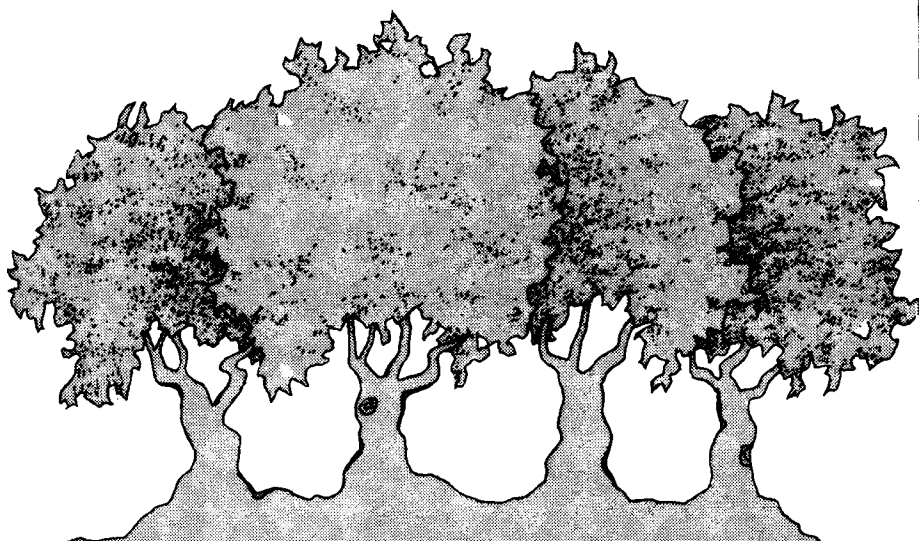
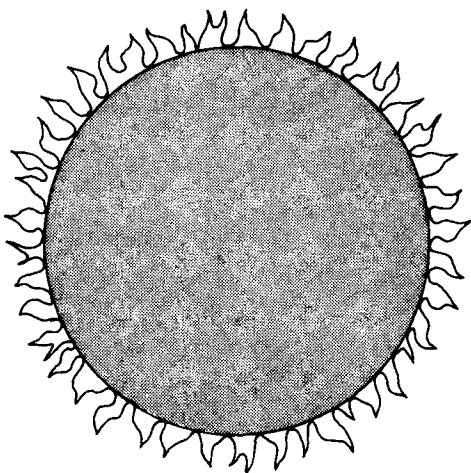
Instructors are University and visiting faculty members. Instructors this summer will include television and movie director Ezra Stone, poet Michael Dennis Browne, painter Malcolm Myers, and potter Douglas Johnson.

The 1977 *Summer Arts Study Center Catalogue of Courses* may be requested by phone (373-1925) or may be picked up at 320 Westbrook Hall on the Minneapolis campus or at the Arts Center office at 1128 LaSalle Avenue in downtown Minneapolis.





*Course  
Descriptions*



## College of Agriculture

The College of Agriculture offers many courses during the summer, primarily for graduate students. Most departments correlate thesis and problem work with work at the Agricultural Experiment Station.

High school teachers of agriculture may take advanced courses in those agricultural fields applicable to the requirements of the Department of Agricultural Education (see College of Education section).

In addition to regularly scheduled classes, the summer program includes readings, seminars, special problems, and concentrated courses.

Information concerning admission to the Graduate School should be obtained from the Dean of the Graduate School, 322 Johnston Hall, 101 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455. Students wishing information regarding courses at the graduate level should confer with the graduate staff of the department in which they will be working.

### Agricultural and Applied Economics (AgEc)

#### FIRST TERM

- 3990. PROBLEMS OR INDEPENDENT STUDY.** (Cr ar; prereq #) Staff  
Independent study, supervised reading, or research on agricultural economics problems not covered in regularly offered courses.
- 5150. AGRICULTURAL POLICY—June 13-24.** (3 cr; not open to AgEc majors; prereq 1020-1030; 1:00-4:00 MTWThF; ClaOff B36) Christiansen, Sundquist  
Application of economic analysis to agricultural price and income policy issues; development of present-day price and income programs.
- 8200. GENERAL SEMINAR: AGRICULTURAL ECONOMICS.** (3 cr; prereq #: hrs ar) Staff  
Special problems for individual work by qualified students.

#### SECOND TERM

- 3990. PROBLEMS OR INDEPENDENT STUDY.** (Cr ar; prereq #) Staff  
See First Term.
- 5140. AGRICULTURAL PRODUCTION—July 18-29.** (3 cr; not open to AgEc majors; prereq 1020-1030; 1:00-4:00 MTWThF; ClaOff B36) Fuller, Hasbargen  
Application of managerial and economic analysis to the planning and evaluation of farm firms. Use of hand procedures and computerized decision aids in obtaining credit, budgeting and evaluating farm plans.
- 8201. GENERAL SEMINAR: AGRICULTURAL ECONOMICS.** (3 cr; prereq #: hrs ar) Staff  
See 8200 First Term.

### Agricultural Engineering

#### *Agricultural Engineering Technology (AgEn)*

#### FIRST TERM

- 1020. AGRICULTURAL SHOP—METALWORK.** (4 cr; prereq Chem 1004 or #; \$4 lab fee; 2 lect and 6 lab hrs per wk; III MTWTh, IV F; AgEng 20 and 35) Riesenber  
Arc and oxyacetylene welding, soldering, use and conditioning of metalworking tools, and the identification and characteristics of metals used in farm machinery.

**5020. PROGRAM PLANNING AND INSTRUCTIONAL METHODS IN AGRICULTURAL MECHANICS—June 13-July 1.** (4 cr; prereq 10 cr in agricultural engineering technology, AgEd 3031 or fAgEd 3031; \$4 lab fee; VI-IX MTWThF; AgEng 218) Bear

Planning and designing high school vocational agriculture facilities, organizing equipment, tools, supplies, and storage as demanded by the instructional program. Administering the agricultural mechanics program. Developing techniques and programs for student supervised study programs.

**5034. PROBLEMS AND FIELD STUDIES IN ADVANCED AGRICULTURE—NATURAL RESOURCES DEVELOPMENT AND MANAGEMENT.** (1-3 cr; prereq 5020 or #; special problems as ar; AgEng 218) Bear

Principles and practices in the implementation of instructional programs in agricultural mechanics. Selection, application, operation, service, and maintenance of equipment for the specific agricultural mechanics instructional program.

## SECOND TERM

**5035. PROBLEMS AND FIELD STUDIES IN ADVANCED AGRICULTURE—METAL FABRICATION MATERIALS AND TECHNIQUES.** (1-3 cr; prereq 5020 or #; special problems as ar) Bear

See 5034 First Term.

# Agriculture (Agri)

## FIRST TERM

**1000. ACADEMIC ENRICHMENT AND HONORS PROGRAM: SPECIAL PROJECTS.** (1-15 cr; S-N only; prereq application and acceptance for Special Opportunity Grant, agriculture major only) Wharton  
An alternative to regular classroom activities. Students submit a project proposal to pursue a special interest in depth. This includes a description of the project, an estimation of its duration, and a tentative expense budget (funds of up to \$100 are available for approved projects). For further information check with the college office.

**5555. INTEGRATING PAPER FOR MASTER OF AGRICULTURE STUDENTS.** (1 cr) Hanson  
Preparation of a paper of the quality of a professional trade journal article integrating the student's studies with application to an agricultural problem or the student's major area of concentration. The paper will be reviewed and graded by the student's advisory committee.

## SECOND TERM

**1000. ACADEMIC ENRICHMENT AND HONORS PROGRAM: SPECIAL PROJECTS.** (1-15 cr; S-N only; prereq application and acceptance for Special Opportunity Grant, agriculture major only) Wharton  
See First Term.

**5555. INTEGRATING PAPER FOR MASTER OF AGRICULTURE STUDENTS.** (1 cr) Hanson  
See First Term.

# Agronomy and Plant Genetics (Agro)

## Agronomy

### FIRST TERM

**1020. SPECIAL PROBLEMS.** (1-3 cr; prereq #) Smith, Cardwell  
In-depth research or studies in agronomy. Intended for students who wish to pursue aspects of agronomy in greater depth than that offered in formal courses or who wish to investigate areas not presently offered in courses. Tutorial instruction under staff guidance.

**5001. PROBLEMS IN AGRONOMY FOR ADVANCED STUDENTS.** (1-5 cr; prereq #) Smith, Cardwell  
In-depth research or studies in agronomy. Intended for advanced students who wish to pursue aspects of agronomy in greater depth than that offered in formal courses or who wish to investigate areas not presently offered in courses. Independent study and research under staff guidance.

**8010.\* RESEARCH IN AGRONOMY.** (Cr ar; prereq #) Staff  
Problems in physiology and production of crop plants.

## **SECOND TERM**

- 1020. SPECIAL PROBLEMS.** (1-3 cr; prereq #) Smith, Cardwell  
See First Term.
- 5001. PROBLEMS IN AGRONOMY FOR ADVANCED STUDENTS.** (1-5 cr; prereq #) Smith, Cardwell  
See First Term.
- 8010.\* RESEARCH IN AGRONOMY.** (Cr ar; prereq #) Staff  
See First Term.

## *Plant Breeding*

### **FIRST TERM**

- 8310.\* ORIENTATION TO FIELD CROP BREEDING.** (1 cr; prereq 5020 or #) Lambert  
Field study of plant breeding programs and techniques.
- 8330.\* RESEARCH IN PLANT GENETICS.** (Cr ar) Staff

### **SECOND TERM**

- 8310.\* ORIENTATION TO FIELD CROP BREEDING.** (1 cr; prereq 5020 or #) Lambert  
See First Term.
- 8330.\* RESEARCH IN PLANT GENETICS.** (Cr ar) Staff

## **Animal Science (AnSc)**

### **FIRST TERM**

- 5413. RUMINANT NUTRITION—June 14-24.** (3 cr, §5403; prereq 1401)  
Nutrient requirements of ruminants (beef and dairy cattle, sheep); nutrient content of feedstuffs, primarily forages; protein and nonprotein nitrogen utilization; energy utilization; nutritional disorders; and formulation of adequate rations. Nutrition of horses also considered.
- 5710. SPECIAL PROBLEMS.** (Cr ar; open to students who have completed pertinent prereqs with #) Staff  
Research in an area of animal science under the supervision of a staff member. A written report on the research is required.
- 8810.\* RESEARCH IN ANIMAL SCIENCE.** (Cr and hrs ar; prereq #) Staff  
Research including experimental studies in the disciplines associated with animal production and research, with emphasis on interdisciplinary studies embracing environmental and managerial considerations.
- 8820.\* RESEARCH IN ANIMAL GENETICS.** (Cr and hrs ar; prereq #) Staff  
Research in quantitative genetics, cytogenetics, and other areas related to animal breeding.
- 8830.\* RESEARCH IN ANIMAL PHYSIOLOGY.** (Cr and hrs ar; prereq #) Staff  
Individual research under faculty direction. Topics to be determined by consultation; may be a specialized aspect of a thesis problem or an individual problem of mutual interest to graduate student and adviser.
- 8840.\* RESEARCH IN ANIMAL NUTRITION.** (Cr and hrs ar; prereq #) Staff  
Research in selected areas of animal nutrition. Topics and species studied determined by consultation with adviser.
- 8850.\* RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY.** (Cr and hrs ar; prereq #) Staff  
Individual, original research, under staff direction, on selected problems involving the chemical, biochemical, and physiological aspects of muscle and meat technology. The topic may be a specialized aspect of a thesis problem or an individual problem of mutual interest to graduate student and adviser.

### **SECOND TERM**

- 5614. DAIRY FARM MANAGEMENT—July 19-29.** (3 cr, §5604; prereq 3403 or #...3220 recommended)  
Application of principles of animal breeding, nutrition, physiology, and economics to the planning and management of the dairy farm; emphasis on genetic influences, housing requirements, health programs for large herds, feed budgets, and record analysis.

- 5710. SPECIAL PROBLEMS.** (Cr ar; open to students who have completed pertinent prereqs with #) Staff  
See First Term.
- 8810.\* RESEARCH IN ANIMAL SCIENCE.** (Cr and hrs ar; prereq #) Staff  
See First Term.
- 8820.\* RESEARCH IN ANIMAL GENETICS.** (Cr and hrs ar; prereq #) Staff  
See First Term.
- 8830.\* RESEARCH IN ANIMAL PHYSIOLOGY.** (Cr and hrs ar; prereq #) Staff  
See First Term.
- 8840.\* RESEARCH IN ANIMAL NUTRITION.** (Cr and hrs ar; prereq #) Staff  
See First Term.
- 8850.\* RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY.** (Cr and hrs ar; prereq #) Staff  
See First Term.

## Entomology, Fisheries, and Wildlife<sup>1</sup>

Ample opportunity for research work in various phases of entomology, fishery biology, and wildlife biology is available to properly qualified students on an individual basis.

### *Entomology (Ent)*

#### FIRST TERM

- 3100. ENTOMOLOGICAL TECHNIQUES.** (Cr ar; prereq 3175 or equiv, #) Staff  
Practical laboratory instruction in mounting, preservation of insect larvae, preparation of microscopic mounts of minute insects; labeling, classifying, and cataloging specimens of insects for scientific study.
- 5901. ADVANCED WORK IN ENTOMOLOGY.** (Cr ar; prereq #) Staff  
Library and laboratory research in various lines of entomology.
- 8500.\* RESEARCH IN ENTOMOLOGY.** (Cr ar; prereq #) Staff

#### SECOND TERM

- 3100. ENTOMOLOGICAL TECHNIQUES.** (Cr ar; prereq 3175 or equiv, #) Staff  
See First Term.
- 5901. ADVANCED WORK IN ENTOMOLOGY.** (Cr ar; prereq #) Staff  
See First Term.
- 8500.\* RESEARCH IN ENTOMOLOGY.** (Cr ar; prereq #) Staff

### *Fisheries and Wildlife (FW)*

#### FIRST TERM

- 5393. ADVANCED WORK IN FISHERY BIOLOGY.** (Cr ar; prereq #) Staff  
Library and laboratory research in various areas of fishery biology.
- 5398. ADVANCED WORK IN WILDLIFE BIOLOGY.** (Cr ar; prereq #) Staff  
Library and laboratory research in various areas of wildlife biology.
- 8364.\* RESEARCH IN FISHERY BIOLOGY.** (Cr ar; prereq #) Staff
- 8377.\* RESEARCH IN WILDLIFE BIOLOGY.** (Cr ar; prereq #) Staff

#### SECOND TERM

- 5393. ADVANCED WORK IN FISHERY BIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.

<sup>1</sup>For additional courses, see Biology Session.

**5398. ADVANCED WORK IN WILDLIFE BIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.

**8364.\* RESEARCH IN FISHERY BIOLOGY.** (Cr ar; prereq #) Staff

**8377.\* RESEARCH IN WILDLIFE BIOLOGY.** (Cr ar; prereq #) Staff

## Food Science and Nutrition (FScN)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

**1602. PRINCIPLES OF NUTRITION.** (4 cr; limited to 25 students; prereq one course in biology and one course in chemistry or equiv in natural science sequence; \$4 lab fee; I-II MWF, II TTh; FScN 15)  
Survey of fundamental principles of nutrition including requirements for various nutrients and results of excess or deficient intake of these nutrients.

**3472. PRINCIPLES OF FOOD PURCHASING.** (4 cr; limited to 25 students; prereq 5 cr in food science and nutrition; \$4 lab fee; III-IV M, IV TWThF, 2 hrs ar; McNH 146) Trammell  
Principles of purchasing basic groups of foods. Relative cost of key nutrients from alternates within the food group. Food prices and indices of change. Laws and regulations pertinent to the labeling of food. Food standards and grades. Functional role of food additives.

**3720. ADMINISTRATIVE EXPERIENCE: HOSPITALITY OR FOOD SERVICE ENTERPRISE.** (5 cr; prereq 3750, sr in hospitality and food service management or #; hrs ar) Staff  
Planned management experience in a selected food service or hospitality business, including understanding of the operation, planning, purchasing, personnel management, financial management, supervision, and related functions.

**5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (1-5 cr [may be repeated for cr]; prereq Δ; \$4 lab fee; hrs ar) Staff  
Individual laboratory or library research in some area related to food chemistry, food processing, nutrition, food service, or hospitality management.

**5321. INDEPENDENT STUDY IN FOOD MICROBIOLOGY.** (1-5 cr; prereq sr, Δ; \$4 lab fee; hrs ar) Busta  
Laboratory or library research on problems related to the microbiology of dairy and food products.

**5790. QUANTITY FOOD PREPARATION PRACTICES—June 13-24.** (3 cr; limited to 16 students; prereq baccalaureate degree and current or impending affiliation with occupational food program in a secondary school; \$4 lab fee; 8:00-12:00 MTWThF; DinC 152) Billings  
Storage, preparation, service, and pricing of selected menu items. Students investigate and seek solutions to problems related to quantity food service. Opportunity to integrate lectures, laboratory experiences, and independent study with instructional programs in occupational foods.

**8401. INDEPENDENT STUDY: FOOD SCIENCE.** (1-5 cr; prereq Δ; hrs ar) Morris, staff  
Independent study and written reports.

**8621. INDEPENDENT STUDY: NUTRITION.** (1-9 cr; prereq Δ; hrs ar) Morse, staff  
Independent study and written reports.

### SECOND TERM

**3720. ADMINISTRATIVE EXPERIENCE: HOSPITALITY OR FOOD SERVICE ENTERPRISE.** (5 cr; prereq 3750, sr in hospitality and food service management or #; hrs ar) Staff  
See First Term.

**5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (1-5 cr [may be repeated for cr]; prereq Δ; \$4 lab fee; hrs ar) Staff  
See First Term.

**5321. INDEPENDENT STUDY IN FOOD MICROBIOLOGY.** (1-5 cr; prereq sr, Δ; \$4 lab fee; hrs ar) Busta  
See First Term.

**5404. CURRENT ISSUES IN FOOD AND NUTRITION—August 1-12.** (3 cr; limited to 25 students; prereq 15 cr in food science and nutrition or #; \$4 lab fee; 9:00-11:30 MTWThF; FScN 15) Levine  
Evaluation of popular and scientific literature as it deals with nutrition, food additives, food safety, food fads, health foods, environmental contamination, the consumer movement, naturally occurring food toxicants, processed foods, synthetic foods, organically grown foods.

**8401. INDEPENDENT STUDY: FOOD SCIENCE.** (1-5 cr; prereq Δ; hrs ar) Morris, staff  
See First Term.

**8621. INDEPENDENT STUDY: NUTRITION.** (1-9 cr; prereq Δ; hrs ar) Morse, staff  
See First Term.

## Plant Pathology (PIPa)<sup>1</sup>

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

Register for both first term and second term, one-half the total credits each term.

**5013. DISEASES OF ECONOMIC PLANTS.** (2 cr; prereq 1001 or equiv...5100 recommended; II T; StakH 103)  
Pfleger

Diseases of ornamental plants, trees, and field fruit and vegetable crops. Laboratory and fieldwork continues throughout the summer.

**5650. CLINICAL PLANT PATHOLOGY.** (6 cr; prereq 1001, 8 cr plant pathology) Groth  
Laboratory and field experience in Plant Disease Clinic in diagnosis, treatment, and control of plant diseases of field crops, vegetable crops, turf, ornamentals, and trees.

**8090.\* RESEARCH IN PLANT PATHOLOGY.** (Cr ar) Staff  
Special assignment in laboratory and field problems in pathological research.

**8110.\* PROBLEMS IN MYCOLOGY.** (Cr ar; prereq 5106, 5107) Stewart, Anderson  
Individual research in taxonomy, ecology, and genetics of special groups of fungi.

**8301.\* RESEARCH IN PLANT VIROLOGY.** (Cr ar; prereq 5400 or #) Banttari  
Identification, transmission, purification, serological or histological studies involving viruses, their host plants, and vectors.

**8401.\* RESEARCH IN PLANT BACTERIOLOGY.** (Cr ar; prereq 5400 or #) Kennedy  
Special assignments on problems of current interest; investigations related to ecology and interaction among bacterial plant pathogens and their hosts.

## Rhetoric (Rhet)

Courses with limited enrollment must be reserved in 130 Coffey Hall unless otherwise indicated (see instructions under "Reserved Courses").

### FIRST TERM

**1147. EFFICIENT READING.** (3 cr; limited to 32 students, reserved in JohH 12; I MTWThF; ForH 115) Holloway  
For students, teachers, and business or professional people of average reading ability who wish to improve speed, comprehension, and vocabulary. Techniques valuable in scholastic or professional achievement. Maximum use of recently developed visual aids. Of special value to teachers interested in laboratory-type experience in adult reading techniques. Not a remedial course.

**1222. PUBLIC SPEAKING.** (4 cr; limited to 18 students; prereq satisfaction of fr communication requirements; II MTWThF; HckrH 222) McBride  
A practical course in the fundamentals of speechmaking. Emphasis upon organizing and delivering the speech.

**1442. NOVEL, SHORT STORY.** (4 cr; limited to 35 students; IV MTWThF; HckrH 310) Price  
Analysis of selected European and American fiction. Emphasis on literary style in relation to themes of prose fiction.

**3551. PROFESSIONAL WRITING.** (4 cr; each section limited to 23 students; prereq jr)  
Projects and reports in professional communication: the résumé, application letter, interview; study of professional journals; the review of literature; specialized bibliographic tools; the feature article.

Sec 1, II MTWThF, HckrH 111, Wright  
Sec 2, III MTWThF, HckrH 111, Walzer.

**3562. SCIENTIFIC AND TECHNICAL WRITING.** (4 cr; limited to 23 students; prereq jr; IV MTWThF; HckrH 111)  
Ferguson  
Methods of exposition in scientific and technical writing; types of reports; audience analysis; practice in report writing.

<sup>1</sup>For additional course, see Biology Session.



## **SECOND TERM**

- 1147. EFFICIENT READING.** (3 cr; limited to 32 students, reserved in JohH 12; II MTWThF; ForH 115) Griffin  
See First Term.
- 1222. PUBLIC SPEAKING.** (4 cr; limited to 18 students; prereq satisfaction of fr communication requirements; II MTWThF; HckrH 222) Connolly  
See First Term.
- 3551. PROFESSIONAL WRITING.** (4 cr; each section limited to 23 students; prereq jr; III MTWThF; HckrH 111) Horberg  
See First Term.
- 5400. DISSEMINATION AND UTILIZATION OF INFORMATION.** (4 cr; limited to 15 students; prereq jr, sr, or grad standing; 11:15-1:15 TTh; HckrH 224) Schuelke  
Methods and processes using specialized information. Students investigate cases and develop materials for application in their professional field. Emphasis on channels for dissemination and utilization.

## **Soil Science (Soil)<sup>1</sup>**

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

- 5114.\* SPECIAL PROBLEMS IN SOILS.** (1-5 cr [may be repeated for 10 cr max]; prereq 1122 or #) Martin, Adams, Arneman, Baker, Blake, Caldwell, Farnham, Rust, Schmidt, Gast, Grava, Ham, Grigal  
Research, readings, instruction.
- 5565. FIELD COURSE—SOIL SURVEY.** (10 cr; limited to 20 students; prereq 5512 and #; \$25 course fee; I-X MTWThF) Arneman, Rust  
Principles of soil survey including description of soils in acceptable terms, mapping soils on airphoto base, interpretative groupings of soils, descriptive legend development, classification of soils according to soil taxonomy.
- 8124.\* RESEARCH PROBLEMS IN SOILS.** (2-5 cr; hrs ar) Martin, Adams, Arneman, Baker, Blake, Caldwell, Farnham, Rust, Schmidt, Gast, Grava, Ham, Grigal  
Individual laboratory or fieldwork on special problems in a phase of soils other than the student's major thesis. Arrangements must be made in advance.

### **SECOND TERM**

- 5114.\* SPECIAL PROBLEMS IN SOILS.** (1-5 cr [may be repeated for 10 cr max]; prereq 1122 or #) Martin, Adams, Arneman, Baker, Blake, Caldwell, Farnham, Rust, Schmidt, Gast, Grava, Ham, Grigal  
See First Term.
- 8124.\* RESEARCH PROBLEMS IN SOILS.** (2-5 cr; hrs ar) Martin, Adams, Arneman, Baker, Blake, Caldwell, Farnham, Rust, Schmidt, Gast, Grava, Ham, Grigal  
See First Term.

<sup>1</sup>For additional course, see Biology Session.

# College of Biological Sciences

The College of Biological Sciences provides a visible structure for the coordination and unification of basic biological research and training activities throughout the University. Information concerning its undergraduate programs is presented in the *College of Biological Sciences Bulletin* or may be obtained from the college office in P190 Kolthoff Hall.

The college is composed of the Departments of Biochemistry, Biology, Botany, Ecology and Behavioral Biology, and Genetics and Cell Biology, as well as the Dight Institute for Human Genetics, the James Ford Bell Museum of Natural History, and the new Freshwater Biological Institute. The course offerings listed are available on the Twin Cities campus to all eligible students through the University of Minnesota college in which they are registered.

Many summer courses in the biological sciences are offered through the Biology Session held at the Lake Itasca Forestry and Biological Station. Students interested in studying at a field station should refer to the section on the Biology Session and to the special bulletin available upon request from: Summer Session, 135 Johnston Hall, 101 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## Biochemistry (BioC)

### FIRST TERM

**3990. UNDERGRADUATE RESEARCH.** (1-3 cr; prereq sr biochemistry major) Staff  
Research problems for the B.S. thesis (optional).

**5001. BIOCHEMISTRY.** (3 cr, §Biol 3021; for grad students; prereq Biol 1011, Chem 3302 or #; 10:45-12:05 MTWThF; PalmC 12) Staff  
Biochemistry and biophysics of cells; emphasis on enzyme catalysis, cellular energetics, biosynthesis of cellular constituents and cellular regulatory mechanisms.

**8990. GRADUATE RESEARCH.** (2-5 cr; prereq #) Graduate faculty

### SECOND TERM

**3990. UNDERGRADUATE RESEARCH.** (1-3 cr; prereq sr biochemistry major) Staff  
See First Term.

**8990. GRADUATE RESEARCH.** (2-5 cr; prereq #) Graduate faculty

## Biology (Biol)<sup>1</sup>

Courses with limited enrollment must be reserved in P190 Kolthoff Hall unless otherwise indicated (see instructions under "Reserved Courses").

<sup>1</sup>For additional courses, see Biology Session.

## **FIRST TERM**

- 1011. GENERAL BIOLOGY.** (5 cr; limited enrollment, reserved in JohH 12 or CofH 130; \$4 lab fee; lect 12:20-1:30 MTWThF; NH 45) Kerr  
An introduction to the principles of biology. The cell, metabolism, heredity, reproduction, ecology, and evolution. Closed-circuit TV and multi media presentation of lectures.  
Lab 1, III-IV MTWTh, Kolth S160 and ar  
Lab 2, 1:40-3:20 MTWTh, Kolth, S160 and ar
- 3011. ANIMAL BIOLOGY.** (5 cr; limited to 48 students; prereq 1011, Chem 1005; \$4 lab fee; lect 12:15-1:15 MTWThF; BioSci 18) Herman  
Survey of types of animals; emphasis on the varied ways in which different animals have solved similar problems.  
Lab 1, I-IV TTh, BioSci 245  
Lab 2, VI-IX TTh, BioSci 245
- 3012. PLANT BIOLOGY.** (5 cr; limited to 36 students; prereq 1011, Chem 1005; \$4 lab fee; lect 12:15-1:15 MTWThF, BioSci 6) Koukkari  
Plant diversity and evolution; structure and function of the plant cell and of the whole organism; growth and development of plants.  
Lab 1, VI-VIII MWF, BioSci 151  
Lab 2, VI-VIII MWF, BioSci 163
- 3021. BIOCHEMISTRY.** (4 cr, §BioC 5001; prereq 1011, Chem 3302; 10:45-12:05 MTWThF; PalmC 12)  
Introduction to the biochemistry and biophysics of cells; emphasis on enzyme catalysis, cellular energetics, biosynthesis of cellular constituents, and cellular regulatory mechanisms.

## **SECOND TERM**

- 1011. GENERAL BIOLOGY.** (5 cr; limited enrollment, reserved in JohH 12 or CofH 130; \$4 lab fee; lect 12:20-1:30 MTWThF, NH 45) Kerr  
See First Term.  
Lab 1, III-IV MTWTh, Kolth S160 and ar  
Lab 2, 1:40-3:20 MTWTh, Kolth S160 and ar
- 1103. GENERAL BOTANY.** (5 cr; limited to 40 students, reserved in JohH 12 or CofH 130; prereq 1011; \$4 lab fee; lect 12:15-1:15 MTWThF; BioSci 12) Hall  
Levels of organization of plants, plant functions, plant growth and development, plant reproduction.  
Lab 1, III-IV MTWTh, BioSci 182  
Lab 2, VI-VII MTWTh, BioSci 182
- 1106. GENERAL ZOOLOGY.** (5 cr; limited to 72 students, reserved in JohH 12 or CofH 130; prereq 1011; \$4 lab fee; lect 12:15-1:15 MTWThF; Bo 6) Underhill  
Survey of animal phyla; considerations of structure, function, behavior, adaptation, and evolutionary relationships.  
Lab 1, VI-VIII MW, Kolth P168  
Lab 2, VI-VIII TTh, Kolth P168
- 3041. ECOLOGY.** (5 cr; limited to 30 students; prereq 1011 plus 10 addtl cr in biology, Math 1231 or #; \$4 lab fee; lect 12:15-1:15 MTWThF; Owre 12) Tilman  
Interactions of plant and animal populations and their environments. The organization, functioning, and development of ecological systems; population growth and regulation. Modern man's impact on the biosphere.  
Lab 1, VII-VIII TTh, Z 101A  
Lab 2, VII-VIII MW, Z 101A

## **Botany (Bot)<sup>1</sup>**

Courses with limited enrollment must be reserved in P190 Kolthoff Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

- 1009. MINNESOTA PLANT LIFE.** (4 cr; suitable for nonmajors; \$4 lab fee; lect I MTW; dem II-III MTW; Bo 301; field trips I-IV Th) Bonnewell  
Identification of the more common and conspicuous Minnesota plants; their basic distinctions, life cycles, habitat requirements, distribution, and ecological relations.

<sup>1</sup>For additional courses, see Biology Session.

- 3131. SURVEY OF PLANT PHYSIOLOGY.** (4 cr, §5131, §PIPh 3131, §PIPh 5131; prereq Biol 1103 or 3012, Chem 3301 or BioC 1301; lect 12:20-1:25 MTWThF; BioSci 12) Soulen  
Physiological principles underlying processes that occur in living plants with emphasis on higher plants. Growth and development, mineral nutrition, water relations, metabolism including respiration and photosynthesis.
- 3990. RESEARCH PROBLEMS.** (1-5 cr; prereq #) Staff  
Individual research for undergraduates.
- 5131. SURVEY OF PLANT PHYSIOLOGY.** (4 cr, §3131, §PIPh 3131, §PIPh 5131; prereq Biol 1103 or 3012, Chem 3301 or BioC 1301; 12:20-1:25 MTWThF, 1:40-3:00 W; BioSci 12) Soulen  
See 3131. Includes a weekly discussion section.
- 5132. PLANT PHYSIOLOGY LABORATORY.** (2 cr; prereq 3131 or 5131 or §13131 or §5131; \$4 lab fee; 1:40-4:30 TTh; BioSci 198) Soulen  
Laboratory course to accompany 3131 or 5131.
- 8990. RESEARCH PROBLEMS.** (Cr ar; prereq #) Staff

## SECOND TERM

- 3990. RESEARCH PROBLEMS.** (1-5 cr; prereq #) Staff  
See First Term.
- 8990. RESEARCH PROBLEMS.** (Cr ar; prereq #) Staff

# Ecology and Behavioral Biology (EBB)<sup>1</sup>

Courses with limited enrollment must be reserved in P190 Kolthoff Hall (see instructions under "Reserved Courses").

## FIRST TERM

- 3111. VERTEBRATE BEHAVIOR.** (4 cr, §AnSc 3111; prereq Biol 1106 or 3011, or #; 8:40-9:55 MTWThF; PetH 110) Phillips  
Introduction to the nature and variety, development, motivation, and evolution of animal behavior, emphasizing social interactions and communication.
- 5970. DIRECTED STUDIES.** (Cr ar; prereq Δ) McKinney, Parmelee, Phillips, Tester, Tordoff, Wood, Birney, Bright, Corbin, Regal, Hopkins, Pace
- 8391. ADVANCED WORK IN ECOLOGY AND BEHAVIORAL BIOLOGY.** (Cr ar; prereq #) McKinney, Parmelee, Phillips, Tester, Tordoff, Wood, Birney, Bright, Corbin, Regal, Hopkins, Pace

## SECOND TERM

- 3001. INTRODUCTION TO ECOLOGY.** (4 cr, §Biol 10 04; open to jrs and above but not biology majors; 7:50-8:50 MTWThF; AndH 250)  
Basic concepts in ecology dealing with organization, development, and functioning of ecosystems; population growth and regulation. Human impact on such systems.
- 5041. ECOLOGY.** (4 cr; for grad students; limited to 10 students; prereq 1011 plus 10 addtl cr in biology, Math 1231 or #; \$4 lab fee; lect 12:15-1:15 MTWThF; Owre 12) Tilman  
Interactions of plant and animal populations and their environments. The organization, functioning, and development of ecological systems; population growth and regulation. Modern man's impact on the biosphere.  
Lab 1, VII-VIII TTh, Z 101A  
Lab 2, VII-VIII MW, Z 101A
- 5970. DIRECTED STUDIES.** (Cr ar; prereq Δ) McKinney, Parmelee, Phillips, Tester, Tordoff, Wood, Birney, Bright, Corbin, Regal, Hopkins, Pace
- 8391. ADVANCED WORK IN ECOLOGY AND BEHAVIORAL BIOLOGY.** (Cr ar; prereq #) McKinney, Parmelee, Phillips, Tester, Tordoff, Wood, Birney, Bright, Corbin, Regal, Hopkins, Pace

<sup>1</sup>For additional courses, see Biology Session.

# Genetics and Cell Biology (GCB)

## FIRST TERM

- 3022. GENETICS.** (4 cr; designed primarily for students other than CBS majors and CLA biology majors; prereq Biol 1011; 10:10-11:25 MTWThF; PalmC 10) Simmons  
The mechanisms of heredity; their implications for biological populations, and applications to practical problems.
- 3970. INDEPENDENT STUDY.** (Cr ar; prereq #, Δ) Staff  
Individual study on selected topics or problems with emphasis on selected readings and use of scientific literature.
- 3990. LABORATORY RESEARCH.** (Cr ar; prereq #, Δ) Staff  
Individual projects on selected topics and problems.
- 5022. GENETICS.** (3 cr, §3022, §Biol 3032; for grad students except those in genetics; 10:10-11:25 MTWThF; PalmC 10) Simmons  
See 3022.
- 8970. DIRECTED STUDIES.** (Cr ar; prereq #) Staff
- 8990. RESEARCH.** (Cr ar) Staff

## SECOND TERM

- 3970. INDEPENDENT STUDY.** (Cr ar; prereq #, Δ) Staff  
See First Term.
- 3990. LABORATORY RESEARCH.** (Cr ar; prereq #, Δ) Staff  
See First Term.
- 8970. DIRECTED STUDIES.** (Cr ar; prereq #) Staff
- 8990. RESEARCH.** (Cr ar) Staff

# Zoology (Zool)<sup>1</sup>

Courses with limited enrollment must be reserved in P190 Kolthoff Hall (see instructions under "Reserved Courses").

## SECOND TERM

- 5052. GENERAL AND COMPARATIVE EMBRYOLOGY.** (5 cr; limited to 40 students; prereq Biol 1106 or 3011; \$4 lab fee; 8:00-9:00 MTWThF, BioSci 12; lab II-IV MTWTh, BioSci 245) McKinnell  
Embryological development of vertebrates.

<sup>1</sup>For additional courses, see Biology Session.

# Biology Session

## Held at the Lake Itasca Forestry and Biological Station

During two 5-week terms of the summer session (June 12-July 16 and July 17-August 20), an opportunity for fieldwork in terrestrial and freshwater biology in its most fundamental aspects is presented at Itasca State Park, approximately 220 miles northwest of the Twin Cities.

Classes will be conducted cooperatively by various departments in the College of Agriculture and the College of Biological Sciences. Interested persons will find the following opportunities offered:

1. Instruction in field biology for college undergraduates, graduate students, high school and nature study teachers, and others interested.
2. Biological investigation in the lakes, prairies, or forests of the area for graduate students.
3. Facilities for guest investigators working on independent research in terrestrial and freshwater biology.

For the *Lake Itasca Biology Session Bulletin*, which describes in detail the opportunities and facilities available at the station, write to: Director of Summer Session, 135 Johnston Hall, 101 Pleasant Street S.E., University of Minnesota, Minneapolis, Minnesota 55455.

## ADMISSION AND REGISTRATION

The courses are open to all qualified graduate and undergraduate students who have had the usual preliminary course work in biological sciences.

Course work taken at the Itasca Biology Session may be considered for resident requirements at the University of Wisconsin upon recommendation of the department concerned.

Reservations for housing and course work should be made as early as possible. A special Request for Reservation form for this purpose is included in the *Lake Itasca Biology Session Bulletin*. This form should be mailed to: Chairman of Field Biology Program, 349 Bell Museum of Natural History, 10 Church Street S.E., University of Minnesota, Minneapolis, Minnesota 55455. Assignments to classes will be verified by April 10. Late applications will be accepted for classes that are not closed, up to the time of registration. The necessary class reservation cards will be held with the reservation request and are to be turned in by the student when he or she registers at the station on June 12 or July 17.

## FEES AND EXPENSES

The following fees are payable by each registrant on or before June 12 or July 17 and must be paid before registration is completed:

Tuition Fee <sup>1</sup> .....	\$15.00 per credit
Student Services Fee <sup>1</sup> .....	\$14.00 per term
Laboratory Fee .....	\$ 8.50 per term

Graduate students may register for thesis-only upon payment of \$69 tuition per term and required student services and laboratory fees.

Individuals holding the Ph.D. degree or its equivalent who are pursuing research as an independent investigator will pay a research table fee of \$5 per week and a lab fee of \$8.50 per 5-week term.

On the basis of the experience of other groups of students, it is estimated that board—which is determined on an actual cost basis—will be approximately \$140 for the 5-week period. A charge of \$25 per term is made for room in the cabins of the station and is to be paid to the chairman during the first week of each term.

The laboratory fee covers the use of microscopes, nets, boats, and various kinds of equipment and supplies.

The estimated cost of \$328 for each 5-week term does not include books, various class supplies, traveling expenses including class field trips, clothing, laundry, and minor incidental personal expenses.

Tuition and fees are payable on or before June 12 and July 17. After these dates, a late fee will be charged according to the following schedule:

June 13-17 or July 18-22 .....	\$ 6
June 20-24 or July 25-29 .....	10
Thereafter .....	20

No registration will be accepted after June 12 or July 17 without the approval of the chairman. Fee statements *dated* June 12 may be paid on June 13, without penalty. However, fee statements *dated* June 13 will carry the late fee described above.

## Biology (Biol)

### FIRST TERM

5870. ITASCA SEMINAR. (Cr ar; prereq #) Staff

5890. RESEARCH PROBLEMS AT ITASCA IN ECOLOGY AND BEHAVIORAL BIOLOGY; OR ENTOMOLOGY, FISHERIES, AND WILDLIFE; OR PLANT PATHOLOGY; OR SOIL SCIENCE; OR ZOOLOGY. (Cr ar; prereq #) Staff

### SECOND TERM

5870. ITASCA SEMINAR. (Cr ar; prereq #) Staff

5890. RESEARCH PROBLEMS AT ITASCA IN ECOLOGY AND BEHAVIORAL BIOLOGY; OR ENTOMOLOGY, FISHERIES, AND WILDLIFE; OR PLANT PATHOLOGY; OR SOIL SCIENCE; OR ZOOLOGY. (Cr ar; prereq #) Staff

## Botany (Bot)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

3990. RESEARCH PROBLEMS. (1-5 cr; prereq #) Staff

<sup>1</sup>Subject to change.

- 5801. SUMMER FLORA OF MINNESOTA.** (5 cr; limited to 20 students; prereq course in taxonomy; WS) Thomson
- 5811. FRESHWATER ALGAE.** (5 cr; limited to 20 students; prereq 10 cr in botany, biology, or zoology; TF) Schlichting
- 8970. SPECIAL TOPICS: BIOLOGY OF THE FERNS.** (5 cr; limited to 20 students; prereq #; undergraduates should enroll in Bot 3970; MTh) Wagner
- 8990. GRADUATE RESEARCH PROBLEMS.** (Cr ar; prereq #) Staff

## SECOND TERM

- 3990. RESEARCH PROBLEMS.** (1-5 cr; prereq #) Staff
- 5805. AQUATIC FLOWERING PLANTS.** (5 cr; limited to 20 students; prereq course in taxonomy; MTh) Ownbey
- 5815. BRYOPHYTES.** (5 cr; limited to 20 students; prereq 10 cr biology or #; TF) Bowers
- 8990. GRADUATE RESEARCH PROBLEMS.** (Cr ar; prereq #) Staff

## **Ecology and Behavioral Biology (EBB)**

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 5812. AQUATIC ECOLOGY.** (5 cr; limited to 20 students; prereq 15 cr in biology and 5 cr in chemistry; WS) Wright
- 5815. FIELD ETHOLOGY.** (5 cr; limited to 15 students; prereq course in behavior or ecology; TF) Jenni

### SECOND TERM

- 5812. AQUATIC ECOLOGY.** (5 cr; limited to 20 students; prereq 15 cr in biology and 5 cr in chemistry; WS) Megard
- 5814. COMMUNITY STRUCTURE AND FUNCTIONING.** (5 cr; limited to 20 students; prereq course in ecology; WS) Cushing
- 5817. VERTEBRATE ECOLOGY.** (5 cr; limited to 15 students; prereq course in ecology; TF) Ford
- 5820. WETLAND ECOLOGY.** (5 cr; limited to 15 students; prereq 15 cr biology, introductory chemistry, course in plant identification or fl...Biol 3041 recommended; WS) Gorham

## **Entomology (Ent)**

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 5020. FIELD ENTOMOLOGY.** (5 cr; limited to 15 students; prereq introductory biology; MTh) Deonier

### SECOND TERM

- 5130. AQUATIC ENTOMOLOGY.** (5 cr; limited to 15 students; prereq Ent 3175 or 5020 or equiv or #; MTh) Berner

## **Plant Pathology (PIPa)**

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### SECOND TERM

- 5102. INTRODUCTORY MYCOLOGY.** (5 cr; limited to 15 students; prereq 6 cr in botany; MTh) Stewart



## Soil Science (Soil)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

**5532. SOILS AND THE ECOSYSTEM.** (5 cr; limited to 20 students; prereq course in ecology; MTh) Grigal

## Zoology (Zool)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

**5146. EXPERIMENTAL PARASITOLOGY.** (5 cr; limited to 12 students; prereq introductory course in parasitology; TF) MacInnis

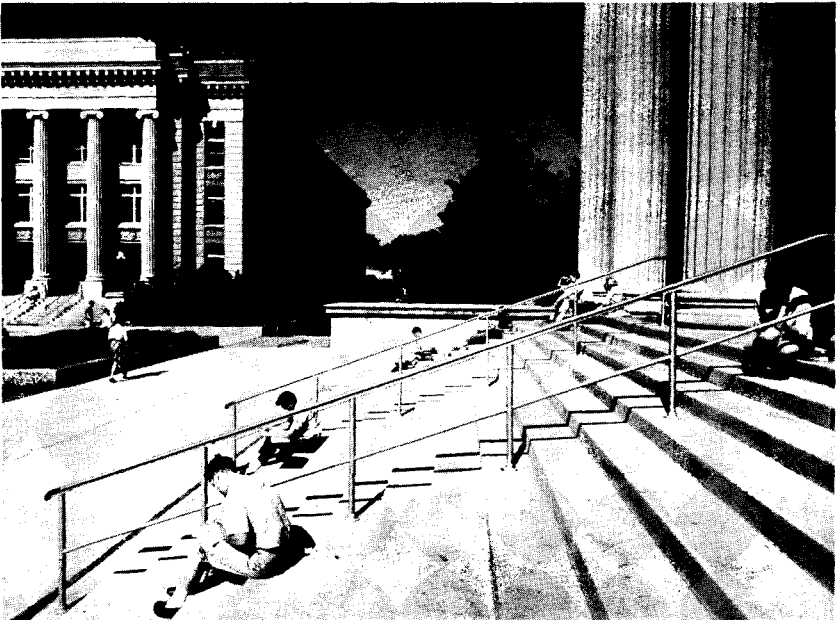
**5814. NATURAL HISTORY OF INVERTEBRATES.** (5 cr; limited to 20 students; prereq Biol 1106 or equiv; WS) Gilbertson

**5834. FIELD ORNITHOLOGY.** (5 cr; limited to 15 students; prereq Biol 1106 or equiv; TF) Warner

### SECOND TERM

**5807. PROTOZOOLOGY.** (5 cr; limited to 15 students; prereq Biol 1106 or equiv; TF) Bovee

**5819. NATURAL HISTORY OF VERTEBRATES.** (5 cr; limited to 20 students; prereq Biol 1106 or equiv; TF) Schmid



# College of Business Administration

## ADMISSION AND REGISTRATION

Students are admitted to College of Business Administration degree programs only in the fall, winter, and spring quarters; they may enroll in the summer as a summer-only student. Admission to a degree program requires completion of 80 quarter credits, including specific prebusiness courses, and a minimum overall grade point average of 2.50 for the Business—Regular program or 2.70 for the Business—Accounting program. Information about prebusiness course requirements and graduation requirements is available in the college office, 225 Business Administration Building.

Students registering for College of Business Administration courses follow procedures described in the Registration section of this bulletin.

## Accounting (Acct)

Courses with limited enrollment must be reserved in 225 Business Administration Building unless otherwise indicated (see instructions under "Reserved Courses").

### FIRST TERM

- 1050. PRINCIPLES OF ACCOUNTING I.** (4 cr; each section limited to 35 students, reserved in JohH 12; prereq 3rd-qr fr; A-N only)  
Introduction to basic financial accounting concepts and their application to the recording and reporting of business events. Accelerated class recommended for graduate students completing prerequisites and for honor students.  
Sec 7, I-II MTWTh, BlegH 110, Zorko  
Sec 8, III-IV MTWTh, BlegH 110, Barrett
- 3102. ACCOUNTING THEORY AND PRACTICE II.** (4 cr; limited to 35 students; prereq 3101; III-IV MTWTh; BlegH 330) Hamilton  
Concepts and problems in accounting for specific assets and equities.
- 3201. COST ACCOUNTING.** (4 cr; limited to 35 students; prereq 1051, MIS 3099, OAM 3055; \$4 lab fee; V-VI MTWTh; BlegH 125) Ardoin  
Process and standard costs, behavior of costs under varying conditions, cost allocations, variance analysis, capital budgeting.
- 5180. ADVANCED ACCOUNTING.** (4 cr; limited to 40 students; prereq 3102; I-II MTWTh; BlegH 145) Cumming  
Consolidated statements, partnerships, fiduciary, international, and fund accounting.
- 5310. CURRENT TOPICS IN FINANCIAL ACCOUNTING.** (4 cr [may be repeated for cr]; limited to 35 students; prereq 5135 and #; III-IV MTWTh; BlegH 240) Cleveland  
Current topic(s) in financial accounting.

## **FIRST AND SECOND TERMS: NINE-WEEK COURSES**

**1050. PRINCIPLES OF ACCOUNTING I.** (4 cr; each section limited to 35 students, reserved in JohH 12; prereq 3rd-qr fr; A-N only)

See First Term.

- Sec 1, 7:30-8:50 MWF, BlegH 115, Guttman
- Sec 2, 7:30-8:50 MWF, BlegH 335, Abdou-Elezz
- Sec 3, 7:30-8:50 MWF, BlegH 230, Park
- Sec 4, 9:05-10:25 MWF, BlegH 115, Eger
- Sec 5, 9:05-10:25 MWF, BlegH 220, Horwood
- Sec 6, 11:15-12:35 MWF, BlegH 330, Evans

**1051. PRINCIPLES OF ACCOUNTING II.** (4 cr; each section limited to 35 students, reserved in JohH 12; prereq 1050; A-N only)

Accounting analysis and reports for management and investor decision making. Emphasis on planning and control reporting.

- Sec 1, 7:30-8:50 MWF, BlegH 210, Ardoin
- Sec 2, 7:30-8:50 MWF, BlegH 240, Lindsay
- Sec 4, 9:05-10:25 MWF, BlegH 210, Rod

**3101. ACCOUNTING THEORY AND PRACTICE I.** (4 cr; each section limited to 35 students; prereq 1051)

The search for principles and postulates for income determination and for valuation. Includes measurement problems and funds concepts.

- Sec 1, 7:30-8:50 MWF, BlegH 220, Purdy
- Sec 2, 9:05-10:25 MWF, BlegH 220, Purdy

**5125. AUDITING PRINCIPLES AND PROCEDURES.** (4 cr; each section limited to 40 students; prereq 3102 and 3201).

The auditor's role and function. Includes audit standards, ethics, procedures, legal responsibilities.

- Sec 1, 7:30-8:50 MWF, BlegH 420, Berryman
- Sec 2, 9:05-10:25 MWF, BlegH 420, Berryman

**5135. INCOME TAX ACCOUNTING.** (4 cr; each section limited to 35 students; prereq 1051)

Individual, partnership, and corporate taxation; emphasizing income tax planning.

- Sec 1, 7:30-8:50 MWF, BlegH 340, Jacobs
- Sec 2, 9:05-10:25 MWF, BlegH 340, Jacobs

## **SECOND TERM**

**1051. PRINCIPLES OF ACCOUNTING II.** (4 cr; limited to 15 students, reserved in JohH 12; prereq 1050; A-N only; I-II MTWTh; BlegH 404) King

Accounting analysis and reports for management and investor decision making. Emphasis on planning and control reporting.

**5300. CURRENT TOPICS IN MANAGERIAL ACCOUNTING.** (4 cr [may be repeated for cr]; limited to 35 students; prereq 3201 and #; III-IV MTWTh; BlegH 110) King

Selected topic(s) in managerial accounting.

**8051. PRINCIPLES OF ACCOUNTING I.** (4 cr; limited to 20 graduate students; prereq 1050; A-N only; I-II MTWTh; BlegH 404) King

Accounting analysis and reports for management and investor decision making. Emphasis on planning and control reporting.

## **Business, Government, Society (BGS)**

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

### **FIRST TERM**

**3001. MANAGERIAL ECONOMICS.** (4 cr, §Econ 3101, §Econ 3105; each section limited to 40 students; prereq Econ 1002 or equiv) Hastings

Intermediate microeconomics from the perspective of the business enterprise and of the manager. Firm and industry demand, firm revenues and costs, supply, pricing practices, market structure, and other relevant economic concepts are applied to the individual business.

- Sec 1, I-II MTWThF, BlegH 435
- Sec 2, III-IV MTWThF, BlegH 435

## **SECOND TERM**

### **3002. BUSINESS AND SOCIETY.** (4 cr; each section limited to 50 students) Buchholz

The strategic and dynamic relations of business and society in a goals-oriented and problem-solving context. The interfaces of business institutions with the physical environment, social milieu, political process, and economic activity. National priorities vs. the respective roles of the private and public sectors concerning the challenges confronting U.S. society. Assessment of the concept, determinants, and indicators of the "quality of life" and the social responsibilities of business.

Sec 1, III-IV MTWThF, BlegH 135

Sec 2, VI-VII MTWThF, BlegH 135

## **Business Law (BLaW)**

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

## **FIRST TERM**

### **3058. INTRODUCTION TO LAW, AND THE LAW OF CONTRACTS AND AGENCY.** (4 cr, §8158; each section limited to 50 students; prereq Econ 1002 or equiv) Wright

The origin of law, its place in and effect upon society; the history and development of law; the systems of courts and legal procedure. The law of contracts as the basic law affecting business transactions. Laws affecting the relationship between principal and agent, master and servant, and employer and employee.

Sec 1, I MTWThF, BlegH 150

Sec 2, II MTWThF, BlegH 150

### **8158. INTRODUCTION TO LAW, AND THE LAW OF CONTRACTS AND AGENCY.** (4 cr, §3058; each section limited to 5 students; prereq Econ 1002 or equiv) Wright

See 3058.

Sec 1, I MTWThF, BlegH 150

Sec 2, II MTWThF, BlegH 150

## **Finance (BFin)**

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

## **FIRST TERM**

### **3000. FINANCE FUNDAMENTALS.** (4 cr, §8000; each section limited to 50 students; prereq Acct 1051)

A comprehensive, analytical introduction to the principal concepts in finance. The general business environment, valuation theory, financial management decisions concerning uses and sources of funds (i.e., capital budgeting), and the nation's financial markets.

Sec 1, 9:30-10:45 MTWTh, BlegH 130, Gahlon

Sec 2, 11:15-12:30 MTWTh, BlegH 130, Rosko

### **3300. INVESTMENT MANAGEMENT.** (4 cr, §8300; limited to 40 students; prereq 3000; 12:20-2:50 TTh; BlegH 225) Alexander

A comprehensive introduction to investment decision making from the viewpoints of both individual and institutional investors. Principal focus is on risk-return relationships of various marketable securities. Analytical techniques of security selection and portfolio management in the context of the nation's changing securities markets.

### **3500. REAL ESTATE INVESTMENT ANALYSIS.** (4 cr; limited to 40 students; prereq Econ 1002 or equiv; 12:45-2:00 MTWTh; BlegH 255) Rosko

Analysis of investments in real property. Economic aspects of such investments including: cash flows; accounting depreciation vs. market value depreciation or appreciation; financing methods and costs; sources of funds; measures of return on investment. Ellwood techniques. Computer models for investment analysis. Impact of property taxes on urban land use.

### **8800. FINANCE SEMINAR.** (Cr ar [may be repeated for cr]; limited to 25 students; prereq 8000 and #; 2:30-5:00 TTh; BlegH 330) Jessup

Forum for advanced research in finance, emphasizing contemporary research in selected subareas of finance. Focus this offering is on management planning and decision making in banking institutions; primarily a case approach.

### **8990. READINGS AND RESEARCH IN FINANCE.** (Cr ar; prereq consent of adviser and # in field covered)

Advanced readings in finance. Experimental subject areas and materials for seminar discussion. Opportunities for individualized readings and research programs developed under faculty supervision.

## **SECOND TERM**

- 3000. FINANCE FUNDAMENTALS.** (4 cr, \$8000; limited to 50 students; prereq Acct 1051; 8:00-9:15 MTWTh; BlegH 135) Schreiner  
See First Term.
- 3100. FINANCIAL MANAGEMENT.** (4 cr, \$8100; limited to 30 students; prereq 3000; 12:20-2:50 TTh; BlegH 330) Stover  
A broad case-oriented course building on concepts introduced in 3000. The viewpoint of a corporation's principal financial officer is generally used. Case discussions, augmented by lectures and readings, enable students to apply finance principles in actual business situations. Experience in problem definition, specification of alternatives, analysis, and decisions. Effective verbal and written communication is stressed.
- 3300. INVESTMENT MANAGEMENT.** (4 cr, \$8300; limited to 40 students; prereq 3000; 12:20-1:35 MTWTh; BlegH 205) Jessup  
See First Term.
- 8990. READINGS AND RESEARCH IN FINANCE.** (Cr ar; prereq consent of adviser and # in field covered)  
See First Term.

## **Industrial Relations (IR)**

### **FIRST TERM**

- 3002. INDUSTRIAL RELATIONS SYSTEMS: LABOR MARKETS AND THE MANAGEMENT OF HUMAN RESOURCES.** (4 cr, \$8002; prereq Econ 1001, 1002, Psy 1001; II-III MTWTh; BlegH 135)  
Labor markets, employee management, federal-state employment policy, and the resolution of industrial conflict. Process followed in valuing, employing, developing, motivating, and maintaining human resources in an industrial society.
- 3010. HUMAN RELATIONS AND APPLIED ORGANIZATION THEORY.** (4 cr; VI-VII MTWTh; BlegH 205)  
The problems of human relations arising in modern organizations and approaches to their solution. Philosophies and theories of human relations and their translation into policy. Discussion, cases, role playing, and skill building sessions.
- 8002. INDUSTRIAL RELATIONS SYSTEMS: LABOR MARKETS AND THE MANAGEMENT OF HUMAN RESOURCES.** (5 cr, \$3002; prereq Econ 1001, 1002, Psy 1001; I-II MTWTh; BlegH 245)  
See 3002.
- 8003. ORGANIZATION AND STAFFING.** (4 cr; prereq 8002 or #; III-IV MTWTh; BlegH 245)  
Integration of organization goals and objectives with individual needs and objectives through the staffing processes of human resources planning, recruitment, selection/reduction, allocation and evaluation of human resources.
- 8005. EMPLOYEE COMPENSATION AND REWARD.** (4 cr; prereq 8002 or #; V-VI MTWTh; BlegH 245)  
Systems of employee compensation and reward within economic organizations. Concepts, models, and theories relating to processes of compensation designed to influence employee behavior and performance within constraints; wage structuring, pricing, individual appraisal and reward, employee motivation, and compensation controls.
- 8007. COLLECTIVE BARGAINING NEGOTIATIONS: PROCESSES IN THE PUBLIC AND PRIVATE SECTORS.** (4 cr; prereq 8002 or #; VII-VIII MTWTh; BlegH 245)  
The elements in collective bargaining negotiations and the legal framework imposed on negotiations both public and private. Conflict and behavioral models containing institutional constraints guide the examination of strategies and tactics that characterize employee-employer bargaining relationships.

### **SECOND TERM**

- 3002. INDUSTRIAL RELATIONS SYSTEMS: LABOR MARKETS AND THE MANAGEMENT OF HUMAN RESOURCES.** (4 cr, \$8002; prereq Econ 1001, 1002, Psy 1001; II-III MTWTh; BlegH 215)  
See First Term.
- 3010. HUMAN RELATIONS AND APPLIED ORGANIZATION THEORY.** (4 cr; 1:30-2:45 MTWTh; BlegH 120)  
See First Term.
- 8002. INDUSTRIAL RELATIONS SYSTEMS: LABOR MARKETS AND THE MANAGEMENT OF HUMAN RESOURCES.** (5 cr, \$3002; prereq Econ 1001, 1002, Psy 1001; I-II MTWTh; BlegH 255)  
See 3002 First Term.
- 8006. LABOR MARKETS: PROCESSES AND DYNAMICS.** (4 cr; prereq 8002 or #; III-IV MTWTh; BlegH 260)  
Basic concepts, applications, and data sources to examine the usefulness of market analysis for human resources development, allocation, and utilization. Labor force dynamics and measurement, mobility, productivity, technological change, changes in the cost of living, wage structures, and public policy programs.

# Management (Mgmt)

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

## FIRST TERM

- 3001. FUNDAMENTALS OF MANAGEMENT.** (4 cr, §8001; limited to 50 students)  
Concepts, theory, research, and operational problems. The principal functional areas of management. Factors and relationships necessary to achieve organizational objectives: establishment of goals, policies, procedures; the planning process; control systems; organizational structure and behavior; leadership.  
Sec 1, I-II MTWThF, BlegH 425  
Sec 2, III-IV MTWThF, BlegH 425
- 3002. PSYCHOLOGY IN MANAGEMENT.** (4 cr, §8006; limited to 30 students; III-IV MTWThF; BlegH 105) Heinen  
Development and application of behavior principles, methods, and skills that underlie managerial competence in preventing and solving problems within and between individuals and groups and aid in effective utilization of human resources. Various laboratory procedures highlight concepts, methods, and skills and furnish practice in applying them to management problems.
- 8006. PSYCHOLOGY IN MANAGEMENT.** (4 cr, §3002; limited to 30 students; I-II MTWThF; BlegH 105) Heinen  
See 3002.

## SECOND TERM

- 3001. FUNDAMENTALS OF MANAGEMENT.** (4 cr, §8001; limited to 50 students; III-IV MTWThF; BlegH 435)  
See First Term.
- 3004. BUSINESS POLICY: STRATEGY FORMULATION AND IMPLEMENTATION.** (5 cr; limited to 35 students; prereq sr and completion of business core or final core course; I-II MTWThF; BlegH 260)  
Identifying and analyzing problems, establishing corporate or divisional goals, and designing realistic programs of action. Usually the viewpoint of the general line manager (department, division, or executive level) is taken. Case analysis and discussion, small group work, and occasional presentations made to the class.

# Management Information Systems (MIS)

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

## FIRST TERM

- 3098. ELEMENTARY COBOL.** (1 cr; S-N only; limited to 50 students; \$4 lab fee; V MW; BlegH 110)  
An introduction to programming in the COBOL language. Using a programmed text in this self-paced course, the student will complete a set of simple COBOL programs. Consultants assist and administer quizzes in a laboratory environment.
- 3099. INTRODUCTION TO PROGRAMMING USING FORTRAN.** (1 cr; S-N only; limited to 50 students; \$4 lab fee; V TTh; BlegH 110)  
An introduction to programming in the FORTRAN language. Using a programmed text in this self-paced course, the student will complete a set of simple FORTRAN programs. Consultants assist and administer quizzes in a laboratory environment.
- 5101. INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS.** (4 cr; limited to 45 students; III-IV MTWTh; BlegH 205)  
An overview of management information systems. Conceptual foundation including: concepts of information, humans as information processors, systems concepts and information systems, management and organizational concepts, decision-making concepts and the value of information for decision making. The structure, development, organization, management, and evaluation of a management information system. Emphasis on the user/system interface.

## SECOND TERM

- 5100. INTRODUCTION TO COMPUTERS AND COMPUTER DATA PROCESSING.** (4 cr, §8208; limited to 55 students; prereq 3098 or 3099 or 13098 or 13099; III-IV MTWTh; BlegH 110)  
Elements of computer hardware and their functions. Computer software. Tools and methods for development of computer applications. Preparing computer programs. Acquisition, organization, and management of computer resources. The computer industry. Future developments.

## Marketing (Mktg)

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").

### FIRST TERM

- 3000. PRINCIPLES OF MARKETING.** (4 cr, §8000; section 1 limited to 50 students, section 2 limited to 40 students; prereq Econ 1002 or equiv)  
Basic policy and strategy issues in marketing and the environmental factors that affect these issues. Legal, behavioral, ethical, competitive, economic, and technological factors as they affect product, pricing, promotion, and marketing channel decisions.  
Sec 1, 7:45-9:00 MTWThF, BlegH 125  
Sec 2, 9:30-10:45 MTWThF, BlegH 215, Berkowitz
- 3077. ADVERTISING AND SALES PROMOTION.** (4 cr, §8077, §8078; limited to 50 students; prereq 3000; 11:15-12:30 MTWThF; BlegH 215) Berkowitz  
The promotion function in marketing; media, audience, message. Establishing objectives for advertising and sales promotion, budget and media allocation decisions, sales promotion, mix components, advertiser-agency structure and relationships, measuring advertising and sales promotion effectiveness, and socioeconomic considerations.
- 3098. INTRODUCTION TO CONSUMER BEHAVIOR.** (4 cr, §8098; limited to 50 students; prereq 3000; 9:45-11:00 MTWThF; BlegH 120) Ross  
Application of the behavioral sciences to understanding human behavior in the marketplace. Perception, learning, attitude theory and measurement, persuasion, motivation, personality, social and cultural influences, family decision making, the social influence process, consumer decision-making strategies, managerial implications of consumer research and "consumerism."
- 8000. PRINCIPLES OF MARKETING.** (4 cr, §3000; limited to 20 students; prereq Econ 1002 or equiv; 9:30-10:45 MTWThF; BlegH 215) Berkowitz  
See 3000.
- 8098. INTRODUCTION TO CONSUMER BEHAVIOR.** (4 cr, §3098; limited to 25 students; prereq 3000 or 8000; 11:15-12:30 MTWThF; BlegH 120) Ross  
See 3098.

### SECOND TERM

- 3000. PRINCIPLES OF MARKETING.** (4 cr, §8000; limited to 50 students; prereq Econ 1002 or equiv; 7:45-9:00 MTWThF; BlegH 120)  
See First Term.
- 3065. RETAIL MANAGEMENT.** (4 cr, §8065; limited to 50 students; prereq 3000; 9:15-10:30 MTWThF; BlegH 120)  
Retailing principles, problems, and trends as they relate to various types of retailing institutions. Trade journal and supplementary readings for in-store study (buying and pricing) with a local retailer.
- 3098. INTRODUCTION TO CONSUMER BEHAVIOR.** (4 cr, §8098; limited to 50 students; prereq 3000; 11:15-12:30 MTWThF; BlegH 230) Walton  
See First Term.
- 8078. MARKETING COMMUNICATIONS.** (4 cr, §3077, §8077; limited to 25 students; prereq 3000 or 8000; 9:15-10:30 MTWThF; BlegH 350) Walton  
Design and evaluation of marketing communications; communication theory, theories of persuasion and attitude change, message creation and execution, marketing communications media and audience research data, and methods of measuring communications effectiveness. Deals primarily with communications theory and research and does not include the management of marketing communications activity.

## Quantitative Analysis (QA)

Courses with limited enrollment must be reserved in 225 Business Administration Building unless otherwise indicated (see instructions under "Reserved Courses").

### FIRST TERM

- 1050. ELEMENTARY MANAGERIAL STATISTICS.** (4 cr; limited to 45 students, reserved in JohH 12; prereq Math 1111 or equiv or Math 1131; \$4 lab fee; I-II MTWTh; BlegH 205)  
Introduction to quantitative decision making. Probabilistic and statistical techniques in decision making, data analysis, and management information systems; e.g., laws of probability, sampling, estimation, and regression.

**3055. INTRODUCTION TO MANAGEMENT SCIENCES.** (4 cr; limited to 40 students; prereq 1050, Math 1142 or equiv; \$4 lab fee)  
Analytical approaches and quantitative reasoning in management problems; problem formulation, analytical methods for solution, and use of computer models. Management science concepts, decision theory, simulation, linear programming, implementation.

Sec 1, I-II MTWTh, BlegH 225  
Sec 2, III-IV MTWTh, BlegH 225

## **SECOND TERM**

**1050. ELEMENTARY MANAGERIAL STATISTICS.** (4 cr; limited to 45 students, reserved in JohH 12; prereq Math 1111 or equiv or Math 1131; \$4 lab fee; I-II MTWTh; BlegH 205)  
See First Term.

**3055. INTRODUCTION TO MANAGEMENT SCIENCES.** (4 cr; limited to 40 students; prereq 1050, Math 1142 or equiv; \$4 lab fee; I-II MTWTh; BlegH 225)  
See First Term.

# **Risk Management and Insurance (Ins)**

## **FIRST TERM**

**3100. RISK MANAGEMENT AND INSURANCE.** (4 cr, §8100; 7:30-8:45 MTWTh; BlegH 155) Whitman  
How to recognize and evaluate the property, liability, and personnel risks facing a business firm, a family, or some other economic unit. The tools of risk management—retention, loss prevention, and insurance—and the conditions under which they should be used. How to select and deal with an insurer. Public policy issues—government regulation, social insurance, and automobile insurance problems.

**3200. LIFE AND HEALTH INSURANCE.** (4 cr, §8200; prereq 3100 or equiv; 8:50-10:05 MTWTh; BlegH 155) Whitman  
Types of individual life and health insurance contracts, their uses, and their major provisions. Insurance and pension components of employee benefit plans—their characteristics and regulation. Programming and estate planning. Business uses of individual life and health insurance. Selection of a life and health insurer.

**8100. RISK MANAGEMENT AND INSURANCE.** (4 cr, §3100; 7:30-8:45 MTWTh; BlegH 155) Whitman  
See 3100.

**8200. LIFE AND HEALTH INSURANCE.** (4 cr, §3200; prereq 8100 or equiv; 8:50-10:05 MTWTh; BlegH 155) Whitman  
See 3200.

**8990. READINGS IN RISK MANAGEMENT AND INSURANCE.** (Cr ar; prereq consent of adviser and # in field covered)  
Readings useful to the student's individual program and objectives but not available in regular course offerings.

## **SECOND TERM**

**3100. RISK MANAGEMENT AND INSURANCE.** (4 cr, §8100; 8:00-9:15 MTWTh; BlegH 155) Rollins  
See First Term.

**8100. RISK MANAGEMENT AND INSURANCE.** (4 cr, §3100; 8:00-9:15 MTWTh; BlegH 155) Rollins  
See 3100 First Term.

**8990. READINGS IN RISK MANAGEMENT AND INSURANCE.** (Cr ar; prereq consent of adviser and # in field covered)  
See First Term.

# **Transportation (Tran)**

Courses with limited enrollment must be reserved in 225 Business Administration Building (see instructions under "Reserved Courses").



## FIRST TERM

- 3054. FUNDAMENTALS OF TRANSPORTATION.** (4 cr, §8154; each section limited to 50 students)  
Organizational and economic aspects of the transportation system of the United States including rail, highway, air, pipeline, and water transportation. Administration of transportation by users, carriers, and government.
- Sec 1, I MTWThF, BlegH 425  
Sec 2, II MTWThF, BlegH 425

## SECOND TERM

- 3064. BUSINESS LOGISTICS.** (5 cr, §8264; limited to 40 students; prereq 3054; 7:30-8:50 MTWThF; BlegH 425)  
Control of the flow of physical products by the firm. Rate negotiation, transportation alternatives, logistics information systems, inventory control, warehouse operations and location, and logistics system design.
- 8264. BUSINESS LOGISTICS.** (5 cr, §3064; limited to 10 students; prereq 3054 or 8154; 7:30-8:50 MTWThF; BlegH 425)  
See 3064.



## College of Education

Those expecting to become a candidate for a bachelor's degree or M.Ed. degree should apply for admission as a regular student in the College of Education by filling out the application form in the Office of Admissions and Records and filing in that office any credentials on the basis of which they wish to request advanced standing. Summer admission is possible in the following B.S. degree programs: business education, distributive education, industrial education, music education, and school health education. Students interested in a specific degree program are encouraged to contact the Education Career Development Office (ECDO), 1425 University Avenue S.E., at once to learn when students are accepted and the deadline for application for those programs. The *College of Education Bulletin* provides current information about programs and requirements.

Summer session students who do not expect to become a candidate for an undergraduate or graduate degree do not need to present credentials (see section on Admission and Registration); they are classified as a "summer-only" student. Those wishing to enter the Graduate School should apply immediately for admission to the Graduate School (see Admission section).

For detailed descriptions of courses and curricula in education, see the *College of Education Bulletin*.

Although normally classes are *not* scheduled on the final registration days (June 13 and July 18), some College of Education short-term workshops *will* meet on those dates.

### **COUNSELING SERVICES**

The staff of the Education Career Development Office of the College of Education will be available during both terms for consultation concerning admission, information about requirements of the teaching profession, and counseling. Appointments should be made at 1425 University Avenue S.E.

### **STUDENT PROGRESS COMMITTEE**

Undergraduate and master of education students with questions concerning program adjustments and substitutions for required work should consult their adviser or a representative of the Student Progress Committee at 1425 University Avenue S.E.

### **GRADUATE CREDIT FOR WORKSHOPS**

The amount of graduate credit in workshops that may be applied toward a master's degree program is limited. Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

## STUDENT TEACHING

Student teaching during the summer is open ONLY to certain groups of students completing programs in the College of Education: (a) regularly approved applicants for student teaching in the nursery school-kindergarten program; (b) secondary education seniors needing 3 credits or less for completion of graduation requirements in the first term; (c) some students in special education. Application must be made prior to April 22 in the Education Career Development Office. Because of limited facilities, it is NOT possible to offer student teaching to students completing programs at other institutions.

## INSTITUTE OF CHILD DEVELOPMENT

### Child Psychology (CPsy)

#### FIRST TERM

- 1301. INTRODUCTORY CHILD PSYCHOLOGY.** (4 cr; prereq 5 cr introductory psychology; III MTWThF; WuH 230)  
Cleaves  
Introduction to science of child behavior; review of theories and research. Course formerly taught as CPsy 3301; content equivalent.
- 3303. ADOLESCENT PSYCHOLOGY.** (4 cr, §5303; prereq 5 cr introductory psychology; II MTWThF; Arch 40)  
Grotevant  
Physical, cognitive, and social development during adolescence. Meets with 5303.
- 3304. INTRODUCTION TO MATURITY AND AGING.** (4 cr; prereq 1301, 3301 or equiv; III MTWThF) Keating  
Empirical and theoretical issues in developmental psychology of maturity and aging; survey of perceptual-motor, cognitive, and social-psychological changes from young adulthood to old age.
- 3311. BEHAVIORAL AND EMOTIONAL PROBLEMS.** (4 cr, §5311; prereq 1301, 3301 or equiv; IV MTWThF; WuH 230) Tomlinson  
Description, etiology, development of behavioral and emotional problems of children; treatment where germane. Excluded are problems deriving primarily from sensory or physical handicap, mental retardation, or neurological impairment. Meets with 5311.
- 3313. PSYCHOLOGY OF ATYPICAL CHILDREN.** (4 cr, §5313; prereq 1301 or equiv; I MTWThF; Pt 214) Brown  
Problems of research, assessment, and behavior associated with atypicality; evaluation of research in areas of major concern for sensory, language, intellectual, and physical deviation. Meets with 5313.
- 3347. CHILDREN'S LEARNING AND INTELLECTUAL SKILLS.** (4 cr; prereq 1301; IV MTWThF; CD 216) Butterworth  
Current research on learning, problem solving, intellectual performance in children; application to practical contexts.
- 5303. ADOLESCENT PSYCHOLOGY.** (4 cr, §3303; prereq 5 cr introductory psychology; II MTWThF; Arch 40)  
Grotevant  
Physical, cognitive, and social development during adolescence. Meets with 3303.
- 5311. BEHAVIORAL AND EMOTIONAL PROBLEMS.** (4 cr, §3311; prereq 1301 or equiv; IV MTWThF; WuH 230) Tomlinson  
Description, etiology, development of behavioral and emotional problems of children; treatment where germane. Excluded are problems deriving primarily from sensory or physical handicap, mental retardation, or neurological impairment. Meets with 3311.
- 5313. PSYCHOLOGY OF ATYPICAL CHILDREN.** (4 cr, §3313; prereq 1301 or equiv; I MTWThF; Pt 214) Brown  
Problems of research, assessment, and behavior associated with atypicality; evaluation of research in areas of major concern for sensory, language, intellectual, and physical deviation. Meets with 3313.
- 5315. INTRODUCTION TO MENTAL RETARDATION.** (4 cr, §SpEd 5120; prereq 1301 or equiv; II MTWThF; Pt 102)  
Turnure  
Psychological and educational problems related to the mentally retarded. Meets with SpEd 5120.
- 5319. CLINICAL PROCEDURES WITH CHILDREN AND YOUTH.** (4 cr; prereq 12 cr in child psychology, psychology, educational psychology, or sociology; I MTWThF; CD 216) Gross  
Survey of assessment and intervention procedures of child clinical psychology in clinical and community settings. Primarily for students not majoring in clinical psychology.

- 5335. PEER RELATIONS.** (4 cr; prereq 3331 or 5331; II MTWThF) Mohr  
Peer influences, social interactions and social relations; developmental changes.
- 5345. LANGUAGE DEVELOPMENT.** (4 cr; prereq 1301; III MTWThF; CD 216) Maratsos  
Development of structure and function of language; factors influencing development; methodological problems, language scales, theories.
- 5970. DIRECTED STUDY IN CHILD PSYCHOLOGY.** (Cr ar; prereq #) Masters  
Independent reading.
- 5990. DIRECTED RESEARCH IN CHILD PSYCHOLOGY.** (Cr ar; prereq #) Masters  
Individual empirical investigation.
- 8970. INDEPENDENT STUDY.** (Cr ar; prereq #) Masters  
Independent reading.
- 8990. RESEARCH PROBLEMS.** (Cr ar; prereq #) Masters  
Individual empirical investigation.

## **SECOND TERM**

- 1301. INTRODUCTORY CHILD PSYCHOLOGY.** (4 cr; prereq 5 cr introductory psychology; IV MTWThF; WuH 130)  
Butterworth  
See First Term.
- 3302. INFANCY.** (4 cr; prereq 1301 or 3301; III MTWThF) Bushnell  
Perceptual, motor, emotional, social, and cognitive development during the first 2 years of life; the developing infant in his or her social and physical environment.
- 3303. ADOLESCENT PSYCHOLOGY.** (4 cr, §5303; prereq 5 cr introductory psychology; II MTWThF; EItH N119)  
Keating  
See First Term.
- 3311. BEHAVIORAL AND EMOTIONAL PROBLEMS.** (4 cr, §5311; prereq 1301 or equiv; I MTWThF; Arch 30)  
Reed  
See First Term.
- 3331. PROCESSES OF SOCIALIZATION OF CHILDREN.** (4 cr, §5331; prereq 1301 or equiv; IV MTWThF; EItH N119) Grueneich  
Processes of social learning; identification, social influence, imitation, reward and punishment, internalization, object choice. Meets with CPsy 5331.
- 5303. ADOLESCENT PSYCHOLOGY.** (4 cr, §3303; prereq 5 cr introductory psychology; II MTWThF; EItH N119)  
Keating  
See First Term.
- 5311. BEHAVIORAL AND EMOTIONAL PROBLEMS.** (4 cr, §3311; prereq 1301 or equiv; I MTWThF; Arch 30)  
Reed  
See First Term.
- 5315. INTRODUCTION TO MENTAL RETARDATION.** (4 cr, §SpEd 5120; prereq 1301 or equiv; II MTWThF; Pt 111)  
Warfield  
See First Term. Meets with SpEd 5120.
- 5331. PROCESSES OF SOCIALIZATION OF CHILDREN.** (4 cr, §3331; prereq 1301 or equiv; IV MTWThF; EItH N119) Grueneich  
Processes of social learning; identification, social influence, imitation, reward and punishment, internalization, object choice. Meets with 3331.
- 5339. PARENT-CHILD RELATIONS.** (4 cr; prereq 3331 or 5331; III MTWThF) Vaughn  
Discussion of parent-child relationships and evaluation of relevant research (e.g., cross-cultural child rearing perspectives, alternative parenting roles, economics of parent-child relations, rights of parents and children).
- 5970. DIRECTED STUDY IN CHILD PSYCHOLOGY.** (Cr ar; prereq #) Masters  
See First Term.
- 5990. DIRECTED RESEARCH IN CHILD PSYCHOLOGY.** (Cr ar; prereq #) Masters  
See First Term.
- 8970. INDEPENDENT STUDY.** (Cr ar; prereq #) Masters  
See First Term.
- 8990. RESEARCH PROBLEMS.** (Cr ar; prereq #) Masters  
See First Term.

# DEPARTMENT OF CURRICULUM AND INSTRUCTION

## Art Education (ArEd)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### FIRST TERM

- 3001. SURVEY OF ART ACTIVITIES.** (4 cr; not open to art education majors; limited to 30 students; I-II MTWThF; WuH 240) Olson  
Introduction to pictorial expression, design, and the function of art in the school environment.
- 5001. ART MEDIA TECHNIQUES.** (1-12 cr [max 12 cr]; sec 1 limited to 30 students, sec 2 limited to 40 students)  
Lectures, demonstrations, discussions, and critique sessions exploring and learning various creative techniques and processes; handling specific media with each offering focusing on a single topic.  
**Sec 1, Bookbinding, June 14-24,** 3 cr, III-V MTWThF and 3 lab hrs ar, WuH 240, Olson  
Bookbinding and children's book design.  
**Sec 2, Art Appreciation, June 27-July 8,** 3 cr, III-V MTWThF and 3 lab hrs ar, WuH 240, Day  
Art appreciation with emphasis on fostering art appreciation in children.
- 5605. PRACTICUM.** (3-9 cr; prereq #) Day, Olson  
Independent project under direction; gathering data, developing proposals, experimenting with evaluating innovative practices.
- 5900. PROFESSIONAL PROBLEMS.** (3 cr; prereq MEd student; hrs ar) Day, Olson  
Independent study for M.Ed. candidates integrating learning from art education, art, and education.
- 8300. RESEARCH IN ART EDUCATION.** (3 cr; II MTWThF; WuH 110) Day  
Research techniques.
- 8306. SEMINAR: ART EDUCATION.** (1 cr; VI T; WuH 110) Day  
Reports, evaluation of problems, recent literature.
- 8900.\* PROBLEMS: ART EDUCATION.** (Cr ar; prereq #; hrs ar) Day  
Independent projects under staff guidance may include advanced studio practice or technical problems requiring experimental or library research.

### SECOND TERM

- 3009. WEAVING WITHOUT A LOOM.** (4 cr; limited to 25 students; I-II MTWThF; WuH 340) Smits  
Developing fundamental weaving skills employing inexpensive equipment and techniques without the use of the floor loom.
- 3010. INTRODUCTION TO WEAVING.** (3 cr; limited to 20 students; \$4 lab fee; III-IV MTWThF; WuH 340) Smits  
Equipment, design, setting up and operation of table and floor looms.
- 3020. CONTEMPORARY CRAFTS.** (3 cr; limited to 25 students; \$4 lab fee; III-IV MTWThF; WuH 120) Kremer  
Materials, equipment, design criteria, and techniques for textiles, wood, metal, and ceramics.
- 5303. CURRICULUM BUILDING IN ART EDUCATION: PROGRAMS FOR EXCEPTIONAL CHILDREN.** (3 cr; II MTWThF; WuH 110) Slettehaugh  
Selection, evaluation, and organization of materials for teaching units and projects.
- 5318. ART EDUCATION IN EUROPE.** (3 cr; III MTWThF; WuH 110) Slettehaugh  
Current practices, problems, and achievements in art education in Western Europe compared with practices in American art education.
- 5386. IMPROVING ART PROGRAMS IN THE SCHOOLS—August 8-12.** (4 cr; prereq tchg exper or #; 9:00-12:00 and 12:30-4:30 MTWThF and 5 lab hrs ar; WuH 240) Day  
For teachers of art; critical examination of present art programs in the schools. Prominent art educators will provide expertise for teachers interested in program survival, improvement, and communication with the community. See Special Programs section.
- 5605. PRACTICUM.** (3-9 cr; prereq #; hrs ar) Slettehaugh  
See First Term.
- 5900. PROFESSIONAL PROBLEMS.** (3 cr; prereq MEd student; hrs ar) Slettehaugh  
See First Term.
- 8900.\* PROBLEMS: ART EDUCATION.** (Cr ar; prereq #; hrs ar) Slettehaugh  
See First Term.

## Education: Adult, Higher, and Teacher (Educ)

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

### FIRST TERM

**5103.<sup>1</sup> ADULT EDUCATION WORKSHOP.** (1-12 cr [max 12 cr]; limited to 35 students; prereq practicing adult educator and #: 10:10-12:50 MW; NH 209) Park  
Study of topic appropriate to the activities and interests of the participants.

**Sec 1 Vocational Literacy for Adults,** 3 cr, 10:10-12:50 MW, NH 209, Park  
Research in skills needed to read work-related material, strategies for teaching these skills in prevocational programs for poor readers and high risk students with emphasis on workers with poor reading skills.

**Sec 2, Issues in University Adult Education,** 3 cr, 9:05-11:35 MW, Campbell  
Review of current and projected university adult education programs; examination of the social, philosophical, and institutional influences on them.

**5205. FIELD EXPERIENCE IN ADULT EDUCATION.** (4-8 cr [max 8 cr]; prereq #) Willie, Park

**5401. ADULT LEARNING AND DEVELOPMENT THROUGH THE LIFE SPAN.** (3 cr; 1:30-4:00 TTh; Bu 125) Williams

Physiological, social, and cultural bases of adult behavior; motivation, socialization, personality change as applied to education of adults.

**8228.\* PROBLEMS: HIGHER EDUCATION.** (Cr and hrs ar; prereq #) Corcoran, Keller, Kellogg, Williams

**8250. HIGHER EDUCATION IN THE UNITED STATES.** (3 cr; prereq yr of grad study in any field or 18 cr in education; I MTWThF; Bu 123) Keller

Development, present status, and outlook for American colleges; purposes; current and projected programs; trends in curriculum, instruction, and administration; evaluation of outcomes.

**8252. EFFECTIVE COLLEGE TEACHING.** (3 cr; prereq 8250 and yr of grad study in any field or 18 cr in education; 10:10-12:50 TTh; FolH 102) Williams

Teaching-learning relationship; study and appraisal of methods employed to encourage, guide, and evaluate students' learning.

**8284.\* PROBLEMS: TEACHER EDUCATION.** (3-9 cr; prereq #; hrs ar) E Anderson

**8302.\* PROBLEMS: ADULT EDUCATION.** (3-9 cr; prereq #) Willie, Park  
Individual research in area of adult education.

### SECOND TERM

**5182. LABORATORY APPROACHES IN TEACHER EDUCATION.** (3 cr; III MTWThF; CD 105) Bruning  
Training modes in teacher education; microteaching, simulation, games, and protocol materials.

**8228.\* PROBLEMS: HIGHER EDUCATION.** (Cr and hrs ar; prereq #) Corcoran, Keller, Kellogg

**8284.\* PROBLEMS: TEACHER EDUCATION.** (3-9 cr; prereq #; hrs ar) Bruning

## Elementary Education (Elem)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### FIRST TERM

**3604.<sup>2</sup> STUDENT TEACHING IN THE NURSERY SCHOOL.** (3-6 cr; S-N only; prereq approval of major adviser and director of student tchg; hrs ar) Sternberg, Stoner, Yelensky

**5100. ELEMENTARY SCHOOL CURRICULUM.** (3 cr; limited to 40 students; prereq 3101; II MTWThF; Pt 111)

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate programs.

<sup>2</sup>Student teaching is open only to students in regular degree programs of the College of Education. Application must be made prior to April 22. Forms and instructions are available in the Education Career Development Office, 1425 University Avenue S.E.

- 5107. DIAGNOSIS AND TREATMENT OF LEARNING DIFFICULTIES.** (3 cr; limited to 40 students; III MTWThF; Bu 120)
- 5109. SUPERVISORY STRATEGIES IN PLANNING, OBSERVING, CONFERENCING—June 20-July 1.** (3 cr; limited to 40 students; prereq #: 8:30-11:30 MTWThF; Sheridan School, 1203 University Ave NE, Mpls) McNergney  
Overview of responsibilities of the supervising teacher; material development and practice in basic supervisory skills and functions.
- 5300. LITERATURE FOR THE ELEMENTARY SCHOOL.** (3 cr; limited to 60 students; II MTWThF; Bu 120) Odland
- 5317. MATERIALS LABORATORY FOR TEACHING ENGLISH IN ELEMENTARY SCHOOLS—June 30-July 15.** (3 cr; limited to 40 students; prereq 3316 or elem tchg exper; III-IV MTWThF; Bu 123) Youngers  
Examination and evaluation of textbooks, programmed materials, and audiovisual resources for elementary school language arts instruction.
- 5318. CREATIVE WRITING FOR AND BY CHILDREN—June 14-29.** (3-6 cr; [max 6 cr]; limited to 35 students; prereq 3300 or 3336 or elem tchg exper and #; III-IV MTWThF; Bu 123)  
Language arts in the elementary school for experienced teachers, supervisors, graduate students, and college instructors; emphasis on creative aspects of writing of children's literature and the children's own writing. Authors of children's books will be involved in this offering for 3 credits.
- 5331. TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOLS.** (3 cr; limited to 50 students; prereq 9 cr in education; II MTWThF; Bu 123) D Pearson  
For graduate students and summer students who hold a bachelor's degree.
- 5334. READING DIFFICULTIES.** (3 cr; each section limited to 40 students; prereq 5331 or SeEd 5344)  
Sec 1, III MTWThF, CD 218, Schreiner  
Sec 2, V MTWThF, Bu 123
- 5335. CLINICAL DIAGNOSIS OF READING DIFFICULTIES.** (3 cr; students are required to register concurrently in Elem 5336; limited to 23 students; prereq 5334; IV MTWThF; CD 105) Manning  
Relationship to psychological factors and clinical remedial correction.
- 5336. CLINICAL PRACTICE IN REMEDIAL TEACHING.** (3 cr; students are required to register concurrently in Elem 5335; limited to 23 students; prereq 5334 or 5107 and #; III MTWThF; CD 105) Manning  
Remedial tutoring of individual children who have difficulty in school learning.
- 5337. BEGINNING READING INSTRUCTION.** (3 cr; limited to 40 students; prereq 3331 and #; IV MTWThF; WuH 130) D Pearson  
For teachers and specialists interested in initial teaching procedures; compares alternative methods of beginning instruction; emphasis on readiness program, test-grouping patterns, language factors, and intensive instructional procedures to prevent reading failure.
- 5338. TEACHING READING IN THE INTERMEDIATE GRADES.** (3 cr; limited to 40 students; prereq 3331 and #; I MTWThF; WuH 130)  
For teachers and specialists interested in problems of teaching reading beyond the decoding stage; emphasis on comprehension strategies, basic study skills, and reading in the content areas.
- 5346. TEACHING SCIENCE IN THE ELEMENTARY SCHOOL.** (3 cr; limited to 40 students; prereq elem tchg exper or #; IV-V MWF; PeikH 385) Humphreys
- 5350. ELEMENTARY SCHOOL SCIENCE: MATERIALS AND RESOURCES.** (3 cr; limited to 35 students; prereq 5349; IV-VI TTh; PeikH 385) Humphreys  
Experiences in the use of educational materials and media common to teaching modern elementary school science.
- 5361. TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL.** (3 cr; limited to 50 students; prereq 3101 or equiv; II MTWThF; Pt 214) Ellis  
For graduate students and summer students who hold a bachelor's degree in elementary education.
- 5363.<sup>1</sup> WORKSHOP: CURRICULUM IMPLEMENTATION IN ELEMENTARY SCHOOL SOCIAL STUDIES.** (Cr or [max 9 cr]; limited to 35 students; prereq elem tchg exper and #; III MTWThF; Pt 214) Ellis  
This offering for 3 credits will provide an analysis of new instructional materials, recent curriculum developments in the field and training in innovative instructional procedures.
- 5376. CURRENT TRENDS IN EARLY CHILDHOOD EDUCATION.** (3 cr; limited to 40 students; prereq tchg exper in kindergarten or primary school or #; II MTWThF; CD 218) Hansen  
Continuing needs of children in our changing culture; current practices and recent research; not intended for kindergarten certification requirements.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5377. EARLY CHILDHOOD EDUCATION: MATERIALS AND RESOURCES.** (3 cr; limited to 30 students; prereq 3377 or 5376 and tchg exper; IV MTWThF; CD 218) Hansen  
Experience in the selection and use of commercial and teacher-made education materials common to early childhood education programs.
- 5602. PRACTICUM: IMPROVEMENT OF TEACHING.** (3 cr; prereq MEd student in elem education, #; S-N only; hrs ar) Dykstra, Hansen, Manning, Odland, Schreiner, Stochl, Ellis, Humphreys, D Pearson, McNergney, Youngers
- 8300. RESEARCH IN SPECIAL COLLECTIONS OF CHILDREN'S LITERATURE.** (1-3 cr [max 6 cr]; limited to 15 students; I MTWThF; Bu 125) Odland  
This offering for 3 credits will provide comparative study of national and international special collections of original manuscripts, artwork, first editions, and other bases for collection of children's books; research in Kerlan or other accessible collection.
- 8916.\* PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar; prereq #) Dykstra
- 8931.\* PROBLEMS: TEACHING READING.** (Cr and hrs ar; prereq 5331 or SeEd 5344 and #) Manning, Odland, Schreiner, D Pearson
- 8961.\* PROBLEMS: TEACHING SOCIAL STUDIES.** (Cr and hrs ar; prereq 5361 or SeEd 5155 or 8104 and #) Ellis
- 8976. PROBLEMS: TEACHING KINDERGARTEN.** (3 cr; prereq #; hrs ar) Hansen
- 8991.\* PROBLEMS: IMPROVEMENT OF INSTRUCTION.** (Cr and hrs ar; prereq #) Dykstra, Hansen, Manning, Odland, Schreiner, Stochl, Ellis, Humphreys, D Pearson, McNergney

## **SECOND TERM**

- 3604.<sup>2</sup> STUDENT TEACHING IN THE NURSERY SCHOOL.** (4 cr; S-N only; prereq approval of major adviser and director of student tchg; hrs ar) S Johnson
- 5100. ELEMENTARY SCHOOL CURRICULUM—July 19-August 5.** (3 cr; limited to 40 students; prereq 3101; I-II MTWThF; Pt 102)
- 5107. DIAGNOSIS AND TREATMENT OF LEARNING DIFFICULTIES—July 19-August 5.** (3 cr; limited to 40 students; III-IV MTWThF; Pt 102)
- 5305. SURVEY OF SPECIAL COLLECTIONS IN CHILDREN'S LITERATURE—July 19-August 5.** (3 cr; limited to 25 students; prereq 5300 or #; I-II MTWThF; Bu 125) Odland  
Content and accessibility of collections that relate to the creation of books; emphasis on possibilities and methods for interpreting the content of the collections to children.
- 5316. TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOL—July 19-August 5.** (3 cr; limited to 35 students; prereq 3316 or elem tchg exper; III-IV MTWThF; PeikH 315) Youngers
- 5317. MATERIALS LABORATORY FOR TEACHING ENGLISH IN ELEMENTARY SCHOOLS—July 19-August 5.** (3 cr; limited to 40 students; prereq 3316 or elem tchg exper; V-VI MTWThF; Bu 120) Youngers  
See First Term.
- 5331. TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOL—July 19-August 5.** (3 cr; limited to 50 students; prereq 9 cr in education; I-II MTWThF)  
See First Term.
- 5334. READING DIFFICULTIES—July 19-August 5.** (3 cr; limited to 40 students; prereq 5331 or SeEd 5344; III-IV MTWThF; Bu 120) D Pearson
- 5335. CLINICAL DIAGNOSIS OF READING DIFFICULTIES—July 19-August 5.** (3 cr; limited to 23 students; prereq 5334; I-II MTWThF; WuH 130)  
See First Term.
- 5338. TEACHING READING IN THE INTERMEDIATE GRADES—July 19-August 5.** (3 cr; limited to 40 students; prereq 3331 and #; V-VI MTWThF; Bu 123) D Pearson  
See First Term.
- 5348.<sup>1</sup> WORKSHOP: OUTDOOR SCIENCE EDUCATION—August 8-12.** (3 cr; limited to 30 students; prereq elem tchg exper; all day MTWThF; Itasca State Park) R Johnson  
Classroom and fieldwork activities dealing with models, materials, and methods in the outdoor setting. The course will be held in Itasca State Park. Participants are required to provide sleeping bags and other

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

<sup>2</sup>Student teaching is open only to students in regular degree programs of the College of Education. Application must be made prior to April 22. Forms and instructions are available in the Education Career Development Office, 1425 University Avenue S.E.



necessary items. Students will be responsible for the costs of food, transportation, and campsite rental. The course will cover many aspects of outdoor science including forestry activities, nature trail development, marsh studies, and stargazing. For further informatin, contact Roger Johnson, 370 Peik Hall, University of Minnesota, 159 Pillsbury Drive S.E., Minneapolis, Minnesota 55455.

- 5350. ELEMENTARY SCHOOL SCIENCE: MATERIALS AND RESOURCES—July 19-August 5.** (3 cr; limited to 35 students; prereq 5349; V-VII MTWThF, PeikH 385) R Johnson  
See First Term.
- 5362. MATERIALS LABORATORY FOR ELEMENTARY SCHOOL SOCIAL STUDIES—July 19-August 5.** (3 cr; limited to 40 students; prereq 3361 or 5361 or #; III-IV MTWThF; Pt 214) Cogan  
Printed, audiovisual, and other materials; investigation and evaluation of teaching materials and devices.
- 5363.1 WORKSHOP: CURRICULUM IMPLEMENTATION IN ELEMENTARY SCHOOL SOCIAL STUDIES—July 19-August 5.** (Cr or [max 9 cr]; limited to 40 students; prereq elem tchg exper and #; I-II MTWThF; Pt 214) Cogan  
See First Term. This offering for 3 credits.
- 5602. PRACTICUM: IMPROVEMENT OF TEACHING.** (3 cr; prereq MEd student in elem education, #; S-N only; hrs ar) Dykstra, Hansen, Jackson, Odland, Schreiner, Cogan, D Pearson, Post, Youngers
- 8916.\* PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar; prereq #) Dykstra
- 8931.\* PROBLEMS: TEACHING READING.** (Cr and hrs ar; prereq 5331 or SeEd 5344 and #) Odland, Schreiner, D Pearson
- 8961.\* PROBLEMS: TEACHING SOCIAL STUDIES.** (Cr and hrs ar; prereq 5361 or SeEd 5155 or 8104 and #) Cogan
- 8976. PROBLEMS: TEACHING KINDERGARTEN.** (3 cr; prereq #; hrs ar) Hansen
- 8991.\* PROBLEMS: IMPROVEMENT OF INSTRUCTION.** (Cr and hrs ar; prereq #) Dykstra, Hansen, Jackson, Odland, Schreiner, Cogan, D Pearson, Post

## Mathematics Education (MthE)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### FIRST TERM

- 5101.1 WORKSHOP: ELEMENTARY SCHOOL MATHEMATICS.** (1-12 cr [max 12 cr]; limited to 35 students; not open to majors in mathematics education; prereq #; I-II MWF; PeikH 375) Stochl  
Modern trends, methods, and materials used to convey mathematical ideas. This offering for 3 credits.
- 5102.1 WORKSHOP: MATHEMATICS EDUCATION: Calculators in School Mathematics.** (1-12 cr [max 12 cr]; limited to 25 students; V-VII MW; PeikH 375) D C Johnson  
Issues, materials, and instructional techniques focusing on a single current topic of particular relevance to secondary school and college mathematics teachers. This 3-credit offering will deal with the role of the hand-held minicalculator in school mathematics with emphasis on instructional activities that involve the calculator as an integral component.
- 5312. TEACHING AND SUPERVISION OF MATHEMATICS IN THE SECONDARY SCHOOL.** (3 cr; prereq mathematics tchg exper or #; limited to 30 students; I MTWThF; PeikH 315) House  
Methods, materials, and curriculum development; principles of learning; review of research; preparation and evaluation of tests, units, and materials of instruction.
- 5345. MATHEMATICS FOR GIFTED CHILDREN.** (3 cr; prereq 5311 or Elem 3391 or #; limited to 30 students; IV MTWThF; PeikH 375) Stochl  
Curriculum and methods of instruction for academically talented children; development of enrichment units; source materials for teachers.
- 5355. MATHEMATICS FOR SLOW LEARNING CHILDREN.** (3 cr; limited to 35 students; prereq 5311 or Elem 3391 or #; II-III MWF; PeikH 315) House  
Units of instruction emphasizing mathematical concepts essential for vocational competence; experimental materials and methods designed to improve performance of low achievers.
- 5366. COMPUTER-ASSISTED MATHEMATICS INSTRUCTION.** (3 cr; limited to 24 students; prereq 5311 or 5312 or SeEd 3365 or #; \$4 lab fee; V-VII TTh; PeikH 315, 336) D C Johnson

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

Role of the computer in a mathematics department; its contribution to learning concepts, problem solving, and computational skill; consideration of various types of equipment and languages, programming of problems, instructional materials.

**5980. DIRECTED STUDIES IN MATHEMATICS EDUCATION.** (3-9 cr [max 9 cr]; prereq #) House, D C Johnson, Stochl  
Survey of recent literature; design and preparation of reports on special problems.

**8980.\* PROBLEMS: MATHEMATICS EDUCATION.** (Cr ar; prereq 8500 or 8570) House, D C Johnson, Stochl

## SECOND TERM

**5101.<sup>1</sup> WORKSHOP: ELEMENTARY SCHOOL MATHEMATICS—July 19-August 5.** (1-12 cr [max 12 cr]; limited to 35 students; not open to majors in mathematics education; prereq #; III-IV MTWThF; PeikH 375) Jackson

See First Term. This offering for 3 credits.

**5321. MATERIALS LABORATORY FOR ELEMENTARY SCHOOL MATHEMATICS INSTRUCTION—July 19-August 5.** (3 cr; limited to 24 students; prereq 5311 or Elem 3391 or #; I-II MTWThF; PeikH 375) Post

Printed and programmed materials, audiovisual aids, community resources; laboratory projects and techniques for using mathematical devices and instruments.

**5355. MATHEMATICS FOR SLOW LEARNING CHILDREN—July 19-August 5.** (3 cr; limited to 35 students; prereq 5311 or Elem 3391 or #; V-VI MTWThF; PeikH 375) Jackson

See First Term.

**5980. DIRECTED STUDIES IN MATHEMATICS EDUCATION.** (3-9 cr [max 9 cr]; prereq #) Jackson, Post  
See First Term.

**8980.\* PROBLEMS: MATHEMATICS EDUCATION.** (Cr ar; prereq 8500 or 8570) Jackson, Post

## **Music Education (MuEd)**

*(See also Music in the College of Liberal Arts section)*

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

## FIRST TERM

**1525. BRASS TECHNIQUES.** (4 cr; prereq music education major or #; IV-V TWTh; NMA 5) Turrentine  
Theory and technical development of instruments, elementary instruction in performing, special attention to routine class instruction.

**3011. TEACHING MUSIC IN THE ELEMENTARY SCHOOL.** (4 cr; each section limited to 20 students; prereq Mus 1001 or exemption) Buckner

For nonmusic majors; methods and materials in teaching singing, rhythm, music reading, creativity, classroom instruments, fundamentals, appreciation in K-6.

Sec 1, II MTWThF, ScH 4

Sec 2, IV MTWThF, ScH 4

**3701. BEGINNING CONDUCTING.** (3 cr; prereq Mus 1506, 1516; II MTWThF; NMA 4) Schultz  
Fundamentals, rehearsal techniques; score reading and arranging; literature and materials for instrumental performance in elementary and secondary schools.

**5111. BIBLIOGRAPHY.** (3 cr; II MTWThF; ScH 103) Turrentine  
Sources, materials, and techniques.

**5327. TECHNIQUES AND MATERIALS: ORFF-SCHULWERK APPROACH.** (4 cr; I MTWThF; ScH 4) Caswell  
Demonstration and class practice in teaching and performance skills of Orff-Schulwerk instrument playing; the recorder; movement, improvisation, singing, and creation of musical forms; techniques to encourage children to create and improvise song, instrumental music, and related bodily movement; class exercises in adapting indigenous and foreign ethnic musical material for school use.

**5421. SELECTION, CONDUCTING OF CHORAL MATERIALS.** (3 cr; prereq sr; III MTWThF; ScH 4) Caswell  
Student conducting with class as performing ensemble; criteria for selecting choral and combined choral and instrumental materials; rehearsal techniques.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5564. BAND ARRANGING.** (4 cr, §Mus 5564; prereq Mus 1506, 5563 or MuEd 3516 or #; V TW and ar; ScH 3) Schultz  
Current scoring techniques for wind and percussion instruments. Scoring for band; creative arrangements for marching or concert band.
- 5970. INDEPENDENT STUDY.** (1-4 cr; prereq consent of adviser and of dept; hrs ar; ScH 104) Caswell, Turrentine, Schultz, Buckner  
An independent study project organized by the student in consultation with the appropriate instructor.
- 8990.\* RESEARCH PROBLEMS.** (4-12 cr; prereq knowledge of elem statistics; hrs ar; ScH 104) Caswell, Turrentine, Schultz  
Individual projects.

## **SECOND TERM**

- 3011. TEACHING MUSIC IN THE ELEMENTARY SCHOOL.** (4 cr; limited to 20 students; prereq Mus 1001 or exemption; III MTWThF; ScH 4)  
See First Term.
- 3851-3852. CLINICAL INTERNSHIP IN MUSIC THERAPY.** (2 cr each; prereq Δ; hrs ar; MusEd 2) Jellison  
Six-month resident internship in music therapy at an affiliated, approved hospital or clinic.
- 5306. TEACHING MUSIC LITERATURE—August 1-12.** (3 cr; prereq 3011 or 3302 or #; 1:00-4:00 MTWThF; ScH 4)  
*Principles, methods, and materials for teaching music history (appreciation) in grades K-12.*
- 5515. ADVANCED WOODWIND TECHNIQUES—July 19-29.** (3 cr; prereq 1515 or #; 9:00-12:00 MTWThF; NMA 4) Schultz  
Practical performance with lectures and discussion of research in performance techniques.
- 5801. INFLUENCE OF MUSIC ON BEHAVIOR—July 25-August 5.** (3 cr; 9:00-12:00 MTWThF; MusEd 101) Jellison  
Methods and principles of the behavioral and biological sciences as they relate to the art of music.
- 5970. INDEPENDENT STUDY.** (1-4 cr; prereq consent of adviser and of dept; hrs ar; ScH 104) Borg, Jellison, Schultz  
See First Term.
- 8990.\* RESEARCH PROBLEMS.** (4-12 cr; prereq knowledge of elem statistics; hrs ar; ScH 104) Borg, Jellison, Schultz  
See First Term.

## **Secondary Education (SeEd)**

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### **FIRST TERM**

- 3150. INTRODUCTION TO SECONDARY SCHOOL TEACHING.** (5 cr; limited to 30 students; prereq 5 cr introductory psychology; V MTWThF, VI TWTh and addtl hrs ar in mornings for observation in schools)  
Secondary education; purposes, history, organization, curriculum, pupils; organization of instructional units; teaching profession; lecture, discussion section, individual youth leadership project.
- 3600.<sup>1</sup> STUDENT TEACHING.** (Cr ar; prereq Δ) E Anderson  
Supervised teaching for students wishing to elect credits in student teaching in addition to regular requirements.
- 5000. EDUCATIONAL TECHNOLOGY: INSTRUCTIONAL SYSTEMS.** (1 cr, §5102; \$4 lab fee; II TTh; EdH Annex 64) Carrier  
Introduction to the use of technology in instruction; self-instructional, computer-managed module.
- 5001. EDUCATIONAL TECHNOLOGY: INSTRUCTIONAL MEDIA.** (1 cr, §5102; \$4 lab fee; III TTh; EdH Annex 64) Carrier  
Introduction to the use of media technology in instruction; self-instructional, computer-managed module.
- 5002. EDUCATIONAL TECHNOLOGY: INSTRUCTIONAL EQUIPMENT RESOURCES.** (1 cr, §5102; \$4 lab fee; IV TTh; EdH Annex 64) Carrier  
Introduction to the use of technology in instruction; self-instructional, computer-managed module.

<sup>1</sup>Student teaching is open only to students in regular degree programs of the College of Education. Application must be made prior to April 22. Forms and instructions are available in the Education Career Development Office, 1425 University Avenue S.E.

- 5003. EDUCATIONAL TECHNOLOGY: COMPUTERS IN THE CLASSROOM.** (1 cr, \$5102; \$4 lab fee; V TTh; EdH Annex 64) R Tennyson  
Introduction to the use of computer technology in instruction; self-instructional, computer-managed module.
- 5004. EDUCATIONAL TECHNOLOGY: CLASSROOM VIDEO.** (1 cr, \$5102; limited to 50 students; \$4 lab fee; I TTh; EdH Annex 64) Carrier  
Introduction to the use of video technology in instruction; self-instructional, computer-managed module.
- 5113. INTRODUCTION TO CURRICULUM DEVELOPMENT.** (3 cr; limited to 30 students; prereq 3155 or equiv; II MTWThF; Bu 125) Kimpston  
Environment of the secondary school in relation to educational philosophy, goals, objectives; systematic planning for assessing educational needs; current alternative designs for curriculum and instruction.
- 5150. ADVANCED METHODS OF TEACHING THE SOCIAL STUDIES.** (3 cr; limited to 40 students; IV MTWThF; PeikH 165) Glenn  
Advanced methods for social studies teachers; prerequisite to other graduate-level courses in social studies education.
- 5151. SCHOOL-BASED PROJECTS IN SOCIAL STUDIES EDUCATION.** (1-12 cr [max 12 cr]) Glenn  
Opportunity to work individually or in teams on curricular, instructional, or evaluation problems within the school.
- 5153. NEW PERSPECTIVES IN THE SOCIAL STUDIES: Improving the Teaching of Geography—June 27–July 8.** (1-3 cr [max 12 cr]; limited to 40 students; 8:00-11:00 MTWThF and 4 hrs ar; PeikH 165) Glenn  
This offering for 3 credits.
- 5170. MODELS AND PROCEDURES FOR CURRICULUM PLANNING.** (3 cr; limited to 40 students; prereq 5113 or Elem 5100; IV MTWThF; Bu 120) Kimpston  
Review and employment of model for planning and designing a systematic plan for curriculum change.
- 5176. CLASSROOM RESEARCH IN ENGLISH EDUCATION AND READING.** (3 cr; limited to 30 students; prereq MEd student in English education or #; I-II MTWThF; PeikH 225) Graves  
Review and analysis of current studies; design and analyses for school-based research.
- 5185. SCHOOL AND PROFESSIONAL-BASED EXPERIENCES IN SECOND LANGUAGES AND CULTURES.** (1-12 cr [max 12 cr]; prereq MEd students only) Lange  
Opportunity for teachers to work together on curricular, instructional, or evaluation problems; internship experiences; participation in professional activities.
- 5191.<sup>1</sup> WORKSHOP: TEACHING OF SECOND LANGUAGES AND CULTURES.** (1-10 cr [max 10 cr]; sec 1 limited to 50 students, sec 2 and 3 limited to 30 students each)  
Related specifically to the needs of the in-service teacher; topics, location, and duration will be highly flexible. See Special Programs section.
- Sec 1, PER Bill Emphasis, June 13–July 15,** 10 cr, 8:30-12:30 MTWThF, Jones 10, Lange  
Planning and preparing for school or school districts compliance with PER bill and working out SELOs (Some Essential Learner Outcomes) with staff; giving direction to statewide effort to comply with PER bill. Guest speakers will include legislative representatives.
- Sec 2, Intensive German, June 13–28,** 6 cr, 9:00-12:00 and 1:00-4:00 MTWThF, PeikH 215, B and L Hildebrandt  
An opportunity to speak the German language exclusively for 6 hours per day to perfect language skills; to learn about present-day German language; and to work with and learn about present-day German culture.
- Sec 3, Intensive French, June 29–July 15,** 6 cr, 9:00-12:00 and 1:00-4:00 MTWThF, PeikH 215  
For American teachers of French language and language teaching methodology from a French point of view. All classes will be conducted in French by French natives. Three topics: phonétique corrective; enseignement du vocabulaire; and culture et vie françaises.
- 5201. SYSTEMS APPROACH TO DESIGN OF INSTRUCTION.** (3 cr; prereq 5000; \$4 lab fee; II-III MWF; EdH Annex 64) R Tennyson  
Instructional materials design in accordance with systems principles; design of a specific unit of course-ware.
- 5205. APPLICATIONS OF COMPUTERS IN EDUCATION.** (3 cr; prereq 5003; \$4 lab fee; VI MWF; EdH Annex 54) R Tennyson  
Computer uses in education and training; instructional applications: simulation, tutorial, counseling, testing, instructional management, modeling and information retrieval (including data base inquiry). Computer-managed course includes criteria for selection, evaluation, and examination of on-line examples.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5209. APPLICATIONS OF AUDIO AND VISUALS IN EDUCATION.** (2 cr, \$5105; \$4 lab fee; IV MWF; EdH Annex 64)  
Carrier  
Characteristics, advantages, limitations, and practical classroom use of audiovisual materials of nonprojected and projected types; practice in operation of audiovisual equipment.
- 5322. TEACHING COMPOSITION AND COMMUNICATION IN JUNIOR AND SENIOR HIGH SCHOOLS.** (3 cr; limited to 30 students; I MTWThF; PeikH 225) Michlin  
Contemporary directions in rhetorical theory and analysis of recent curriculum developments bearing on the teaching of oral and written composition.
- 5344. TEACHING READING IN CONTENT AREAS.** (3 cr; limited to 40 students; prereq 9 cr in education; IV MTWThF; PeikH 315) Graves  
Procedures, objectives, and materials.
- 5351. DIRECTED STUDY.** (Cr ar [max 6 cr]; S-N optional; prereq #) Gennaro, Lange, Glenn  
Individual or group work on curricular, instructional, or evaluation problems.
- 5394.<sup>1</sup> WORKSHOP: SCIENCE EDUCATION.** (1-12 cr [max 12 cr]; each section limited to 35 students) Gennaro  
Analysis of issues, materials, and instructional techniques on current topics of relevance to secondary school and college science teachers.  
**Sec 1, Teaching Environmental Science, June 14-24, 3 cr, I-III MTWThF and 6 lab hrs ar, PeikH 385**  
Materials and techniques for teaching environmental science. Includes laboratory, trips, and speakers on topics related to value questions concerning environmental science.  
**Sec 2, Gaming in the Science Classroom, July 5-15, 3 cr, I-III MTWThF and 6 lab hrs ar, PeikH 385**  
Evaluation of available games and construction of new simulation and board games usable in science instruction.
- 5395. SCHOOL-BASED PROJECTS IN SCIENCE EDUCATION.** (1-12 cr [max 12 cr]; prereq MEd student in science education) Gennaro  
Individual or group work on curricular, instructional, or evaluation problems and projects applicable to school situations.
- 5404. LANGUAGE, CULTURE, AND EDUCATION.** (4 cr, \$Spch 5404; limited to 35 students; III MTWThF; PeikH 225) Michlin  
Psychological and social-psychological perspectives for the study of language-communication; dimensions of language variation (dialects, codes, registers); implications for program development and instructional practices.
- 5509. DIRECTED INDIVIDUAL STUDY.** (1-6 cr [max 6 cr]) Carrier, R Tennyson  
Review of literature in research and theory of instructional systems.
- 5659. SCHOOL-RELATED PROJECTS IN LANGUAGE ARTS.** (1-12 cr [max 12 cr]; prereq MEd student in English education) Graves  
Individual or group work on curricular, instructional, or evaluation problems and projects applicable to school situations.
- 8501.\* PROBLEMS: INSTRUCTIONAL SYSTEMS.** (Cr ar; prereq #) Carrier, R Tennyson  
Individual empirical investigation.
- 8801.\* PROBLEMS: TEACHING SOCIAL STUDIES.** (3-9 cr; prereq 5150, 5152, 5156, 8104 or #; hrs ar) Gardner, Glenn  
Individual research.
- 8871.\* PROBLEMS: CURRICULUM CONSTRUCTION.** (Cr and hrs ar; prereq #) Gennaro, Kimpston
- 8894.\* PROBLEMS; SECOND LANGUAGES AND CULTURES EDUCATION.** (Cr ar [max 8 cr]; prereq #) Lange  
Individual research.
- 8895. READINGS IN ENGLISH EDUCATION.** (1-3 cr) Graves, Lange  
Readings in secondary school English curriculum and instruction.
- 8896.\* PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar) Graves
- 8936. FIELD STUDY IN GENERAL CURRICULUM.** (6-9 cr; prereq #; hrs ar) Kimpston

## SECOND TERM

- 5113. INTRODUCTION TO CURRICULUM DEVELOPMENT—July 19-August 5.** (3 cr; prereq 3155 or equiv; I-II MTWThF; NH 107) Kimpston  
See First Term.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5129. TRENDS AND ISSUES IN SECONDARY CURRICULUM—July 19-August 5.** (3 cr; limited to 40 students; prereq 5113 or equiv; III-IV MTWThF; NH 107) Hughes  
Comprehensive perspective on the secondary school curriculum; analysis and interpretation of the status that confronts subject fields.
- 5151. SCHOOL-BASED PROJECTS IN SOCIAL STUDIES EDUCATION.** (1-12 cr [max 12 cr]) Mackey  
See First Term.
- 5152. TECHNIQUES OF INSTRUCTION IN SOCIAL STUDIES—July 19-29.** (3 cr; limited to 40 students; prereq 5150; I-IV MTWThF; PeikH 165) Mackey  
Analysis of teaching strategies and contemporary curriculum materials in the social studies; techniques of instruction useful in inquiry; strategies of analysis; classroom behavior and evaluation; required of M.A., M.Ed., and Ph.D. candidates.
- 5153. NEW PERSPECTIVES IN THE SOCIAL STUDIES: Teaching About the Newspaper in the Classroom—August 1-12.** (1-3 cr [max 12 cr]; limited to 60 students; I-IV MTWThF; WuH 230) Mackey  
See First Term. This offering for 3 credits.
- 5173. DESIGN OF CURRICULUM/INSTRUCTIONAL MATERIALS—July 19-August 3.** (1-12 cr; limited to 35 students; 1:00-3:30 MTWThF; NH 122) Hughes  
Development and implementation of systematic principles and procedures; writing of goals and objectives, selection of content, development of activities, identification/selection of resources, evaluative activities for measuring objective attainment. This offering for 3 credits.
- 5194. ENGLISH LANGUAGE ARTS CURRICULA IN THE SECONDARY SCHOOL—July 19-August 9.** (3 cr; limited to 30 students; prereq 3326 or equiv; I-II MTWThF; PeikH 225) Brunetti  
Growth and development of English as a major school subject; description and evaluation of current curricular direction.
- 5195.<sup>1</sup> WORKSHOP: CURRICULUM DEVELOPMENT IN SECONDARY SCHOOL ENGLISH LANGUAGE ARTS—July 19-August 9.** (3 cr; limited to 30 students; prereq 5194 or 5194 or #; IV-V MTWThF; PeikH 225) Brunetti  
Establishing curricular goals; planning new programs, courses, experiences; developing and selecting materials and processes. Emphasis on the ways in which new writing materials and composition activities can be incorporated into the language arts curricula.
- 5203. RESOURCE MANAGEMENT IN INSTRUCTIONAL PROGRAMS.** (3 cr; prereq 5000 or #; \$4 lab fee; II-III MWF; EdH Annex 64) Davis  
Processes an instructor or media generalist employs in integrating resources into a planned program; introduction to facilities planning; environmental health and safety.
- 5207. APPLICATIONS OF TELEVISION IN EDUCATION.** (2 cr; prereq 5004; \$4 lab fee; I-II TTh; EdH Annex 64) Davis  
Current uses of video systems in education.
- 5215. PREPARATION OF MEDIA MATERIALS: VIDEO.** (2 cr; prereq 5201, 5207; \$4 lab fee; III-IV TTh; EdH Annex 64) Davis  
Prototype development of instructional materials using video materials.
- 5321. TEACHING LITERATURE IN SECONDARY SCHOOLS.** (3 cr; limited to 30 students; prereq 3155 or jr-sr high school tchg exper; III MTWThF; PeikH 225) Beach  
Current theory and methods of instruction; research and response to literature and reading; adolescent literature; growth assessment; curriculum design and evaluation.
- 5326. TEACHING FILM—July 19-August 9.** (3 cr; limited to 30 students; \$4 lab fee; VI-VII MTWThF and 2 hrs ar; EdH Annex 64) Beach  
Current theory and methods of teaching film appreciation; use of the short film and filmmaking in the classroom.
- 5351. DIRECTED STUDY.** (Cr ar [max 6 cr]; S-N optional; prereq #) Brunetti, Mackey, Beach, Boeck  
See First Term.
- 5394.<sup>1</sup> WORKSHOP: SCIENCE EDUCATION.** (1-12 cr [max 12 cr]; each section limited to 35 students) Boeck  
See First Term.
- Sec 1, Teaching Weather, July 19-29,** 3 cr, I-III MTWThF and 6 lab hrs ar, PeikH 385  
Background and application of principles of meteorology. Design, construction, and use of instruments used in teaching.
- Sec 2, Teaching Science Through Toys, August 2-12,** 3 cr, I-III MTWThF and 6 lab hrs ar, PeikH 385  
Science principles illustrated, demonstrated, and applied in the explanation of the operation of the toys.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5395. SCHOOL-BASED PROJECTS IN SCIENCE EDUCATION.** (1-12 cr [max 12 cr]; prereq MEd student in science education) Gennaro  
See First Term.
- 5509. DIRECTED INDIVIDUAL STUDY.** (1-6 cr [max 6 cr]) Davis  
See First Term.
- 5659. SCHOOL-RELATED PROJECTS IN LANGUAGE ARTS.** (1-12 cr [max 12 cr]; prereq MEd student in English education) Brunetti, Beach  
See First Term.
- 8801.\* PROBLEMS: TEACHING SOCIAL STUDIES.** (3-9 cr; prereq 5150, 5152, 5156, 8104 or #; hrs ar) Mackey  
See First Term.
- 8871.\* PROBLEMS: CURRICULUM CONSTRUCTION.** (Cr and hrs ar; prereq #) Gennaro, Kimpston
- 8895. READINGS IN ENGLISH EDUCATION.** (1-3 cr) Brunetti, Beach  
See First Term.
- 8896.\* PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar) Brunetti, Beach
- 8936. FIELD STUDY IN GENERAL CURRICULUM.** (6-9 cr; prereq #; hrs ar) Kimpston

## DEPARTMENT OF EDUCATIONAL ADMINISTRATION

### Educational Administration (EdAd)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

#### FIRST TERM

- 5130. ADMINISTRATOR DEVELOPMENT SEMINAR.** (3-9 cr [max 9 cr]; limited to 25 students; III-VII MTWThF; BioSci 64) Jackson  
Assessment and development of skills required of the administrator in the areas of planning, decision making, and human relations; introduction to contemporary issues in educational administration; polling community opinions on educational issues confronting schools in urban areas. Initial course for students pursuing professional certification programs. Preapplication is required. First term participants will register concurrently for 3 credits in EdAd 5130 and 3 credits in EdAd 5139 (section 1). Second term participants will register for 3 credits in EdAd 5130 and 3 credits in EdAd 5139. See Special Programs section.
- 5139. LABORATORY IN DECISION MAKING.** (1-4 cr per term; each section limited to 25 students)  
Contribution of recent research and theory to effective administration; analysis of administrative behavior in realistic settings and relations of administration to human behavior. See Special Programs section.  
Sec 1, 3 cr, III-VII MTWThF, BioSci 64, Jackson  
Students register concurrently for 5130.  
Sec 2, June 27-July 8, 3 cr, VI-VIII MTWThF, BioSci 70, Alkire
- 5231. PRACTICUM IN SCHOOL-COMMUNITY RELATIONS—June 14-24.** (1-4 cr; S-N optional; 2:00-5:00 MTWThF; CofH 120) Popper  
Practical experience in design and use of basic tools in a program such as conducting community analysis; preparing copy and news releases; meeting, working with material for the press, radio, and television; planning school publications; opinion polling and personal conferences. This offering for 3 credits. See Special Programs section.
- 8202. POLITICS OF EDUCATION.** (3 cr; II MTWThF; ClaOff B25) Mazzoni  
Formal and informal institutional governance structures; processes of political influence at local, state, and national levels; social science concepts, techniques of analysis, and research findings applied to participants, processes, structures, issues and outcomes involved in governing the public schools.
- 8215. THE ELEMENTARY SCHOOL PRINCIPALSHIP.** (3 cr; prereq 8201 and 8202 or #; I MTWThF; ClaOff 27) Alkire  
Problems in elementary school administration and the principal's role of leadership.
- 8218. SEMINAR: THE SOCIAL ORGANIZATION OF SCHOOLS.** (3 cr; limited to 30 students; prereq educational administration major or #; IV-V MWF; ClaOff 27) Popper  
Structural components of school organization examined within the framework of social system theory; classifications of system properties and observation in operational contexts investigated by means of empirical models.

- 8220. QUANTITATIVE FOUNDATIONS FOR MANAGEMENT METHODS.** (3 cr; III MTWThF; ClaOff B36) Hendrix  
Quantitative techniques for research and analysis of policy, program, and management problems and decision situations in administration of educational organizations; includes computer usage.
- 8224. LEGAL IMPLICATIONS OF ACTS BY SCHOOL BOARDS, ADMINISTRATORS, AND TEACHERS—July 1-15.** (3 cr; III-V MTWThF; ClaOff B42) Hooker  
Constitutional, statutory, and common law bases of school administration; principles growing out of fundamental legal procedures. See Special Programs section
- 8227. PUBLIC SCHOOL PERSONNEL PROGRAMS—June 14-24.** (3 cr; 1:00-4:00 MTWThF; ClaOff B25) Mansergh  
Selection, assignment, evaluation, and development of school personnel; salary and conditions of service; policies of administrative, instructional, and noninstructional personnel. See Special Programs section.
- 8238. SEMINAR: THEORY AND RESEARCH.** (3 cr; prereq 8218, 8235, educational administration major or #; IV MTWThF; ClaOff B36) Hendrix  
Research design involving thesis or field project; includes interrelatedness of formulation of conceptual framework and the analytical process; clinical and research problems.
- 8264. THE SECONDARY SCHOOL PRINCIPALSHIP.** (3 cr; I MTWThF; ClaOff B35) Nickerson  
The role of the principal: qualifications, duties, and problems including current issues and factors in staff and student relationships.
- 8265. ADMINISTERING THE HIGH SCHOOL PROGRAM.** (3 cr; III MTWThF; ClaOff B35) Nickerson  
Practices and procedures in scheduling, improving the curriculum, community relations, records and reports, school services, and program evaluation.
- 8270.\* PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #) Alkire
- 8271.\* PROBLEMS: SECONDARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #) Nickerson, Popper, Mazzoni, Jackson
- 8272.\* PROBLEMS: EDUCATIONAL ADMINISTRATION.** (1-3 cr per term; hrs ar) Hendrix, Hooker, Nickerson, Popper, Alkire, Mansergh, Mazzoni, Jackson  
For superintendents and principals qualified to make intensive studies of a school system.
- 8273.\* FIELD STUDY.** (0-10 cr; prereq #; hrs ar) Hendrix, Hooker, Nickerson, Popper, Alkire, Mansergh, Mazzoni, Jackson  
Required for specialist in education certificate. The 10 credits will be based on a written report covering an approved field study. Students may register for the general planning and organization of their study without credit.

## SECOND TERM

- 5103. SUPERVISION AND ADMINISTRATION OF SPECIAL EDUCATION.** (3 cr, §SpEd 5160; prereq #; I MTWThF; ClaOff B30)  
Procedures in establishing and improving educational programs for exceptional children. Meets with SpEd 5160.
- 5128.<sup>1</sup> WORKSHOP: EDUCATIONAL ADMINISTRATION—August 1-12.** (1-6 cr; S-N optional; prereq practicing educational administrator or #; limited to 30 students; II-VII MTWThF; BioSci 70) Hooker  
Laboratory approach provides opportunities for experienced administrators to concentrate their study on common administrative and supervisory problems. This workshop, Managing Educational Change, is designed for superintendents and other central office administrators who are interested in pursuing the doctor of education or doctor of philosophy degree. A broad range of topics, generally related to the management of schools in a declining market, will be covered. Experts in educational administration and related fields will participate. Preapplication is required; inquiries should be addressed to the Department of Educational Administration, 225 Health Services Building, 1518 North Cleveland Avenue, University of Minnesota, St. Paul, Minnesota 55108. This offering is for 6 credits.
- 5130. ADMINISTRATOR DEVELOPMENT SEMINAR.** (3-9 cr [max 9 cr]; limited to 25 students; III-VII MTWThF; BioSci 64) Nickerson  
See First Term. This offering for 3 credits. Students register concurrently for 5139.
- 5139. LABORATORY IN DECISION MAKING.** (1-4 cr per qtr; limited to 25 students; III-VII MTWThF; BioSci 64) Nickerson  
See First Term. This offering for 3 credits. Students register concurrently for 5130.
- 8201. FORMAL ORGANIZATIONS IN EDUCATION.** (3 cr; IV-V MWF; ClaOff B36) Popper  
Focus on schools; organizations as social systems; individual behavior in organization roles; technical or production processes and management control systems.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.



- 8210. ECONOMICS OF EDUCATION.** (3 cr; II MTWThF; ClaOff B36) Mueller  
Application of economic concepts to education, human capital, cost-benefit analyses of educational expenditures, rates of return to investment, economic decision making; sources of revenue, alternative tax sources, federal, state, and local distribution systems.
- 8221. QUANTITATIVE MODELS FOR PROGRAM ANALYSIS AND RESEARCH.** (3 cr; prereq 8220; III MTWThF; ClaOff B25) Morris  
Quantitative techniques for program analysis, research and decision making in the administration of educational organizations; emphasis on general linear models and computer usage.
- 8225. EDUCATIONAL POLICY AND THE LAW.** (3 cr; I MTWThF; ClaOff B25) Hooker  
Analysis of court decisions, statutes, and administrative regulations related to equality of educational opportunity and equal protection under the law.
- 8241. SEMINAR: INTERNSHIP IN EDUCATIONAL ADMINISTRATION.** (0-9 cr; VII MTWThF; ClaOff 27) Alkire  
For interns in elementary, secondary, general, and postsecondary administration. This offering for 3 credits.
- 8253. ADMINISTRATION IN HIGHER EDUCATION.** (3 cr; prereq Educ 8250; III MTWThF; ClaOff B36) Keller  
Control, faculty and employee personnel administration, budget making and administration, financial accounting and reporting, protection of college funds, public relations.
- 8270.\* PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #) Alkire
- 8271.\* PROBLEMS: SECONDARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #) Nickerson, Popper, Mazzoni
- 8272.\* PROBLEMS: EDUCATIONAL ADMINISTRATION.** (1-3 cr per term; hrs ar) Hooker, Keller, Mueller, Nickerson, Popper, Alkire, Morgan, Morris  
See First Term.
- 8273.\* FIELD STUDY.** (0-10 cr; prereq #: hrs ar) Hooker, Keller, Mueller, Nickerson, Popper, Alkire, Morgan, Morris  
See First Term.
- 8274. THE TWO-YEAR COLLEGE.** (3 cr; IV MTWThF; Jones 4) Morgan  
Present status, development, functions, organization, curriculum, and trends in postsecondary, nonbaccalaureate institutions.
- 8275. TWO-YEAR COLLEGE ADMINISTRATION.** (3 cr; prereq 8274 or #: V MTWThF; Jones 4) Morgan  
Selected topics and problems in administration, administrative positions, and organization of postsecondary, nonbaccalaureate institutions.

## SCHOOL OF PHYSICAL EDUCATION, RECREATION, AND SCHOOL HEALTH EDUCATION

### Physical Education (PE)

Students interested in meeting a college requirement for physical education or in taking activity courses for elective credit may register for PE 1007, 1014, 1024, 1038, 1050, 1074, 1107, 1138, 1410.

**Professional Physical Education**—Courses are offered at the undergraduate and advanced major in physical education. Many of these courses apply toward the certification requirements for teaching physical education in the state of Minnesota. Courses are also offered that will apply toward the athletic coaching credential requirements for men and women. The following courses that apply toward the requirements in the various programs are offered this summer:

1. An Advanced Degree in Physical Education—PE 5101, 5112, 5126, 5130, 5134, 5136, 5140, 5150, 5152, 5160, 5170, 5620, 5700, 5740, 5980, 5981, 5983, 8980, 8981
2. Undergraduate Major in Physical Education—PE 3110, 3111, 3113, 3115, 3130, 3143
3. State of Minnesota Coaching Credential—PE 3110, 3111, 3113, 3115, 3130, 3143

**Elementary School Majors** —PE 3327 is offered to accommodate elementary education majors and classroom teachers.

All activity courses listed below are high intensity (participation requiring a high level of energy expenditure) except those otherwise indicated. It is therefore recommended that students who have questions about their ability to participate safely in the physical activities involved in a course seek advice from a physician.

### **PHYSICAL ACTIVITY PROGRAM COURSES (PE)**

*(Open to all students)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 1007. SWIMMING.** (1 cr; limited to 22 students; \$4 lab fee; II MTWTh; NorrisH 58) Chien  
Course for nonswimmers includes aquatic breathing, floating, bobbing, treading, finning, human stroke, elementary backstroke, sidestroke, front crawl.
- 1014. CONDITIONING.** (1 cr; each section limited to 40 students; \$4 lab fee)  
Improvement of physical fitness and general appearance through the use of running, circuit training, and progressive exercises of various types.  
Sec 1, I MTWTh, FieldHse, Conrad  
Sec 2, II MTWTh, FieldHse, Ben-Sira
- 1024. MODERN DANCE.** (1 cr; limited to 30 students; II MTWTh; NorrisH 151) Jette  
Introduction to the fundamental techniques of modern dance.
- 1038. TENNIS.** (1 cr; each section limited to 24 students; \$4 lab fee)  
Includes fundamental strokes such as service, forehand and backhand, drives and volley; court positions and strategy for singles and doubles; rules, terminology, and etiquette.  
Sec 1, I MTWTh, BFAB 101, Tennis Courts, Ringhofer  
Sec 2, II MTWTh, BFAB 101, Tennis Courts, Ringhofer  
Sec 3, II MTWTh, St. Paul Gym, Tennis Courts, Kundla  
Sec 4, III MTWTh, St. Paul Gym, Tennis Courts, Kundla  
Sec 5, IV MTWThF, BFAB Tennis Courts, Ben-Sira
- 1050. GOLF.** (1 cr; moderate intensity; each section limited to 24 students; \$4 lab fee) Dorn  
Emphasizes fundamentals of grip, stance, and swing in addition to etiquette and rules.  
Sec 1, V-VI MW, NorrisH 60, Golf Course  
Sec 2, V-VI TTh, NorrisH 60, Golf Course
- 1074. VOLLEYBALL.** (1 cr; limited to 48 students; \$4 lab fee; II MTWTh; CookeH 325) Renick  
Emphasizes the fundamentals of volleyball including serving, setting, spiking, and defensive and offensive theory.
- 1107. SWIMMING** (1 cr; limited to 24 students; prereq 1007 or equiv; \$4 lab fee; III MTWTh; NorrisH 58) Chien
- 1138. TENNIS.** (1 cr; limited to 24 students; prereq 1038 or equiv; \$4 lab fee; III MTWTh; Tennis Courts, BFAB 101) Renick
- 1410. WATER SAFETY INSTRUCTOR.** (2 cr; limited to 22 students; prereq current American Red Cross Senior Lifesaving Certificate; \$4 lab fee; I-II MTWThF; CookeH 15) Mowerson  
For those interested in obtaining the Red Cross Swimming Instructor's Certificate.

### **PROFESSIONAL COURSES (PE)**

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

## FIRST TERM

- 3113. MOTOR LEARNING AND MOTOR DEVELOPMENT.** (4 cr; limited to 40 students; II MTWThF; CookeH 206)  
R Johnson  
Examination of motor growth and development of children, adolescents, and adults with emphasis on sociopsychological factors.
- 3115. PHYSIOLOGICAL APPLICATION TO SPORTS.** (3 cr, §PubH 3385, §3386; limited to 40 students; III MTWThF; CookeH 206) Alexander  
Consideration of muscular contraction for strength development programs; contributions of training programs to endurance, speed, and skill acquisition; influence of training on the cardiovascular system; fatigue and recovery; early season training, pregame meals and ergogenic aids in athletics. Required for the Minnesota Coaching Certificate.
- 3130. HISTORY OF PHYSICAL EDUCATION AND SPORT.** (3 cr; limited to 40 students; I MTWThF; CookeH 206)  
Morgan  
Introductory description and interpretation of the influence of past sociocultural events upon the development of physical education and sport from primitive to 20th-century civilization.
- 3181. DANCE THERAPY.** (2 cr; limited to 25 students; IV MTWThF; NorrisH 3 and 151) Jette  
For students and teachers interested in dance therapy as a means of communication and interaction for the emotionally disturbed or handicapped person.
- 3327. TEACHING PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL.** (3 cr §1560, §3325, §Hth 3325; limited to 35 students; prereq elementary education major; I MTWThF; NorrisH 153, 153a) Lampe  
An overview of the elementary school physical education program; primarily a laboratory course, with participation in representative physical education activities for children; opportunities for observation of children, microteaching, skill analysis, and group discussion.
- 5101. PHYSICAL EDUCATION ACTIVITIES FOR THE HANDICAPPED.** (3 cr; prereq 5100 or SpEd 5101; II MTWThF; CookeH 215) Cato  
Adaptation of methods, materials, and physical activities to meet the needs of physically, mentally, or emotionally atypical students applied to specific handicaps in selected activity areas.
- 5112. PHYSICAL EDUCATION EQUIPMENT—June 27–July 15.** (3 cr; IV–V MTWThF; BFAB 125) Jaeger  
Selection, purchase, and maintenance of athletic equipment and supplies with opportunity to investigate selected equipment in depth. See Special Programs section.
- 5126. ADVANCED PSYCHOLOGICAL AND SOCIOLOGICAL DIMENSIONS OF PHYSICAL ACTIVITY.** (3 cr; prereq #: III MTWThF; CookeH 215) Krotee  
Advanced insight into the substance, nature, and significance of these dimensions of physical activity; focus on current research, issues, and trends as well as potential practical contributions.
- 5130. MOTOR LEARNING AND HUMAN PERFORMANCE.** (3 cr; prereq 3113 or #: I MTWThF; CookeH 215)  
R Johnson  
Mechanisms of human motor skill learning; emphasis on theories of motor learning and control of movement, motor memory, and individual differences.
- 5152. CURRICULUM DEVELOPMENT.** (3 cr; prereq 5151 or equiv; I MTWThF; CookeH 214) Young  
Trends, issues, and problems at selected levels of interest: elementary, secondary, junior college. For experienced teachers.
- 5160. EVALUATION IN PHYSICAL EDUCATION.** (3 cr; prereq 3150 or equiv; IV MTWThF; CookeH 215) Shick  
General principles and techniques of evaluation.
- 5620. PRACTICUM: PREVENTION AND CARE OF ATHLETIC INJURIES—June 27–July 8.** (3 cr; limited to 50 students; prereq Anat 1027 or equiv; 1:30–4:00 MTWThF; BFAB 125, 144) Marshall, Monroe  
An overview of problems (recognition, principles, and responsibilities) related to athletic injuries in secondary and college programs; demonstration and practice in training techniques and familiarity with the use of instruments for athletic rehabilitation.
- 5740.<sup>1</sup> WORKSHOP: COACHING OF INDIVIDUAL, DUAL, OR TEAM SPORTS—June 14–21.** (1–12 cr [max 12 cr]; limited to 50 students; 12:00–5:00 MTWThF; CookeH 206, Fieldhouse, Northrop Field) Krotee, Hunt  
Instruction at the advanced level including analyses of skills, game strategies, specific techniques of coaching, and methods of training and conditioning. This offering for 3 credits will focus on coaching of soccer. See Special Programs section.
- 5980. RESEARCH METHODOLOGY.** (3 cr, §Hlth 5980; prereq #: II MTWThF; CookeH 214) Shick  
Methods and design for research in health, physical education, and recreation.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #) Alexander, Cato, Jaeger, Jette, R Johnson, Krotee, Shick, Young  
Focus on teaching of physical education.
- 5983. READINGS: PHYSICAL EDUCATION.** (1-3 cr; prereq sr honor or grad student, #) Jaeger, Shick, Young  
Independent study under tutorial guidance.
- 8980.\* RESEARCH PROBLEMS.** (1 cr; prereq 5980, PsyF 5110 or #; S-N only; V MTWThF; CookeH 226)  
Alexander  
Designing and reporting on individual problems. Required of all M.A. and Ph.D. candidates.
- 8981.\* RESEARCH PROBLEMS.** (Cr and hrs ar; prereq 8980 or #; S-N only) Alexander, Jaeger, Shick, R Johnson, Young  
Individual problems.

### **PHYSICAL ACTIVITY PROGRAM COURSES (PE)**

*(Open to all students)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### **SECOND TERM**

- 1007. SWIMMING.** (1 cr; limited to 22 students; \$4 lab fee; III MTWTh; CookeH 15) Rasmussen  
See First Term.
- 1014. CONDITIONING.** (1 cr; limited to 40 students; \$4 lab fee; I MTWTh; Fieldhouse) Rasmussen  
See First Term.
- 1038. TENNIS.** (1 cr; each section limited to 24 students; \$4 lab fee)  
See First Term.  
Sec 1, I MTWTh, BFAB 101, Tennis Courts, Niczyporuk  
Sec 2, II MTWTh, BFAB 101, Tennis Courts, Wilson  
Sec 3, III MTWTh, BFAB 101, Tennis Courts, Wilson  
Sec 4, IV MTWTh, BFAB 101, Tennis Courts, Niczyporuk
- 1050. GOLF.** (1 cr; moderate intensity; each section limited to 24 students; \$4 lab fee)  
See First Term.  
Sec 1, V-VI MW, NorrisH 60, Golf Course, French  
Sec 2, V-VI TTh, NorrisH 60, Golf Course, French
- 1107. SWIMMING.** (1 cr; limited to 24 students; prereq 1007 or equiv; \$4 lab fee; II MTWTh; CookeH 15) Paulson

### **PROFESSIONAL COURSES (PE)**

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### **SECOND TERM**

- 3110. HUMAN ANATOMY.** (3 cr; limited to 40 students; II MTWThF; CookeH 206) Serfass  
Emphasizes bones, nerves, and muscles and their significance in physical education.
- 3111. MECHANICS OF MOVEMENT.** (3 cr; limited to 35 students; prereq Anat 1027; IV MTWThF; CookeH 215)  
Stoner  
Structure of the body, principles and mechanics of bodily movements.
- 3143. ORGANIZATION AND MANAGEMENT OF SPORT.** (3 cr; limited to 40 students; prereq 2 cr coaching course; III MTWThF; CookeH 206) French  
Principles, policies, and procedures involved in the coaching of interscholastic sports.
- 5134. PERCEPTUAL-MOTOR DEVELOPMENT IN CHILDHOOD—July 19-August 5.** (3 cr; prereq 3113 or #; IV-V MTWThF; CookeH 206) Plack  
The motoric dimension of perception; emphasis on developmental tenets of perception, diagnosis and remediation of perceptual-motor deficiencies, and related research.
- 5136. PSYCHOLOGY OF COACHING—July 19-August 5.** (3 cr; prereq 3113 or #; VI-VII MTWThF; BFAB 125)  
LaPointe  
Psychological aspects of coaching at the elementary, secondary, and college levels.

- 5140. BIOMECHANICS OF SPORT SAFETY—July 19-August 5.** (3 cr; prereq undergrad kinesiology; I-II MTWThF; CookeH 215) Stoner  
Forces and torques developed in sports activities; tolerances of the human body; techniques for preventing injury; design of protective equipment.
- 5150. TEACHING ELEMENTARY SCHOOL PHYSICAL EDUCATION—July 19-August 5.** (3 cr; prereq tchg certificate or #; I-II MTWThF; CookeH 214) Plack  
Principles, techniques, and procedures in developing basic motor skills, physical fitness, and sports skills.
- 5170. FOUNDATIONS OF PHYSICAL EDUCATION—July 19-August 5.** (3 cr; prereq grad or MEd student; III-IV MTWThF; CookeH 214) LaPoint  
Establishment of guidelines for individual and group professional action; examination of pertinent social forces, educational philosophies, and general ethics.
- 5700.<sup>1</sup> WORKSHOP: DANCE IN EDUCATION—July 18-August 5.** (1-12 cr [max 12 cr]; limited to 145 students; 9:00-5:00 MTWThF; NorrisH 68, 151, 153, 153a) Jette  
History, principles, instructional techniques, and materials for teaching dance in schools and recreational agencies. Topic and credit will vary with each offering. This offering for 6 credits. See Special Programs section for details.
- 5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #) French, LaPoint, Plack, Serfass, Stoner, Jette  
See First Term.
- 5983. READINGS: PHYSICAL EDUCATION.** (1-3 cr; prereq sr honor or grad student, #) Krotee, LaPoint, Stoner, Plack, Jette, French  
See First Term.
- 8981.\* RESEARCH PROBLEMS.** (Cr and hrs ar; prereq 8980 or #; S-N only) Krotee, LaPoint, Plack, Serfass, Stoner  
See First Term.

## Recreation, Park, and Leisure Studies (Rec)

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

### FIRST TERM

- 1700. FIELD EXPERIENCE.** (1-15 cr; prereq students in Recreation for Special Groups Program only; S-N only; hrs ar) Backus  
Supervised experiences in selected agencies.
- 3150. LEADERSHIP IN OUTDOOR RECREATION—June 21-July 5.** (3 cr; section 1 limited to 13 students, section 2 limited to 9 students; prereq 1520 or Δ) McAvoy  
Identity and scope of outdoor recreation programs. This offering will focus on methods of organizing, guiding, and protecting groups in outdoor recreation settings with a practical field application on either a backpacking or canoe trip. See Special Programs section.  
Sec 1, 1:30-3:00 MTWThF, CookeH 214, with a weekend backpacking trip July 1-3  
Sec 2, 1:30-3:00 MTWThF, CookeH 214, with a weekend canoe trip June 24-26
- 3700. SENIOR INTERNSHIP.** (1-15 cr; limited to 15 students; prereq sr recreation major or minor, Δ; S-N only; hrs ar) Chapman, McAvoy  
Supervised experiences in selected agencies.
- 5200. RECREATION IN COMMUNITY EDUCATION.** (3 cr; prereq 1520 or 5100 or Δ; III MTWThF; CookeH 214) Chapman  
Recreation and leisure services in the community education process.
- 5630. PRACTICUM: THERAPEUTIC RECREATION.** (3-9 cr; prereq 12 cr in recreation; hrs ar) Chapman  
Supervised experiences in program operation; administrative and supervisory duties.
- 5640. PRACTICUM: PUBLIC RECREATION AND PARKS.** (3-9 cr; prereq 12 cr in recreation; hrs ar) Chapman  
Supervised experiences in program operation; administrative and supervisory duties.
- 5900.<sup>1</sup> WORKSHOP: CONTEMPORARY ISSUES IN LEISURE SERVICES—June 14-17.** (1-12 cr [max 12 cr]; limited to 30 students; prereq Δ; all day TWThF; Camp St Croix) Griffin  
This 3-credit offering will focus on programming in outdoor education. See Special Programs section.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #) Chapman  
Focus on conduct of recreation programs.
- 5983. READINGS: RECREATION.** (1-3 cr; prereq MEd or grad student or Δ; hrs ar) Chapman  
Independent study under tutorial guidance.
- 8981.\* RESEARCH PROBLEMS.** (Cr and hrs ar; prereq 8980 or #) Chapman  
Individual problems.

## **SECOND TERM**

- 1700. FIELD EXPERIENCE.** (1-15 cr; prereq students in Recreation for Special Groups Program only; S-N only; hrs ar) Backus  
See First Term.
- 3700. SENIOR INTERNSHIP.** (1-15 cr; prereq sr, recreation major or minor, Δ; S-N only; hrs ar) Schultz  
See First Term.
- 3900. DIRECTED STUDY.** (3 cr per qtr [max 9 cr]; S-N optional; prereq recreation majors only, Δ; hrs ar) Schultz  
Self-directed study preceded by classroom study and possession of basic competence.
- 5630. PRACTICUM: THERAPEUTIC RECREATION.** (3-9 cr; prereq 12 cr in recreation; hrs ar) Schultz  
See First Term.
- 5640. PRACTICUM: PUBLIC RECREATION AND PARKS.** (3-9 cr; prereq 12 cr in recreation; hrs ar) Schultz  
See First Term.
- 5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #) Schultz  
See First Term.
- 5983. READINGS: RECREATION.** (1-3 cr; prereq MEd or grad student or Δ; hrs ar) Schultz  
See First Term.

## **School Health Education (Hlth)**

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

**Teaching Requirements for School Health Education**—Those interested in teaching school health education in the state of Minnesota may qualify through one of the following professional programs:

1. Courses offered this summer that apply to the undergraduate major in school and community health education are Hlth 1500, 5120, and 5140.
2. Courses offered this summer that apply to advanced and graduate degrees in school health education are Hlth 5120, 5140, 5400, 5402, 5685, 5980, 5981, 5983, and 8980.

## **FIRST TERM**

- 3330. TEACHING HEALTH IN THE ELEMENTARY SCHOOL.** (3 cr; prereq elem education major; II MTWThF; NorrisH 201) Borstad  
Content (including critical health issues) and methods of instruction in health education for the elementary school.
- 5140. ADMINISTRATION OF THE SCHOOL HEALTH PROGRAM.** (3 cr; III MTWThF; NorrisH 3) Cobb  
Coordination of total program; health supervision and guidance; relationships between public schools and governmental health organizations and agencies; evaluation; guidance in the solution of individual professional problems.
- 5402. DEATH EDUCATION IN CONTEMPORARY SOCIETY—June 14-July 1.** (3 cr, \$PubH 5040; limited to 80 students; prereq education sr, certified teacher, mortuary science major, school or public health nurse or #: 1:30-4:00 MTWThF; HSUnitA 2-520) Fredlund, Lindgren, Slater  
Basic background information on concepts and attitudes toward death, grief, and bereavement with emphasis on instructional aspects for the elementary and secondary schools; role of the school in suicide prevention.

- 5985. SCHOOL-BASED PROJECTS IN SCHOOL HEALTH EDUCATION.** (1-12 cr [max 12 cr]; prereq #: hrs ar) Cobb  
Individual or group projects, applicable to local school situations, such as curricular, instructional, or evaluative problems.
- 5980. INTRODUCTION TO RESEARCH.** (3 cr, §PE 5980; prereq #: II MTWThF; CookeH 214) Shick  
Methods and design for research in health, physical education, and recreation.
- 5981. PROBLEMS.** (Cr and hrs ar; prereq #) Cobb  
Focus on teaching school health education.
- 5983. READINGS: HEALTH EDUCATION.** (1-3 cr; prereq sr honor or grad student, #) Cobb  
Independent study under tutorial guidance.
- 8980.\* RESEARCH PROBLEMS.** (1 cr; S-N only; prereq PE 5980, PsyF 5110 or #: V MTWThF; CookeH 226) Alexander  
Designing and reporting on individual problems. Required of all M.A. and Ph.D. candidates.

## SECOND TERM

- 1500. AMERICAN RED CROSS STANDARD FIRST AID AND PERSONAL SAFETY.** (2 cr; limited to 35 students; II MTWThF; NorrisH 201) McCabe  
Lectures, demonstrations, and practice in first aid and personal safety; ARC Standard First Aid and Personal Safety Certificate awarded upon recommendation of instructor.
- 3300. INSTRUCTOR'S COURSE IN STANDARD FIRST AID AND PERSONAL SAFETY.** (3 cr; prereq ARC First Aid and Personal Safety or Advanced Certificate; IV MTWThF; NorrisH 201) Hlidek  
Preparation to teach the ARC basic first aid and standard first aid and personal safety courses.
- 5120. ROLE OF THE SCHOOL HEALTH EDUCATOR IN HEALTH APPRAISAL.** (3 cr; III MTWThF; NorrisH 3) Lindgren  
Role of school medical and dental advisers, nurses, teachers, and other school personnel in protection and maintenance phases.
- 5150. FAMILY LIFE AND SEX EDUCATION IN THE SECONDARY SCHOOLS.** (3 cr; prereq FSoS 5001 or #: II MTWThF; NorrisH 3) Lindgren  
Concepts, appropriate materials, and methods for teaching in the junior and senior high schools.
- 5400. TOPICS: EDUCATIONAL ASPECTS OF DRUG USE AND ABUSE—July 25-August 5.** (3 cr, §PubH 5032; prereq education sr, certified teacher, or school nurse; 9:00-12:00 MTWThF; HSUnitA 2-520) Cobb, Rothenberger  
Basic background information on alcohol and other drugs and chemicals with emphasis on curriculum concepts, teaching methodology, materials, and referral procedures appropriate for elementary, junior high, and senior high schools.
- 5983. READINGS; HEALTH EDUCATION.** (1-3 cr; prereq sr honor or grad student or #: hrs ar) Cobb  
See First Term.

## DEPARTMENT OF PSYCHOEDUCATIONAL STUDIES

### Counseling and Student Personnel Psychology (CSPP)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

#### FIRST TERM

- 5101. FOUNDATIONS OF CAREER DEVELOPMENT.** (3 cr; limited to 40 students; III-IV MW, 1 hr ar; Bu 125) W Tennyson  
Vocational theory and career development research; occupational analysis and industrial structure; methods of classifying the world of work; analysis of labor force and employment trends; basic concepts and principles for effective work in educational and vocational planning and development.
- 5110. COUNSELING PROCEDURES.** (3 cr; limited to 35 students; III-IV TTh, 1 hr ar; Bu 125) Shaffer  
For persons whose professional work includes counseling and interviewing; not for certification as school counselors. Emphasis on counseling relationship and principles of interviewing; utilizes case studies, role playing, and demonstration.
- 5130. INTRODUCTION TO GUIDANCE.** (3 cr; limited to 40 students; I-II MWF; WuH 230) W Tennyson  
Philosophy, principles, and practices in development and operation of pupil personnel services; role of counselor, teacher, principal, and specialized personnel; guidance techniques and case studies.

- 5300.<sup>1</sup> WORKSHOP: CAREER DEVELOPMENT—June 20-July 1.** (1-6 cr per qtr [max 12]; limited to 40 students; prereq #: 9:00-4:00 MTWTh and 9:00-12:00 F; FraH B1, B20, B25; all-day retreat June 18) L Hansen, Shaffer, Jones  
For all counselors, teachers, and administrators; aspects of intervention theory in relation to psychological principles; counseling, career development, assessment, psychological education, and consultation. Designed for teams of educators interested in career-related sex-role socialization; aspects of career development theory and principles; counseling and curriculum interventions in elementary, secondary, and higher education. This offering for 6 credits. See Special Programs section.
- 5310. CAREER DEVELOPMENT AND COUNSELING OF WOMEN.** (3 cr; limited to 30 students; VI-VII MW, 1 hr ar; Bu 125) L Hansen  
Theory, research, fact, trends regarding the role and status of women in relation to work; counseling skills, strategies, interventions for facilitating female career development.
- 5320. GROUP COUNSELING: PRINCIPLES AND PROCEDURES.** (3 cr; prereq counseling certification or #: VI-VII MW; Bu 123) A Anderson  
Basic principles of group dynamics related to the group counseling process; emphasis on developing concepts, attitudes, and skills; includes theory and laboratory experiences.
- 5540. SEMINAR: THE COLLEGE STUDENT.** (3 cr; prereq 6 cr in psychology or educational psychology or #: hrs ar)  
Psychology and sociology of college students; research concerning diversity of college student populations, vocational development of students, student society, culture, mental health, underachievement, dropouts, values, and attitudes; relevant research methods.
- 5620. PRACTICUM IN GROUP COUNSELING.** (1-6 cr [max 6 cr]; limited to 6 students; prereq counseling certification and #: VIII-IX MW; Bu 129) A Anderson  
Supervised practice in counseling several groups, preferably in the setting in which the student intends to work; emphasis on systematic evaluation of progress through direct observations and tapes and on developing skills in interpersonal perception, communication, and research. Students must register both terms for 3 credits each term.
- 5900. INDEPENDENT STUDY: GUIDANCE AND COUNSELING.** (Cr and hrs ar; prereq #) L Hansen, W Tennyson, A Anderson, Shaffer  
Independent study in areas of special interest to students.
- 8701. INTERNSHIP: COUNSELING AND STUDENT PERSONNEL PSYCHOLOGY.** (0-6 cr per qtr [max 9 cr for MA and specialist students, max 18 cr for PhD students]) L Hansen, W Tennyson, A Anderson, Shaffer  
Supervised employment at departmentally approved internship sites.
- 8900.\* RESEARCH METHODS IN COUNSELING AND STUDENT PERSONNEL PSYCHOLOGY.** (1-3 cr [max 9 cr per qtr]; prereq MA student and #: hrs ar) L Hansen, W Tennyson, A Anderson, Shaffer  
Research methodology and techniques; critical examination of literature; participation in formulating and executing a research proposal.

## **SECOND TERM**

- 5110. COUNSELING PROCEDURES.** (3 cr; limited to 35 students; III-IV TTh, 1 hr ar; Bu 125) Shaffer  
See First Term.
- 5130. INTRODUCTION TO GUIDANCE.** (3 cr; limited to 40 students; I-II MWF; PeikH 315) W Tennyson  
See First Term.
- 5332. CAREER DEVELOPMENT: PRINCIPLES AND PRACTICE II.** (3 cr; limited to 40 students; III-IV MW, 1 hr ar; Bu 125) W Tennyson
- 5620. PRACTICUM IN GROUP COUNSELING.** (1-6 cr [max 6 cr]; limited to 6 students; prereq counseling certification and #: VI-VII TTh; Bu 139C) Shaffer  
See First Term. This offering for 3 credits.
- 5900. INDEPENDENT STUDY: GUIDANCE AND COUNSELING.** (Cr and hrs ar; prereq #) W Tennyson, Shaffer  
See First Term.
- 8701. INTERNSHIP: COUNSELING AND STUDENT PERSONNEL PSYCHOLOGY.** (0-6 cr per qtr [max 9 cr for MA and specialist students, max 18 cr for PhD students]) W Tennyson, Shaffer  
See First Term.
- 8900.\* RESEARCH METHODS IN COUNSELING AND STUDENT PERSONNEL PSYCHOLOGY.** (1-3 cr per qtr [max 9 cr]; prereq MA student and #: hrs ar) W Tennyson, Shaffer  
See First Term.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.



## School Psychology (SchP)

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

### FIRST TERM

- 5300.<sup>1</sup> WORKSHOP: DEVELOPMENTAL EDUCATION.** (6 cr; limited to 35 students; prereq #: S-N optional; 8:30-11:30 MTWThF; E1H N508) Erickson, Sprinthall  
Concepts and techniques of psychological and developmental education applied to assessed needs of specific groups of educators; emphasis on practical application of developmental psychological approaches to improve the effectiveness of educational programming in conceptual, moral, or ego development; positive self-identity; or interpersonal and affective growth. Not intended to meet certification requirements in school psychology. Students are required to register concurrently in 5514. Preapplication is required; write Professor Norman Sprinthall, N548 Elliott Hall, 75 East River Road, University of Minnesota, Minneapolis, Minnesota 55455.
- 5514. METHODS OF PSYCHOLOGICAL INTERVENTION IN THE CLASSROOM: GROUP.** (3 cr; limited to 35 students; prereq #: S-N optional; 11:30-12:30 MTWThF; E1H N508) Erickson, Sprinthall  
A practical use of group techniques to broaden the accommodative power of the classroom in meeting developmental needs of a variety of students. Not intended to meet certification requirements in school psychology. Students are required to register concurrently in 5300. Preapplication is required; see 5300.
- 5910. DIRECTED READINGS: PSYCHOLOGICAL EDUCATION.** (1-6 cr [max 6 cr]; prereq #: S-N optional; hrs ar) Erickson, Sprinthall  
Theoretical and research literature in deliberate psychological education and other classroom intervention; designed to facilitate psychological growth and effectiveness. Not intended to meet certification requirements in school psychology.
- 8700. INTERNSHIP: SCHOOL PSYCHOLOGICAL SERVICES.** (5-15 cr; prereq 8610, #; hrs ar) Ysseldyke  
Advanced field experience. For doctoral candidates in school psychology.
- 8900.\* RESEARCH PROBLEMS.** (Cr ar; prereq #: hrs ar) Ysseldyke

### SECOND TERM

- 8700. INTERNSHIP: SCHOOL PSYCHOLOGICAL SERVICES.** (5-15 cr; prereq 8610, #; hrs ar) Weinberg  
See First Term.
- 8900.\* RESEARCH PROBLEMS.** (Cr ar; prereq #: hrs ar) Weinberg
- 8910. DIRECTED STUDY IN SCHOOL PSYCHOLOGY.** (1-5 cr; prereq #: hrs ar) Weinberg  
Reading and analysis of research on selected problems in school psychology.

## Special Education (SpEd)

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

### FIRST TERM

- 5100. CHILDHOOD LANGUAGE DEVELOPMENT: CLASSROOM IMPLICATIONS.** (3 cr; II MTWThF; Pt 215) Moores  
Recent trends and findings in the study of language acquisition; classroom implications for the education of exceptional children.
- 5101. EDUCATION OF EXCEPTIONAL CHILDREN.** (3 cr; III MTWThF; Pt 215) Force  
Introduction to field of special education for classroom teachers and other school personnel.
- 5104. SOCIAL AND VOCATIONAL DEVELOPMENT OF HANDICAPPED STUDENTS.** (Cr ar [max 4 cr]; prereq #: IV MTWThF; Pt 111) Warfield  
Organization and design of training programs to promote independent living, vocational and community adjustment of handicapped persons; curriculum materials and methods at adolescent and adult levels. This offering for 4 credits.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5105. IMPLEMENTING COURT DECISIONS ON EDUCATION OF THE HANDICAPPED.** (2-4 cr; III MTWThF; Pt 102) Balow  
Analysis of recent litigation and legislation; emphasis on implementation of right to education, right to treatment, labeling, due process, and related issues. This offering for 3 credits.
- 5107. MAINSTREAMING: ISSUES IN INDIVIDUALIZING INSTRUCTION.** (3-5 cr; IV MTWThF; CD 215) Deno  
Mandate for, implications of, and problems in the implementation of systems models and practical classroom practices that facilitate the education of the handicapped within regular classroom settings. This offering for 3 credits.
- 5112. EDUCATION OF LEARNING-DISABLED CHILDREN.** (3 cr; II MTWThF; CD 216) Ysseldyke  
Analysis of considerations in design and conduct of services for learning-disabled children; approaches to the education of such children.
- 5120. INTRODUCTION TO MENTAL RETARDATION.** (4 cr, §CPsy 5315; prereq 5101; II MTWThF; Pt 102) Turnure  
Issues that relate to educational practices; community planning; educational philosophy, administration and organization, and programming. Meets with CPsy 5315.
- 5123. METHODS AND MATERIALS FOR SEVERELY RETARDED PRESCHOOL AND SCHOOL-AGE PUPILS.** (4 cr; limited to 50 students; prereq 5101 or equiv; V-VI TTh; Pt 214) Rynders  
Issues and problems in curriculum development; pupil assessment and evaluation techniques; materials and teaching strategies.
- 5124. BIOMEDICAL ASPECTS OF DEVELOPMENTAL DISABILITIES.** (Cr ar [max 4 cr]; prereq #: V-VI MW; Pt 214) Rynders  
Selected information in genetics, anatomy and physiology, the central nervous system, biochemistry of the body, and prenatal development; causative factors and clinical features, particularly mental retardation and its clinical manifestations. This offering for 4 credits.
- 5130. EDUCATION OF CRIPPLED CHILDREN.** (3 cr; prereq 5101 or #: V MTWThF; Pt 102) Force  
Characteristics and abilities; methods and materials for training; observation of teaching situations involving these groups; personal consultation scheduled in addition to class hours.
- 5143. TEACHING LANGUAGE TO THE HEARING IMPAIRED I.** (3 cr; prereq 5140; IV MTWThF; Pt 102) Moores  
Survey of the language curricula and teaching techniques in infant, nursery, preschool, and beginning primary programs for the deaf; overview of language development in the deaf and the hearing child in the primary years.
- 5150. EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN.** (3 cr; prereq grad or #: V-VII MW; Pt 215) McCauley  
Discussion and evaluation of curricula, materials, and methods for instruction of disturbed and delinquent children in hospital, training school, and public school settings.
- 5180. EDUCATION OF THE DISADVANTAGED.** (3 cr; prereq 12 cr in psychology, educational psychology, or sociology; IV MTWThF; Pt 214) Wood  
Educational needs of children handicapped by behavior related to deficiencies of physical or cultural environment; adaptations of educational programs.
- 5190. OUTSTANDING ABILITIES AND THE EDUCATIONAL PROCESS.** (3 cr; III MTWThF; Pt 111) Rubin  
The origin and development of terms such as giftedness, creativity, genius, talent, and intelligence; implications for educational practice; current issues and trends.
- 5301. CONTINGENCY MANAGEMENT IN SPECIAL EDUCATION SYSTEMS.** (3 cr; II MTWThF; Pt 111) Deno  
Behavior modification, precision teaching, and contingency contracting applied to problems in teaching exceptional children and adults.
- 5302. WORKSHOP: SPECIAL EDUCATION.** (Cr ar; section 2 limited to 30 students; prereq #) Taylor  
Laboratory approach provides opportunities for school personnel to study specific problems related to special education. See also section 1 listed under Eight-Week Courses. See Special Programs section.  
Sec 2, III MTWThF, FoIH 105
- 5601. PRACTICUM: SPECIAL EDUCATION.** (Cr ar; section 2 limited to 10 students; S-N optional; prereq #) R Bruininks  
Supervised experience in teaching or related work in schools or other agencies serving exceptional children. See also section 1 listed under Eight-Week Courses.  
Sec 2, cr and hrs ar
- 5610. PRACTICUM: DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY I.** (3 cr; prereq f5110 and #: S-N optional; I-VI MTWThF; Owre 12) V Bruininks  
Clinical practice in prescriptive teaching using a selected range of techniques presented in SpEd 5110. Prior application required; limited to Institute participants only. See Special Programs section.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5611. PRACTICUM: DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY II.** (3 cr; prereq 5610, 5111, and #; S-N optional; I-VI MTWThF; Owre 12) V Bruininks  
Clinical practice in prescriptive teaching using a selected range of techniques presented in SpEd 5111. Prior application required; limited to Institute participants only. See Special Programs section.
- 5900. INDEPENDENT STUDY: SPECIAL EDUCATION.** (Cr ar [max 12 cr]; prereq #; hrs ar) R Bruininks, Force, Wood, Deno
- 8601. ADVANCED PRACTICUM.** (Cr ar; prereq #; hrs ar) R Bruininks, Force, Wood, Deno  
Experience planned with supervising professor in college teaching, supervision of student teachers, or other forms of advanced professional practice; usually taken by advanced graduate students.
- 8900.\* PROBLEMS.** (Cr ar; prereq #; hrs ar) Balow, R Bruininks, Force, Moores, Rynders, Turnure, Wood, Deno, V Bruininks, McCauley, Warfield

## **FIRST AND SECOND TERMS: EIGHT-WEEK COURSES**

- 5302<sup>1</sup>. WORKSHOP: SPECIAL EDUCATION.** (Cr ar; section 1 limited to 20 Institute participants only; prereq #)  
Laboratory approach provides opportunities for school personnel to study specific problems related to special education. Prior application required. See Special Programs section.  
Sec 1, June 13-August 5, 6 cr, I-VIII MTWThF, MRRC 211, McCauley
- 5601. PRACTICUM: SPECIAL EDUCATION.** (Cr ar; section 1 limited to 20 Institute participants only; S-N optional; prereq #)  
Supervised experience in teaching or related work in schools or other agencies serving exceptional children. Prior application required. See Special Programs section.  
Sec 1, June 13-August 5, 6 cr, I-VIII MTWThF, MRRC 211, McCauley

## **SECOND TERM**

- 5100. CHILDHOOD LANGUAGE DEVELOPMENT: CLASSROOM IMPLICATIONS.** (3 cr; II MTWThF; Pt 215)  
See First Term.
- 5101. EDUCATION OF EXCEPTIONAL CHILDREN.** (3 cr; III MTWThF; Pt 215) Force  
See First Term.
- 5112. EDUCATION OF LEARNING-DISABLED CHILDREN.** (3 cr; III MTWThF; Pt 111) Balow  
See First Term.
- 5120. INTRODUCTION TO MENTAL RETARDATION.** (4 cr, §CPsy 5315; prereq 5101; II MTWThF; Pt 111) Warfield  
See First Term.
- 5125. EDUCATION OF SEVERELY HANDICAPPED INFANTS AND PRESCHOOL CHILDREN.** (4 cr; prereq 5101 or 5120 or #; V-VI TTh; Pt 215) Rynders  
Issues and implications and practical application in designing teaching strategies and curricula for maximizing educational development in such children.
- 5144. TEACHING LANGUAGE TO THE HEARING IMPAIRED II.** (3 cr; prereq #; IV MTWThF; Pt 111)  
Devising language curricula and teaching techniques for primary intermediate and advanced programs for the deaf; comparative study of the language development of the deaf and hearing child in these years.
- 5150. EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN.** (3 cr; prereq grad student or #; IV MTWThF; Pt 214) Wood  
See First Term.
- 5160. SUPERVISION AND ADMINISTRATION OF SPECIAL EDUCATION.** (3 cr, §EdAd 5103; prereq #; I MTWThF; ClaOff B30)  
Procedures for establishing and improving educational programs for exceptional children.
- 5301. CONTINGENCY MANAGEMENT—July 18-August 5.** (3 cr; I-II MTWThF; Pt 102) Deno  
See First Term.
- 5302.<sup>1</sup> WORKSHOP: SPECIAL EDUCATION—July 18-August 5.** (Cr ar; sec 2 limited to students; prereq #) Deno  
Laboratory approach provides opportunities for school personnel to study specific problems related to special education. Prior application required. See Special Programs section. See also section 1 listed under Eight-Week Courses.  
Sec 2, 3 cr, IV-V MTWThF, Pt 102
- 5601. PRACTICUM: SPECIAL EDUCATION.** (Cr ar; section 2 limited to 10 students; S-N optional; prereq #)  
See First Term. See also section 1 under Eight-Week Courses.  
Sec 2, hrs ar, R Bruininks

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5900. INDEPENDENT STUDY: SPECIAL EDUCATION.** (Cr ar [max 12 cr]; prereq #: hrs ar) R Bruininks, Force
- 8601. ADVANCED PRACTICUM.** (Cr ar; prereq #: hrs ar) R Bruininks  
See First Term.
- 8900.\* PROBLEMS.** (Cr ar; prereq #: hrs ar) Balow, R Bruininks, Force, Rynders, Warfield, McCauley, Wood, Deno

## DEPARTMENT OF SOCIAL, PSYCHOLOGICAL, AND PHILOSOPHICAL FOUNDATIONS OF EDUCATION

### Psychological Foundations (PsyF)

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

#### FIRST TERM

- 3380. INTRODUCTION TO HUMAN RELATIONS.** (3 cr; each section limited to 20 students; prereq education jr, sr; S-N only; lect 8:00-9:00 MTW; MechE 18) Aneshensei  
Based on small-group training theory and methods; designed to help the student develop an understanding of his or her own behavior, the behavior of other individuals, and group and organizational behavior. See Special Programs section.  
Sec 1, 9:00-10:00 MTW, MechE 302  
Sec 2, 9:00-10:00 MTW, Aero 211  
Sec 3, 9:00-10:00 MTW, Aero 215
- 5110. INTRODUCTORY STATISTICAL METHODS.** (3 cr; each section limited to 40 students) Stecklein  
(Not equivalent to 8110, 8310) Basic statistical techniques; comprehension of literature using elementary concepts and methods.  
Sec 1, I MTWThF, EItH N647  
Sec 2, II MTWThF, EItH N647
- 5120. EDUCATIONAL MEASUREMENT IN THE CLASSROOM.** (3 cr; limited to 35 students; II MTWThF; Arch 55) Terwilliger  
Principles and methods for construction, evaluation, and improvement of classroom measures; techniques for describing results statistically; use of measurement in evaluating instruction and student performance; assignment of grades.
- 5121. BASIC PRINCIPLES OF MEASUREMENT.** (3 cr; limited to 35 students; prereq 5110 or 8110 or Psy 3801 or equiv; III MTWThF; Arch 55) Terwilliger  
Fundamental concepts, principles, and methods in educational and psychological measurement; educationally useful properties of tests; types and uses of derived scores; factors influencing reliability and validity.
- 5162. PERSONALITY AND SOCIAL DEVELOPMENT.** (3 cr; prereq 5 cr introductory psychology; II MTWThF; CD 105)  
Major concepts and research findings in adjustment and development with special emphasis on educational implications.
- 5162. LEARNING AND EDUCATIONAL PRACTICE: THE CHILD AND ADOLESCENT.** (3 cr; 10:00-12:30 TTh; NH 209)  
Survey of psychological methods and principles; models of the learner; topics in development, creativity, intelligence, and motivation; implications for teaching and curriculum design in preschool, elementary, and secondary education; professional training with children and adolescents as clients.
- 5305.<sup>1</sup> WORKSHOP IN HUMAN RELATIONS.** (1-6 cr [max 6 cr], §CSPP 5305, §Educ 5305; each section limited to 20 students; S-N only; lect 8:00-9:00 MTWTh; Ph 131) Oden  
Experientially based course including simulation activities, curriculum writing, and supervised practice in basic human relations skills emphasizing individual, cultural, and ethnic differences and their implications for educational practice. This offering for 6 credits. See Special Programs section.  
Sec 1, 9:00-11:00 MTWTh, Aero 317  
Sec 2, 9:00-11:00 MTWTh, Aero 319  
Sec 3, 9:00-11:00 MTWTh, Aero 321

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5900. DIRECTED STUDY.** (Cr ar; prereq #: hrs ar) MacEachern
- 8110. STATISTICAL METHODS.** (3 cr; prereq 5110 or Psy 3801 or equiv; I MTWThF; Arch 50) MacEachern  
Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems.
- 8120.\* METHODS IN EDUCATIONAL RESEARCH.** (3 cr; II MTWThF; WuH 130) D Anderson  
Methods and techniques employed in investigation and report of educational problems. Suggested for all candidates for graduate degrees.
- 8900.\* RESEARCH PROBLEMS.** (Cr ar; prereq #: hrs ar) D Anderson, Terwilliger, MacEachern, Corcoran
- 8910.\* PROBLEMS: STATISTICS FOR STUDENTS IN EDUCATION AND PSYCHOLOGY.** (Cr and hrs ar) MacEachern  
Recent developments in statistical science; applications to educational and psychological problems.
- 8920.\* PROBLEMS: MEASUREMENT.** (1-3 cr [max 9 cr]; hrs ar) Terwilliger, Stecklein  
Intensive study and individual research.
- 8921.\* PROBLEMS: EVALUATION.** (Cr ar; prereq 5621 or 8525; hrs ar) Corcoran  
Designing, implementing, and analyzing strategies; students work on their own problems, on evaluation problems in schools of the area, or on problems associated with national curriculum projects.

### **FIRST AND SECOND TERMS: TEN-WEEK COURSE**

- 8112. STATISTICAL METHODS (PARTS I AND II).** (3 cr total for both parts; prereq 8111; II MWF; Arch 50) MacEachern  
Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems.

### **SECOND TERM**

- 3380. INTRODUCTION TO HUMAN RELATIONS.** (3 cr; each section limited to 20 students; prereq education jr, or sr; S-N only; lect 8:00-9:00 MTW; Ph 131) Oden  
See First Term and Special Programs section.  
Sec 1, 9:00-10:00 MTW, Ph 143  
Sec 2, 9:00-10:00 MTW, Ph 157  
Sec 3, 9:00-10:00 MTW, Ph 236A  
Sec 4, 9:00-10:00 MTW
- 5110. INTRODUCTORY STATISTICAL METHODS.** (3 cr; IV MTWThF; Bu 123) Merwin  
See First Term.
- 5120. EDUCATIONAL MEASUREMENT IN THE CLASSROOM.** (3 cr; II MTWThF; Bu 123) Anderson  
See First Term.
- 5125. PRINCIPLES AND METHODS OF EVALUATION.** (3 cr; III MTWThF; Bu 125) Merwin  
Nature of inquiry in education (evaluation vs. elucidation); internal and external validity of designs; analytical operations on data; overview of models.
- 5153. INTRODUCTION TO THE PSYCHOLOGY OF INSTRUCTION.** (3 cr; 10:00-12:30 TTh; FoIH 105)  
Survey of psychological factors important in design of instruction; performance criteria, strategy, and sequence in the context of research; activities in development and implementation of instructional techniques, technologies, and delivery systems; psychological processes relevant to measures of effectiveness in the teaching-learning environment.
- 5176. PSYCHOLOGY OF DRUG ABUSE.** (3 cr; 9:00-11:00 TWTh; Bu 123) Norem-Hebeisen  
Psychological and sociological problems of drug abuse with special reference to schools, teachers, and students.
- 5305.<sup>1</sup> WORKSHOP IN HUMAN RELATIONS.** (1-6 cr [max 6 cr], §CSPP 5305, §Educ 5305; each section limited to 20 students; S-N only; lect 8:00-9:00 MTWTh; MechE 18) Aneshensel  
See First Term and Special Programs section. This offering for 6 credits.  
Sec 1, 9:00-11:00 MTWTh, LindH 315  
Sec 2, 9:00-11:00 MTWTh, LindH 320  
Sec 3, 9:00-11:00 MTWTh, LindH 325
- 5900. DIRECTED STUDY.** (Cr ar; prereq #: hrs ar) MacEachern
- 8111. STATISTICAL METHODS.** (3 cr; prereq 8110; I MTWThF; Arch 50) MacEachern  
Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems.
- 8900.\* RESEARCH PROBLEMS.** (Cr ar; prereq #: hrs ar) D Anderson, MacEachern, Corcoran

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 8910.\* PROBLEMS: STATISTICS FOR STUDENTS IN EDUCATION AND PSYCHOLOGY.** (Cr and hrs ar) MacEachern  
See First Term.
- 8920.\* PROBLEMS: MEASUREMENT.** (1-3 cr [max 9 cr]; hrs ar) Merwin, D Anderson  
See First Term.
- 8921.\* PROBLEMS: EVALUATION.** (Cr ar; prereq 5621 or 8525; hrs ar) Merwin, D Anderson, Corcoran  
See First Term.

## Social and Philosophical Foundations of Education

### *History and Philosophy of Education (HEd)*

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

#### FIRST TERM

- 3090. THE SCHOOL AND SOCIETY.** (3 cr; limited to 75 students; prereq sr; IV MTWThF; Arch 45) Harkins  
Readings in social science and philosophy give the student opportunity to integrate points of view concerning the role of the school in present-day society.
- 3099. DIRECTED STUDY.** (1-6 cr; prereq #; hrs ar) Harkins, Taylor
- 5190. SOCIOLOGY OF EDUCATION.** (3 cr, §Soc 5953; III MTWThF; BlegH 404) Taylor  
Advanced studies in the social aspects of education including the school as a socialization process, the social structure of education, the role of the school in social change.
- 5209. EDUCATION IN FUTURE SOCIAL SYSTEMS.** (3 cr, §5212; II MTWThF; Arch 15) Harkins  
Interdisciplinary inquiry into problems of social specialization and generalization; projections and analysis of long-range (30 years or more) social and technological trends related to education.
- 8241.\* PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION.** (Cr ar; prereq #; hrs ar) Harkins, Taylor  
For graduate students interested in research and original work in these areas.

#### SECOND TERM

- 3090. THE SCHOOL AND SOCIETY.** (3 cr; limited to 75 students; prereq sr; II MTWThF; Arch 15) Harkins  
See First Term.
- 3099. DIRECTED STUDY.** (1-6 cr; prereq #; hrs ar) Harkins
- 5211. SOCIAL DESIGN AND EDUCATIONAL FUTURES.** (3 cr; IV MTWThF; Arch 45) Harkins  
Medium-range interdisciplinary approach to community design and analysis emphasizing formal education systems in a community context; focus upon new neighborhoods, towns, experimental cities, and subcultural enclaves in rural and urban settings emphasizing time period from several years to 3 decades hence.
- 8241.\* PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION.** (Cr ar; prereq #; hrs ar) Harkins, Corcoran  
See First Term.

## DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

### Agricultural Education (AgEd)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

#### FIRST TERM

- 5027. PRACTICUM: EXTENSION EXPERIENCES.** (2-6 cr [max 6 cr]; prereq #; hrs ar) Norenberg  
Observation of the activities of county extension staff; familiarization with staff, program planning and development, county committee, youth activities and office activities, with opportunity to participate in the functions of an extension educator.

**5041.<sup>1</sup> WORKSHOP: AGRICULTURAL EDUCATION TECHNOLOGY.** (1-6 cr [max 6 cr]; sec 1 limited to 50 students, sec 2 limited to 25 students)

New understandings, techniques, and materials in animal science, plant science, horticulture, soil science, agricultural mechanics, forestry, natural resources, youth organization, visual aids, and occupational exploration.

Sec 1, FFA, 3 cr, location and dates to be announced, Leske, Norenberg

Sec 2, Farm Management, July 11-15, 3 cr, location to be announced, I-IV and VI-VIII MTWThF, Persons

**5071. SUPERVISED OCCUPATIONAL EXPERIENCES IN AGRICULTURE—June 13-24.** (3 cr; I-IV MTWThF; ClaOff 143) Leske

Organization and administration of an occupational experience program in agriculture for high schools and area schools.

**5072. PRACTICUM: AGRICULTURAL BUSINESS AND INDUSTRY—July 11-15.** (1-3 cr [max 9 cr]; I-IV and VI-VIII MTWThF; ClaOff 143) Leske

Observation, study, and experience in agricultural business and industry; application to educational programs in agriculture.

**5090. INDEPENDENT STUDY.** (1-3 cr; prereq sr; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson

Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure.

**5095. INDEPENDENT STUDY.** (3 cr; prereq MEd student in agricultural education; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson

Preparation of a paper dealing with studies in agricultural education applied to professional responsibilities.

**5128. METHODS OF TEACHING—June 13-July 1.** (3 cr; prereq non-agricultural education major and/or #; I-II MTWThF; ClaOff 143) R Peterson

Methods of teaching agriculture or related subjects; developing competencies in planning, organizing, implementing, and evaluating instruction with practice in instructional techniques.

**5129. CURRICULUM PLANNING—June 13-July 1.** (3 cr; prereq 5128 or 5128, non-agricultural education major and/or #; III-IV MTWThF; ClaOff 143) Marvin

Methods and procedures in planning a curriculum to teach within a specific subject matter area; curriculum construction for use in native country setting.

**8001.\* RESEARCH IN AGRICULTURAL EDUCATION.** (Cr ar; each section limited to 20 students; prereq 15 cr in education)

Selecting problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts.

Sec 1, June 13-24, 3 cr, I-IV MTWThF, ClaOff 130, Swanson

Sec 2, hrs ar, Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson

**8091. FIELD PROBLEMS.** (3 cr; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson

Making investigations, gathering data, and formulating plans regarding agricultural education.

## **SECOND TERM**

**5027. PRACTICUM: EXTENSION EXPERIENCES.** (2-6 cr [max 6 cr]; prereq #; hrs ar) Norenberg  
See First Term.

**5032. HIGH SCHOOL CURRICULUM IN AGRICULTURE—July 18-29.** (3 cr; prereq 10 cr in education; I-IV MTWThF; ClaOff 130) Leske, R Peterson

Philosophy, organization, and administration of instruction in agriculture departments in secondary schools.

**5051. ENTERPRISE ANALYSIS—July 18-29.** (3 cr; prereq #; I-IV MTWThF; ClaOff 143) Persons

Analyzing the farm business as a basis for identifying problems; planning learning experiences to improve farm management at the high school, young farmer, and adult levels.

**5080. ORGANIZATION AND MANAGEMENT—August 8-12.** (3 cr; prereq #; I-IV and VI-VIII MTWThF; ClaOff 143) Marvin

Administrative structure and function of subcollegiate programs.

**5090. INDEPENDENT STUDY.** (1-3 cr; prereq sr; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson

See First Term.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

- 5095. INDEPENDENT STUDY.** (3 cr; prereq MEd student in agricultural education; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson  
See First Term.
- 8001.\* RESEARCH IN AGRICULTURAL EDUCATION.** (Cr ar; prereq 15 cr in education) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson  
See First Term.
- 8091. FIELD PROBLEMS.** (3 cr; hrs ar) Marvin, Bear, Persons, M Peterson, Swanson, Copa, Leske, Norenberg, R Peterson  
See First Term.

## Business Education (BsEd)

Courses with limited enrollment must be reserved at 1425 University Avenue S. E. (see instructions under "Reserved Courses").

### FIRST TERM

- 1501.<sup>1</sup> BEGINNING TYPEWRITING.** (2 cr; S-N optional for nonmajors; \$4 lab fee; IV MTWThF; PeikH 265)  
Emphasis on correct typewriting techniques; letter styles; manuscripts; simple tabulations; proofreading.
- 1502.<sup>1</sup> INTERMEDIATE TYPEWRITING.** (2 cr; prereq 1501 or proficiency exam; \$4 lab fee; IV MTWThF; PeikH 265)  
Speed and accuracy building; carbons; tabulations; simple manuscripts; rough drafts; additional letter styles; interoffice memoranda; office forms; outlines and enumerations.
- 1503.<sup>1</sup> ADVANCED TYPEWRITING.** (2 cr; prereq 1502 or proficiency exam; \$4 lab fee; IV MTWThF; PeikH 265)  
Proficiency in typing; complex manuscripts; footnotes; bibliographies; additional letter styles; complex tabulations.
- 5103. CONSUMER EDUCATION IN THE SCHOOLS—June 14–July 1.** (3 cr; IV-V MTWThF; PeikH 225) Hopkins  
Objectives, content, and curriculum organization at elementary and secondary levels.
- 5106. ORGANIZATION AND SUPERVISION OF BUSINESS EDUCATION—July 5–15.** (3 cr; limited to 30 students; prereq #: I-III MTWThF) Lambrecht  
Evaluative criteria for business education departments, teacher selection and supervision, and organization of business education in the United States.
- 5112. PROGRAM DEVELOPMENTS IN BUSINESS EDUCATION: Machine Shorthand—June 14–July 1.** (1-12 cr [max 12 cr]; limited to 30 students; I-II MTWThF; PeikH 265) Lambrecht  
Developments emerging from research and local, state, and national programs and projects. Development of theory competency; factors of interest in alternative shorthand systems; materials and methodologies of instruction. This offering for 3 credits.
- 5114. OFFICE OCCUPATIONAL EXPERIENCE.** (1-18 cr; limited to 20 students; prereq #: S-N optional; 5:30-7:00 pm T and hr ar; PeikH 255)  
Observation and practice in business offices; weekly seminars on application to teaching and guidance of high school and post-high school students. Each 1-credit offering requires 85 hours of work; may not apply for credit toward an advanced degree.
- 5116. SCHOOL-BASED PROJECTS IN BUSINESS EDUCATION.** (1-12 cr [max 12 cr]; limited to 20 students; prereq #: S-N only; hrs ar) Hopkins, Lambrecht  
Individual or group work on curricular, instructional, or evaluation problems and projects applicable to local school situations.
- 5390. DIRECTED STUDIES IN BUSINESS EDUCATION.** (1-6 cr [max 6 cr]; prereq #: hrs ar) Hopkins, Lambrecht  
Opportunity for individual learning experiences not covered by regular courses.
- 8300. SEMINAR: RESEARCH IN BUSINESS AND ECONOMIC EDUCATION.** (1 cr per qtr; prereq #: S-N only; hrs ar) Hopkins  
Primarily for doctoral-level students. Planning and evaluation of research and individual projects.
- 8600. INTERNSHIP: BUSINESS EDUCATION.** (3-12 cr; hrs ar) Hopkins  
In-service experience in a business education specialist role, supervised experience in communication, planning, decision making, materials, curriculum development, and supervising and working with people.
- 8900.\* PROBLEMS: BUSINESS EDUCATION.** (Cr and hrs ar; prereq #: S-N only) Hopkins, Lambrecht  
Investigations in field of student's interest.

<sup>1</sup>These courses meet concurrently. A total of 28 students will be accepted in the three courses, BsEd 1501, 1502, 1503.



## **SECOND TERM**

- 5111. MATERIALS AND METHODS FOR A SIMULATED OFFICE COURSE—July 19-29.** (3 cr; limited to 30 students; prereq sr; I-III MTWThF; PeikH 255) McLean  
Course organization; development and evaluation of objectives and materials.
- 5112. PROGRAM DEVELOPMENTS IN BUSINESS EDUCATION: New Office Technology—July 19-29.** (1-12 cr [max 12 cr]; limited to 30 students; V-VII MTWThF; PeikH 265) McLean  
See First Term. This offering for 3 credits will focus on word processing systems, electronic office machines, remote filing and retrieval systems, reprographics, office landscaping, and other innovations for the office of the future.
- 5116. SCHOOL-BASED PROJECTS IN BUSINESS EDUCATION.** (1-12 cr [max 12 cr]; limited to 20 students; prereq #: hrs ar) McLean  
See First Term.
- 5390. DIRECTED STUDIES IN BUSINESS EDUCATION.** (1-6 cr [max 6 cr]; prereq #: hrs ar) McLean  
See First Term.
- 8900.\* PROBLEMS: BUSINESS EDUCATION.** (Cr and hrs ar; prereq #: S-N only) McLean  
See First Term.

## **Distributive Education (DE)**

Courses with limited enrollment must be reserved at 1425 University Avenue S.E. (see instructions under "Reserved Courses").

### **FIRST TERM**

- 5325. DIRECTED OCCUPATIONAL EXPERIENCE AND SEMINAR—July 11-15.** (3-9 cr; prereq Δ; II-IV, VI-VIII MTWThF; PeikH 245) Jacobs  
Current operating practices and career opportunities in business and industry, combining planned experiences in work environments and related seminars. This offering for 3 credits deals with marketing occupations for the handicapped and disadvantaged. See Special Programs section.
- 5400. PROGRAM DEVELOPMENTS IN DISTRIBUTIVE EDUCATION: High School-Postsecondary Distributive Education—June 20-July 8.** (1-12 cr [max 12 cr]; limited to 30 students; prereq #: I-V MTWThF; PeikH 245) Klaurens  
Problems, practices, methodology, and relationships; topics of concern to distributive education personnel. This 3-credit offering deals with articulation and coordination of high school and postsecondary distributive education personnel. Students will be required to register concurrently in DE 5600, section 1. See Special Programs section.
- 5600. SCHOOL-BASED PROJECTS IN DISTRIBUTIVE EDUCATION.** (1-12 cr [max 12 cr]; Sec 1 limited to 30 students, sec 2 limited to 5 students; prereq Δ) Klaurens  
School-related experiences on an individual or group basis involving curricular, instructional, developmental, or evaluative problems and projects applicable to local school situations.  
**Sec 1, High School—Postsecondary Distributive Education—June 20-July 8,** 3 cr, I-V MTWThF, PeikH 245  
Students will be required to register concurrently in DE 5400. See Special Programs section.  
**Sec 2, Individual Projects,** cr and hr ar, for MEd students.
- 5900. DIRECTED STUDY: DISTRIBUTIVE EDUCATION.** (1-6 cr [max 6 cr]; prereq Δ; S-N optional; hrs ar) Klaurens  
Individually arranged learning experiences in instruction, curricula, organization, operation, and evaluation.
- 8900.\* PROBLEMS: DISTRIBUTIVE EDUCATION.** (Cr ar; prereq #: hrs ar) Klaurens

### **SECOND TERM**

- 5105. COORDINATION TECHNIQUES—July 19-29.** (2 cr; limited to 30 students; I-II MTWThF; PeikH 245) Ashmun  
Problems of coordinators in cooperative vocational education; guidance and selection; placing students in work stations, assisting job adjustments, developing the training program. This course should be taken concurrently with DE 5106 or HEEd 5106 for certification purposes. See Special Programs section.
- 5106. COORDINATION TECHNIQUES IN COOPERATIVE DISTRIBUTIVE EDUCATION—July 19-29.** (2 cr; limited to 30 students; prereq 5105 or 15105; III-IV MTWThF; PeikH 245) Ashmun  
Applications in secondary and postsecondary cooperative and project plan programs; certification course for distributive education teacher coordinators. This course should be taken concurrently with DE 5105 for certification purposes.

- 5600. SCHOOL-BASED PROJECTS IN DISTRIBUTIVE EDUCATION.** (1-12 cr [max 12 cr]; prereq Δ; hrs ar) Ashmun  
See First Term.
- 5900. DIRECTED STUDY: DISTRIBUTIVE EDUCATION.** (1-6 cr [max 6 cr]; prereq Δ; S-N optional; hrs ar) Ashmun  
See First Term.
- 8600. INTERNSHIP: DISTRIBUTIVE EDUCATION.** (3-9 cr; hrs ar) Ashmun
- 8900.\* PROBLEMS: DISTRIBUTIVE EDUCATION.** (Cr ar; prereq #; hrs ar) Ashmun

## Home Economics Education (HEED)

### FIRST TERM

- 5300. HOME ECONOMICS CURRICULUM—July 5-15.** (3 cr; prereq 3530 and #; VI-VIII MTWThF; ClaOff B30) McFadden  
Examination of research and literature; development of units of study and programs at elementary and secondary levels; production and evaluation of materials.
- 5331. HOME ECONOMICS OCCUPATIONAL EDUCATION—June 14-24.** (3 cr per qtr [max 12 cr]; prereq sr or tchg exper or #; II-IV MTWThF; ClaOff B30) Erickson  
Exploration of career opportunities; identification of needed competencies; development of instruction units; objectives, teaching-learning experiences, appraisal procedures; preparation of teaching materials.
- 5405.<sup>1</sup> WORKSHOP: CHILD DEVELOPMENT AND HUMAN RELATIONS—June 14-24.** (3 or 4 cr; prereq grad student; VI-VIII MTWThF; ClaOff B30) McFadden  
Recent emphasis on growth and guidance of individuals; materials and techniques for high school and adult levels to attain better understanding. This offering for 3 credits will emphasize the teaching of child development and parenting.
- 5900. READINGS IN HOME ECONOMICS EDUCATION.** (1-3 cr; prereq #; hrs ar) McFadden  
Independent study under tutorial guidance. This offering for 3 credits.
- 5910. INTEGRATING PAPER.** (3 cr; prereq MEd student; hrs ar) McFadden  
Independent paper integrating learnings from a course or courses in education with learnings in home economics education.
- 8900.\* PROBLEMS: HOME ECONOMICS EDUCATION.** (1-9 cr; prereq 8300, #; hrs ar) McFadden  
Independent study of current educational problems.

### SECOND TERM

- 5106. COORDINATION TECHNIQUES IN HOME ECONOMICS OCCUPATIONAL EDUCATION—July 19-29.** (2 cr; prereq DE 5105 or 1DE 5105; VI-VIII MTWThF; ClaOff B30) Torrie  
Application in secondary and postsecondary cooperative and project plan programs; certification course for home economics teacher-coordinators.
- 5315. EVALUATION: THEORETICAL AND TECHNICAL ASPECTS—August 1-12.** (3 cr; prereq 3530 and #; II-IV MTWThF; ClaOff B30) Brown  
Collecting and interpreting evidence related to achievement of objectives, emphasizing higher levels of cognition and affective behaviors.
- 5410. WORKSHOPS: FOODS AND NUTRITION—August 1-12.** (3 or 4 cr [max 12 cr]; prereq Δ; VI-VIII MTWThF; ClaOff B30) Thomas  
Problems in teaching at high school and adult levels; use of new materials and techniques; group and individual projects for experienced teachers. This offering for 3 credits will emphasize examination of critical issues in nutrition and the teaching of nutrition so that it is stimulating to secondary and adult students.
- 5415.<sup>1</sup> WORKSHOP: MATERIALS FOR INSTRUCTION—July 19-29.** (1-4 cr; prereq grad student or teacher in service; II-IV MTWThF; ClaOff B30) Brown  
Problems in selection and use of new materials for instruction in home economics. This offering for 3 credits will emphasize the use of consumer curriculum materials and the assumptions and theories underlying their development.
- 5900. READINGS IN HOME ECONOMICS EDUCATION.** (1-3 cr; prereq #; hrs ar) Brown  
See First Term.
- 8900.\* PROBLEMS: HOME ECONOMICS EDUCATION.** (1-9 cr; prereq 8300, #; hrs ar) Brown  
See First Term.

<sup>1</sup>Graduate students planning to register for any workshop should consult their adviser concerning the possibility of using credit for the workshop in their graduate program.

## Industrial Education (Ind)

Courses with limited enrollment must be reserved in 125 Peik Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 3110. CONSTRUCTION: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1612, #; hrs ar) Loeb  
Individualized technical skill development in areas of house framing, concrete work, domestic wiring, plumbing, surveying, painting, paper hanging, and basic construction codes.
- 3111. CONSTRUCTION: ADVANCED.** (3 or 6 or 9 cr; prereq 3110, #; hrs ar) Loeb  
Individualized advanced skill development in areas of forming, block and brick, commercial plumbing, industrial circuitry, landscaping, finishing, and advanced construction codes.
- 3112. CONSTRUCTION: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3111, #; hrs ar) Loeb  
Students contract with AVTI instructor and industrial education coordinator for specialized work in areas of cabinet making, plumbing and electrical design, interior design, and code inspection.
- 3120. GRAPHIC COMMUNICATIONS: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1622, #; hrs ar) Loeb  
Individualized technical skill development in areas of offset printing, technical illustrating, machine and architectural drafting, photography.
- 3121. GRAPHIC COMMUNICATIONS: ADVANCED.** (3 or 6 or 9 cr; prereq 3120, #; hrs ar) Loeb  
Individualized advanced skill development in areas of color separation, web press operation, drafting design, color renditions, air brush.
- 3122. GRAPHIC COMMUNICATIONS: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3121, #; hrs ar) Loeb  
Students contract with AVTI instructor and industrial education coordinator for specialized work in areas of graphic design, printing management, computer drafting, production planning.
- 3130. MANUFACTURING: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1632, #; hrs ar) Loeb  
Individualized technical skill development in areas of welding, lathe operation, milling machine operation, sheet metal construction.
- 3131. MANUFACTURING: ADVANCED.** (3 or 6 or 9 cr; prereq 3130, #; hrs ar) Loeb  
Individualized advanced skill development in areas of numerical control and machine setup inspection, electric discharge machining, TIG welding.
- 3132. MANUFACTURING: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3131, #; hrs ar) Loeb  
Students contract with AVTI instructor and industrial education coordinator for specialized work in areas of tool design and making, materials testing, quality control, powder metal.
- 3140. POWER AND ENERGY: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1642, #; hrs ar) Loeb  
Individualized technical skill development in areas of digital, hydraulic and pneumatic control systems, and radio and TV repair.
- 3141. POWER AND ENERGY: ADVANCED.** (3 or 6 or 9 cr; prereq 3140, #; hrs ar) Loeb  
Individualized advanced skill development in areas of digital, hydraulic, and pneumatic system design, electronic maintenance and repair, and alternative energy sources.
- 3142. POWER AND ENERGY: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3141, #; hrs ar) Loeb  
Students contract with AVTI instructor and industrial education coordinator for specialized work in areas of production system, electronics, and power plant design.
- 3150. TRANSPORTATION: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1652, #; hrs ar) Loeb  
Individualized technical skill development in areas of small gas and marine engine repair, automotive tune-up, cooling systems, brakes, and autobody repair.
- 3151. TRANSPORTATION: ADVANCED.** (3 or 6 or 9 cr; prereq 3150, #; hrs ar) Loeb  
Individualized advanced skill development in areas of diesel engine repair, auto engine overhaul, front end repair, automatic transmission, aircraft engine maintenance, chassis straightening.
- 3152. TRANSPORTATION: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3151, #; hrs ar) Loeb  
Students contract with AVTI instructor and industrial education coordinator for specialized work in areas of engine modification, chassis and airframe design, experimental vehicle testing.
- 3900, 3901, 3902. INDEPENDENT STUDY.** (3 cr per qtr; prereq jr or #; hrs ar) Bjorkquist, Kavanaugh, Irvin, Miletich  
Self-directed study, preceded by classroom instruction in basic research procedures.
- 5100. COMMUNICATIONS OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #; hrs ar) Miletich  
Structured/supervised employment in the communications industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.

- 5101. PRODUCTION/MANUFACTURING OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #: hrs ar) Miletich  
Structured/supervised employment in the production/manufacturing industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.
- 5102. POWER/ENERGY OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #: hrs ar) Miletich  
Structured/supervised employment in the power/energy industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.
- 5103. CONSTRUCTION OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #: hrs ar) Miletich  
Structured/supervised employment in the construction industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.
- 5301. TESTS IN INDUSTRIAL SUBJECTS—July 5-15.** (3 cr; limited to 30 students; prereq SeEd 3155; II-IV MTWThF; PeikH 41A) Pucel  
Application of principles of evaluation to shop and drawing subjects.
- 5303. INSTRUCTIONAL AIDS—June 14-24.** (3 cr; limited to 30 students; prereq 3360 or 5360 or equiv; II-IV MTWThF; PeikH 41A) Kavanaugh  
Planning, construction, use.
- 5310. COORDINATION—June 13-17.** (3 cr; prereq 3330 or 5325 or #: I-IV MTWThF; HckrH 100) Bjorkquist  
Duties and responsibilities of coordinators in trade schools, part-time programs, and comprehensive high schools.
- 5330. INDUSTRIAL COURSE CONSTRUCTION—July 5-15.** (3 cr; VI-VIII MTWThF; PeikH 41A) Kavanaugh  
Principles and techniques; experience in planning, organizing, and building a teaching guide.
- 5440. INSTRUCTIONAL MATERIALS LABORATORY FOR NONMAJORS—June 14-24.** (3 cr; limited to 20 students; prereq tchg exper or #: VI-VIII MTWThF; PeikH 60) Irvin  
For students needing manipulative skills and craftwork activities in their teaching; individual and group projects.
- 8310. RESEARCH.** (3 cr; limited to 20 students; prereq #: I MTWThF; Pt 102) Moss  
Analysis of existing research; selection of problems; organization and presentation of projects.
- 8900, 8901, 8902.\* RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar) Bjorkquist, Irvin, Kavanaugh, Miletich, Moss, Pucel, Smith  
Individual conferences.

## SECOND TERM

- 3110. CONSTRUCTION: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1612, #: hrs ar) Loeb  
See First Term.
- 3111. CONSTRUCTION: ADVANCED.** (3 or 6 or 9 cr; prereq 3110, #: hrs ar) Loeb  
See First Term.
- 3112. CONSTRUCTION: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3111, #: hrs ar) Loeb  
See First Term.
- 3120. GRAPHIC COMMUNICATIONS: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1622, #: hrs ar) Loeb  
See First Term.
- 3121. GRAPHIC COMMUNICATIONS: ADVANCED.** (3 or 6 or 9 cr; prereq 3120, #: hrs ar) Loeb  
See First Term.
- 3122. GRAPHIC COMMUNICATIONS: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3121, #: hrs ar) Loeb  
See First Term.
- 3130. MANUFACTURING: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1632, #: hrs ar) Loeb  
See First Term.
- 3131. MANUFACTURING: ADVANCED.** (3 or 6 or 9 cr; prereq 3130, #: hrs ar) Loeb  
See First Term.
- 3132. MANUFACTURING: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3131, #: hrs ar) Loeb  
See First Term.
- 3140. POWER AND ENERGY: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1642, #: hrs ar) Loeb  
See First Term.

- 3141. POWER AND ENERGY: ADVANCED.** (3 or 6 or 9 cr; prereq 3140, #; hrs ar) Loeb  
See First Term.
- 3142. POWER AND ENERGY: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3141, #; hrs ar) Loeb  
See First Term.
- 3150. TRANSPORTATION: INTERMEDIATE.** (3 or 6 or 9 cr; prereq 1652, #; hrs ar) Loeb  
See First Term.
- 3151. TRANSPORTATION: ADVANCED.** (3 or 6 or 9 cr; prereq 3150, #; hrs ar) Loeb  
See First Term.
- 3152. TRANSPORTATION: SPECIALIZATION.** (3 or 6 or 9 cr; prereq 3151, #; hrs ar) Loeb  
See First Term.
- 3900, 3901, 3902. INDEPENDENT STUDY.** (3 cr per qtr; prereq jr or #; hrs ar) Bjorkquist, Miletich  
See First Term.
- 5100. COMMUNICATIONS OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #; hrs ar) Miletich  
See First Term.
- 5101. PRODUCTION/MANUFACTURING OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #; hrs ar) Miletich  
See First Term.
- 5102. POWER/ENERGY OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #; hrs ar) Miletich  
See First Term.
- 5103. CONSTRUCTION OCCUPATIONAL EXPERIENCE.** (1-5 cr per qtr [max 15 cr]; limited to 15 students; prereq #; hrs ar) Miletich  
See First Term.
- 5600. INSTRUCTIONAL MATERIALS LABORATORY.** (3-6-9 cr; each section limited to 30 students; prereq major, tchg exper or #)  
Laboratory and shop experiences with new materials, processes, and equipment, development of complementary instructional materials.  
**Sec 1, Manufacturing, July 19-29,** VI-VIII MTWThF, PeikH 41A, 3 cr, Irvin  
**Sec 2, Youth Organizations, August 1-12,** II-IV MTWThF, PeikH 41A, 3 cr, Olson
- 8900, 8901, 8902.\* RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar) Bjorkquist, Miletich, Moss, Pucel, Smith  
See First Term.

## Vocational Education (VoEd)

Courses with limited enrollment must be reserved at 125 Peik Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 5102. SPECIAL TOPICS IN ADMINISTRATION: Planning Vocational Programs—July 5-15.** (1-6 cr [max 9 cr]; prereq #; II-IV MTWThF: ClaOff 130C) Copa  
Topics will vary with each offering but will deal with leadership and management of vocational education programs. This offering for 3 credits features several national leaders who will explore various models and techniques for gathering and utilizing data to make program planning decisions.
- 5300. PHILOSOPHY AND PRACTICE OF VOCATIONAL EDUCATION.** (3 cr; each section limited to 50 students)  
Interpretation of the purposes of vocational education in varying socioeconomic contexts; analysis of vocational fields in regard to recipients, practices, legislation, and funding.  
**Sec 1 June 14-24,** VI-VIII MTWThF, WuH 230, Hopkins  
**Sec 2, June 20-24,** I-IV, VI-VII MTWThF, HckrH 100, Bjorkquist
- 5500. INTRODUCTION TO VOCATIONAL EDUCATION ADMINISTRATION—July 5-15.** (3 cr; VI-VIII MTWThF; Elth N119)  
Basic concepts of the structure, financing, program planning and evaluation, law and liability, personnel policies, and management of vocational education programs.

## SECOND TERM

- 5100. SPECIAL TOPICS IN INSTRUCTION: Working with Special Needs Students—August 1-12.** (1-6 cr [max 9 cr]; limited to 30 students; prereq #: VI-VIII MTWThF; PeikH 315) Wentling  
Topics will vary with each offering but will deal with planning, providing, and/or evaluating instruction. This offering for 3 credits will deal with identification and monitoring of special needs students with emphasis on strategies for mainstreaming in vocational programs.
- 5101. SPECIAL TOPICS IN CURRICULUM: Small Business Management Education—August 1-5.** (1-6 cr [max 9 cr]; sec 3; prereq #: I-IV, VI-VIII MTWThF; ClaOff 143) Persons  
Topics will vary with each offering but will deal with development and evaluation of curricula and/or curriculum materials. This offering for 3 credits features organization, implementation, and operation of a small business management education program for adults.
- 5102. SPECIAL TOPICS IN ADMINISTRATION: Utilizing Advisory Committees—August 15-17.** (1-6 cr [max 9 cr]; prereq #: I-IV, VI-VIII MTW; ClaOff 143) Ashmun, Marvin  
Topics will vary with each offering but will deal with leadership in and management of vocational education programs. This workshop for 2 credits is designed to assist vocational instructors, administrators, board members, and other interested persons in meeting requirements of the new vocational education legislation regarding the effective utilization of advisory committees.
- 5300. PHILOSOPHY AND PRACTICE OF VOCATIONAL EDUCATION—August 1-12.** (3 cr; limited to 50 students; II-III MTWThF; ClaOff 130C) Swanson  
See First Term.



## College of Forestry

Undergraduate forestry field studies are provided for beginning juniors, both resident and transfer students, at the Lake Itasca Forestry and Biological Station, Itasca State Park, during the 4 weeks immediately preceding the opening of the fall quarter. This fieldwork is required of all forestry students majoring in forest resources and forest science. Required courses at Itasca are FR 3100, Important Forest Plants (2 credits); FR 3101, Forest Ecology (3 credits); and FR 3201, Field Forest Measurements (1 credit). This intensive field training provides all students entering professional forestry courses in the junior year with an introduction to forestry in an excellent field setting and is timed to interfere as little as possible with summer employment.

About one-half of the basic nonforestry courses required for graduation in all College of Forestry curricula are available during the summer session on the Twin Cities campus through various departments as listed elsewhere in this bulletin. Students with deficiencies or those desiring to graduate early can effectively utilize the summer session offerings to complete required courses in the biological and physical sciences, mathematics, social sciences, communications, etc.

Graduate course offerings are largely limited to the "research problem" area and are for graduate students majoring in some field of forestry.

### OFFERED AT LAKE ITASCA FORESTRY AND BIOLOGICAL STATION<sup>1</sup>

(SPECIAL TERM FOR FORESTRY STUDENTS—AUGUST 30-SEPTEMBER 22)

The field training session is required of all forest resources and forest science majors and must be completed between the sophomore and junior years. Required freshman and sophomore courses (see the *College of Forestry Bulletin*) must be completed with no more than 5 credits of D grades before the student can attend the Itasca Forestry Session. Transfer students must have been accepted for admission into the College of Forestry, and registration for Itasca is administered at the same time as the fall quarter registration in early August. The schedule is arranged to occupy the student's full time for 5½ days per week. The session consists largely of field or laboratory work. All students must register for the following courses.

#### Forest Resources (FR)

- 3100. IMPORTANT FOREST PLANTS.** (2 cr; prereq Biol 1103) Scholten  
Identification of forest plants as related to forest types.
- 3101. FOREST ECOLOGY.** (3 cr; prereq college physics) Kurmis, Sucoff  
Ecological principles. Silvical characteristics of trees and shrub species. Forest communities and environmental factors. The ecology of recreational areas.
- 3201. FIELD FOREST MEASUREMENTS.** (1 cr; prereq Math 1008) Hallgren  
Introduction to and use of instruments in forest mensuration.

<sup>1</sup>For additional courses, see Biology Session.

## OFFERED ON THE ST. PAUL CAMPUS

### Forest Products (ForP)

#### FIRST TERM

8300.\* RESEARCH PROBLEMS IN FOREST PRODUCTS ENGINEERING. (Cr ar) Bowyer, Erickson, Gertjensen, Haygreen, Hossfeld, Neuman

8301.\* RESEARCH PROBLEMS IN FOREST UTILIZATION. (Cr ar) Bowyer, Erickson, Gertjensen, Haygreen, Hossfeld, Neuman

#### SECOND TERM

8300.\* RESEARCH PROBLEMS IN FOREST PRODUCTS ENGINEERING. (Cr ar) Bowyer, Erickson, Gertjensen, Haygreen, Hossfeld, Neuman

8301.\* RESEARCH PROBLEMS IN FOREST UTILIZATION. (Cr ar) Bowyer, Erickson, Gertjensen, Haygreen, Hossfeld, Neuman

### Forest Resources (FR)

#### FIRST TERM

8100.\* RESEARCH PROBLEMS IN SILVICULTURE. (Cr ar) Bakuzis, Brown, Hansen, Scholten, White, Alm

8101.\* RESEARCH PROBLEMS IN FOREST TREE PHYSIOLOGY. (Cr ar) Sucoff

8102.\* RESEARCH PROBLEMS IN FOREST TREE GENETICS. (Cr ar) Mohn

8103.\* RESEARCH PROBLEMS IN FOREST HYDROLOGY. (Cr ar) Brooks, Mace

8200.\* RESEARCH PROBLEMS IN FOREST MANAGEMENT. (Cr ar) Brown, Irving, Hallgren, Rose

8201.\* RESEARCH PROBLEMS IN FOREST ECONOMICS. (Cr ar) Skok, Ellefson, Gregersen

8202.\* RESEARCH PROBLEMS IN FOREST MEASUREMENTS. (Cr ar) Meyer, Rose

8203.\* RESEARCH PROBLEMS IN FOREST RECREATION. (Cr ar) Hansen, Merriam, Knopp

8204.\* RESEARCH PROBLEMS IN FOREST POLICY. (Cr ar) Irving, Merriam, Skok, Ellefson, Gregersen, Hallgren

8205.\* RESEARCH PROBLEMS IN REMOTE SENSING. (Cr ar) Meyer

#### SECOND TERM

8100.\* RESEARCH PROBLEMS IN SILVICULTURE. (Cr ar) Bakuzis, Brown, Hansen, Scholten, White, Alm

8101.\* RESEARCH PROBLEMS IN FOREST TREE PHYSIOLOGY. (Cr ar) Sucoff

8102.\* RESEARCH PROBLEMS IN FOREST TREE GENETICS. (Cr ar) Mohn

8103.\* RESEARCH PROBLEMS IN FOREST HYDROLOGY. (Cr ar) Brooks, Mace

8200.\* RESEARCH PROBLEMS IN FOREST MANAGEMENT. (Cr ar) Brown, Irving, Hallgren, Rose

8201.\* RESEARCH PROBLEMS IN FOREST ECONOMICS. (Cr ar) Skok, Ellefson, Gregersen

8202.\* RESEARCH PROBLEMS IN FOREST MEASUREMENTS. (Cr ar) Meyer, Rose

8203.\* RESEARCH PROBLEMS IN FOREST RECREATION. (Cr ar) Hansen, Merriam, Knopp

8204.\* RESEARCH PROBLEMS IN FOREST POLICY. (Cr ar) Irving, Merriam, Skok, Ellefson, Gregersen, Hallgren

8205.\* RESEARCH PROBLEMS IN REMOTE SENSING. (Cr ar) Meyer

## OFFERED AT CLOQUET FORESTRY CENTER

### Forest Resources (FR)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").



## **FIRST TERM**

- 5406. FORESTRY WORKSHOP FOR TEACHERS—June 13-24.** (5 cr; limited to 40 students; prereq teacher or #) Study of forest ecosystems and forest management in lecture and laboratory sessions. In field exercises, techniques and materials are developed for the teaching of principles of forestry in indoor and outdoor classrooms. Tours to forest and wildlife research and management units and utilization locations and discussions of contemporary forestry issues by guest lecturers. See Special Programs section.
- 8212. ADVANCED FIELD SILVICULTURE.** (3 cr; prereq 5101, #) White Selected current silvicultural problems and research. Plant soil relationships with particular reference to forest soils. Methods of forest soil investigations in the field and the laboratory.



## General College

The General College is open to any resident of Minnesota who is a high school graduate and for whom its courses and student personnel services are appropriate. Non-high school graduates who perform satisfactorily on scholastic aptitude tests also may apply for admission.

A student enrolled in the General College pursues a course of study individually planned in consultation with an adviser, selecting subjects from a free-choice curriculum. The student may use this program to explore educational and personal interests, to test his or her ability to succeed in college-level academic work, or (if previous grades are acceptable) to prepare for advanced study at the University of Minnesota or at another institution. The student may combine general and liberal arts courses with instruction in such career education sequences as dental assisting, marketing, legal paraprofessions, and human services generalist programs. Credits earned in these occupational options, and in some cases through work experience, can be applied toward the requirements for the degrees offered through the General College. Information about the associate in arts (A.A.), bachelor of general studies (B.G.S.) and bachelor of applied studies (B.A.S.) degrees can be found on pages 13-16 of the current *General College Bulletin*.

General or liberal studies courses in the General College resemble those offered in a traditional curriculum in that they can be classified into the social sciences, the natural sciences, and the humanities. However, the curriculum departs from tradition in some respects. Instruction focuses not only upon factual content but also on relations in and among fields of knowledge, on practical applications, and on critical and creative thinking. The courses tend to be broad in scope rather than specialized and may be used to develop an overview of a field. Students deciding upon a major should register for the basic courses offered by the department in which they hope to complete advanced study.

Students enrolling in the college for the first time as entering freshmen are required to register for General College courses only. After they have satisfactorily completed 1 quarter in the college, they may consult an adviser about the possibility of registering for a "combination program," in which some of their course work is taken in other colleges of the University. The combination program is especially valuable during the summer session, when only a limited number of General College courses are available.

General College students may transfer to other colleges of the University without undue loss of time or academic credits if their grades meet the level of academic achievement required by the college they hope to enter.

Students and prospective students are urged to bring problems and questions to the General College Student Personnel office, 10 Nicholson Hall.

### General College (GC)

Courses with limited enrollment must be reserved in 20 Nicholson Hall (see instructions under "Reserved Courses").

## FIRST TERM

- 1111. SCIENCE IN CONTEXT: WEATHER AND CLIMATE.** (5 cr; limited to 75 students; \$4 lab fee; 2 lab hrs per wk; I-II MTWThF; SciCB 175) A Johnson  
Day-to-day and long-range weather patterns in terms of interactions among atmosphere, oceans, land surfaces, and motions of the earth. Fair weather, storms, seasonal changes, air pollution, and water resource problems. Basic principles of science are applied to problems of analyzing and forecasting weather, interpreting climates and climatic change, and realizing the great extent to which man is changing his atmospheric environment.
- 1131. BIOLOGICAL SCIENCE: PRINCIPLES.** (5 cr; limited to 75 students; \$4 lab fee; 4 lab hrs per wk; I-II MTWThF; SciCB 125) Dearden  
The variety and relationships of living organisms, illustrating general principles of biology as they apply to man, animals, and plants. These principles are drawn from fields such as study of cells, relationships of organisms in nature, heredity, chemical and physical properties of living organisms in nature, evolution, and reproduction. Work in multimedia laboratory on biological information and biological problems through the aid of tapes, pictures, graphs, movies, and experiments.
- 1221. MINNESOTA: HISTORY.** (5 cr; limited to 50 students; I-II MTWThF; NH 213) Moen  
Introduction to people and institutions of the state. Topics include geography, exploration, frontier settlement, statehood, economic development, politics, and social and intellectual history.
- 1285. SOCIAL SCIENCE: CULTURAL ANTHROPOLOGY.** (5 cr; limited to 50 students; III-IV MTWThF; NH 207) F Johnson  
Human culture viewed as integrated system of behavior patterns learned and shared that serves to guide behavior of all members in given society. Development of generalizations about influence of culture on human behavior by analyzing and comparing ways of life in particular cultures. Any and all cultures deemed worthy of such study. Power of culture to shape personality and power of persons to alter cultures are two emphases.
- 1363. LITERATURE FOR CHILDREN.** (3 cr; limited to 40 students; IV MTWThF; NH 111) Collins  
Survey of children's literature. For parents, prospective parents, or child-care workers who wish to become acquainted with children's literature and to guide children in selecting and reading books, or for other students who may not have had an opportunity to read books—including classics—when they were children.
- 1405. COMMUNICATION SKILLS: FUNDAMENTALS OF USAGE AND STYLE.** (3 cr; limited to 25 students; students are to report to NH 109 between 9 am and noon Tuesday, June 14) V Kurak  
Grammatical principles and punctuation. In some sections, where approach is primarily oral, students listen to and imitate grammatical patterns and record and play back these patterns in order to "hear" English style.
- 1421. WRITING LABORATORY: PERSONAL WRITING.** (4 cr; each section limited to 25 students)  
Students read and write descriptive narratives, characterizations, and autobiographical sketches. Personal help with writing problems in laboratory. Emphasis is on clear and effective written expression.  
Sec 1, I-II TWThF, NH 216, Arrington  
Sec 2, III-IV TWThF, NH 216, Warren
- 1431. FUNDAMENTAL COLLEGE MATHEMATICS I.** (2 cr; limited to 50 students; I MTWThF; FolH 109, 110) Denny  
One of a three-part series of courses intended for students who have gaps in their mathematics background. Topics chosen, as appropriate, from number theory, algebra, and geometry. (Meets with 1432.)
- 1432. FUNDAMENTAL COLLEGE MATHEMATICS II.** (1 cr; limited to 50 students; prereq #: I MTWThF; FolH 109, 110) Denny  
See 1431.
- 1465. ORAL COMMUNICATION: INTERPERSONAL COMMUNICATION.** (3 cr; limited to 25 students; III MTWThF; NH 107) Kyle  
Students examine their own communication patterns—verbal, nonverbal, and vocal—and try to discover why they are effective or ineffective communicators, to uncover some origins of their communicative behavior, and to understand means we use to relate to our fellowman and ways we alienate ourselves from each other. Course asks students to begin or deepen their search for identity and to aid others in their search. Students apprehensive about the "personal" dimension should not take this course.
- 1540. ACCOUNTING FUNDAMENTALS I.** (4 cr; limited to 40 students; III-IV TWThF; NH 122) Roger Larson  
The basic accounting cycle for both service and merchandising businesses, including balance sheet and income statement methodology, and end-of-period adjustments. Special journals and accounting procedures for inventories, payables, and receivables.
- 3531. WRITING FOR BUSINESS AND THE PROFESSIONS.** (4 cr; limited to 30 students; prereq 1412 or 1413 or 1421...1415 or 1422 recommended; III-IV TWThF; NH 209A) Rathburn  
Students write letters, informal and formal reports, recommendations, proposals, summaries, memos—i.e., the forms of writing used in business; in health, education, and welfare; and in legal professions. Content adapted to vocational needs of students enrolled. Form, clarity, economy of expression, and suitable tone are stressed. Typed final drafts are required.

- 3725. THE INDIVIDUAL, SEXUALITY, AND SOCIETY.** (4 cr; limited to 30 students; I-II TWThF; NH 207) Latts  
Three independently varying components of human sexuality and development: biological-constitutional makeup, sex-role behavior, and sexuality as a form of communication. Focuses on cognitive rather than affective aspects of sexuality, to demonstrate the breadth of human sexuality and the individual's role as both actor and reactor.
- 3841. MINNESOTA RESOURCES.** (5 cr; limited to 30 students; III-IV MTWThF; NH 213) Steinhauser  
Quality of life in Minnesota observed in context of the "American dream" and "the good life." Minnesota's people, physical environment, and economic activities. Films, slides, and audiotapes provide immediate experience with present-day Minnesota.

## **SECOND TERM**

- 1132. BIOLOGICAL SCIENCE: THE HUMAN BODY.** (5 cr; limited to 75 students; I-II MTWThF; SciCB 125) Jefferson  
Problems of physical, mental, and social health are related to anatomy, physiology, and needs of the human organism. Films, televised dissections, and demonstrations supplement lectures.
- 1261. CURRENT HISTORY.** (4 cr; limited to 40 students; I-II TWThF; NH 213) Detzner  
Background and contemporary status of major foreign or domestic developments such as challenge of Common Market; dangers to peace in such divided regions as Ireland, India, Germany, and Palestine; forms of modern communism; law in American society; and democracy in American education. Development of alertness to news media and ability to make critical judgments about current events. Topics usually vary from quarter to quarter.
- 1262. FIELDS OF APPLIED PSYCHOLOGY.** (5 cr; limited to 40 students; III-IV MTWThF; NH 216) Borow  
Use of psychological principles in study of human affairs. Contributions of psychological research in fields such as teaching and learning; mental retardation; personnel selection and training in industry; measurement and improvement of worker efficiency and morale; law, crime, and aggression; consumer research and advertising; and attitude and opinion formation and measurement.
- 1311. ART: GENERAL ARTS.** (4 cr; limited to 40 students; III MTWThF; NH 111) Gates  
Basic similarities in terms of human needs that underlie all art forms. Concentrates upon painting, sculpture, music, architecture, and literature.
- 1357. PHILOSOPHY: MAN'S RELIGIOUS BELIEFS.** (5 cr; limited to 50 students; III-IV MTWThF; NH 207) Zanoni  
Beliefs, rituals, and attitudes of the world's major religions in their historical, social, and cultural settings.
- 1401. COMMUNICATION SKILLS: VOCABULARY DEVELOPMENT.** (3 cr; limited to 30 students; II MTWThF; NH 209) Kivits  
In class discussion, small-group work, and individual projects, students develop substantial and workable vocabulary through study of the dictionary, word parts, and meanings in context in programmed textbooks, current college textbooks, and individually compiled contextual passages. Both written and oral classwork.
- 1422. WRITING LABORATORY: COMMUNICATING IN SOCIETY.** (4 cr; limited to 25 students; prereq 1412 or 1413 or 1421; I-II TWThF; NH 216) Stockdale  
How people communicate in society and how they perceive, think about, and write and talk about events. Assumptions, inferences, and distortions involved in thinking; habits and processes of observation; factual and slanted reporting; persuasive devices; and cultural and cross-cultural communication. Primarily a writing course but also involves reading and discussion.
- 1445. MATHEMATICS: INTERMEDIATE ALGEBRA.** (5 cr; limited to 40 students; prereq 1 yr high school algebra; III-IV MTWThF; FolH 104) Barnes  
Concepts and manipulative skills necessary for college algebra. The real number system, special products and factoring, exponents and radicals, linear equations in one and two variables, quadratic equations in one variable, progressions, inequalities, variation, and logarithms. Prospective students may have to give evidence of adequate preparation.
- 1471. CREATIVITY: CREATIVE PROBLEM SOLVING—INNOVATION TECHNIQUES.** (4 cr; limited to 30 students; I-II TWThF; NH 122) Hagen  
To heighten awareness of difficulties and challenges in academic and personal life, students solve problems in an open and trusting environment and become aware of their creative potential. Working individually or in groups, students use innovative techniques to help them perceive and approach problems flexibly and imaginatively. Readings and class exercises.
- 1511. INTRODUCTION TO MODERN BUSINESS.** (5 cr; limited to 40 students; III-IV MTWThF; NH 122) Kroll  
Overview of economic environment in which business operates. Production, finance, personnel, and marketing. Intended for both business and general education students.
- 1534. PRACTICAL LAW.** (5 cr; limited to 45 students; I-II MTWThF; NH 207) Hower  
Common legal problems: formation and discharge of contracts, torts (personal injury and property damage suits), criminal law, bailments, nature and classification of real and personal property, and joint ownership and tenancy.
- 3251. THE WORLD: GREAT CITIES.** (5 cr; limited to 50 students; III-IV MTWThF; NH 213) Jones  
New York, London, Tokyo, Shanghai, and other cities that vary from quarter to quarter. Histories of the cities as well as their preeminence in the world community. Lectures, group research, and presentation of projects.

# Health Sciences

## SCHOOL OF DENTISTRY

### Dental Hygiene (DH)

#### FIRST TERM

- 3053. DENTAL PROPHYLAXIS.** (3 cr) Haider  
Sec 1, I-II M, HSUnitA 5-125, clinic ar  
Sec 2, VIII-IX W, HSUnitA 5-125, clinic ar

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 1054. BIOMATERIALS.** (3 cr; lect III-IV M, HSUnitA 5-125; VI-VII W, HSUnitA 5-125) Young  
Lab 1, II-IV TF, HSUnitA 5-140  
Lab 2, II-IV WTh, HSUnitA 5-140
- 1250. OFFICE MANAGEMENT.** (2 cr; VI-VII Th; MirdH 213 first term, HSUnitA 2-520 second term) Hangge
- 3055. DENTAL PROPHYLAXIS.** (3 cr) Haider  
Sec 1, VI M, HSUnitA 5-125, clinic ar  
Sec 2, VIII Th, HSUnitA 5-181, clinic ar
- 3276. CLINICAL ROENTGENOGRAPHY.** (2 cr) Beck

#### SECOND TERM

- 3054. DENTAL PROPHYLAXIS.** (3 cr) Haider  
Sec 1, III-IV T, HSUnitA 5-125, clinic ar  
Sec 2, VI-VII T, HSUnitA 5-125, clinic ar

### Dentistry

The School of Dentistry will offer instruction for undergraduate students in the clinical disciplines who elect to continue their clinical experience during the summer months.

The following courses are available for graduate students (hours to be arranged).

### Endodontics (Endo)

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 5303. ADVANCED CLINICAL ENDODONTICS.** (Cr ar) Jensen  
Diagnosis and treatment of clinical cases. Students assigned complex cases and explore new and unique techniques.

- 5313. ENDODONTIC EMERGENCY PROBLEMS.** (1 cr) Jensen  
Each student is responsible for all emergencies in the Endodontic Clinic during an assigned 1-week period (8 hours a day).
- 5323. TREATMENT PLANNING.** (1 cr) Jensen  
Students are assigned to the Admissions, Treatment Planning area as part of a total treatment planning team with members drawn from other clinical divisions. Students share in the decisions of the overall treatment planning of clinical cases as they are processed in the School of Dentistry and observe how the other disciplines function in this capacity.
- 5333. REVIEW OF CASES.** (1 cr) Jensen  
Students present cases from the previous quarter for review by endodontic faculty and graduate students.
- 8004. RESEARCH IN ENDODONTICS.** (Cr ar) Jensen  
Organized literature review in areas of specific interest to student, selection of thesis project, and completion of research and thesis.
- 8313. SEMINAR: ENDODONTICS.** (2 cr) Jensen  
Review of current literature, research, and clinical areas. Sessions assigned to student.
- 8323. ADVANCED ENDODONTIC LECTURES.** (1 cr) Jensen  
Pulpal and periapical pathology, diagnosis, and treatment planning.

## Oral Biology (OBio)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8001. RESEARCH IN ORAL BIOLOGY.** (Cr ar)
- 8002. TUTORIAL IN ORAL BIOLOGY.** (Cr ar [may be repeated for cr]; 2 hrs per wk=1 cr)
- 8024. TOPICS IN ORAL BIOLOGY.** (1-3 cr [may be repeated for cr]; prereq #)

## Oral Pathology (OPat)

### FIRST TERM

- 8014. EXFOLIATIVE CYTOLOGY OF THE ORAL MUCOSA.** (2 cr) Witkop  
Comparative histology of skin and normal mucosa; cytology maturation of oral mucosa compared to vaginal mucosa, techniques, stains, and smears, menstrual cycle; benign lesions of oral mucosa, tooth-brushing effects; introduction to grading system for malignant lesions; X-ray and drug effects on oral mucosa; oral squamous cell carcinoma; in situ and basal cell carcinoma.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8004. HISTOPATHOLOGY.** (2 cr) Vickers  
Weekly presentation of various pathologic cases in which methods of diagnosis are stressed. Clinical or radiographic aspects utilized. Covers the spectrum of oral and paraoral pathology.
- 8006. CURRENT LITERATURE REVIEW AND TOPICS.** (2 cr) Gorlin  
Monthly journals are analyzed and interesting papers and articles are summarized and presented. Special topics in oral pathology and related fields are also presented by staff.

## Oral Radiology (ORad)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8100. ORAL RADIOLOGY SEMINAR.** (1 cr; prereq #) Beck, Kuba
- 8900. ORAL RADIOLOGY RESEARCH.** (Cr ar; prereq #) Beck, Kuba

## Oral Surgery (OSur)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8250. ADVANCED ORAL SURGERY.** (Cr ar) Waite  
Assigned clinics in University, Veterans Administration, Hennepin County General, and St. Paul-Ramsey Hospitals and School of Dentistry; 4-month rotation in general anesthesiology at University Hospitals; 4-month rotation in general surgery at Fairview Hospital.
- 8251. SEMINAR: ORAL SURGERY.** (1 cr) Ogle  
Oral surgical subjects on a seminar basis.
- 8252. RESEARCH IN ORAL SURGERY.** (Cr ar) Waite  
Research in fields related to oral surgery.
- 8253. PROBLEMS IN ORAL SURGERY.** (Cr ar) Ogle  
Current literature review; experience in surgical techniques.
- 8254. TOPICS.** (1 cr) Waite, Isaacson  
Surgical orthodontic techniques on seminar basis.
- 8255. GENERAL SURGERY.** (Cr ar) Christensen, Miller, Stiegler  
Clinical rotation on the general surgical service at Fairview Hospital, Minneapolis. Includes seminars, clinics, and operating room experience.

## Orthodontics (Otho)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

#### *Required Courses for Graduate Students*

- 5004. CLINICAL ORTHODONTICS.** (Cr ar; prereq #)  
Students are assigned patients for the complete management of orthodontic and orthodontically related occlusal problems under direct staff supervision. Credits from this course may not be used for degree programs.
- 8203. GROWTH AND DEVELOPMENT.** (Cr ar; prereq #)  
Head growth, development, osteology and myology. Includes both normal and abnormal morphology and function; cephalometric methods.
- 8207. DIAGNOSIS AND TREATMENT PLANNING.** (Cr ar; prereq #)  
Etiology, treatment, and prognosis of clinical orthodontic patients.
- 8211. ORTHODONTIC SEMINAR.** (Cr ar; prereq #)  
Review of current literature and discussion of current research and its implications.

#### *Elective Courses*

- 8215. RESEARCH IN ORTHODONTICS.** (Cr ar; prereq #)
- 8219. TOPICS IN ORTHODONTICS.** (Cr ar; prereq #)  
Studies in special topics for advanced students.

## Pediatric Dentistry (Pedo)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 5414. ADVANCED CLINICAL PEDODONTICS.** (Cr ar; prereq #) Till, Walker  
Assignment of patients for treatment of difficult or unusual pedodontic problems under direct faculty supervision.
- 5415. DENTAL TEACHING.** (Cr ar; elective) Till, Walker  
Practice teaching in appropriate dental clinics. Preparation of seminars and lectures. Use of various educational methods including slide-tape sequences and programmed instruction.
- 8001. RESEARCH IN PEDIATRIC DENTISTRY.** (Cr ar; prereq #)
- 8290. HOSPITAL PEDODONTICS I.** (Cr ar; prereq #)  
Diagnosis and treatment of difficult and unusual problems in children with various handicapping conditions in the Children's Physical Medicine and Rehabilitation Center under direct faculty supervision. Includes pre-op and post-op discussion of faculty-supervised general anesthetic cases and seminar discussion of operating room techniques and procedures, pharmaceutical adjuncts for dental procedures.

- 8291. HOSPITAL PEDODONTICS II.** (Cr ar; prereq #)  
Diagnosis and treatment of pedodontic problems under direct faculty supervision at Hennepin County General Hospital. Includes participation on a rotation basis in seminars in pediatrics and anesthesia conducted by staff faculty. Pre-op and post-op seminar discussion and evaluation of treatment plans.
- 8293. ADVANCED PEDODONTIC TECHNIQUES.** (Cr ar; prereq #) Till
- 8294. PEDODONTIC DIAGNOSIS AND TREATMENT PLANNING.** (Cr ar; prereq #) Till, Walker  
Systematic approach to diagnosis and treatment planning for various pedodontic problems.
- 8295. INDEPENDENT PEDODONTIC STUDY.** (Cr ar; prereq #) Till, Walker  
Preparation of a position paper on an assigned topic, including a review of pertinent literature.

## Periodontology (Pero)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8000. ADVANCED CLINICAL PERIODONTOLOGY.** (Cr ar) Pihlstrom  
Practical work in clinic in examination, diagnosis, treatment planning, and various phases of treatment of patients with periodontal disease. Practice of curettage, gingival resection, splinting of teeth, and balancing the occlusion.
- 8100. RESEARCH IN PERIODONTOLOGY.** (Cr ar)  
Opportunity to take part in many phases of laboratory work under way in periodontal research.
- 8200. LECTURES IN PERIODONTOLOGY.** (Cr ar) Pihlstrom  
Tissues involved in periodontal disease. Etiology and treatment of periodontal disease.
- 8300. SEMINAR: PERIODONTOLOGY.** (Cr ar) Pihlstrom  
Basic structural components of the periodontium as well as fundamental periodontal treatment procedures. The epithelial attachment, periodontal ligament, cementum, alveolar bone, and periodontal pathology. Oral hygiene and scaling and root planing. Literature reviews are required of each student. Second year students present case reports.

## Prosthodontics (Pros)

### FIRST TERM

- 8030. INTRODUCTION TO COMPREHENSIVE MAXILLOFACIAL CARE.** (Cr and hrs ar; prereq #) Kersten  
Milestones in development of maxillofacial prosthetics and interdisciplinary relationships in treatment of the maxillofacial patient.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 8001. RESEARCH IN PROSTHODONTICS.** (Cr ar [may be repeated for cr]) Goodkind  
Arranged with individual students upon application after completion of a critical review of current and historical literature pertaining to the problem.
- 8006. ADVANCED CLINICAL PROSTHODONTICS II.** (Cr ar [may be repeated for cr]; prereq #) Goodkind, Meyer  
Experience in prosthodontic treatment of patients having systemic complications.

## MEDICAL SCHOOL

Complete listings of courses offered by departments of the Medical School for undergraduate (prebaccalaureate) students, allied health students, medical students (pre-M.D.), and graduate students (postbaccalaureate in basic health science fields or post-M.D. in clinical fields) can be found in one or more of the following sources: the *Medical School Bulletin*, the *Graduate Programs in the Health Sciences Bulletin*, the *Graduate School Bulletin*, or bulletins of allied health programs. For further information on specific courses, write or call the appropriate departmental office at the Health Sciences Center. In general, admission to courses offered within the medical student curriculum (pre-M.D.) or in residency training programs in clinical fields (post-M.D.) is restricted to students previously admitted to and enrolled in those specific programs.



# Anatomy (Anat)

## FIRST TERM

3970. **SPECIAL PROBLEMS.** (Cr ar; prereq #) Staff  
Individual projects and research experience.
8156. **ADVANCED ANATOMY.** (Cr ar; prereq #) Staff  
Individual problems in gross anatomy, embryology, histology, or neuroanatomy.
8204. **RESEARCH IN ANATOMY.** (Cr ar; prereq #) Staff  
Gross anatomy, cytochemistry, histology, endocrinology, embryology, hematology, or neuroanatomy.

## SPECIAL TERMS: THREE-OR SIX-WEEK COURSES

5500. **GENERAL GROSS ANATOMY.** (Cr ar; prereq Phase D) Robertson.
5501. **THE EXTREMITIES.** (Cr ar; prereq Phase D) Robertson.
5502. **HEAD AND NECK.** (Cr ar; prereq Phase D) Robertson.
5504. **THE ENDOCRINE SYSTEM.** (Cr ar; prereq Phase D) Robertson.
5508. **THE THORAX.** (Cr ar; prereq Phase D) Robertson.
5509. **THE ABDOMEN.** (Cr ar; prereq Phase D) Robertson.
5510. **PERINEUM, GENITAL-URINARY SYSTEM AND PELVIS.** (Cr ar; prereq Phase D) Robertson

## SECOND TERM

3970. **SPECIAL PROBLEMS.** (Cr ar; prereq #) Staff  
See First Term.
8156. **ADVANCED ANATOMY.** (Cr ar; prereq #) Staff  
See First Term.
8204. **RESEARCH IN ANATOMY.** (Cr ar; prereq #) Staff  
See First Term.

# Anesthesiology (Anes)

## FIRST AND SECOND TERMS: TEN-WEEK COURSES

### *Elective Courses*

5181. **EXTERNSHIP IN CLINICAL PRACTICE OF ANESTHESIOLOGY.** (9 cr; University Hospitals) Van Bergen, staff  
Primarily for family practice and surgery tracks, although open to others in limited number. Fundamentals of clinical anesthesia with emphasis on airway and ventilatory management, resuscitation, evaluation of the unconscious patient, choice of agents and techniques, practice administration of general and regional anesthesia, pre- and post-anesthetic management.
5182. **EXTERNSHIP IN RESPIRATORY PROBLEMS.** (9 cr; University Hospitals) Van Bergen, staff  
Primarily for family practice, medical and surgical tracks. Two weeks spent on fundamentals of airway and ventilatory management in anesthetized patients. Four weeks spent on management of clinical respiratory problems, Respiratory Ward and Pulmonary Function Testing Laboratory.

### *Required Courses for Graduate Students*

8265. **GENERAL ANESTHESIA.** (12 cr) Van Bergen, staff  
Instruction and experience in general anesthesia.
8266. **REGIONAL ANESTHESIA.** (4 cr) Van Bergen, staff  
Observation, instruction, and administration in all types of local, regional, and spinal anesthesia.
8267. **PRE- AND POST-ANESTHETIC EVALUATION.** (2 cr; VIII MTWThF; 1108 PoH) Van Bergen, staff  
Selection of proper anesthetic agent and technique, premedication and observation of recovery from anesthesia.
8268. **SEMINAR: ANESTHESIOLOGY.** (2 cr; 1108 PoH) Van Bergen, staff  
Review of literature, reporting of case problems, and discussion of research work in progress within the department.

8269. **RESEARCH IN ANESTHESIA.** (Cr and hrs ar) Van Bergen, staff  
Anesthesia problems in experimental laboratory or in hospital.

## Biochemistry (MdBc)

### *Elective Courses*

#### FIRST TERM

5053. **PROBLEMS IN BIOCHEMISTRY.** (Cr and hrs ar; may be taken one or both terms; prereq 5743 or 5101) Staff  
Special work arranged with qualified students.
8300. **RESEARCH IN BIOCHEMISTRY.** (Cr and hrs ar) Staff

#### SECOND TERM

5053. **PROBLEMS IN BIOCHEMISTRY.** (Cr and hrs ar; may be taken one or both terms; prereq 5743 or 5101) Staff  
See First Term.
8300. **RESEARCH IN BIOCHEMISTRY.** (Cr and hrs ar) Staff

## Dermatology (Derm)

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

5181. **CLINICAL PROBLEMS.** (4.5 cr) Dahl, Gentry, Goltz, Manick, others
5182. **DERMATOLOGY EXTERNSHIP.** (Cr ar; prereq regis med) Dahl, Gentry, Goltz, Manick, others
5183. **ADVANCED DERMATOLOGY.** (Cr ar; prereq 5182) Dahl, Gentry, Goltz, Manick, others
8225. **CLINICAL DERMATOLOGY.** (Cr ar) Dahl, Gentry, Goltz, others
8226. **CLINICAL SEMINAR.** (Cr ar) Goltz, Gentry, others  
Conference twice weekly on diagnosis and treatment of skin conditions.
8227. **HISTOLOGY OF THE SKIN.** (Cr ar) Goltz, Orkin, others  
Includes histopathology, histochemistry, and fluorescence microscopy.
8228. **RESEARCH IN DERMATOLOGY.** (Cr ar) Goltz, Pass, others
8229. **ELECTRON MICROSCOPY IN DERMATOLOGY.** (Cr ar) Zelickson, others
8230. **FUNCTIONAL BIOLOGY OF THE SKIN.** (Cr ar) Goltz, Pass, others
8231. **CLINICS: DERMATOLOGY: NONDERMATOLOGISTS.** (Cr ar) Goltz, others
8232. **SEMINAR: DERMATOLOGIC HISTOPATHOLOGY, MYCOLOGY.** (Cr ar) Goltz, others

## Family Practice and Community Health (FPCH)

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

#### *Elective Courses*

5557. **SPECIAL TOPICS IN PSYCHOLOGICAL MEDICINE.** (1 cr; prereq 0555, 0556; hrs ar) Kelly, staff
5567. **COMMUNICATIONS.** (1 cr; hrs ar) Cassata
8201. **CLINICAL FAMILY MEDICINE.** (9 cr; hrs ar) Ciriacy, staff
8207. **SEMINAR: COMMON DISEASES SEEN IN FAMILY PRACTICE.** (1 cr; hrs ar) Ciriacy, staff
8208. **FAMILY MEDICINE CONFERENCE.** (1 cr; hrs ar) Ciriacy, staff
8209. **FAMILY MEDICINE X-RAY CONFERENCE.** (1 cr; hrs ar) Ciriacy, staff
8210. **FAMILY MEDICINE GRAND ROUNDS.** (Cr and hrs ar) McConnell

8212. **CLINICAL PSYCHIATRY ROUNDS.** (1 cr; hrs ar) Kelly, staff  
 8243. **FAMILY MEDICINE IN THE RURAL AREA.** (Cr ar; prereq #: hrs ar) Verby, staff  
 8253. **RESEARCH PROBLEMS.** (Cr ar; prereq #: hrs ar) O'Leary, staff

## Interdepartmental Medicine (InMd)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

5103. **INTRODUCTION TO CLINICAL MEDICINE.** (2 cr; prereq 5100, 5101, 5102) Petzel, staff  
 5110. **MEDICAL GENETICS.** (2 cr; prereq #) J Yunis, staff  
 5227. **SKIN.** (Cr ar; prereq regis med) Manick, staff  
 5228. **EAR, NOSE, THROAT.** (Cr ar; prereq regis med) Quick, staff  
 5229. **EYE.** (Cr ar; prereq regis med) Letson, staff  
 5233. **HUMAN SEXUALITY.** (Cr ar; prereq regis med) Maddock, staff

## Laboratory Medicine and Pathology (LaMP)

### *Courses for Medical and Undergraduate Students*

(Phase A pathology [5101], which began in March, will continue through July 30.)

### SPECIAL TERMS: THREE- AND SIX-WEEK COURSES

5104. **AUTOPSIES.** (Cr ar; prereq Phase B) Staff  
 5113. **SURGICAL PATHOLOGY.** (Cr ar; prereq Phase B) Rosai  
 5114. **SURGICAL PATHOLOGY (Hennepin County Medical Center).** (Cr ar; prereq Phase B) Staff  
 5115. **SURGICAL PATHOLOGY (Veterans Hospital).** (Cr ar; prereq Phase B) Staff  
 5118. **ENDOCRINE PATHOLOGY (St. Paul-Ramsey Hospital).** (Cr ar; prereq Phase B) Haus, Lakatua  
 5123. **PULMONARY PATHOLOGY (St. Paul-Ramsey Hospital).** (Cr ar) Woolfrey  
 5125. **CHRONOBIOLOGY.** (Cr ar; prereq Phase B, #) Halberg  
 5141. **PROBLEMS: EXPERIMENTAL PATHOLOGY.** (Cr ar; prereq Phase B, #) Halberg  
 5151. **ANATOMIC PATHOLOGY: HOSPITAL SETTING (Hennepin County Medical Center).** (Cr ar) Staff  
 5152. **ANATOMIC PATHOLOGY (Veterans Hospital).** (Cr ar; prereq Phase B) Staff  
 5153. **ANATOMIC PATHOLOGY: HOSPITAL SETTING (St. Paul-Ramsey Hospital).** (Cr ar; prereq Phase B) Staff  
 5155. **ANATOMIC PATHOLOGY: HOSPITAL SETTING.** (Cr ar; prereq Phase B, Δ; hospital to be arranged)  
 5158. **CARDIAC PATHOLOGY (Miller Hospital).** (Cr ar; prereq Phase B, #) Edwards  
 5181. **LABORATORY AND CLINICAL HEMATOLOGY.** (Cr ar; prereq #) Brunning  
 5182. **LABORATORY STUDIES OF GENETIC DISORDERS.** (Cr ar; prereq #) J Yunis  
 5183. **CLINICAL AND LABORATORY IMMUNOLOGY.** (Cr ar; prereq #)  
 5184. **IMMUNOHEMATOLOGY IN BLOOD BANKING.** (Cr ar; prereq #) McCullough  
 5185. **LABORATORY PROBLEMS IN BLOOD COAGULATION.** (Cr ar; prereq #) Edson  
 5186. **CLINICAL PATHOLOGY EXTERNSHIP (Hennepin County Medical Center).** (Cr ar; prereq #) Strom  
 5187. **CLINICAL PATHOLOGY EXTERNSHIP (Mt. Sinai Hospital).** (Cr ar; prereq #) Ward  
 5189. **CLINICAL BLOOD BANK IMMUNOLOGY (Minneapolis War Memorial Blood Bank).** (Cr ar; prereq #) Polesky  
 5191. **GENERAL CLINICAL MICROBIOLOGY.** (Cr ar; prereq #) Balfour  
 5193. **CLINICAL PATHOLOGY EXTERNSHIP (Hibbing Hospital).** (Cr ar; prereq #) Nollet

5194. **COMPUTER APPLICATIONS IN MEDICINE.** (Cr ar; prereq #) Ackerman, Ellis, Gatewood  
 5195. **COMPUTER APPLICATIONS IN MEDICAL RESEARCH.** (Cr ar; prereq #) Ackerman, Ellis  
 5197. **CLINICAL PATHOLOGY BIOCHEMISTRY (St. Paul-Ramsey Hospital).** (Cr ar; prereq #) Lakatua, Haus

## Laboratory Medicine and Pathology (LMed)

### FIRST TERM

5139. **ADVANCED MICROBIOLOGY.** (Cr ar; prereq #) Balfour, Blazevic, Ederer  
 5169. **RESEARCH: HUMAN GENETICS.** (Cr ar; prereq #) J Yunis  
 5170. **ADVANCED PROBLEMS: MEDICAL GENETICS.** (Cr ar; prereq #) J Yunis, others  
 5180. **ADVANCED CHEMISTRY.** (Cr ar; prereq #) Benson, staff  
 5194. **COMPUTER APPLICATIONS IN MEDICINE.** (4 cr; prereq #) Ackerman, Ellis, Gatewood  
 5195. **COMPUTER APPLICATIONS IN MEDICAL RESEARCH.** (Cr ar; prereq #) Ackerman, Ellis  
 5272. **IMMUNOLOGY SEMINAR.** (1 cr; prereq #) Azar  
 5273. **ADVANCED IMMUNOLOGY.** (Cr ar; prereq #) Azar  
 5768. **ADVANCED HEMATOLOGY.** (Cr ar; prereq #) Brunning  
 8235. **ADVANCED CLINICAL LABORATORY MEDICINE.** (Cr ar; prereq #) Benson, Azar  
 8236. **RESEARCH ON CLINICAL LABORATORY PROBLEMS.** (Cr ar; prereq #) Benson, Azar

### SECOND TERM

5139. **ADVANCED MICROBIOLOGY.** (Cr ar; prereq #) J Yunis  
 5169. **RESEARCH: HUMAN GENETICS.** (Cr ar; prereq #) J Yunis  
 5170. **ADVANCED PROBLEMS: MEDICAL GENETICS.** (Cr ar; prereq #) J Yunis, others  
 5180. **ADVANCED CHEMISTRY.** (Cr ar; prereq #) Benson, staff  
 5194. **COMPUTER APPLICATIONS IN MEDICINE.** (4 cr; prereq #) Ackerman, Ellis, Gatewood  
 5195. **COMPUTER APPLICATIONS IN MEDICAL RESEARCH.** (Cr ar; prereq #) Ackerman, Ellis  
 5272. **IMMUNOLOGY SEMINAR.** (1 cr; prereq #) Azar  
 5273. **ADVANCED IMMUNOLOGY.** (Cr ar; prereq #) Azar  
 5768. **ADVANCED HEMATOLOGY.** (Cr ar; prereq #) Brunning  
 8235. **ADVANCED CLINICAL LABORATORY MEDICINE.** (Cr ar; prereq #) Benson, Azar  
 8236. **RESEARCH ON CLINICAL LABORATORY PROBLEMS.** (Cr ar; prereq #) Benson, Azar

## Medical Technology (MedT)

### FIRST TERM

5082. **APPLIED CLINICAL CHEMISTRY.** (4 cr; prereq 5063, 5108, #)  
 Application of basic methods and techniques in chemistry in the clinical laboratory.  
 5085. **APPLIED CLINICAL HEMATOLOGY.** (4 cr; prereq 5065, 5067, #)  
 Application of basic methods and techniques in hematology in the clinical laboratory, morphology of blood cells, application of techniques in hemostasis.  
 5086. **APPLIED CLINICAL IMMUNOHEMATOLOGY.** (4 cr; prereq 5066, #)  
 Application of basic methods and techniques in serology and immunology in the clinical laboratory. Blood grouping and cross-matching for transfusions.  
 5088. **APPLIED DIAGNOSTIC MICROBIOLOGY.** (4 cr; prereq 5102, #)  
 Identification of bacteria by microscopic techniques. Correlation with clinical cases. Identification of parasites and fungi.  
 5090. **SPECIAL LABORATORY METHODS.** (2 cr; prereq #)  
 Special assignment on an individual basis in a special area of experience within the clinical laboratory; field experience.

## **SECOND TERM**

- 5082. APPLIED CLINICAL CHEMISTRY.** (4 cr; prereq 5063, 5108, #)  
See First Term.
- 5085. APPLIED CLINICAL HEMATOLOGY.** (4 cr; prereq 5065, 5067, #)  
See First Term.
- 5086. APPLIED CLINICAL IMMUNOHEMATOLOGY.** (4 cr; prereq 5066, #)  
See First Term.
- 5088. APPLIED DIAGNOSTIC MICROBIOLOGY.** (4 cr; prereq 5102, #)  
See First Term.
- 5090. SPECIAL LABORATORY METHODS.** (2 cr; prereq #)  
See First Term.

## **Medicine (Med)**

### **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

#### **Elective Courses**

- 5501. MEDICAL ONCOLOGY EXTERNSHIP AT UNIVERSITY HOSPITALS.** (9 cr per period; report at 411 Mason H on first day of elective) Kennedy  
Training in internal medicine with emphasis on the total care of patients with cancer by assuming direct patient responsibilities as a co-intern.
- 5502. MEDICINE EXTERNSHIP.** (9 cr per period; offered all periods; reported to the Dept of Medicine of assigned hospital at 8:30 am on first day of elective) Murray  
Introduction to the diagnosis, treatment, and management of patients on medical wards, allowing as much individual patient care responsibility as possible.
- 5505. INFECTIOUS DISEASE RESEARCH AT UNIVERSITY HOSPITALS.** (18 cr; offered all periods) Sabath, Verhoef  
Students actively participate in investigation of a problem in infectious diseases. This may be a clinical or laboratory based problem dealing with diagnosis, treatment, natural history, or epidemiology of infections. Studies regarding antibiotic action, resistance testing, and toxicity are especially encouraged.
- 5509. RESEARCH IN RHEUMATOLOGY.** (18 cr per period) Caperton  
Opportunity for research in broad area of rheumatology, with emphasis on immune mechanisms of injury, inflammatory reactions, innovative therapeutic trials in induced disease. Broad latitude allowed student in designing individual research project. Multidisciplinary approach encouraged. Contact Dr. Caperton before beginning elective.
- 5510. RESEARCH IN INFECTIOUS DISEASE.** (9 cr per period; offered all periods) Hall  
Research under the supervision of Dr. Wendall Hall or Dr. Horace Zinneman, Veterans Administration Hospital.
- 5511. RESEARCH IN GASTROENTEROLOGY.** (9 cr per period; offered all periods; hrs ar) Levitt  
Arrangements made with Dr. Levitt at University Hospitals. Students will be assigned to a staff member and participate in some aspects of his or her program.
- 5512. RESEARCH IN HEMATOLOGY AT UNIVERSITY HOSPITALS.** (9 cr per period; offered all periods; report at C313 on first day of elective) Jacob  
To acquaint the student who is specifically interested in research with a problem or problems currently under investigation in hematology.
- 5521. INFECTIOUS DISEASES, CLINICAL ASPECTS AT UNIVERSITY HOSPITALS.** (9 cr per period; offered all periods; report to C315 Mayo) Sabath, Williams  
Students participate in clinical evaluation and management of inpatient problems and in formal conferences, and have an opportunity to observe role of the clinical microbiology laboratory in the practice of clinical infectious disease.
- 5522. MEDICAL GASTROENTEROLOGY.** (9 cr per period; offered all periods; report to GI Section, University Hospitals, VFW Bldg, Room 462) Bond  
Opportunity to do workups and attend teaching rounds caring for patients with gastrointestinal disease, attend intrahospital as well as interhospital conferences, and gain outpatient clinical experience. Students may express a preference for base hospital when registering.
- 5523. MEDICAL ENDOCRINOLOGY, METABOLISM AND CLINICAL PHARMACOLOGY.** (9 cr per period; offered all periods; report to HSUnitA 14-236 at 8:15 am on first day of each period) Barbosa  
Introductory experience in clinical endocrinology and metabolic disease. Emphasis on clinical diagnosis, efficient and incisive workups and clinical management in both inpatient and outpatient settings. Students may express a preference for base hospital when registering. A clinical externship is available in the Clinical Research Center of University Hospitals each period.

- 5524. CLINICAL INFECTIOUS DISEASES.** (9 cr per period; offered all periods) Hall  
Emphasis is on inpatients on all hospital services with clinical problems related to infection. Antibiotic use, relevant laboratory procedures, and the approach to the patient with infectious disease. Students may express a preference for base hospital when registering.
- 5525. CARDIOVASCULAR MEDICINE.** (9 cr per period; offered periods 3-8; hrs ar) Richman  
The first week of each period includes 4 half-day introductory sessions on basic cardiology for all students. Students initially report to the Cardiology Section at the Veterans Administration Hospital for an orientation session. Student's preference for a base hospital will be honored in accordance with positions available.
- 5528. CLINICAL HEMATOLOGY.** (9 cr per period; offered all periods; report to C313 Mayo at 8:30 am on first day)  
Howe  
Clinical and research aspects of hematology. Course structured to the student's specific goals, but generally the student is given initial responsibility for proposing diagnoses and treatment plans for patients with hematologic diseases.
- 5531. CLINICAL RHEUMATOLOGY AT UNIVERSITY HOSPITALS.** (4.5 cr per period; offered periods 3-8; hrs ar)  
Hathaway  
Clinical aspects of diseases of rheumatic and immunologic nature including the broad aspects of collagen disease, autoimmune disease, and all types of arthritic and musculoskeletal disease.
- 5532. PULMONARY DISEASE.** (9 cr per period; offered all periods; report to 3rd floor HSUnitK-E at 9:00 am on first day of elective) Drage  
Evaluation of clinical pulmonary problems and pathophysiology of pulmonary disease. Students may express a preference for base hospital when registering.
- 5533. CLINICAL ALLERGY AT UNIVERSITY HOSPITALS.** (4.5 cr or 9 cr per period; offered all periods; hrs ar)  
Blumenthal  
Practical features of doing an allergic and immunologic workup and of treating patients in a safe and medically acceptable fashion.
- 5554. FLUID, ELECTROLYTE, ACID-BASE METABOLISM AT VETERANS HOSPITAL.** (9 cr per period; offered all periods; report to the Dialysis Unit, Bldg 1, fifth floor, VA Hospital, at 8 am on first day of period)  
Masler  
The prevention, diagnosis, and treatment of acid-base (A/B) and fluid and electrolyte (F/E) disorders. The student will be a member of a consulting team that evaluates patients with A/B and F/E abnormalities associated with a variety of medical and surgical diseases.
- 5562. MEDICAL NEPHROLOGY.** (9 cr per period; offered all periods) Rao  
Evaluation and treatment of patients with acute and chronic renal disease, acid-base and electrolyte disturbances, and hypertension.
- 5572. AMBULATORY INTERNAL MEDICINE AT ST. PAUL-RAMSEY HOSPITAL.** (9 cr per period; offered all periods; report to Dr. Spilane's office) Spilane  
Ambulatory care of patients with general internal medicine and subspecialty medical problems. Students participate in the care of a diverse group of patients in the various general internal medicine clinics and subspecialty internal medicine clinics at St. Paul-Ramsey Hospital.
- 5590. PRECEPTORSHIPS IN INTERNAL MEDICINE.** (9 cr per period; offered all periods; hrs ar) Murray  
The student works with physicians either in rural or city clinics, by arrangement.
- 5595. INTRODUCTION TO THE PSYCHOLOGICAL ASPECTS OF MEDICAL CARE.** (Cr ar; offered all periods; hrs ar) Wilder, Simon, others  
An introductory program emphasizing student-patient interviews on closed-circuit TV, reading seminars, diagnostic conferences, supervised psychotherapies. Focus is on patients characteristic of a medical practice population.

## Microbiology (MicB)

### FIRST TERM

- 5970. SPECIAL PROBLEMS.** (Cr ar; prereq #) Rogers, staff
- 8990. RESEARCH IN MICROBIOLOGY.** (Cr and hrs ar) Dworkin, staff  
Graduate students with the requisite preliminary training may elect research project outside their thesis work.

### SECOND TERM

- 5970. SPECIAL PROBLEMS.** (Cr ar; prereq #) Rogers, staff
- 8990. RESEARCH IN MICROBIOLOGY.** (Cr and hrs ar) Dworkin, staff  
See First Term.

## **SPECIAL TERM: MAY 23-JULY 29**

**5206. MICROBIOLOGY FOR MEDICAL STUDENTS.** (4 cr; prereq regis med fr or grad) Brand, staff  
(Continuation of 5205) Immunology, parasitology, mycology, and medical bacteriology, virology with emphasis on pathogenesis. Principles and techniques enabling diagnosis, treatment (especially chemotherapy), and prevention of infectious disease.

Lect II MTThF, May 23-July 1 and II MTWThF July 5-29, HSUnitA 2-650

Lab A III-IV M, VII-VIII and ½ IX W

Lab B VII-VIII and ½ IX M, III-IV W

## **Neurology (Neur)**

### **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

- 5120. SELECTED PROBLEMS IN NEUROLOGY.** (Cr ar; prereq regis med) Staff
- 5510. EXTERNSHIPS IN CLINICAL NEUROLOGY.** (Cr ar; prereq regis med) Klassen, staff
- 5540. NEUROCHEMISTRY.** (Cr ar; prereq regis med) Berry, Cohen, Lin
- 5541. PEDIATRIC NEUROLOGY—NEUROCHEMISTRY.** (Cr ar; prereq regis med) Swaiman
- 5544. CLINICAL ELECTROENCEPHALOGRAPHY.** (Cr ar; prereq regis med) Torres, Zeese
- 5545. ELECTROMYOGRAPHY.** (Cr ar; prereq regis med) Kennedy
- 5550. NEUROPATHOLOGY.** (4.5 cr; prereq regis med) Sung, Mastro
- 5570. IMMUNOLOGY.** (Cr ar; prereq regis med) Ansari
- 8200. CLINICAL NEUROLOGY.** (Cr ar) Resch, staff
- 8201. CLINICAL PEDIATRIC NEUROLOGY.** (Cr ar) Swaiman, staff
- 8202. RESEARCH.** (Cr ar) Resch, staff
- 8203. APPLIED ELECTROENCEPHALOGRAPHY.** (Cr ar) Torres
- 8204. APPLIED ELECTROMYOGRAPHY.** (Cr ar) Kennedy
- 8205. APPLIED NEUROPATHOLOGY.** (Cr ar) Sung, Mastro
- 8236. RESEARCH: NEUROPATHOLOGY.** (Cr ar) Sung, Mastro
- 8705. NEUROLOGICAL-NEUROSURGICAL CONFERENCE.** (1 cr, §Rad 5163, §Surg 8318) Staff

## **Neurosurgery (NSur)**

### **SPECIAL TERMS: THREE- AND SIX-WEEK COURSES**

#### **Required Courses for Undergraduate Students**

- 5127. CLINICAL LECTURES IN NEUROSURGERY.** (1 cr per yr; prereq regis med) Staff

#### **Elective Courses for Undergraduate Students**

- 5500. NEUROSURGERY EXTERNSHIP (University Hospitals).** (Cr ar; prereq regis med; MTWThF) Staff
- 5510. NEUROSURGERY EXTERNSHIP (Veterans Administration Hospital).** (Cr ar; prereq regis med; MTWThF) Staff
- 5511. NEUROSURGERY EXTERNSHIP (Hennepin County Medical Center).** (Cr ar; prereq regis med; MTWThF) Staff
- 5512. NEUROSURGERY EXTERNSHIP (St. Paul-Ramsey Hospital).** (Cr ar; prereq regis med; MTWThF) Staff
- 5520. NEUROSURGERY INVESTIGATION.** (Cr ar; prereq regis med; MTWThF) Staff
- 5530. NEURORADIOLOGICAL CONFERENCE.** (1 cr; prereq regis med; Friday) Staff  
A review of X-ray films and case histories on neurosurgical service.
- 5540. NEUROSURGICAL CONFERENCE.** (1 cr; prereq regis med; Saturday) Staff  
In-depth review of selected topics in basic and clinical neurosurgery.

- 5550. NEUROPHYSIOLOGICAL LITERATURE SEMINAR.** (1 cr; prereq Medical School course in physiology or equiv with #: hrs ar) Bloedel  
Study of selected papers covering several topics in neurophysiology. Correlations between neurological and neurosurgical problems and basic concepts in neurophysiology will be emphasized.

## **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

### **Required Courses for Graduate Students**

- 8305. NEUROSURGICAL DIAGNOSIS.** (4 cr; MTWThF) Chou, French, Seljeskog  
Neurosurgical fellow assists in instruction of clinical clerks and interns, studies problems in diagnosis at University and affiliated hospitals.
- 8308. NEUROSURGICAL PROBLEMS AND MANAGEMENT.** (4 cr; MTWThF) Chou, French, Seljeskog  
Neurosurgical fellow acts as house surgeon at University and affiliated hospitals.
- 8311. OPERATIVE NEUROSURGERY.** (4 cr; MTWThF) Chou, French, Seljeskog  
Neurosurgical fellow acts as first assistant for operations at University and affiliated hospitals and later may be permitted to operate.
- 8316. NEUROSURGICAL RESEARCH.** (6 cr; MTWThF) Chou, French, Seljeskog, Bloedel  
Problems in experimental or clinical surgery.
- 8318. NEURORADIOLOGICAL CONFERENCE.** (1 cr; F) Chou, French, Seljeskog  
A review of X-ray films and case histories on neurosurgical service.
- 8320. NEUROSURGICAL CONFERENCE.** (2 cr; Sat) Chou, French, Seljeskog, Bloedel  
In-depth review of selected topics in basic and clinical neurosurgery.
- 8322. NEUROSURGERY-OPHTHALMOLOGY SEMINAR—PART I.** (1 cr; T; offered Su and W) Staff  
Review and discussion of topics.
- 8323. NEUROSURGERY-OPHTHALMOLOGY SEMINAR—PART II.** (1 cr; prereq 8322; T; offered F and S) Staff  
Advanced review and discussion of topics.
- 8330. NEUROSURGERY LITERATURE SEMINAR.** (2 cr; 1st and 2nd Th evenings) Staff  
Review and discussion of current literature relating to neurosurgery and the neurosciences.

## **Obstetrics and Gynecology (Obst)**

### **SPECIAL TERMS: THREE- AND SIX-WEEK COURSES**

#### **Elective Courses for Undergraduate Students**

- 5500. EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY.** (9 cr; prereq Phase D) Foreman, staff  
Clinical experience that includes total care of inpatients and outpatients on obstetrics and gynecology service at Hennepin County Medical Center, North Memorial Hospital, St. Joseph's Hospital, St. Mary's Hospital, St. Paul-Ramsey Hospital, and University Hospitals. Emphasis on medical aspects of obstetrics and gynecology.
- 5520. OBSTETRICS AND GYNECOLOGY EXTERNSHIP IN CLINICAL PRACTICE.** (4.5 cr; prereq 5500) Foreman, staff  
Practical community experience in obstetrics and gynecology under preceptorship of one or more practicing members of clinical staff. Both office and hospital practice included.
- 5522. OBSTETRICS AND GYNECOLOGY SPECIAL EXTERNSHIP IN FAMILY PLANNING.** (Cr ar; prereq 5500) Foreman  
Opportunity to work in family planning programs in Twin Cities area.
- 5540. ADVANCED EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY.** (9 cr; prereq 5500) Foreman, staff  
Full-time clinical experience as acting intern on obstetrical and gynecological service at Hennepin County Medical Center, or St. Paul-Ramsey Hospital.
- 5550. PSYCHIATRIC ASPECTS OF OBSTETRICS AND GYNECOLOGY.** (4.5 cr; prereq Phase D) Foreman, Bernstein  
Clinical course. Psychiatric problems relating to reproductive system.
- 5560. RESEARCH IN REPRODUCTION.** (9 cr; prereq Phase D) Foreman, Notation  
Topics selected for each student.



- 5575. GYNECOLOGICAL PATHOLOGY AND DIAGNOSTIC CYTOLOGY.** (9 cr; prereq 5500) Foreman, Okagaki, Brooker  
Review of daily gynecological histopathology material of surgical and clinical cases from the Ob-Gyn Service. Includes diagnostic cytology of Pap smears encountered in actual practice.
- 5590. PRECEPTORSHIP IN OBSTETRICS AND GYNECOLOGY.** (9 cr; prereq 5500) Foreman  
Two full-time preceptorships in clinical obstetrics and gynecology, one in Little Falls and one in St. Cloud, offered by AHEC. Student will receive per diem expenses. Similar to 5520, but in smaller community.

### ***Courses for Graduate Students***

- 8201. ADVANCED OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8205. ADVANCED OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8209. ADVANCED OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8210. ADVANCED OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8213. ADVANCED OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8217. SEMINAR IN OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8221. SEMINAR IN OBSTETRICS AND GYNECOLOGY.** (Cr ar) Prem, staff
- 8222. GYNECOLOGICAL ONCOLOGY.** (Cr ar) Prem, staff
- 8223. GYNECOLOGICAL ONCOLOGY.** (Cr ar) Prem, staff
- 8224. GYNECOLOGICAL ENDOCRINOLOGY—PART I.** (Cr ar) Prem, staff
- 8225. GYNECOLOGICAL ENDOCRINOLOGY—PART II.** (Cr ar) Prem, staff
- 8226. OBSTETRICAL PHYSIOLOGY AND ANESTHESIOLOGY.** (Cr ar) Prem, staff
- 8230. RESEARCH IN REPRODUCTION.** (Cr ar) Prem, staff

## **Ophthalmology (Oph)**

### **FIRST TERM**

- 8101. CLINICAL OPHTHALMOLOGY.** (8 cr; 8:00-5:00 MTWThF; OP Clin) Harris, staff
- 8106. STRABISMUS MANAGEMENT.** (1 cr; 8:00-9:00 Th; Mayo A675) Letson
- 8131. PRACTICAL OCULAR SURGERY.** (3 cr; 8:30-12:00 MTWThF; Oper Rm) Harris, staff
- 8151. BASIC AND APPLIED OPHTHALMOLOGY.** (2 cr; 8:00-12:00 S; HSUnitA 2-533) Harris, staff
- 8152. OPHTHALMOLOGY LABORATORY.** (15 cr; 8:00-5:00 MTWThF; DiehlH 251) Harris, staff

### **SECOND TERM**

- 8101. CLINICAL OPHTHALMOLOGY.** (8 cr; 8:00-5:00 MTWThF; OP Clin) Harris, staff
- 8106. STRABISMUS MANAGEMENT.** (1 cr; 8:00-9:00 Th; Mayo A675) Letson
- 8131. PRACTICAL OCULAR SURGERY.** (3 cr; 8:30-12:00 MTWThF; Oper Rm) Harris, staff
- 8152. OPHTHALMOLOGY LABORATORY.** (15 cr; 8:00-5:00 MTWThF; DiehlH 251) Harris, staff

## **Orthopaedic Surgery (OrSu)**

### **SPECIAL TERMS: THREE- AND SIX-WEEK COURSES**

#### ***Elective Courses for Undergraduate Students***

- 5180. ORTHOPEDICS I.** (Cr ar; prereq regis med)
- 5185. ORTHOPEDICS II.** (Cr ar; prereq regis med)
- 5186. RESEARCH PROBLEMS IN ORTHOPEDIC SURGERY.** (Cr ar; prereq regis med)
- 5187. EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES.** (Cr ar; prereq regis med)  
St. Paul-Ramsey Hospital.

- 5188. EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES.** (Cr ar; prereq regis med)  
Gillette Children's Hospital, St. Paul.
- 5189. EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES.** (Cr ar; prereq regis med)  
Fairview-St. Mary's Hospitals.
- 5190. EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES.** (Cr ar; prereq regis med)  
Veterans Hospital.
- 5191. ORTHOPEDIC EXTERNSHIP AT HENNEPIN COUNTY MEDICAL CENTER.** (Cr ar; prereq regis med)

## FIRST AND SECOND TERMS: TEN-WEEK COURSES

### *Required Courses for Graduate Students*

- 8401. ORTHOPEDIC CONFERENCE.** (3 cr) Thompson, Bradford, House, Mayfield, Premer  
Review of X-ray films and case histories of patients on the orthopedic inpatient or outpatient service.
- 8403. FRACTURES.** (5 cr) Gustilo, staff  
Orthopedic fellow acts as house surgeon on the fracture service at Hennepin County Medical Center.
- 8404. FRACTURES.** (5 cr) Comfort, staff  
Orthopedic fellow acts as house surgeon on the fracture service at St. Paul-Ramsey Hospital.
- 8405. ORTHOPEDIC DIAGNOSIS.** (3 cr) Thompson, Bradford, House, Mayfield  
Orthopedic fellow assists in instruction of medical students and interns and studies problems in diagnosis in the Outpatient Department and in the University Hospitals.
- 8407. PEDIATRIC ORTHOPEDICS.** (5 cr) Winter, staff  
Orthopedic fellow acts as house surgeon at Gillette Children's Hospital.
- 8408. ORTHOPEDIC PROBLEMS AND MANAGEMENT.** (5 cr) Thompson, Bradford, House, Mayfield, Premer  
Orthopedic fellow acts as house surgeon at University and Veterans Hospitals.
- 8409. ORTHOPEDIC PROBLEMS AND MANAGEMENT.** (5 cr) Winter, Lonstein  
Orthopedic fellow acts as house surgeon on the orthopedic service at Fairview Hospital.
- 8410. ORTHOPEDIC PATHOLOGY.** (2 cr) Thompson, Bradford, House, Mayfield, Premer  
Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities.
- 8411. ORTHOPEDIC OPERATIVE SURGERY.** (5 cr) Thompson, Bradford, House, Mayfield, Premer  
Orthopedic fellow acts as first assistant at operations at University and affiliated hospitals and later may be permitted to operate.
- 8412. ORTHOPEDIC ANATOMY.** (2 cr) House  
Orthopedic fellow dissects upper and lower extremities and aids in instruction of medical students in anatomy of the extremities.
- 8416. ORTHOPEDIC RESEARCH.** (5 cr) Thompson, Bradford, House, Mayfield  
Problems in experimental or clinical surgery, University Hospitals.

## Otolaryngology (Otol)

### SPECIAL TERMS: THREE, SIX-, AND TWELVE-WEEK COURSES, JUNE 20-SEPTEMBER 9

- 5500. GENERAL—ENT ELECTIVE.** (4.5 cr)
- 5501. ACTING INTERNSHIP—ENT ELECTIVE.** (9 cr)
- 5503. RESEARCH: BASIC SCIENCE—ENT ELECTIVE.** (9 or 18 cr)

### SPECIAL TERM: EIGHT-WEEK COURSES

- 8220. RESEARCH.** (18 cr)
- 8230. CLINICAL OTORHINOLARYNGOLOGY.** (6 cr)
- 8231. SURGERY OF EAR, NOSE, THROAT.** (4 cr)
- 8232. MAXILLOFACIAL SURGERY.** (1 cr)
- 8233. PLASTIC, RECONSTRUCTIVE SURGERY: HEAD, NECK.** (1 cr)

- 8234. ANATOMY: HEAD, NECK, TEMPORAL BONE DISSECTION. (2 cr)
- 8235. ROENTGENOLOGY OF HEAD, NECK. (2 cr)
- 8236. PHARMACOLOGY. (2 cr)
- 8237. ENDOSCOPY. (2 cr)
- 8238. PATHOLOGY OF EAR, NOSE, THROAT. (2 cr)
- 8239. OTONEUROLOGY. (2 cr)
- 8240. ALLERGY. (2 cr)
- 8241. TUMOR CLINIC. (1 cr)
- 8242. AUDIOLOGY, SPEECH PATHOLOGY. (2 cr)
- 8243. INTRODUCTION: RESEARCH METHODOLOGY. (2 cr)
- 8244. SEMINAR: CURRENT LITERATURE. (1 cr)
- 8245. MASTER'S THESIS RESEARCH. (Cr ar)
- 8246. PH.D. THESIS RESEARCH. (Cr ar)
- 8248. RESEARCH. (Cr ar)

## Pathology (Path)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

#### *Courses for Graduate Program*

- 5101. GENERAL PATHOLOGY. (6 cr for Phase A period March 7 through July 30; prereq regis Phase A or equiv)  
Ratliff, staff
- 5104. AUTOPSIES. (Cr ar; prereq Phase B or equiv) Staff
- 5106. DISEASES OF THE HEART. (1 cr; prereq Phase B or equiv) Edwards
- 5113. SURGICAL PATHOLOGY. (Cr ar; prereq Phase B or equiv) Rosai
- 5140. SEMINAR: EXPERIMENTAL CHRONOBIOLOGY. (1 cr; prereq #) Halberg
- 5141. PROBLEMS IN EXPERIMENTAL CHRONOBIOLOGY. (Cr ar; prereq #) Halberg
- 5169. RESEARCH: HUMAN GENETICS. (Cr ar; prereq #) J Yunis
- 5170. ADVANCED PROBLEMS: MEDICAL GENETICS. (Cr ar; prereq #) J Yunis, staff
- 8200. ADVANCED PROBLEMS IN PATHOLOGY. (Cr ar; prereq #) Staff
- 8201. RESEARCH. (Cr ar; prereq #) Staff  
Students with the necessary preliminary training may elect research either as a major or minor in pathology.
- 8207. RESEARCH IN EXPERIMENTAL CHRONOBIOLOGY. (Cr ar; prereq #) Halberg

## Pediatrics (Ped)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

#### *Elective Courses*

- 5501. PEDIATRIC CLERKSHIP (University Hospitals, Hennepin County Medical Center, St. Paul-Ramsey Hospital, St. Paul Children's Hospital). (Cr ar) Nesbit
- 5503. PEDIATRIC CLERKSHIP WITH OUTSTATE CLINICIANS. (Cr ar; prereq #) Nesbit
- 5510. OUTPATIENT EXTERNSHIP AT MINNEAPOLIS PUBLIC HEALTH DEPARTMENT CHILD CARE CLINICS.  
(Cr ar) Deinard
- 5512. PEDIATRIC ACTING INTERNSHIP. (University Hospitals, St. Paul Children's Hospital, Hennepin County Medical Center). (Cr ar) Nesbit

5514. **CHILD CARE CLINIC PROGRAM.** (Cr ar) Fisch
5515. **CHILD DEVELOPMENT AT ST PAUL-RAMSEY HOSPITAL.** (Cr ar) Davis
5517. **PRECEPTORSHIP IN CLINICAL PEDIATRICS.** (Cr ar) Ulstrom.
5519. **EXPERIENCE IN MEDICAL EDUCATION.** (Cr ar; prereq #) Moller
5520. **PEDIATRIC OUTPATIENT.** (Cr ar; prereq #) Satran
5523. **OUTPATIENT EXTERNSHIP AT COMMUNITY UNIVERSITY HEALTH CARE CENTER.** (Cr ar; prereq 5501, 5503, 5512, Med 5502) Smelker
5525. **INTERNATIONAL HEALTH.** (Cr ar; prereq #) Venters, McKay, Olness
5532. **CLINICAL ALLERGY AND IMMUNOLOGY AT UNIVERSITY HOSPITALS.** (Cr ar; prereq 5501, 5503, 5512, Med 5502) Fish
5534. **PEDIATRIC CARDIOLOGY AT UNIVERSITY HOSPITALS.** (Cr ar; prereq 5501, 5503, 5512, Med 5502) Moller
5535. **INFECTIOUS DISEASE.** (Cr ar; prereq 5501, 5503, 5512, Med 5502) Ferrieri
5536. **PEDIATRIC HEMATOLOGY-ONCOLOGY AT UNIVERSITY HOSPITALS.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Krivit
5537. **PEDIATRIC ENDOCRINOLOGY AND METABOLISM AT UNIVERSITY HOSPITALS.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Ulstrom
5538. **PEDIATRIC GASTROENTEROLOGY.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Sharp
5539. **NEONATAL MEDICINE EXTERNSHIP.** (Cr ar; prereq 5501, 5502 or Med 5502) Reynolds
5540. **PEDIATRIC NEUROLOGY.** (Cr ar) Swaiman
5543. **PEDIATRIC NEPHROLOGY.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Michael
5544. **PULMONARY DISEASE IN PEDIATRICS.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Warwick
5546. **PEDIATRIC PATHOLOGY.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Burke
5547. **TOPICS IN MATERNAL AND CHILD HEALTH.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) tenBensel
5548. **PEDIATRIC GENETICS.** (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Desnick
8200. **GRADUATE SEMINAR: PEDIATRICS.** (1.5 cr) Moller, staff
8202. **PEDIATRICS CLINICS.** (Cr ar; prereq #) Staff
8204. **RESIDENCY IN PEDIATRICS.** (Cr ar; prereq #) Staff
8206. **PEDIATRIC SPECIAL INTEREST.** (Cr ar; for grad students who have completed at least 1½ yrs of general grad pediatric training; prereq #) Staff
8208. **PEDIATRIC RESEARCH.** (Cr ar; prereq #) Moller, staff

## Pharmacology (Phcl)

### FIRST TERM

5109. **PROBLEMS IN PHARMACOLOGY.** (Cr and hrs ar; prereq #) Shideman, staff
8203. **RESEARCH IN PHARMACOLOGY.** (Cr and hrs ar; prereq #) Shideman, staff

### SECOND TERM

5109. **PROBLEMS IN PHARMACOLOGY.** (Cr and hrs ar; prereq #) Shideman, staff
8203. **RESEARCH IN PHARMACOLOGY.** (Cr and hrs ar; prereq #) Shideman, staff

## Physical Medicine and Rehabilitation (PMed)

### SPECIAL TERM: JULY 1-SEPTEMBER 30

8200. **PHYSICAL MEDICINE SERVICE.** (Cr and hrs ar) Staff
8205. **READINGS.** (1 cr; I-II M; 825 Mayo) Kottke

8206. **CONFERENCE.** (Cr and hrs ar) Staff  
 8210. **RESEARCH IN PHYSICAL MEDICINE.** (Cr and hrs ar) Staff  
 8212. **ELECTROMYOGRAPHY.** (Cr and hrs ar) Awad

## *Occupational Therapy*

### **FIRST AND SECOND TERMS: TWELVE-WEEK COURSES**

- 5396, 5397. **FIELDWORK EDUCATION.** (15 cr per qtr; for sr OT students) Eliason  
 Six months of supervised training in affiliated hospitals and community centers.

## *Physical Therapy*

### **FIRST TERM**

5255. **CLINICAL TRAINING.** (3 cr; limited to PT students in the professional program; hrs ar at affiliated hospitals)  
 Five weeks of supervised practice at affiliated hospitals.  
 8103. **PHYSICAL THERAPY CLINIC.** (Cr ar; prereq physical therapy) Staff  
 8170. **SPECIAL TOPICS.** (1 cr; prereq #) Staff  
 8185. **PROBLEMS IN PHYSICAL THERAPY.** (Cr ar; prereq physical therapy) Staff  
 8193. **RESEARCH PROBLEMS IN PHYSICAL THERAPY.** (Cr ar; prereq physical therapy) Staff  
 8195. **RESEARCH IN PHYSICAL THERAPY.** (Cr ar; prereq #) Kottke, Skowlund, staff

### **SECOND TERM**

8103. **PHYSICAL THERAPY CLINIC.** (Cr ar; prereq physical therapy) Staff  
 8170. **SPECIAL TOPICS.** (1 cr; prereq #) Staff  
 8185. **PROBLEMS IN PHYSICAL THERAPY.** (Cr ar; prereq physical therapy) Staff  
 8193. **RESEARCH PROBLEMS IN PHYSICAL THERAPY.** (Cr ar; prereq physical therapy) Staff  
 8195. **RESEARCH IN PHYSICAL THERAPY.** (Cr ar; prereq #) Kottke, Skowlund, staff

## *Physiology (Phsl)*

### **FIRST TERM**

3051. **HUMAN PHYSIOLOGY.** (5 cr; primarily for baccalaureate nursing students and physical therapy students; prereq zoology and 1 yr college chemistry; \$4 lab fee; lect VI MW, VII-VIII TTh, VI-VII F, HSUnitA 2-690, IV TTh, Owre 15; lab VII-IX MW, HSUnitA 3-110) Staff  
 Introduction to human physiology.  
 5111. **HUMAN PHYSIOLOGY—May 23-July 29.** (5 cr; primarily for Phase A4 med students; prereq 5110; \$4 lab fee; lect I MTThF, HSUnitA 2-650) Staff  
 Lab 1, VII-X T, HSUnitA 3-110  
 Lab 2, VII-X Th, HSUnitA 3-110  
 Lab 3, VII-X F, HSUnitA 3-110  
 5113. **PROBLEMS IN PHYSIOLOGY.** (Cr and hrs ar) Staff  
 Topics assigned for laboratory study; conferences and readings.  
 5552. **READINGS IN PHYSIOLOGY.** (Cr and hrs ar) Staff  
 Topics selected for each student; written reviews prepared and discussed.  
 5553. **RESEARCH IN PHYSIOLOGY.** (Cr and hrs ar) Staff

- 8111. HUMAN PHYSIOLOGY—May 23-July 29.** (5 cr; prereq 8110, anatomy, biochemistry; \$4 lab fee; lect 1 MTThF, HSUnitA 2-650) Staff  
 Lab 1, VII-X T, HSUnitA 3-110  
 Lab 2, VII-X Th, HSUnitA 3-110  
 Lab 3, VII-X F, HSUnitA 3-110
- 8113. PROBLEMS IN PHYSIOLOGY.** (Cr and hrs ar) Staff  
 Topics assigned for laboratory study: conferences and readings.
- 8202. READINGS IN PHYSIOLOGY.** (Cr and hrs ar) Staff  
 Topics selected for each student; written reviews prepared and discussed.
- 8203. RESEARCH IN PHYSIOLOGY.** (Cr and hrs ar) Staff

## Psychiatry

### *Adult Psychiatry (AdPy)*

#### **SPECIAL TERM: JUNE 23-SEPTEMBER 12**

- 5109. CLINICAL PSYCHIATRY.** (9 cr per period) Olson  
 Contact George W. Knabe, Jr, M.D., St. Luke's Hospital, 915 E. First Street, Duluth; telephone (218) 727-6636, extension 660.
- 5110. EXTERNSHIP IN PSYCHIATRY.** (9 cr per period) Cowan  
 At St. Luke's Hospital, Duluth. See 5109.
- 5120. CLINICAL EXPERIENCE IN INTERVIEWING AND DIAGNOSTIC SKILLS (Veterans Hospital).** (9 cr per period) Posey
- 5500. COMBINED INPATIENT AND CRISIS INTERVENTION CENTER (Hennepin County Medical Center).** (9 cr per period; hrs ar) Dean  
 Experience on Adult Inpatient Unit; emphasizes diagnosis and team treatment. This is combined with the Crisis Intervention Unit in the E.R. with rapid evaluation, prompt psychosocial intervention, home visits, suicide phone, agency contacts, individual patient responsibility and seminars.
- 5501. CLINICAL PSYCHIATRY (St. Paul-Ramsey Hospital).** (9 cr per period; hrs ar) Wiemer  
 Identifying various psychiatric disorders; their natural history, course, and therapeutic procedures. Students will be involved in the operations of adult inpatient psychiatry, as a key member of a psychiatric team under direct staff supervision.
- 5505. DAY TREATMENT PROGRAM (Hennepin County Medical Center).** (9 cr per period; hrs ar) Jepson  
 Participation for an extensive period in the intensive psychiatric treatment of approximately 30 patients, enabling the student to know them as individuals and to gain awareness of group process.
- 5506. ADULT OUTPATIENT AND PSYCHIATRIC LIAISON SERVICE (Hennepin County Medical Center).** (9 cr per period; hrs ar) Pollock  
 The student, under supervision of a staff psychiatrist, will be assigned new ambulatory patients to evaluate for intake assignment and engage in short intervention, when feasible.
- 5507. CLINICAL RESEARCH (University Hospitals, Station 61).** (9 cr per period; hrs ar) Heston  
 General adult psychiatry with emphasis on pharmacology treatment and research. Inpatients and outpatients.
- 5508. ADULT PSYCHIATRY (University Hospitals, Station 60).** (9 cr per period; hrs ar) Kroll  
 General adult psychiatry with emphasis on acutely ill patients and outpatient follow-up.
- 5511. UNIVERSITY HOSPITALS CONSULTATION.** (9 cr per period; hrs ar) Popkin  
 Students will assist in psychiatric consultation to other services in University Hospitals under direct supervision of staff.
- 5513. DRUG ABUSE, ALCOHOLISM (St. Mary's Hospital).** (9 cr per period; hrs ar) Dorsey  
 Involvement in inpatient service and outpatient follow-up program.
- 5514. DRUG ABUSE, ALCOHOLISM (Veterans Hospital).** (9 cr per period; hrs ar) Heilman
- 5515. NEUROPSYCHOLOGY (University Hospitals).** (9 cr per period; hrs ar) Meier
- 5517. ALCOHOL AND DRUG ADDICTION (St. Cloud Hospital).** (9 cr per period; hrs ar) Warner  
 Participation as a physician member of a multidisciplinary program with emphasis on the team approach.

- 5518. COMMUNITY PSYCHIATRY (Five-County Human Development Program, Inc., Braham).** (9 cr per period; hrs ar) Kollmorgen, Staff  
Participation as a physician member of a multidisciplinary team composed of health science students and mental health professionals.
- 5519. CLINICAL PSYCHIATRY (Abbott Hospital).** (9 cr per period; hrs ar) Mayberg  
Training and supervision in individual therapy, psychiatric hospital management, community psychiatry, group therapy, and an innovative program in the utilization of some of the newer techniques of psychiatric intervention such as movement therapy and Gestalt programs.
- 5521. COMMUNITY PSYCHIATRY (Dakota County Mental Health Center).** (9 cr per period; hrs ar) Nagobads  
Experience in outpatient community psychiatry; would be meaningful for students considering family practice.
- 5522. ADOLESCENT PSYCHIATRY (University Hospitals, Station 62).** (9 cr per period; hrs ar) Greenberg  
Student will be primary therapist (supervised) for selected patients.
- 5530. INDEPENDENT STUDY.** (9 cr per period; hrs ar) Staff
- 5550. GERIATRIC PSYCHIATRY.** (9 cr per period; hrs ar) Garetz
- 5602. CLINICAL PSYCHOPHARMACOLOGY SEMINAR.** (1 cr; hrs ar) Abuzzahab

### **SPECIAL TERM: JULY 1-SEPTEMBER 12**

- 8201. CLINICAL PSYCHIATRY.** (Up to 12 cr per qtr; hrs ar) Staff
- 8203. ADVANCED CLINICAL PSYCHIATRY.** (Up to 12 cr per qtr; hrs ar) Staff
- 8205. SPECIAL ASSIGNMENTS.** (Up to 12 cr per qtr; hrs ar) Staff
- 8206. RESEARCH.** (Up to 12 cr per qtr; hrs ar) Staff
- 8208. SURVEY OF PHYSIOLOGICAL TREATMENTS.** (2 cr; hrs ar) Eckert
- 8221. SEMINAR: CURRENT LITERATURE (Hennepin County Medical Center).** (1 cr; hrs ar) Simon
- 8238. CASE CONFERENCE PSYCHOLOGICAL MEDICINE (Veterans Hospital).** (1 cr; hrs ar) Wilder
- 8263. SUPERVISION IN INTENSIVE PSYCHOANALYTICALLY ORIENTED PSYCHOTHERAPY.** (2 cr; hrs ar) Garetz
- 8970. DIRECTED STUDY.** (Up to 9 cr per qtr; hrs ar) Staff

## *Child and Adolescent Psychiatry (CAPy)*

### **FIRST TERM**

- 5204. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; prereq med student, #; hrs ar) Greenberg  
Multidisciplinary evaluations of children, adolescents, and their families are presented for discussion, dynamic and diagnostic formulations, and disposition planning in conference setting.
- 5206. THERAPEUTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; prereq med student, #; hrs ar) Lawton, Hong  
Therapeutic techniques utilized in child, adolescent, and family psychiatry are reviewed through presentation and discussion of ongoing cases.
- 5502. GRAND ROUNDS.** (1 cr; prereq med student, #; hrs ar) Greenberg  
By means of clinical and didactic presentations and discussions by students, faculty, and invited guests, current diagnostic, therapeutic, and theoretical issues in child, adolescent, and family psychiatry are reviewed.
- 5601. INTRODUCTORY READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Koch, Hong  
Assigned readings and discussions with faculty. A survey course; includes child development diagnostic and therapeutic techniques and psychopathology.
- 8100. READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg  
Comprehensive review of the classical and contemporary literature in the field of child, adolescent, and family psychiatry including growth and development, diagnostic and therapeutic techniques, and psychopathology, with supplemental course work in other departments and schools.
- 8110. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Hong  
See 5204.

- 8120. THERAPEUTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Lawton, Hong  
See 5206.
- 8200. OUTPATIENT CLINICAL CHILD AND ADOLESCENT PSYCHIATRY.** (3-6 cr; 15-30 hrs per wk) Cline  
Supervised diagnostic and therapeutic experiences in an outpatient setting.
- 8212. CLINICAL INPATIENT CHILD PSYCHIATRY.** (Cr ar; 15-30 hrs per wk) Miner, Greenberg  
Supervised diagnostic and therapeutic experiences in an inpatient, multidisciplinary child psychiatry unit with an emphasis on group and milieu therapies.
- 8214. INPATIENT CLINICAL ADOLESCENT PSYCHIATRY.** (Cr and hrs ar) Greenberg, Rigas  
Supervised diagnostic and therapeutic experiences in an inpatient, multidisciplinary adolescent psychiatry unit with an emphasis on group and milieu therapies.
- 8228. RESEARCH IN CHILD AND ADOLESCENT PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Yellin  
Research design, methodology, and current research projects are reviewed with faculty and invited guests.
- 8233. MENTAL HEALTH ADMINISTRATION AND TRAINING SEMINAR.** (1 cr; hrs ar) Greenberg, Hong  
Styles of mental health administration and the role of the child psychiatrist; ongoing evaluation of the child psychiatry residency training program.
- 8301. SEMINAR IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Hong, staff  
See 5502.

## **SECOND TERM**

- 5204. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; prereq med student, #; hrs ar) Greenberg  
See First Term.
- 5206. THERAPEUTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; prereq med student, #; hrs ar) Lawton, Hong  
See First Term.
- 5502. GRAND ROUNDS.** (1 cr; prereq med student, #; hrs ar) Greenberg  
See First Term.
- 5601. INTRODUCTORY READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Koch, Hong  
See First Term.
- 8100. READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg  
See First Term.
- 8110. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Hong  
See 5204 First Term.
- 8120. THERAPEUTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; 9:00-10:00 T)  
Lawton, Hong  
See 5206 First Term.
- 8200. OUTPATIENT CLINICAL CHILD AND ADOLESCENT PSYCHIATRY.** (3-6 cr; 15-30 hrs per wk) Cline  
See First Term.
- 8212. CLINICAL INPATIENT CHILD PSYCHIATRY.** (Cr ar; 15-30 hrs per wk) Miner, Greenberg  
See First Term.
- 8214. INPATIENT CLINICAL ADOLESCENT PSYCHIATRY.** (Cr and hrs ar) Greenberg, Rigas  
See First Term.
- 8228. RESEARCH IN CHILD AND ADOLESCENT PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Yellin  
See First Term.
- 8233. MENTAL HEALTH ADMINISTRATION AND TRAINING SEMINAR.** (1 cr; hrs ar) Greenberg, Hong  
See First Term.
- 8301. SEMINAR IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (1 cr; hrs ar) Greenberg, Hong, staff  
See 5502 First Term.

## *Health Care Psychology (HCPy)*

### **FIRST TERM**

- 5102. HEALTH CARE PSYCHOLOGY CLINIC INTERNSHIP.** (Cr ar; prereq #) Hafner, Petzel, Quast, staff



5103. MEDICAL CONSULTATION FOR HEALTH CARE PSYCHOLOGY INTERNS. (Cr ar; prereq #) Brantner
5104. HEALTH CARE PSYCHOLOGY INTERNSHIP AT THE STUDENT HEALTH SERVICE. (Cr ar; prereq #) Heiberg, Reynolds
5105. HEALTH CARE PSYCHOLOGY FOR THE PHYSICALLY HANDICAPPED CHILD. (Cr ar; prereq #) Briggs, staff
5106. INTRODUCTION TO NEUROPSYCHOLOGICAL ASSESSMENT. (Cr ar; prereq #) Meier, Thomas
5107. ADVANCED NEUROPSYCHOLOGICAL ASSESSMENT. (Cr ar; prereq #) Meier, Thomas
5108. RURAL COMMUNITY MENTAL HEALTH INTERNSHIP FOR PSYCHOLOGISTS. (Cr ar; prereq #) White, staff
5109. COMMUNITY CHILD GUIDANCE CENTER PSYCHOLOGY INTERNSHIP. (Cr ar; prereq #) Hanvik, Reed, staff
5110. FIELDWORK EXPERIENCE IN HEALTH CARE PSYCHOLOGY. (Cr ar; prereq #) Staff
5112. STUDENT COUNSELING BUREAU PSYCHOLOGY INTERNSHIP. (Cr ar; prereq #) Loper, staff
5113. CASE SEMINAR IN HEALTH CARE PSYCHOLOGY. (1 cr; prereq #) Roberts, Schofield, staff
5611. TECHNIQUES OF EVALUATION. (1 cr; prereq regis med; hrs ar) Westermeyer
5701. PROJECT IN CLINICAL PSYCHOLOGY. (Cr ar; hrs ar) Staff
8202. SPECIAL RESEARCH TOPICS. (Cr ar; prereq #) Staff
8203. PSYCHOMETRIC CLERKSHIP. (Cr ar) Staff
8204. INTERNSHIP IN CLINICAL PSYCHOLOGY. (2 or 4 cr; prereq PhD candidate in clinical psychology with #) Staff
8206. MEDICAL PSYCHOLOGY LABORATORY. (2 cr; prereq Psy 8611, 8612, 8613, 8614) Staff
8226. TECHNIQUES OF EVALUATION. (1 cr; hrs ar) Westermeyer

## **SECOND TERM**

5102. HEALTH CARE PSYCHOLOGY CLINIC INTERNSHIP. (Cr ar; prereq #) Hafner, Petzel, Quast, staff
5103. MEDICAL CONSULTATION FOR HEALTH CARE PSYCHOLOGY INTERNS. (Cr ar; prereq #) Brantner
5104. HEALTH CARE PSYCHOLOGY INTERNSHIP AT THE STUDENT HEALTH SERVICE. (Cr ar; prereq #) Heiberg, Reynolds
5105. HEALTH CARE PSYCHOLOGY FOR THE PHYSICALLY HANDICAPPED CHILD. (Cr ar; prereq #) Briggs, staff
5106. INTRODUCTION TO NEUROPSYCHOLOGICAL ASSESSMENT. (Cr ar; prereq #) Meier, Thomas
5107. ADVANCED NEUROPSYCHOLOGICAL ASSESSMENT. (Cr ar; prereq #) Meier, Thomas
5108. RURAL COMMUNITY MENTAL HEALTH INTERNSHIP FOR PSYCHOLOGISTS. (Cr ar; prereq #) White, staff
5109. COMMUNITY CHILD GUIDANCE CENTER PSYCHOLOGY INTERNSHIP. (Cr ar; prereq #) Hanvik, Reed, staff
5110. FIELDWORK EXPERIENCE IN HEALTH CARE PSYCHOLOGY. (Cr ar; prereq #) Staff
5112. STUDENT COUNSELING BUREAU PSYCHOLOGY INTERNSHIP. (Cr ar; prereq #) Loper, staff
5113. CASE SEMINAR IN HEALTH CARE PSYCHOLOGY. (1 cr; prereq #) Roberts, Schofield, staff
5611. TECHNIQUES OF EVALUATION. (1 cr; prereq regis med; hrs ar) Westermeyer
5701. PROJECT IN CLINICAL PSYCHOLOGY. (Cr ar; hrs ar) Staff
8202. SPECIAL RESEARCH TOPICS. (Cr ar; prereq #) Staff
8203. PSYCHOMETRIC CLERKSHIP. (Cr ar) Staff
8204. INTERNSHIP IN CLINICAL PSYCHOLOGY. (2 or 4 cr; prereq PhD candidate in clinical psychology with #) Staff
8206. MEDICAL PSYCHOLOGY LABORATORY. (2 cr; prereq Psy 8611, 8612, 8613, 8614) Staff
8226. TECHNIQUES OF EVALUATION. (1 cr; hrs ar) Westermeyer

# Radiology (Rad)

## SPECIAL TERM: THREE-WEEK COURSES

### *Elective Courses for Third- and Fourth-Year Students*

5100. EXTERNSHIP: NUCLEAR MEDICINE. (Cr and hrs ar; prereq regis med) Loken, staff
5101. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (University Hospitals). (Cr and hrs ar; prereq regis med) Gedgaudas, staff
5102. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (Veterans Administration Hospital). (Cr and hrs ar; prereq regis med) Reinke
5103. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (Hennepin County Medical Center). (Cr and hrs ar; prereq regis med) Tsai
5104. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (St. Paul-Ramsey Hospital). (Cr and hrs ar; prereq regis med) Bjornson
5105. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (St. Luke's Hospital, Duluth). (Cr and hrs ar; prereq regis med) Ahrens, staff
5140. SPECIAL PROBLEMS: ROENTGENOLOGY. (Cr and hrs ar; prereq regis med) Gedgaudas, staff
5240. SPECIAL PROBLEMS: NUCLEAR MEDICINE. (Cr and hrs ar; prereq regis med) Loken, staff

## FIRST AND SECOND TERMS: TEN-WEEK COURSES

### *Required Courses for Graduate Students*

0121. MEDICAL ROENTGENOLOGIC CONFERENCE. (No cr; 11:30-12:00 T; Hosp Todd Amph) Gedgaudas, staff  
Weekly meetings with the medical staff at which all the important medical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.
0122. PEDIATRIC ROENTGENOLOGIC CONFERENCE. (No cr; 9:30-10:00 MTWThF; Rigler Library) L'Heureux  
Daily meetings with the pediatric staff at which all the important pediatric cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.
0123. SURGICAL ROENTGENOLOGIC CONFERENCE. (No cr; II S; Hosp Todd Amph) Amplatz  
Weekly meetings with the surgical staff at which all the important surgical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.
0124. NEUROSURGICAL ROENTGENOLOGIC CONFERENCE. (No cr; VI F; Hosp Todd Amph) Peterson  
Weekly meetings with the neurosurgical staff at which all the important neurosurgical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.
0125. CARDIOVASCULAR ROENTGENOLOGIC CONFERENCE. (No cr; 12:00-1:00 Th; Rigler Library) Amplatz
8100. GASTROINTESTINAL ROENTGENOLOGY. (Cr ar; prereq #) Feinberg
8101. UROLOGIC ROENTGENOLOGY. (Cr ar; prereq #) Goldberg
8102. NEUROLOGICAL ROENTGENOLOGY. (Cr ar; prereq #) Peterson
8103. CARDIOVASCULAR ROENTGENOLOGY. (Cr ar; prereq #) Amplatz
8104. PEDIATRIC ROENTGENOLOGY. (Cr ar; prereq #) L'Heureux
8105. PULMONARY ROENTGENOLOGY. (Cr ar; prereq #) Gedgaudas, staff
8150. RESEARCH: ROENTGENOLOGY. (Cr ar) Gedgaudas, staff  
Problems in roentgen diagnosis.
8200. NUCLEAR MEDICINE. (Cr ar) Loken, staff
8450. RESEARCH: RADIATION BIOLOGY, NUCLEAR MEDICINE. (Cr ar) Staff

# Surgery (Surg)

## SPECIAL TERMS: JUNE 20-JULY 29 AND AUGUST 1-SEPTEMBER 9

### *Elective Courses for Undergraduate Students*

5500. EXTERNSHIP IN GENERAL SURGERY (University and Affiliated Hospitals). (Cr ar; prereq regis med) Najarian, staff

**5523. EXTERNSHIP IN COLON AND RECTAL SURGERY (Veterans Administration Hospital).** (4.5 cr; offered all periods except 5; prereq regis med; 3 weeks) Goldberg

## **SPECIAL TERMS: JULY 1-AUGUST 6 AND AUGUST 8-SEPTEMBER 9**

### ***Required Courses for Graduate Students***

**8200. CLINICAL SURGICAL PROBLEMS AND MANAGEMENT.** (5 cr) Najarian, staff

**8201. SURGERY-ROENTGENOLOGY-PATHOLOGY CONFERENCE.** (1 cr) Najarian

**8202. SURGICAL RESEARCH.** (5 cr) Staff

**8203. SURGERY COMPLICATIONS AND RESEARCH CONFERENCE.** (1 cr) Najarian, staff

**8207. TRANSPLANTATION AND BONE MARROW CONFERENCE.** (1 cr) Surgery and Pathology staffs

## **Therapeutic Radiology (TRad)**

### **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

**5340. SPECIAL PROBLEMS IN RADIATION THERAPY.** (Cr ar; prereq regis med)

**5505. EXTERNSHIP IN RADIATION THERAPY.** (Cr ar; prereq regis med) Levitt, Jones, Haselow, Kim, Lee

**5506. CANCER DIAGNOSIS AND TREATMENT.** (Cr ar; prereq regis med) Levitt, Jones, Haselow, Kim, Lee

**5507. ADVANCED EXTERNSHIP IN RADIATION THERAPY.** (Cr ar; prereq regis med) Levitt, Jones, Haselow, Kim, Lee

**5508. SPECIAL PROBLEMS IN RADIATION BIOLOGY.** (Cr ar)

**5510. BASIC PRINCIPLES OF RADIOLOGICAL PHYSICS.** (1 cr; 3:00-4:00 F; Rigler Library) Khan, Sewchand, Fullerton

**5512. DOSIMETRY OF INTERNAL AND EXTERNAL RADIATION.** (1 cr; 8:30-9:30 W; B141 Mayo) Khan, Sewchand, Fullerton

**5540. SPECIAL PROBLEMS IN RADIOLOGICAL PHYSICS.** (Cr ar; prereq regis med) Khan, Loken, Sewchand, Fullerton

**8300. RADIATION THERAPY.** (Cr ar)

**8310. FUNDAMENTALS OF RADIATION THERAPY.** (1 cr; 4:00-5:00 M; B141 Mayo)

**8315. RADIATION THERAPY PATHOLOGY.** (1 cr)

**8320. RADIATION THERAPY TREATMENT PLANNING PROBLEMS.** (1 cr)

**8325. RADIATION THERAPY PEDIATRICS ONCOLOGY.** (1 cr)

**8350. RESEARCH IN RADIATION THERAPY.** (Cr ar)

**8410. SEMINAR: RADIATION BIOLOGY.** (1 cr; prereq #) Song, Buchsbaum, Clement

**8450. RESEARCH IN RADIATION BIOLOGY.** (Cr ar) Song, Buchsbaum, Clement

**8550. RESEARCH IN RADIOLOGICAL PHYSICS.** (Cr ar) Khan, Loken, Sewchand, Fullerton

## **Urologic Surgery (Urol)**

### **FIRST TERM**

**5180. EXTERNSHIP IN UROLOGY.** (Cr and hrs ar) Staff

### ***Required Courses for Graduate Students***

**8250. UROLOGICAL SURGERY.** (4 cr; 9:00-12:00 MTThF; Main OR-H) Fraley, others  
Urological fellow first assists at operations in the University Hospitals and later is permitted to operate under supervision of the staff.

**8251. CYSTOSCOPY AND UROLOGICAL DIAGNOSIS.** (4 cr; 8:00-12:00 MTWThF; Cysto Suite) Fraley, others  
Urological fellow performs cystoscopies and other diagnostic procedures.

- 8252. UROLOGICAL CONFERENCE.** (4 cr; 4:00-5:00 F, Ward Rds, Sta 57; 9:00-11:00 S, Sta 57 Conf Rm) Fraley, others  
Problems in diagnosis and treatment.
- 8253. RESEARCH: UROLOGY.** (4 cr) Fraley, others  
Problems in experimental and clinical surgery.
- 8254. UROLOGICAL SEMINAR.** (3 cr) Fraley, others
- 8255. UROLOGICAL-RADIOLOGICAL CONFERENCE.** (3 cr; 1:00-2:00 MTWThF; Mayo A503) Fraley, others
- 8256. UROLOGICAL-PATHOLOGICAL CONFERENCE.** (3 cr; 4:30-5:00 W; Mayo A503) Fraley, others

## **SECOND TERM**

- 5180. EXTERNSHIP IN UROLOGY.** (Cr and hrs ar) Staff

### **Required Courses for Graduate Students**

- 8250. UROLOGICAL SURGERY.** (4 cr; 9:00-12:00 MTThF; Main OR-H) Fraley, others  
See First Term.
- 8251. CYSTOSCOPY AND UROLOGICAL DIAGNOSIS.** (4 cr; 8:00-12:00 MTWThF; Cysto Suite) Fraley, others  
See First Term.
- 8252. UROLOGICAL CONFERENCE.** (4 cr; 4:00-5:00 F, Ward Rds, Sta 57; 9:00-11:00 S, Sta 57 Conf Rm) Fraley, others  
See First Term.
- 8253. RESEARCH: UROLOGY.** (4 cr) Fraley, others  
See First Term.
- 8254. UROLOGICAL SEMINAR.** (3 cr) Fraley, others
- 8255. UROLOGICAL-RADIOLOGICAL CONFERENCE.** (3 cr; 1:00-2:00 MTWThF; Mayo A503) Fraley, others
- 8256. UROLOGICAL-PATHOLOGICAL CONFERENCE.** (3 cr; 4:30-5:00 W; Mayo A503) Fraley, others

## **DEPARTMENT OF MORTUARY SCIENCE**

### **Mortuary Science (Mort)**

All courses must be reserved in 114 Vincent Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 5040. DEATH EDUCATION IN CONTEMPORARY SOCIETY—June 14–July 1.** (3 cr, \$PubH 5040, \$Hlth 5402; limited to 80 students; prereq mortuary science major, education sr, certified teacher, health science major, school or public health nurse or #: 1:30-4:00 MTWThF; HSUnitA 2-520) Fredlund, Lindgren, Slater

Basic background information on concepts and attitudes toward death, grief, and bereavement with emphasis on instructional aspects for the elementary and secondary schools and the role of the school in suicide prevention.

#### **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

- 3080. PRACTICUM IN FUNERAL SERVICE.** (12 cr; prereq sr)  
Practical experience in an off-campus funeral home as assigned by the department.
- 3081. SEMINAR.** (3 cr; prereq 13080)  
Funeral service survey based on practicum experiences. Assigned reading of funeral service literature.
- 3090. INDEPENDENT STUDY.** (Cr ar; prereq sr)

# SCHOOL OF NURSING

## Nursing (Nurs)

### FIRST TERM

- 5407. SYSTEMATIC PROCESS II.** (2 cr; prereq 5207)  
Application of the systematic process as a tool in nursing. Effectiveness of use of the process; criteria to judge effectiveness. Introduction to concepts of variables, probability, validity. Provides basis for carrying out studies in subsequent clinical courses.
- 5799. SELF-DIRECTED STUDY AS A MEANS OF ACCOMPLISHING NURSING ELECTIVES.** (1-10 cr; prereq two of the following: 5611, 5612, 5613, 5614; contract with faculty member)  
A means to accomplish the required nursing elective credits.
- 5999. CLINICAL STUDY.** (1 cr; contract with faculty member)  
A clinical study to answer a nursing question.
- 8050. PROBLEMS IN NURSING.** (1-4 cr; prereq Δ) Staff  
Individual study of a problem.
- 8051. SPECIAL TOPICS IN NURSING RESEARCH.** (1-9 cr)  
Seminar and/or individual study.
- 8060. ADVANCED CLINICAL NURSING.** (3-9 cr; prereq 8102 or 8103 or 8203 or 8302 and 8313 or 8302 and 8352) Staff  
Hypothesis generation and testing in general nursing for the purpose of developing creative and critical approaches to nursing.
- 8203. PSYCHIATRIC NURSING—COMMUNITY.** (4 cr; prereq 8202)  
Community mental health problems, community resources, and psychiatric nurse's role in the community.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 5611. SYNTHESIS INCORPORATING CONCEPTS OF CHRONICITY.** (4 cr for 10 wks; prereq 5407 or ¶5407, 5408, 5409, . 5403 or 5404 or 5405 or ¶5403 or ¶5404 or ¶5405)  
Synthesis of the systematic process, adaptation, helping relationships, and tools in nursing care of children, adults, and groups requiring long-term nature. The health team's approach and function in institutions and in the community for care of those with chronic conditions.
- 5614. SYNTHESIS INCORPORATING CONCEPTS OF HEALTH.** (3 cr for 10 wks; prereq 5611 or 5612 or 5613)  
Contemporary and emerging dimensions of the role of nursing in planning and providing holistic health care to children, adults, and groups. Various ways in which human beings can enhance the experience of health.
- 5615. SYNTHESIS IN COMPLEX NURSING SITUATIONS.** (4 cr; prereq 5611, 5612, 5613, 5614)  
Synthesis of previous knowledge and skill areas for comprehensive and effective care of individuals and groups with various problems of health and deviations from health. Focus on cooperation and collaboration with others to achieve nursing goals.
- 5620. INDEPENDENT STUDY IN NURSING TOPICS.** (1-9 cr; prereq #)  
Learning experiences planned to meet individual student needs not satisfied by required courses.
- 5799. SELF-DIRECTED STUDY AS A MEANS OF ACCOMPLISHING NURSING ELECTIVES.** (1-10 cr; prereq two of the following: 5611, 5612, 5613, 5614; contract with faculty member)  
See First Term.
- 8003. HEALTH ASSESSMENT.** (5-6 cr; prereq 8100 or 8201 or 8310 or 8350 and #)  
Designed to prepare the nurse to systematically collect subjective and objective data for a nursing assessment. How to distinguish abnormal from normal findings; stresses normal health. Classroom and clinical experience in history-taking and physical assessment. Emphasis on the incorporation of assessment skills into the student's nursing framework.
- 8050. PROBLEMS IN NURSING.** (1-4 cr; prereq Δ)  
See First Term.
- 8060. ADVANCED CLINICAL NURSING.** (3-9 cr; prereq 8102 or 8103 or 8203 or 8302 and 8313 or 8302 and 8352) Staff  
See First Term.
- 8504. CURRICULUM DEVELOPMENT AND EVALUATION IN NURSING.** (4-6 cr; prereq completion of 1 qtr of an area of concentration. . . a course in educational measurement or ¶)  
Analysis of strategies for curriculum development and evaluation. Emphasis on higher education programs in nursing and the socialization process of the individual educator.

## SECOND TERM

- 5406. ADAPTATION II.** (1 cr; prereq Group Theory, 5207 or 15207)  
The significance of the nurse's intervention with groups. Adaptation theory is related to group theory.
- 5620. INDEPENDENT STUDY IN NURSING TOPICS.** (1-9 cr; prereq #)  
See Ten-Week Courses.
- 5799. SELF-DIRECTED STUDY AS A MEANS OF ACCOMPLISHING NURSING ELECTIVES.** (1-10 cr; prereq two of the following: 5611, 5612, 5613, 5614; contract with faculty member)  
See First Term.
- 5999. CLINICAL STUDY.** (1 cr; contract with faculty member)  
See First Term.
- 8050. PROBLEMS IN NURSING.** (1-4 cr; prereq Δ) Staff  
See First Term.
- 8051. SPECIAL TOPICS IN NURSING RESEARCH.** (1-9 cr)  
See First Term.
- 8060. ADVANCED CLINICAL NURSING.** (3-9 cr; prereq 8102 or 8103 or 8203 or 8302 and 8313 or 8302 and 8352)  
Staff  
See First Term.
- 8203. PSYCHIATRIC NURSING—COMMUNITY.** (4 cr; prereq 8202)  
See First Term.

## COLLEGE OF PHARMACY

### Pharmacy (Phar)

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 0295. PHARMACY EXTERNSHIP.** (No cr; prereq 3rd-yr pharmacy student; 40 hrs per wk for 3 months)  
Supervised and evaluated practical experience under college coordinated field preceptors.
- 5265. DRUGS AND THE ELDERLY.** (2 cr for 10 wks; prereq #)  
Psychological, sociological, physiological/pharmacological, and economic aspects of aging and drug utilization among the elderly.
- 5266. DRUGS AND THE ELDERLY WORKSHOP.** (1-3 cr for 10 wks; prereq 5265 and #)  
Seminar/discussion/workshop sessions on specific drug problems, communication skills with the elderly, and problem solving techniques. Clinical experiences include home visitations to individuals identified as having drug problems and presentations to senior citizens groups on a variety of drug-related subjects.
- 5270. CLINICAL CLERKSHIP.** (4 cr for 10 wks)  
Supervised delivery of pharmaceutical services at University Hospitals or affiliated institutions, or other practice settings.
- 5281. OVER-THE-COUNTER PREPARATIONS.** (2 cr for 10 wks; prereq 3rd-yr pharmacy student)  
Evaluation of nonprescription medication and preparation of student for triage role in preventive medicine.
- 5291. HOSPITAL PHARMACY.** (2 cr for 10 wks; lect and hospital visitations)  
History, organization, and administration of pharmaceutical services in institutional settings.
- 5299. SPECIAL PROBLEMS.** (Cr ar; prereq #)
- 5301. CLINICAL THERAPEUTICS.** (3 cr for 10 wks; prereq 5350, Phcl 5102, or #)  
Clinical therapeutics of common disease entities.
- 5650. DISPENSING PHARMACY.** (3 cr for 10 wks; prereq 5640)  
Technology, record systems, interprofessional relationships, drug use control, etc., involved in dispensing prescription medicine.
- 5651. DISPENSING PHARMACY LABORATORY.** (2 cr for 10 wks; prereq 5650; S-N grading)
- 5670. BIOPHARMACEUTICS—DRUG INFORMATION EVALUATION.** (4 cr for 10 wks; prereq 5330, Phcl 5102, or #)  
Processes of drug absorption, distribution, metabolism, and excretion in vivo. Statistical methods and procedures for evaluation of current drug literature.
- 5970. DIRECTED STUDIES.** (Cr ar; prereq #)

## **SECOND TERM**

- 5696. PARENTERAL PRODUCTS.** (3 cr; prereq 5640, MicB 3103 or #)  
Principles and procedures involved in manufacture of parenteral products.

# **SCHOOL OF PUBLIC HEALTH**

## **Public Health (PubH)**

Courses with limited enrollment must be reserved in 1360 Mayo unless otherwise indicated (see instructions under "Reserved Courses").

### **FIRST TERM**

- 3001. PERSONAL AND COMMUNITY HEALTH.** (3 cr, §3004; meets with 3004, 3033; limited enrollment, reserved in JohH 12; III-IV MTWThF; HSUnitA 2-690) Rothenberger  
Fundamental principles of health conservation and disease prevention.
- 3004. BASIC CONCEPTS IN PERSONAL AND COMMUNITY HEALTH.** (4 cr, §3001, §3033; limited enrollment, reserved in JohH 12; III-IV MTWThF; HSUnitA 2-690) Rothenberger  
Introduction to scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, alcohol and drug problems; emphasis on role of education in health conservation, disease control, and drug abuse.
- 3033. FUNDAMENTALS OF ALCOHOL AND DRUG ABUSE—June 14-24.** (2 cr, §3004; meets with 3001, 3004; limited enrollment; III-IV MTWThF; HSUnitA 2-690) Snowden  
Lecture, discussion, and readings on the scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasis on the incidence, prevalence, high risk populations, prevention, and intervention.
- 3600. HUMAN NUTRITION.** (3 cr; prereq courses in chemistry and biology or #) Brown, staff  
Principles of nutrition, application to individual and family eating patterns, nutritional aspects of selected community problems or programs.
- 5005. TOPICS IN PUBLIC HEALTH.** (Cr ar; limited to 20 students; prereq advance proposal and #) Staff  
Individualized, directed instruction. Selected readings in public health with discussion based on these readings.
- 5006. INTRODUCTION TO COMMUNITY HEALTH.** (5 cr, §Nurs 5625; prereq # or nursing students, nurses, public health students, other health professionals; I-II MTWThF; Owre 15) Rothenberger, Schwanke  
Lectures, discussions, seminars, individualized readings on critical and current issues in community health, emphasizing public health programs and controversies.
- 5007. HEALTH LEADERSHIP AND EFFECTING CHANGE.** (4 cr, §HSU 5007; limited to 20 students; 4:00-6:00 MW; HSUnitA 2-548) Sloan, staff  
Leadership qualities and their effect on organizational behavior. Various theories of change and their practical application to the field of health. The changing role of the health professional.
- 5040. DEATH EDUCATION IN CONTEMPORARY SOCIETY—June 14-July 1.** (3 cr, §Hlth 5402, §Mort 5040; limited to 80 students; prereq education sr, certified tchr, school nurse, mortuary science major, or #; 1:30-4:00 MTWThF; HSUnitA 2-520) Fredlund, Lindgren, Slater  
Basic background information on concepts and attitudes toward death, grief, and bereavement, with emphasis on instructional aspects for the elementary and secondary schools and the role of the school in suicide prevention.
- 5061/5062. COMMUNITY HEALTH EDUCATION LABORATORY.** (total of 4 cr for 5061 and 5062...students must register for both courses this term; prereq 5054, 5055, 5056; 20 hrs per wk) Craig, Mills  
Review of the procedures and techniques utilized in collecting health education data; visitation to major health centers in the metropolitan area and discussion of the goals and organization of each; identification and discussion of representative health education programs and opportunities in the metropolitan area.
- 5083. PATIENT EDUCATION IN REPRESENTATIVE HEALTH CARE SETTINGS.** (3 cr; prereq #) Craig, Mills, Veniga  
Current theories, principles, methods, procedures, and techniques applicable to patient education in a variety of health care settings; i.e., hospitals, health maintenance organizations, clinics, and health agency services. Planning, implementation, and evaluation of patient education.
- 5575. TOPICS: PUBLIC HEALTH NURSING.** (Cr ar; each section limited to 25 students; prereq #) Staff  
Selected readings in public health nursing with discussion based on these readings.

### **Sec 1, Critical Issues Affecting the Nursing Curriculum**

Societal needs, critical issues in education and health and their influence on the curriculum development process.

### **Sec 2, Faculty Peer Review**

Current methods for utilization of peer review in faculty development and evaluation.

- 5600. FIELD EXPERIENCE IN PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #) Brown, staff  
Placement in an approved agency with opportunity for experience in nutritional aspects of public health programs.
- 5601. SEMINAR: PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #) Brown
- 5609. TOPICS: PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #) Brown
- 5610. PRINCIPLES AND ISSUES IN MATERNAL AND CHILD HEALTH.** (3 cr; I-II TTh; HSUnitA 2-690) ten Bensel  
Current issues related to the health needs of families, mothers, and children with emphasis on the principles of primary care, health maintenance, preventive care, organization, and evaluation.
- 5614. FIELD EXPERIENCE IN MATERNAL AND CHILD HEALTH.** (Cr ar; prereq 5610, 5611 or #) ten Bensel, staff  
Field experiences are selected by the student to meet his or her career goals.
- 5649. TOPICS: MATERNAL AND CHILD HEALTH.** (Cr ar; prereq #) ten Bensel, staff  
Selected readings in maternal and child health with discussion based on these readings.
- 5654. TOPICS: DENTAL PUBLIC HEALTH.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 5657. INDEPENDENT STUDY IN DENTAL PUBLIC HEALTH.** (Cr ar; prereq #) Block, staff  
Independent study, under tutorial guidance, of selected problems and current issues in the field of dental health and dental health services.
- 5660. FIELD EXPERIENCE: DENTAL PUBLIC HEALTH.** (Cr ar; prereq 5701)  
Supervised field experience in selected community or public health agencies and institutions.
- 5702. PUBLIC HEALTH ADMINISTRATION CLERKSHIP.** (Cr ar; prereq 5701)  
Assignment to State Health Department or other health agency for supervised work on a project of limited scope and preparation of a formal report.
- 5704. FIELD EXPERIENCE: PUBLIC HEALTH ADMINISTRATION.** (Cr ar; prereq #) Block  
Supervised field experience at a management level in selected community or public health agencies and institutions.
- 5749. TOPICS: PUBLIC HEALTH ADMINISTRATION.** (Cr ar; prereq #) Block  
Selected readings with discussion based on these readings.
- 8510. DIRECTED RESEARCH: PUBLIC HEALTH NURSING.** (Cr ar; prereq 5510) Staff  
Guided study in research designs.
- 8511. DIRECTED RESEARCH: PUBLIC HEALTH NURSING.** (3 cr; prereq 5510, 8510) Staff  
Guided study in research designs.

## **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

- 5004. FIELD INSTRUCTION IN PUBLIC HEALTH.** (10 cr for 10 wks; limited to 30 students; prereq grad student in public health, social work, or other health or helping field, 5008 offered spring 1977, and #; 20-30 hrs per wk) Cohn, Anderson, Schwanke, Hooymann  
Generalized, function-oriented or discipline-oriented community experience under academic and professional supervision. Emphasis on application of acquired knowledge and skills to relevant health issues and problems. This offering: Interdisciplinary Team Building. A team field project involving the application of team skills to improve the outcome of selected public health projects. Development of skills such as resource sharing and utilization, verbal and nonverbal communications, giving and receiving feedback, leadership roles and styles, negotiations, decision making and problem solving, conflict utilization, and process intervention. See Special Programs section.
- 5585. PUBLIC HEALTH NURSING.** (6 cr for 10 wks; prereq current RN licensure and #) Cross, staff  
Designed for nurses with a baccalaureate degree who are interested in public health nursing certification and others interested in gaining theoretical knowledge and clinical skills in community health nursing.

## **SECOND TERM**

- 5005. TOPICS IN PUBLIC HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5032. EDUCATIONAL ASPECTS OF DRUG USE AND ABUSE—July 25-August 5.** (3 cr, §H1th 5400; limited to 50 students; prereq education sr, certified tchr, school nurse or #; 9:00-1200 MTWThF; HSUnitA 2-520) Rothenberger, Cobb  
Basic background information on alcohol and other drugs and chemicals with emphasis on curriculum concepts, teaching methodology, materials, and referral procedures appropriate for elementary, junior, and senior high schools.



- 5300. COMPARATIVE MEDICINE AND PUBLIC HEALTH.** (2 cr; limited to 14 students; VI-VII TTh; HSUnitA 2-542) Survey of comparative medicine in man's relationship to the biologic environment, interrelationship between animal and human health, source of animal diseases, ecology of zoonoses; food production and hygiene; laboratory animal medicine.
- 5575. TOPICS: PUBLIC HEALTH NURSING.** (Cr ar; prereq #)  
Selected readings in public health nursing with discussion based on these readings.
- 5600. FIELD COURSE IN PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #)  
See First Term.
- 5601. SEMINAR: PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #) Brown
- 5609. TOPICS: PUBLIC HEALTH NUTRITION.** (Cr ar; prereq #) Brown
- 5654. TOPICS: DENTAL PUBLIC HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5657. INDEPENDENT STUDY IN DENTAL PUBLIC HEALTH.** (Cr ar; prereq #) Block, staff  
See First Term.
- 5660. FIELD EXPERIENCE: DENTAL PUBLIC HEALTH.** (Cr ar; prereq #) Block, staff  
See First Term.
- 5702. PUBLIC HEALTH ADMINISTRATION CLERKSHIP.** (Cr ar; prereq 5701)  
See First Term.
- 5704. FIELD EXPERIENCE: PUBLIC HEALTH ADMINISTRATION.** (Cr ar; prereq #) Block  
See First Term.
- 5749. TOPICS: PUBLIC HEALTH ADMINISTRATION.** (Cr ar; prereq #) Block  
See First Term.
- 8002. FIELD OBSERVATION OF SELECTED PUBLIC HEALTH PRACTICES.** (Cr ar; limited to 20 students; prereq #) Staff
- 8510. DIRECTED RESEARCH: PUBLIC HEALTH NURSING.** (Cr ar; prereq 5510) Staff  
See First Term.
- 8511. DIRECTED RESEARCH: PUBLIC HEALTH NURSING.** (Cr ar; prereq 5510, 8510) Staff  
See First Term.

## Biometry (PubH)

### FIRST TERM

- 5400. INTRODUCTION TO QUANTITATIVE METHODS IN THE HEALTH AND LIFE SCIENCES.** (4 cr; for students majoring in the biological and health sciences; prereq Biol 1011, Chem 1005, Math 1231, #; I MTWThF; HSUnitA 2-533) McHugh  
Basic quantitative methods for the design and analysis of clinical and laboratory studies in biology and the health sciences.
- 5403. COMPUTER APPLICATIONS IN HEALTH SERVICES ADMINISTRATION.** (4 cr; prereq non-biometry major, health science regis or #) Gatewood  
Survey of current applications of digital computers for health services, clinical algorithms, and health-related information systems. Costs, benefits, and interrelationships between data acquisition, reduction, storage, interpretation, and dissemination for health services. Administrative needs for planning, personnel, backup, and evaluation stressed. Applications illustrated through the use of BASIC computing language and package computer programs.
- 5456. BIOMETRY CONSULTING SEMINAR.** (Cr ar; prereq biometry major; II MTWThF; HSUnitA 2-146) Boen, staff  
Consultant and consultee interaction; communication and formulation of the biometric problem. Role and responsibility of the biometrician. Robustness and relevance of frequently used analytical techniques. Internship experiences.
- 5470. TOPICS IN BIOMETRY.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 8400. SEMINAR IN BIOMETRY.** (Cr ar) Staff
- 8449. TOPICS IN BIOMETRY.** (Cr ar; prereq 5450 and #) Staff  
Studies in special topics for advanced students.
- 8450. RESEARCH IN BIOMETRY.** (Cr ar) Staff  
Opportunities for qualified students to pursue research work.

## SECOND TERM

- 5456. BIOMETRY CONSULTING SEMINAR.** (Cr ar; prereq biometry major) Boen, staff  
See First Term.
- 5470. TOPICS IN BIOMETRY.** (Cr ar; prereq #) Staff  
See First Term.
- 8400. SEMINAR IN BIOMETRY.** (Cr ar) Staff
- 8449. TOPICS IN BIOMETRY.** (Cr ar; prereq 5450 and #) Staff  
See First Term.
- 8450. RESEARCH IN BIOMETRY.** (Cr ar) Staff  
See First Term.

## **Environmental Health (PubH)**

### FIRST TERM

- 5150. TOPICS IN ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Staff  
Selected readings with discussions of problems.
- 5170. TOPICS IN ENVIRONMENTAL BIOLOGY.** (Cr ar; prereq #) Staff  
Selected readings with discussion of control techniques.
- 5180. TOPICS IN AIR POLLUTION.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 5183. PROBLEMS OF AIR POLLUTION CONTROL.** (Cr ar; prereq 5181, #) Paulus  
Special supervised studies involving laboratory and field investigation procedures; review of pertinent literature.
- 5200. TOPICS IN RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 5210. TOPICS IN OCCUPATIONAL HEALTH.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 5220. TOPICS IN FOOD SANITATION.** (Cr ar; prereq #) Staff  
Review of literature and practice to identify association of food sanitation problems to public health.
- 5230. TOPICS IN INSTITUTIONAL ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Staff  
Review of literature and practice to identify institutional environmental health problems.
- 5240. TOPICS IN WATER HYGIENE.** (Cr ar; prereq #) Staff  
Selected readings and discussions of problems relating to the health aspects of water supply and waste water systems.
- 8150. RESEARCH: ENVIRONMENTAL HEALTH.** (Cr ar) Staff  
Opportunities for qualified students to pursue research in the importance to public health of environmental stresses on man.
- 8170. RESEARCH: ENVIRONMENTAL BIOLOGY.** (Cr ar; prereq #) Greene
- 8180. RESEARCH: AIR POLLUTION.** (Cr ar; prereq #) Paulus
- 8200. RESEARCH: RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Barber
- 8208. FIELD PRACTICE IN RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Barber
- 8210. RESEARCH: OCCUPATIONAL HEALTH.** (Cr ar; prereq #) Caplan
- 8220. RESEARCH: FOOD SANITATION.** (Cr ar; prereq #) Pflug
- 8230. RESEARCH: INSTITUTIONAL ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Greene
- 8240. RESEARCH: WATER HYGIENE.** (Cr ar; prereq #) Straub

### SECOND TERM

- 5150. TOPICS IN ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5170. TOPICS IN ENVIRONMENTAL BIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.

- 5180. TOPICS IN AIR POLLUTION.** (Cr ar; prereq #) Staff  
See First Term.
- 5183. PROBLEMS OF AIR POLLUTION CONTROL.** (Cr ar; prereq 5181, #) Paulus  
See First Term.
- 5200. TOPICS IN RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5210. TOPICS IN OCCUPATIONAL HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5220. TOPICS IN FOOD SANITATION.** (Cr ar; prereq #) Staff  
See First Term.
- 5230. TOPICS IN INSTITUTIONAL ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Staff  
See First Term.
- 5240. TOPICS IN WATER HYGIENE.** (Cr ar; prereq #) Staff  
See First Term.
- 8150. RESEARCH: ENVIRONMENTAL HEALTH.** (Cr ar) Staff  
See First Term.
- 8170. RESEARCH: ENVIRONMENTAL BIOLOGY.** (Cr ar; prereq #) Greene
- 8180. RESEARCH: AIR POLLUTION.** (Cr ar; prereq #) Paulus
- 8200. RESEARCH: RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Barber
- 8208. FIELD PRACTICE IN RADIOLOGICAL HEALTH.** (Cr ar; prereq #) Barber
- 8210. RESEARCH: OCCUPATIONAL HEALTH.** (Cr ar; prereq #) Caplan
- 8220. RESEARCH: FOOD SANITATION.** (Cr ar; prereq #) Pflug
- 8230. RESEARCH: INSTITUTIONAL ENVIRONMENTAL HEALTH.** (Cr ar; prereq #) Greene
- 8240. RESEARCH: WATER HYGIENE.** (Cr ar; prereq #) Straub

## Epidemiology (PubH)

*See the Special Programs section for a series of courses offered through Continuing Education and Extension.*

### FIRST TERM

- 5379. TOPICS IN EPIDEMIOLOGY.** (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.
- 8330. RESEARCH: EPIDEMIOLOGY.** (Cr ar) Staff  
Opportunities offered by the School of Public Health and various cooperating organizations for qualified students to pursue research work.

### SECOND TERM

- 5379. TOPICS IN EPIDEMIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.
- 8330. RESEARCH: EPIDEMIOLOGY.** (Cr ar) Staff  
See First Term.

## Hospital and Health Care Administration (PubH)

### FIRST TERM

- 5775. MANAGEMENT AND ORGANIZATION IN HOSPITAL AND HEALTH CARE FACILITIES.** (15 cr; prereq 1 yr experience as health care facility administrator and #) Weckwerth, staff  
A 12-month program of on-campus residential (3 weeks) and off-campus independent study that includes periodic seminars and monthly classes under program preceptors. Principles of management, executive role, hospital development and organization, functions of personnel, financial control, business office, and patient care services.

- 5776. ADMINISTRATIVE AND PROFESSIONAL RELATIONSHIPS WITHIN THE HEALTH CARE FACILITY.** (15 cr; prereq 5775 or #) Weckwerth, staff  
A 12-month program of on-campus residential (3 weeks) and off-campus independent study that includes periodic seminars and monthly classes under program preceptors. Board of trustees, medical staff, nursing, hospital law, medical records, planning, community health systems, continuing health education, change theory.
- 5778. PATIENT CARE MANAGEMENT AND ORGANIZATION WITHIN THE HOSPITAL AND HEALTH CARE ORGANIZATION.** (25 cr; prereq present employment as administrator of patient care [director of nursing or equiv] and #) Danielsen, Weckwerth, staff  
A 12-month program of on-campus residential sessions (3 weeks), independent study, monthly meetings with clinical preceptors, and one required seminar. Principles of management and organizational behavior, hospital development and organization, personnel management, administrative and professional relationships within the hospital, role of the patient care administrator, legal aspects, budget preparation, policy development, and continuing education.
- 5779. MANAGING MULTIPLE FORCES: INTERNAL AND EXTERNAL ASPECTS OF PATIENT CARE ADMINISTRATION.** (Cr ar; prereq present employment as administrator of patient care [director of nursing or equiv] and successful completion of 5778 and #) Weckwerth, Danielsen, Gordon, staff  
A 12-month program of on-campus (3 weeks) and independent study that begins with a 1-week introductory residential session each August. Initial phase of course includes seminars on planning, organizing and staffing, directing and controlling. Students return to campus the following summer to share the demonstration or research project they have prepared.
- 5792. LEGAL ISSUES IN HEALTH CARE ADMINISTRATION.** (3 cr; prereq #) Holloway  
Law and legal liability associated with hospitals and other health care organizations.
- 5793. HOSPITAL FINANCIAL STATEMENT ANALYSIS.** (3 cr; prereq 5764, 5791) Oszustowicz  
Case studies and readings involving review and analysis of actual hospital financial statements, third-party payer cost reports, and other financial documents. Students apply key financial ratios to financial statement analysis to test their ability to apply course material presented in the winter and spring quarters and to become familiar with basic financial documents.
- 5794. FINANCIAL MANAGEMENT SEMINARS.** (3 cr; prereq 5764, 5791) Oszustowicz  
Major financial management topics presented by outside experts in the fields of public accounting, investment banking, lease financing, insurance counseling, hospital-based physician financial negotiation, rate setting/rate review negotiation, etc., for class analysis and practical application. Representatives from government and third-party payers will discuss the impact of legislation and regulation on health care financial management.
- 5796. INTERNAL OPERATIONS OF A MENTAL HEALTH FACILITY.** (15 cr; prereq 1 yr experience as mental health facility administrator and #) Malban, staff  
A 12-month program of on-campus residential (2 weeks) and off-campus independent study that includes periodic seminars and monthly classes under program preceptors. Principles of management, organizational behavior, personnel, problem solving and decision making, financial management, mental health professionals and paraprofessionals, and mental health programs and services.
- 5797. EXTERNAL RELATIONSHIPS AFFECTING THE ROLE AND FUNCTION OF THE MENTAL HEALTH FACILITY.** (15 cr; prereq 5796) Malban, staff  
A 12-month program of on-campus residential (2 weeks) and off-campus independent study that includes periodic seminars and monthly classes under program preceptors. Governance, legal aspects, public education and information, evaluation of mental health programs, prevention and primary treatment in mental health, current trends and concepts, biostatistics and quantitative methods.
- 5798. SOCIAL, POLITICAL, ECONOMIC, AND GOVERNMENTAL FORCES AFFECTING THE ROLE AND SERVICES OF THE MENTAL HEALTH FACILITY.** (25 cr; prereq 5797 or practicing administrator holding and advanced degree with 3 yrs experience and #) Malban, staff  
A 12-month program of on-campus residential (2 weeks) and off-campus independent study that includes periodic seminars and monthly classes under program preceptors. Completion of demonstration and research projects. Mental health; community, regional, state, and national planning; legislation; affirmative action; consumerism and citizen participation; economics of mental health; political and social issues.
- 5799. MENTAL HEALTH ADMINISTRATION SEMINAR.** (2 cr; restricted to and required of students enrolled in mental health administration training) Peterson  
Readings, group discussion, debate and presentation of current issues in the mental health field. Field trips. Follow-up to the A. K. Rice Institute experience.
- 8796. TOPICS IN HEALTH ECONOMICS.** (3 cr; prereq one economics course and #) Dahl  
General principles of health economics are applied to current issues in health such as insurance, licensure, family practice, malpractice, and hospital costs. Models of hospital functioning, area planning, time management, and disease intervention are presented within the framework of economic analysis and used to explain and predict health behavior. Concepts of cost benefit and cost effectiveness analysis and their application to problems in health care delivery.

## **SECOND TERM**

- 5752. CLERKSHIP.** (4 cr; prereq enrollment in 5755) Bieter, staff, clinical preceptors  
Survey and solution of management problem and preparation of formal report with an administrative residency organization.
- 5755.\*\* ADMINISTRATIVE RESIDENCY.** (Cr ar; prereq #) Dornblaser, staff, clinical preceptors  
Eleven months of fieldwork in an approved health care planning or operating organization, weighted rotation through departments, solution of management problems, and special projects. Preparation of formal report.
- 5777. EXTERNAL FORCES AFFECTING HEALTH CARE DELIVERY.** (25 cr; prereq 5776 or #) Weckwerth, staff  
A 10-month program of on-campus residential (3 weeks) and off-campus study that includes three regional seminars covering financing, manpower, organizing, social policy, and project planning and design. Requires a project that can be either a management study or a research thesis. Each student must verbally present and defend the project in symposium at end of course.



# College of Home Economics

Undergraduate and graduate majors in the various fields of the College of Home Economics will find a variety of courses offered by the departments of Design, Family Social Science, Food Science and Nutrition, and Textiles and Clothing as well as by the Center for Youth Development and Research. Many of the courses will interest secondary school home economics teachers for certification purposes. Further information may be obtained by writing Gertrude Strinden, College of Home Economics, University of Minnesota, St. Paul, Minnesota 55108. (See also Home Economics Education and Vocational and Technical Education under the College of Education.)

## Design (Dsgn)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1521. COLOR AND DESIGN.** (4 cr; limited to 24 students; \$4 lab fee; I-III MTWThF; McNH B3)  
Color concepts and their applications to design.
- 3531. SURFACE FABRIC DESIGN II—July 5-15.** (3 cr; limited to 12 students; prereq 1521, 1523, 1531 or #; \$4 lab fee; I-IV MTWThF and ar; McNH B9) Abell  
Selection from printed and dyed techniques.
- 5531. SURFACE FABRIC DESIGN III—July 5-15.** (3 cr; limited to 12 students; prereq 3531 and portfolio review; \$4 lab fee; I-IV MTWThF and ar; McNH B9) Abell  
Designing in one special surface textile technique. Studio problems. Readings.
- 5532. STRUCTURE FABRIC DESIGN III—June 13-17.** (2 cr; limited to 12 students; prereq 3532 and portfolio review; \$4 lab fee; I-IV MTWThF and ar; McNH 16) Burningham  
Designing in one special structural textile technique—floor loom weaving and/or off-loom fiber techniques. Readings.
- 5556. ENVIRONMENTAL STUDIES IN INTERIOR DESIGN—June 20-24.** (2 cr; limited to 24 students; prereq 6 cr in housing, home furnishings, interior design, or equiv; \$4 lab fee; I-IV MTWThF and ar; McNH 233/333) Esteros, Ginthner  
Space, color, light, and arrangements in interiors; work in specially designed laboratories. Review of current research.
- 5584. READINGS IN DESIGN** (1-3 cr; not open to srs; prereq #; hrs ar) Esteros  
Independent study and review of books and periodicals. Written reports.
- 5585. PROBLEMS IN DESIGN: GENERAL.** (1-3 cr; prereq #; hr ar) Esteros  
Independent study under tutorial guidance.
- 5586. PROBLEMS: HOUSING AND/OR INTERIOR DESIGN: Planning and Furnishing Interior Spaces—June 27-July 8.** (2 cr; limited to 24 students; prereq #; \$4 lab fee; I-IV MTWThF and ar; McNH 233/333) Nagle
- 8586-8587. PROBLEMS: DESIGN.** (1-5 cr per term; prereq #; hrs ar) Esteros

### SECOND TERM

- 5533. METALSMITHING: COMBINED TECHNIQUES—August 1-5.** (2 cr; limited to 18 students; prereq 1533 or equiv, by permission only; materials fee required; II-VIII MTWThF and ar; McNH 10) Harper  
Combined cast and fabrication techniques to create jewelry and other useful objects.

## Family Social Science (FSoS)

Courses with limited enrollment must be reserved in 130 Coffey Hall or 12 Johnston Hall unless otherwise indicated (see instructions under "Reserved Courses").

### FIRST TERM

- 1001. DYNAMICS OF DATING, COURTSHIP, AND MARRIAGE.** (3 cr, §1002; limited enrollment; II MTWThF; BlegH 260)  
Application of principles from behavioral sciences to dating, courtship, mate selection, engagement, mixed marriages, roles of men and women, interaction of marital spouses, and marital stability.
- 1025. PARENTHOOD.** (4 cr; limited enrollment; III MTWThF; BlegH 335)  
Differing concepts of family roles—father, mother, son, daughter, sister, brother. Implications for parent-child and sibling interaction. Effects of parenthood on husband-wife relations.
- 5001. HUMAN SEXUAL BEHAVIOR.** (4 cr; limited enrollment; prereq 15 cr in psychology or sociology; III MTWThF; AndH 310)  
Nature of sexual functions, sexual development, ethics and attitudes, research problems.
- 5202. INTRODUCTION TO SOCIAL PSYCHOLOGY WITH APPLICATIONS TO THE FAMILY—June 14-24.** (3 cr, §Psy 5201, § Soc 5201, § PsyF 5170; prereq Psy 1001 and introductory sociology or #: II-IV MTWThF; ClaOff 31) Olson  
Introduction to social psychology with applications to courtship, marriage, and the family. Social interaction, communication, social effects on individual functioning, family as small group, social influence, social ecology, person perception, social motivation, interpersonal attraction, and other topics.
- 5230. INDEPENDENT STUDY.** (Cr ar [max 4 cr]) Gage, Hey, Olson
- 5260. PRINCIPLES OF MANAGEMENT—July 5-15.** (3 cr; prereq AgEc 1030; II-IV MTWThF; ClaOff B25) Hogan  
Development of a theoretical systems framework for analysis of behavior in families with emphasis on managerial aspects of behavior; goal setting, planning, and implementing in use of resources.
- 8251. PROBLEMS: FAMILY SOCIAL SCIENCE.** (1-5 cr; prereq #: hrs ar) Hey, Olson
- 8252. PROBLEMS: FAMILY SOCIAL SCIENCE.** (4 cr; prereq #: hrs ar) Hey, Olson

### SECOND TERM

- 5025. PARENTING.** (4 cr; limited enrollment; prereq 1025, 5200 or 5202; IV MTWThF; ClaOff B25) Fowler  
Parenting methods, focusing on child development from infancy through adolescence. Students identify parenting techniques, develop their own parenting approach, and conduct parenting classes.
- 5230. INDEPENDENT STUDY.** (Cr ar [max 4 cr]) Gage, Hey, Olson
- 5240. SPECIAL TOPICS IN FAMILY SOCIAL SCIENCE: Consumer Education—July 18-29.** (2-6 cr per qtr [max 16 cr]; limited enrollment; prereq set by instructor for each topic; VI-VIII MTWThF; ClaOff B25) Gage
- 8251. PROBLEMS: FAMILY SOCIAL SCIENCE.** (1-5 cr; prereq #: hrs ar) Hey, Olson
- 8252. PROBLEMS: FAMILY SOCIAL SCIENCE.** (4 cr; prereq #: hrs ar) Hey, Olson

## Food Science and Nutrition (FScN)

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1602. PRINCIPLES OF NUTRITION.** (4 cr; limited to 25 students; prereq one course in biology and one course in chemistry or equiv in natural science sequence; \$4 lab fee; I-II MWF, II TTh; FScN 15)  
Survey of fundamental principles of nutrition including requirements for various nutrients and results of excess or deficient intake of these nutrients.
- 3472. PRINCIPLES OF FOOD PURCHASING.** (4 cr; limited to 25 students; prereq 5 cr in food science and nutrition; \$4 lab fee; III-IV M, IV TWThF, 2 hrs ar; McNH 146) Trammell  
Principles of purchasing basic groups of foods. Relative cost of key nutrients from alternate items within the food group. Food prices and indices of change. Laws and regulations pertinent to the labeling of food. Food standards and grades. Functional role of food additives.

- 3720. ADMINISTRATIVE EXPERIENCE: HOSPITALITY OR FOOD SERVICE ENTERPRISE.** (5 cr; prereq 3750, sr in hospitality and food service management or #; hrs ar) Staff  
Planned management experience in a selected food service or hospitality business, including understanding of the operation, planning, purchasing, personnel management, financial management, supervision, and related functions.
- 5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (1-5 cr [may be repeated for cr]; prereq Δ; \$4 lab fee; hrs ar) Staff  
Individual laboratory or library research in some area related to food chemistry, food processing, nutrition, food service, or hospitality management.
- 5321. INDEPENDENT STUDY IN FOOD MICROBIOLOGY.** (1-5 cr; prereq sr, Δ; \$4 lab fee; hrs ar) Busta  
Laboratory or library research on problems related to the microbiology of dairy and food products.
- 5790. QUANTITY FOOD PREPARATION PRACTICES—June 13-24.** (3 cr; limited to 16 students; prereq baccalaureate degree and current or impending affiliation with occupational food program in a secondary school; \$4 lab fee; 8:00-12:00 MTWThF; DinC 152) Billings  
Storage, preparation, service, and pricing of selected menu items. Students investigate and seek solutions to problems related to quantity food service. Opportunity to integrate lectures, laboratory experiences, and independent study with instructional programs in occupational foods.
- 8401. INDEPENDENT STUDY: FOOD SCIENCE.** (1-5 cr; prereq Δ; hrs ar) Morris, staff  
Independent study and written reports.
- 8621. INDEPENDENT STUDY: NUTRITION.** (1-9 cr; prereq Δ; hrs ar) Morse, staff  
Independent study and written reports.

## **SECOND TERM**

- 3720. ADMINISTRATIVE EXPERIENCE: HOSPITALITY OR FOOD SERVICE ENTERPRISE.** (5 cr; prereq 3750, sr in hospitality and food service management or #; hrs ar) Staff  
See First Term.
- 5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (1-5 cr [may be repeated for cr]; prereq Δ; \$4 lab fee; hrs ar) Staff  
See First Term.
- 5321. INDEPENDENT STUDY IN FOOD MICROBIOLOGY.** (1-5 cr; prereq sr, Δ; \$4 lab fee; hrs ar) Busta  
See First Term.
- 5404. CURRENT ISSUES IN FOOD AND NUTRITION—August 1-12.** (3 cr; limited to 25 students; prereq 15 cr in food science and nutrition or #; \$4 lab fee; 9:00-11:30 MTWThF; FScN 15) Levine  
Evaluation of popular and scientific literature as it deals with nutrition, food additives, food safety, food fads, health foods, environmental contamination, the consumer movement, naturally occurring food toxicants, processed foods, synthetic foods, organically grown foods.
- 8401. INDEPENDENT STUDY: FOOD SCIENCE.** (1-5 cr; prereq Δ; hrs ar) Morris, staff  
See First Term.
- 8621. INDEPENDENT STUDY: NUTRITION.** (1-9 cr; prereq Δ; hrs ar) Morse, staff  
See First Term.

## **Textiles and Clothing (TexC)**

Courses with limited enrollment must be reserved in 130 Coffey Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

- 1601. BASIC CLOTHING CONSTRUCTION.** (2 cr; limited to 20 students; prereq ¶1602; \$4 lab fee; IV-V MTWThF; McNH 470) Berg  
Basic principles and techniques for creating clothing.
- 1602. PATTERN FITTING AND ALTERATION.** (2 cr; limited to 20 students; prereq ¶1601; \$4 lab fee; IV-V MTWThF; McNH 470) Gazzuolo  
Analysis of figure problems; alteration of commercial patterns to adjust to any figure problem. Development of individual patterns from commercial basic patterns.
- 3621. TEXTILES.** (5 cr; limited to 28 students; prereq soph, Chem 1002 or 1005, or NSci 1005, or #; \$4 lab fee; lect II MTWThF, III F, lab III-IV MTWTh, 2 hrs ar; McNH 322) Franzen  
Basic physical, chemical, and biological characteristics of fiber, yarn, and fabric structures; interrelationship with choice, maintenance, and performance of consumer textiles.



- 5680. SPECIAL TOPICS IN TEXTILES AND CLOTHING—June 13-17.** (3 cr; limited to 20 students; prereq Δ; \$4 lab fee; 9:00-12:00, 1:00-4:00 MTWThF; McNH 340) Kajitani  
This offering: Textile Conservation. Review of research and methodology in organized group sessions. Problem identification; preparation of textiles for treatment; dry and wet cleaning; stain removal; other restoratives; storage systems.

## **SECOND TERM**

- 5600. ADVANCED APPAREL DESIGN AND CONSTRUCTION PROBLEMS.** (3 cr [may be repeated for max 12 cr]; limited to 20 students; prereq 3621, #; \$4 lab fee; IV-V MTWThF; McNH 470) Nemecek  
Analytical study and construction of advanced apparel design utilizing flat pattern techniques. Relating the latest technological developments in textiles to garment design.
- 5628. CHARACTERIZATION OF YARNS AND WOVEN FABRICS—July 18-23.** (3 cr; limited to 25 students; prereq 3621; \$4 lab fee; 8:00-11:30, 1:30-4:45 MTWThFS; McNH 330) Ball  
Techniques of dimensional and structural characterization of yarns and woven fabrics; the relationship of these characteristics to performance of such fabrics in textile products.
- 8625. PROBLEMS: TEXTILES AND CLOTHING.** (3-9 cr [max 9 cr]; prereq #; hrs ar) Johnson  
Independent study in the physical behavioral aspects of textiles and/or clothing.

# **Center for Youth Development and Research (YoSt)**

## **FIRST TERM**

- 5120. INDEPENDENT STUDY IN YOUTH STUDIES.** (Cr ar [max 12 cr per qtr]; prereq #; hrs ar) Seltzer, staff  
Independent reading and/or research under faculty supervision.

## **SECOND TERM**

- 5120. INDEPENDENT STUDY IN YOUTH STUDIES.** (Cr ar [max 12 cr per qtr]; prereq #; hrs ar) Seltzer, staff  
See First Term.



# College of Liberal Arts

College of Liberal Arts courses seek primarily to provide knowledge and understanding of the world and of the social and intellectual problems of modern life, through exploration of both historical and contemporary subject matter. Although many courses are designed for specialized or professional interests, almost all contribute to general education. Courses are open not only to CLA degree candidates but also to students enrolled in other colleges inside and outside of the University. They serve students enrolled for a variety of purposes: progress toward graduate or undergraduate degrees, personal or professional enrichment, advancement of scholastic records, and many others.

CLA summer courses offer a wide selection from the regular curriculum. In addition, many courses from business, medical, scientific, agricultural, and other divisions of the University are open to CLA summer students who have completed the necessary prerequisites.

Admission to the summer session is described in an early section of this bulletin. Information about costs, housing, and recreational opportunities may be found in this bulletin and in the *General Information Bulletin*. Summer session registration does not of itself constitute admission to CLA or to the Graduate School; students working toward degrees or wishing to attend during the regular academic year must file standard admission applications.

Students should be aware that credit, cancel-add, and other procedures in summer sometimes differ from those of the regular year. Problems or questions may be brought to the CLA summer session advising office, 30 Johnston Hall.

## Afro-American Studies (Afro)

### FIRST TERM

**1025. BLACK AMERICANS: SOCIALIZATION, PERSONALITY, AND BEHAVIOR.** (4 cr; III-IV MTWTh; BlegH 255)

Taborn

Development of the black psyche and of the black person and black culture.

**3970. DIRECTED STUDIES.** (1-15 cr; prereq #) Staff

**5970. DIRECTED STUDIES.** (1-6 cr; qualified sr and grad students may register with # for work on tutorial basis)

Staff

### SECOND TERM

**3021. AN INTRODUCTION TO AFRICAN STUDIES.** (4 cr; III-IV MTWTh; BlegH 255) Pike

Diverse elements of the African studies curriculum, in content and methodology. Historical perspective and material content.

**3062. THE BLACK FAMILY.** (4 cr; prereq 1442 or Hist 3865 or #: V-VI MTWTh; BlegH 255) Tucker

The contemporary black family.

**3970. DIRECTED STUDIES.** (1-15 cr; prereq #) Staff

**5970. DIRECTED STUDIES.** (1-6 cr; qualified sr and grad students may register with # for work on tutorial basis)

Staff

## American Indian Studies (Amin)

### FIRST TERM

3311. **THE AMERICAN INDIAN POPULATION IN THE UNITED STATES** (4 cr; II MTWThF; BlegH 235) Thornton  
The numbers, spatial distribution, and basic characteristics of the Indian nations, tribes, bands, and groups within the United States.
5215. **AMERICAN INDIAN TRADITIONAL DANCE.** (4 cr; prereq #: V MTWThF; RarigC 616) Wapp  
Various traditional dances of native North Americans. History, step patterns, and songs of selected American Indian dances.

### SECOND TERM

5960. **INDIANS OF THE SOUTHWEST.** (4 cr; III MTWThF; BlegH 430) Dunnigan  
Relationships between Indians and other ethnic groups in the southwestern United States and northwest Mexico from an ethnohistorical perspective.

## American Studies (AmSt)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

1102. **AMERICAN LIFE II.** (4 cr; limited to 49 students; I MTWThF; Lind H 215) Abel  
Religious and philosophic attitudes in relation to American civilization.
3970. **DIRECTED STUDIES.** (1-15 cr; prereq #, Δ) Staff
8970. **INDEPENDENT READINGS IN AMERICAN CIVILIZATION.** (Cr and hrs ar; prereq consent of program chair) Staff

### SECOND TERM

1101. **AMERICAN LIFE I.** (4 cr; limited to 49 students; I MTWThF; LindH 215) Masteller  
Individualism in American life and thought.
3970. **DIRECTED STUDIES.** (1-15 cr; prereq #, Δ) Staff
8970. **INDEPENDENT READINGS IN AMERICAN CIVILIZATION.** (Cr and hrs ar; prereq consent of program chair) Staff

## Ancient Near Eastern and Jewish Studies—See Near and Middle Eastern Studies

## Anthropology (Anth)

### FIRST TERM

1102. **INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY.** (5 cr; lect II MTWTh; Ph 133) Preil-Feldes  
Varieties and range of human behavior as revealed through comparative study of cultures in all parts of the world.  
Sec 1, IV TTh, Ph 133  
Sec 2, IV MW, Ph 133
3131. **RELIGION AND CULTURE.** (5 cr [no cr for majors]; prereq 1102 or #: III MTWThF; ForH 115) Ogan  
Comparative study of religion in its cultural contexts.
3970. **DIRECTED STUDIES.** (Cr and hrs ar; prereq #) Staff

- 5141. CULTURE AND PERSONALITY.** (5 cr; prereq 1102 or # [waived for majors in public health, nursing, psychology, sociology, and social work]; III MTWThF; ForH 155) Sarles  
Role of culture in formation of personality. Problems of individual adjustments to demands of culture. Psychological approach to culture.
- 5151. CULTURAL CHANGE AND DEVELOPMENT.** (5 cr; prereq 1102 or #; II MTWThF; ForH 115) Miller  
Processes of cultural change; invention, diffusion, and acculturation. Effects of colonialism, urbanization, and modernization. Analysis of developing societies. Applied anthropology.
- 8508. ADVANCED FIELD TECHNIQUES IN ARCHAEOLOGY.** (Cr and hrs ar; prereq #) Staff
- 8950. ADVANCED RESEARCH.** (Cr and hrs ar; prereq grad, #) Staff

## **SECOND TERM**

- 1101. INTRODUCTION TO PREHISTORY.** (5 cr; lect II MTWThF; Ph 166) Gibbon  
World prehistory as investigated by archaeologists; methods and concepts employed by archaeologists in the study of prehistoric human biological and cultural development.  
Sec 1, II F, Arch 55
- 1102. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY.** (5 cr; III MTWThF; ForH 155) Kiste  
Varieties and range of human behavior as revealed through comparative study of cultures in all parts of the world.
- 3211. INDIANS OF NORTH AMERICA.** (5 cr; prereq 1102 or #; IV MTWThF; ForH 155) Spencer  
Aboriginal cultures of native North America. Effects of culture contact. Contemporary problems of Indian reservations and communities.
- 3970. DIRECTED STUDIES.** (Cr and hrs ar; prereq #) Staff
- 5153. URBAN ANTHROPOLOGY.** (5 cr; prereq 1102 or #; IV MTWThF; VH 113) Rowe  
Structure and process in non-Western urban centers; the role of rural migrants, relationship of urbanism to political and economic development, role of voluntary associations, adjustment of kinship groups to urban life.
- 8508. ADVANCED FIELD TECHNIQUES IN ARCHAEOLOGY.** (Cr and hrs ar; prereq #) Staff
- 8950. ADVANCED RESEARCH.** (Cr and hrs ar; prereq grad, #) Staff

## **Arabic—See Near and Middle Eastern Studies**

## **Art History (ArH)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

- 1001. INTRODUCTION TO THE VISUAL ARTS.** (4 cr, §3001; limited to 80 students; II MTWThF; Arch 25) Torbert  
Basic problems of art. Examples from major visual arts as basis for examination of the nature of art, problems of design, materials, and techniques; presented topically rather than chronologically.
- 1015. ART IN WESTERN CIVILIZATION.** (4 cr; limited to 140 students; IV-V MTW; Arch 25) Waldfogel  
Major achievements of Western artists seen in their historical and cultural setting. Sir Kenneth Clark's series of 13 hour-length films entitled "Civilisation" takes the place of lectures. Strongly interdisciplinary.
- 3001. PRINCIPLES OF THE VISUAL ARTS.** (4 cr, §1001; limited to 60 students; II MTWThF; Arch 25) Torbert  
Similar to 1001 in organization and content with expanded reading and contact with works of art.
- 3465. MASTER PAINTERS OF THE 19TH CENTURY.** (4 cr; limited to 140 students; III MTWThF; Jones 207B) Waldfogel  
European artists selected for their originality, aesthetic excellence, or subsequent influence. Goya, Constable, Cezanne, and Van Gogh.
- 3921. ART OF THE FILM.** (4 cr; limited to 125 students; \$4 lab fee; VI-VII MTWTh; Arch 25)  
The motion picture as an art form. Films of exceptional merit or interest—narrative, poetic, documentary, experimental.

- 3925. HISTORY OF PHOTOGRAPHY.** (4 cr; limited to 60 students; II MTWThF; Jones 207B)  
Origins and technical background of photography. Development of style in photography and the relationship of this development to modern social and aesthetic history.
- 5108. GREEK ARCHITECTURE.** (4 cr, §C1as 5108; prereq 1008 or 3008 or 3152; limited to 50 students; I MTWThF; Jones 207A) Cooper  
Archaic and classical examples of religious and secular architecture and their setting in major archaeological sites.
- 5521. 20TH-CENTURY ART IN THE UNITED STATES.** (4 cr; prereq 4 cr of art history; limited to 50 students; III MTWThF; Jones 207A) Cooper  
Contemporary movements in American painting and sculpture beginning in early 20th century with "The Eight" and the Armory Show, 1913.
- 5535. ART IN THE UNITED STATES.** (5 cr; prereq 4 cr of art history or #; limited to 60 students; IV MTWThF; Jones 207B) Torbert  
Painting and sculpture in the United States. Key works and artists from early settlement to the early 20th century.

## **SECOND TERM**

- 3009. HISTORY OF MEDIEVAL ART.** (4 cr; limited to 140 students; V MTWThF; Arch 25) Steyaert  
Medieval architecture, painting, and sculpture from early Christian to gothic period.
- 3011. HISTORY OF RENAISSANCE AND BAROQUE ART.** (4 cr; limited to 140 students; III MTWThF; Arch 25) Canedy  
The major monuments in architecture, sculpture, and painting from the early 14th century through the baroque period.
- 3012. HISTORY OF 19TH- AND 20TH-CENTURY ART.** (4 cr; limited to 140 students; I MTWThF; Arch 25) Paskus  
Major monuments and concepts of the modern period: sculpture, architecture, painting, and prints.
- 5234. GOTHIC SCULPTURE OF THE CATHEDRAL AGE.** (5 cr; limited to 60 students; prereq 3009, grad student or #; II MTWThF; Jones 207B) Steyaert  
Sculpture in France and Germany from 1150 to 1350. Stylistic evolution.
- 5313. ITALIAN HIGH RENAISSANCE ARCHITECTURE, SCULPTURE, AND PAINTING.** (4 cr; limited to 60 students; prereq 3011, grad student or #; V MTWThF; Jones 207B) Canedy  
Leonardo da Vinci, Michelangelo, Raphael, and Titian and lesser artists working in Florence, Rome, Venice, and northern Italy. Painting emphasized.
- 5463. EARLY 20TH-CENTURY PAINTING.** (5 cr; limited to 60 students; prereq one American or modern art course or #; III MTWThF; Jones 207B) Paskus  
Topics and/or movements in modern painting mainly before the mid-1920s.

## **Arts, Studio (ArtS)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

The Department of Studio Arts covers part of the cost of expendable materials by requiring students in most of its courses to purchase fee cards from the bursar by the end of the second week of classes.

## **FIRST TERM**

- 1101. DRAWING I.** (4 cr; each section limited to 25 students)  
Introduction to studio work; exploration of contemporary and traditional methods. Work from nature, various drawing mediums.  
Sec 1, I-II MTWThF, ArtB 140, Feinberg  
Sec 2, II MTWThF, ArtB 141, Myers  
Sec 3, III-IV MTWThF, ArtB 160, Somberg
- 1102. DRAWING II.** (4 cr; each section limited to 25 students; prereq 1101)  
Work from life and nature; introduction to color and pictorial structure.  
Sec 1, I-II MTWThF, ArtB 150, Gray  
Sec 2, III-IV MTWThF, ArtB 151, Abbott

- 1104. COLOR.** (4 cr; limited to 25 students; prereq 1102; I-II MTWThF; ArtB 160) Somberg  
Intensive investigation of color and its visual implication.
- 1105. BEGINNING PAINTING.** (4 cr; limited to 15 students; prereq 1104 or #; I-II MTWThF; ArtB 161) Hendler  
Contemporary and traditional surfaces in oil and acrylic media.
- 1301. SCULPTURE.** (4 cr; limited to 20 students; I-II MTWThF; ArtB 65, 90) Baldwin  
Intensive study of structure with emphasis on form and space. Construction in metal.
- 1302. SCULPTURE.** (4 cr; limited to 20 students; I-II MTWThF; ArtB 50) Rose  
Study of structure with emphasis on form and space. Clay, plaster, wood. Mold making and casting.
- 1401. INTRODUCTION TO STUDIO ARTS.** (4 cr; limited to 170 students; III-IV MTWThF; BlegH 5) Hendler  
Concepts of visual art making in their contemporary and historical context. The concerns, media, and environment of the practicing artist. Offers broad aesthetic foundation for entering beginning courses in any medium offered by the department and better understanding of the creative process, visual expression, and criteria. Lectures, demonstrations, and discussion.
- 1520. PRINTMAKING: LITHOGRAPHY.** (4 cr per qtr [8 cr max]; limited to 20 students; prereq 1101 or #; I-II MTWThF; ArtB 176) Priede  
Planographic printing processes from stones and metal plates. Basic techniques of image making, processing, printing, and presentation in a creative context.
- 1701. PHOTO MEDIUM.** (4 cr; limited to 20 students; I-II MTWThF; ArtB 131) Brooks  
The photographic medium and its background and meaning today. Lectures on contemporary and historical use of photography. Methods of use of camera, film development, and enlarging. Emphasis on the creative process.
- 1801. CERAMIC PROCESSES.** (4 cr; limited to 20 students; I-II MTWThF; HoIb 157) Hoard  
Clay work by hand and forming on potter's wheel. Ceramics as creative expression, with technical considerations of clays, glazes, and kilns. Pottery and sculptural approaches.
- 3110. DRAWING.** (4 cr per qtr [12 cr max]; limited to 25 students; prereq 1102; III-IV MTWThF; ArtB 150) Gray  
Drawing from model, still life, nature. Principles of anatomy.
- 3120. PAINTING.** (4 cr per qtr [12 cr max]; limited to 10 students; prereq 1105 and 12 cr of 3110 or #; I-II MTWThF; ArtB 161) Hendler  
Media and problems in painting; individual projects and instruction. Meets with 1105.
- 3160. WATERCOLOR.** (4 cr per qtr [12 cr max]; limited to 15 students; prereq 1101, 1104, or #)  
Introduction to transparent watercolor; gouache, casein, tempera. Figure, still life, landscape, abstract design. Meets with 5160.  
Sec 1, I-II MTWThF, ArtB 151, Busa  
Sec 2, II-IV MTWThF, ArtB 141, Myers
- 3301. SCULPTURE: DIRECT METAL.** (4 cr; limited to 10 students; prereq 1301, 1302; III-IV MTWThF; ArtB 65, 90) Baldwin  
Welding and brazing. Meets with 5310.
- 3302. SCULPTURE: PLASTICS MEDIA.** (4 cr; limited to 10 students; prereq 1301, 1302; III-IV MTWThF; ArtB 50) Rose  
Meets with 5320.
- 3520. PRINTMAKING: LITHOGRAPHY.** (4 cr per qtr [12 cr max]; limited to 10 students; prereq 1520 or #; III-IV MTWThF; ArtB 176) Priede  
Planographic techniques on stones and plates. Meets with 5520.
- 3701. FILMMAKING.** (4 cr; limited to 8 students; III-IV MTWThF; ArtB 120) Johnson  
Practical aspects of making films. Meets with 3720.
- 3710. PHOTOGRAPHY.** (4 cr per qtr [12 cr max]; limited to 20 students; prereq 1701 or Jour 1301 or #; III-IV MTWThF; ArtB 131) Brooks  
Continued work in photographic controls and processes. Introduction to related photo-sensitive media. Emphasis on the creative process, with attention given to individual interests and requirements.
- 3720. FILM WORKSHOP.** (4 cr per qtr [12 cr max]; limited to 7 students; prereq #; III-IV MTWThF; ArtB 120) Johnson  
The motion picture as an art form. Production of descriptive and experimental work. Meets with 3701.
- 3810. CERAMIC DESIGN.** (4 cr per qtr [12 cr max]; limited to 20 students; prereq 1801 or #; III-IV MTWThF; HoIb 157) Hoard  
Emphasis on wheel throwing. Advanced design problems and introduction to glaze and clay experimentation. Development of personal expression in ceramic medium. Meets with 5810.
- 5110. DRAWING.** (4 cr per qtr [16 cr max]; limited to 25 students; prereq 12 cr of 3110 or equiv; III-IV MTWThF; ArtB 140) Busa  
Drawing in all mediums from life.

- 5120. PAINTING.** (4 cr per qtr [16 cr max]; limited to 20 students; prereq 12 cr of 3120 and #; III-IV MTWThF; ArtB 161) Feinberg  
Various media. Individual problems.
- 5160. WATERCOLOR.** (4 cr per qtr [16 cr max]; limited to 10 students; prereq 3160 or #)  
Advanced watercolor techniques, aesthetic directions. Individual concepts and development of sensibilities. Meets with 3160.  
Sec 1, I-II MTWThF, ArtB 151, Busa  
Sec 2, III-IV MTWThF, ArtB 141, Myers
- 5310. SCULPTURE: DIRECT METAL.** (4 cr per qtr [16 cr max]; limited to 5 students; prereq 3301; III-IV MTWThF; ArtB 65, 90) Baldwin  
Meets with 3301.
- 5320. SCULPTURE: PLASTICS MEDIA.** (4 cr per qtr [16 cr max]; prereq 3302; III-IV MTWThF; ArtB 50) Rose  
Meets with 3302.
- 5520. PRINTMAKING: LITHOGRAPHY.** (4 cr per qtr [16 cr max]; limited to 10 students; prereq 12 cr of 3520; III-IV MTWThF; ArtB 176) Priede  
Specialized work in color printing and planographic techniques. Meets with 3520.
- 5810. CERAMICS.** (4 cr per qtr [16 cr max]; limited to 5 students; prereq 12 cr of 3810 or #; III-IV MTWThF; HoIB 157) Hoard  
Aesthetic awareness and development; techniques and materials. Meets with 3810.
- 8110. DRAWING.** (3 cr per qtr [9 cr max]; prereq #) Busa, Hendler, Abbott
- 8120. PAINTING.** (3 cr per qtr [18 cr max]; prereq #) Busa, Hendler, Abbott
- 8310. DIRECT METAL SCULPTURE.** (3 cr per qtr [9 cr max]; prereq #) Baldwin
- 8320. PLASTICS MEDIA: WOOD, STONE CARVING.** (3 cr per qtr [9 cr max]; prereq #) Rose
- 8510. PRINTMAKING.** (3 cr per qtr [27 cr max]; prereq #) Priede
- 8710. PHOTOGRAPHY.** (3 cr per qtr [18 cr max]; prereq #) Brooks
- 8810. CERAMICS.** (3 cr per qtr [18 cr max]; prereq #) Hoard

## **SECOND TERM**

- 1101. DRAWING I.** (4 cr; limited to 25 students; I-II MTWThF; ArtB 140) Roode  
See First Term.
- 1102. DRAWING II.** (4 cr; limited to 25 students; prereq 1101; I-II MTWThF; ArtB 161) Cowette  
See First Term.
- 1302. SCULPTURE.** (4 cr; limited to 20 students; I-II MTWThF; ArtB 50) Lucey  
See First Term.
- 1510. PRINTMAKING: INTAGLIO.** (4 cr per qtr [max 8 cr]; limited to 20 students; I-II MTWThF; ArtB 170) Bethke  
Intaglio printing processes. Intensive study of etching, engraving, and collagraphic techniques in their creative context.
- 1701. PHOTO MEDIUM.** (4 cr; limited to 20 students; I-II MTWThF; ArtB 131) Henkel  
See First Term.
- 3110. DRAWING.** (4 cr per qtr [12 cr max]; limited to 25 students; prereq 1102; I-II MTWThF; ArtB 141) Rowan  
See First Term.
- 3120. PAINTING.** (4 cr per qtr [12 cr max]; limited to 20 students; prereq 1105 and 12 cr of 3110 or #; III-IV MTWThF; ArtB 161) Cowette  
See First Term.
- 3160. WATERCOLOR.** (4 cr per qtr [12 cr max]; limited to 15 students; prereq 1101, 1104, or #; I-II MTWThF; ArtB 150) Abbott  
See First Term.
- 3303. SCULPTURE: CAST METAL.** (4 cr; prereq 1301, 1302; limited to 10 students; III-IV MTWThF; HoIB) Lucey  
Lost wax and sand casting in bronze, aluminum, iron. Meets with 5330.
- 3510. PRINTMAKING: INTAGLIO.** (4 cr per qtr [12 cr max]; limited to 10 students; prereq 4 cr of 1510 or #; III-IV MTWThF; ArtB 170) Bethke  
Intaglio techniques on metal and collagraph. Embossing. Meets with 5510.
- 3710. PHOTOGRAPHY.** (4 cr per qtr [12 cr max]; limited to 20 students; III-IV MTWThF; ArtB 131) Henkel  
See First Term.

- 5120. PAINTING.** (4 cr per qtr [16 cr max]; limited to 20 students; prereq 12 cr of 3120 and #; III-IV MTWThF; ArtB 151) Rowan  
See First Term.
- 5160. WATERCOLOR.** (4 cr per qtr [16 cr max]; limited to 10 students; prereq 12 cr of 3160 or #; I-II MTWThF; ArtB 150) Abbott  
See First Term.
- 5330. SCULPTURE: CAST METAL.** (4 cr per qtr [16 cr max]; prereq 3303; limited to 5 students; III-IV MTWThF; HoIB) Lucey  
Lost wax and sand casting in bronze, aluminum, iron. Meets with 3303.
- 5510. PRINTMAKING: INTAGLIO.** (4 cr per qtr [16 cr max]; limited to 10 students; prereq 12 cr of 3510 or #; III-IV MTWThF; ArtB 170) Bethke  
Color processes, intaglio, and combined techniques. Meets with 3510.
- 8110. DRAWING.** (3 cr per qtr [9 cr max]; prereq #) Rowan, Roode, Abbott
- 8120. PAINTING.** (3 cr per qtr [18 cr max]; prereq #) Rowan, Roode, Abbott
- 8510. PRINTMAKING.** (3 cr per qtr [27 cr max]; prereq #) Bethke
- 8710. PHOTOGRAPHY.** (3 cr per qtr [18 cr max]; prereq #) Henkel

## Chicano Studies (Chic)

### FIRST TERM

- 3112. BILINGUAL EDUCATION: PRINCIPLES, PRACTICES, AND PHILOSOPHY.** (5 cr; II MTWThF; ForH 175) Lopez  
Philosophy and principles of bilingual education.
- 3118. THE BILINGUAL CHILD.** (4 cr; prereq Psy 1001, Chic 3112; IV MTWThF; ForH 175) Lopez  
Factors affecting the development of minority-language speaking children, with emphasis on the Chicano.

### SECOND TERM

- 1106. INTRODUCTION TO CHICANO STUDIES: THE MEXICAN-AMERICAN EXPERIENCE, 1821-1960.** (4 cr; IV MTWThF; ForH 175) Lopez y Rivas  
Convergence of Spanish-Mexican and Anglo-American society in the Spanish borderlands, now termed the Southwest. Aspects of this convergence; its historical consequences.
- 3212. LA CHICANA.** (4 cr; III MTWThF; ForH 175) Lopez y Rivas  
Examines the philosophy and psychology of the Chicano in order to understand the Chicana. Women of La Raza—those who have made an impact in literature, history, sociology, and politics. Literature by and about the Chicana.

## Classics

### Classics (Clas)<sup>1</sup>

#### FIRST TERM

- 1042. GREEK AND ROMAN MYTHOLOGY.** (3 cr; prereq soph; I MTWTh; FolH 202) Hershbell  
Classical myths; stories of gods, demigods, and heroes that are a basic component of European cultural heritage; their artistic, religious, psychological, and anthropological implications.
- 1048. TECHNICAL TERMS OF SCIENCE, MEDICINE, AND THE HUMANITIES.** (3 cr, §3048; students *must* attend one orientation meeting V T, June 14, FolH 209, or I W, June 15, FolH 308; optional assistance labs II W, V-VI Th, III-IV F, LRC [WaLib]; independent labs I-VII MTWThF, LRC) Sinopoli  
Presentation in English contexts of Greek and Latin prefixes, suffixes, and roots basic in modern technical vocabularies through computer assisted instruction.

<sup>1</sup>No knowledge of Greek or Latin is required.



- 3008. THE WORLD OF ROME.** (4 cr, §5008; IV MTWThF; FolH 202) Ruebel  
General survey of Roman civilization from its origins to the reign of Constantine. The Roman way of life as seen in art, history, literature, and philosophy. The Etruscans and the golden age of Rome under Augustus.
- 3048. TECHNICAL TERMS OF SCIENCE, MEDICINE, AND THE HUMANITIES.** (3 cr, §1048; students *must* attend one orientation meeting V T, June 14, FolH 209, or I W, June 15, FolH 308; optional assistance labs II W, V-VI Th, III-IV F, LRC [WaLib]; independent labs I-VII MTWThF, LRC) Sinopoli  
See 1048.
- 5002. ANCIENT SATIRE.** (4 cr; prereq two courses in English literature beyond Engl 1002, or in foreign literature, or Δ; V MTWThF; FolH 207) Rochefort  
The development of ancient satire from Homer to Juvenal. Readings in translation from Homer, Aesop, Archilochus, Aristophanes, and Lucian. Introduction to the form of Roman satire, with readings from Lucilius, Horace, Persius, Petronius, Martial, and Juvenal. Survival of Roman satire in English literature.
- 5008. THE WORLD OF ROME.** (4 cr, §3008; IV MTWThF; FolH 202) Ruebel  
Meets with 3008; students do additional work for advanced undergraduate and graduate credit.
- 5120. FIELD RESEARCH IN ARCHAEOLOGY.** (4 cr)  
Field excavation, survey, and research. Techniques of excavation and exploration; interpretation of archaeological materials.
- Sec 1, Ancient Near East, July 3-29**  
Excavations at Tel Mikhhal, Israel, conducted by the Tel Aviv University Institute of Archaeology under the direction of Dr. Zev Herzog. See Special Programs section.
- Sec 2, Sicily, July 2-August 7**  
Field school in archaeological method conducted by the Center for the Archaeological and Anthropological Research of the Belice Valley (Sicily) at the site of Castelazzo. See Special Programs section.

## SECOND TERM

- 1019. MAGIC, WITCHCRAFT, AND THE OCCULT IN GREECE AND ROME.** (4 cr; I MTWThF; FolH 209) Oberhelman  
Reading, lecture, and discussion on magic and witchcraft in classical literature and mythology; the practice of magic as observed from papyri, epigraphical, and literary evidence; and beliefs and practices concerning prophecy and the interpretation of dreams. The changing role of witchcraft and divine possession from earlier to later antiquity and the relation of these phenomena to changes in economic and social conditions.
- 1048. TECHNICAL TERMS OF SCIENCE, MEDICINE, AND THE HUMANITIES.** (3 cr, §3048; students *must* attend one orientation meeting V T, July 19, FolH 209, or I W, July 20, FolH 308; optional assistance labs II W, V-VI Th, III-IV F, LRC [WaLib]; independent labs I-VII MTWThF, LRC) Sinopoli  
See First Term.
- 3007. THE WORLD OF GREECE.** (4 cr, §5007; III MTWThF; FolH 202)  
General survey of Greek civilization from the world of Homer to the age of Alexander. The Greek view of life as seen in art, history, literature, and philosophy. The golden age of Greece in the 5th century B.C. to the expansion of the Greek spirit under Alexander.
- 3048. TECHNICAL TERMS OF SCIENCE, MEDICINE, AND THE HUMANITIES.** (3 cr, §1048; students *must* attend one orientation meeting V T, July 19, FolH 209, or I W, July 20, FolH 308; optional assistance labs II W, V-VI Th, III-IV F, LRC [WaLib]; independent labs I-VII MTWThF, LRC) Sinopoli  
See 1048 First Term.
- 3072. RELIGION IN ANTIQUITY: THE NEW TESTAMENT.** (4 cr, §5072; prereq jr; II MTWThF; BlegH 125) Kraabel  
First-century Israel under Roman rule. Jesus of Nazareth. Earliest Christian communities. Jewish Christianity. Mission to gentiles. Paul the Apostle. Beginnings of New Testament.
- 5072. RELIGION IN ANTIQUITY: THE NEW TESTAMENT.** (4 cr, §3072; prereq #; II MTWThF; BlegH 125) Kraabel  
Meets with 3072; students do additional work for advanced credit.

## Greek (Grk)

### FIRST TERM

- 1101-1102†. BEGINNING CLASSICAL GREEK.** (10 cr; I-III MTWThF; FolH 201) Ruebel, Wigfil  
Language structure in context of graded reading materials from New Testament, Aesop, Xenophon, and Plato. Approach is via biblical Greek, with computer-assisted drills and review. Upon completion of 1102 students will be able to read in the New Testament. See Special Programs section.

**3051-3052†. BEGINNING ANCIENT GREEK: ACCELERATED.** (10 cr, §1101-1102, §1103, §1104; I-III MTWThF; FolH 201) Ruebel, Wigtil  
Rapid mastery of Greek approached via biblical Greek, with computer-assisted drills and review. Previous experience in another foreign language desirable. Upon completion of 3052 students will be able to read in the New Testament. See Special Programs section.

**3970. DIRECTED STUDY.** (1-5 cr; prereq # and Δ)  
Pursuit of individual interests in reading and/or study.

**5970. DIRECTED STUDY.** (1-5 cr; prereq # and Δ)  
See 3970.

## **SECOND TERM**

**1103. SELECTIONS FROM GREEK PROSE.** (5 cr; prereq 1102 or equiv; IV MTWThF; BlegH 125) Kraabel  
The New Testament. Emphasis on reading proficiency and content. See Special Programs section.

**3120. BIBLICAL GREEK.** (5 cr; prereq 1104 or 1122 or 3052 or 3105 or Δ, #; IV MTWThF; BlegH 125) Kraabel  
The New Testament. Emphasis on reading proficiency and content. See Special Programs section.

**8120. GREEK TEXT COURSE.** (3 cr; prereq 3052 or Δ; restricted to students in depts *other* than Classics; IV MTWThF; BlegH 125) Kraabel  
For nonmajors who wish text work in Greek for a minor or related field. Meets with 3120. Supplementary work at the discretion of the instructor. See Special Programs section.

## *Latin (Lat)*

### **FIRST TERM**

**3104. LATIN READINGS.** (5 cr; prereq 1104 or equiv or #; III MTWThF; FolH 302) Rochefort  
Reading of selected Latin authors, development of reading proficiency, introduction to cultural and literary studies as in 1104, with advanced assignments.

**3970. DIRECTED STUDY.** (1-5 cr; prereq # and Δ)  
Pursuit of individual interests in reading and/or study.

**5970. DIRECTED STUDY.** (1-5 cr; prereq # and Δ)  
See 3970.

**8120. LATIN TEXT COURSE.** (3 cr; prereq 3052 or Δ, restricted to students in depts *other* than Classics; III MTWThF; FolH 302) Rochefort  
For nonmajors who wish text work in Latin for a minor or related field. Meets with 3104. Supplementary work at the discretion of the instructor.

## **Communication (Comm)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

**1001. COMMUNICATION.** (4 cr, §Comp 1001; limited to 28 students; prereq English placement category 2, 3, or 5; II MTWThF; FolH 203) Jensen  
The process of communication, language, and nonverbal means of communicating; clarity and appropriateness in expository discourse; writing and speaking with direction and criticism.

## **Communication Disorders (CDIs)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

**3100. CLINICAL AND RESEARCH OBSERVATION.** (1 cr [may be repeated for cr]; S-N only; limited to 10 students; prereq 2nd-qr jr or sr majoring in communication disorders, #) Staff  
Supervised observation of clinical procedures such as evaluation and treatment of persons with communication disorders or of research relating to normal and disordered communication.

- 3101. INTRODUCTION TO SPEECH PATHOLOGY AND AUDIOLOGY.** (4 cr; limited to 40 students; II-III TTh; FoIH 303) McDermott  
 Concepts basic to understanding normal and abnormal speech and hearing functions. Selected communication problems. Strategies and systems of delivery of clinical services.
- 5900. TOPICS IN COMMUNICATION DISORDERS.** (4 cr)  
**Sec 1, Communication Problems of the Child With Cerebral Palsy, II-III MW, FoIH 303, Morris**  
 Managing communication disorders of the cerebral palsied. Problems of movement and coordination presented within a neurological and developmental framework. Emphasizes particular problems of the child with cerebral palsy or other neurological disorders of coordination. Problems in the development of prespeech and prelanguage function and their impact on speech and language development.  
**Sec 2, Clinical Management of Children With Communication Problems Associated With Central Nervous System Disorders,** limited to 15 students, prereq written #, time and room ar, Morris  
 Theory and practical experience in the assessment and treatment of children with neurological impairment. Emphasizes the role of feeding programs as a basis for improving prespeech development. Presents a total neurodevelopmental approach to the management of feeding disorders. Demonstrations, laboratory sessions, and direct clinical work with children.
- 5970. DIRECTED STUDIES.** (Cr ar [may be repeated for cr]; prereq #) Staff  
 Directed readings and preparation of reports on selected subjects.
- 8520. ADVANCED CLINICAL PRACTICE IN SPEECH PATHOLOGY.** (2, 4, or 6 cr [may be repeated for cr]; prereq #: \$4 lab fee) McDermott, Starr  
 Specialized clinical practice. Evaluation and clinical management of persons with communication disorders.
- 8714. SELECTION AND USE OF HEARING AIDS.** (3 cr; prereq 8306 or #; IV MTWTh; room ar) Chaikin  
 Nature and types of amplifying systems used with the hearing impaired. Electroacoustic characteristics including gain, power, acoustic response, distortion, etc. Principles and methods of selection and usage relative to types of hearing disorders.
- 8720. CLINICAL METHODS AND PRACTICE IN AUDIOLOGY.** (2, 4, or 6 cr [may be repeated for cr]; prereq #: \$4 lab fee) Chaikin  
 Supervised internship experiences for graduate students working with communication disorders of persons with auditory impairment.
- 8990. DIRECTED RESEARCH.** (Cr ar [may be repeated for cr]; prereq #: \$4 lab fee) Staff  
 Open to graduate students engaged in research.

## **SECOND TERM**

- 3100. CLINICAL AND RESEARCH OBSERVATION.** (1 cr [may be repeated for cr]; S-N only; limited to 10 students; prereq 2nd-4th jr or sr majoring in communication disorders, #) Staff  
 See First Term.
- 3101. INTRODUCTION TO SPEECH PATHOLOGY AND AUDIOLOGY.** (4 cr; limited to 40 students; II-III TTh; FoIH 303) Haroldson  
 See First Term.
- 5704. NOISE AND MAN.** (4 cr; prereq 5301 or #; II MTWThF; 118 Medical Research East) Ward  
 Temporary and permanent effects of steady, intermittent, and impulse noise on hearing and health. Annoyance and community noise. Noise measurement, reduction, and control; ear defenders and their limitations. Hearing conservation programs; preemployment testing and monitoring audiometry.
- 5900. TOPICS IN COMMUNICATIONS DISORDERS: Applied Phonology.** (4 cr; II-III MW; FoIH 303) Broen  
 The use of distinctive feature models in describing the acquisition of normal articulation skills and in describing and remediating the problems presented by delayed or disordered articulation.
- 5970. DIRECTED STUDIES.** (Cr ar [may be repeated for cr]; prereq #) Staff  
 See First Term.
- 8520. ADVANCED CLINICAL PRACTICE IN SPEECH PATHOLOGY.** (2, 4, or 6 cr [may be repeated for cr]; prereq #: \$4 lab fee) Broen, Haroldson  
 See First Term.
- 8720. CLINICAL METHODS AND PRACTICE IN AUDIOLOGY.** (2, 4, or 6 cr [may be repeated for cr]; prereq #: \$4 lab fee) Staff  
 See First Term.
- 8990. DIRECTED RESEARCH.** (Cr ar [may be repeated for cr]; prereq #: \$4 lab fee) Staff  
 See First Term.

## Composition—See English

## Criminal Justice Studies (CJS)

### FIRST TERM

- 5101. CRIMINAL LAW.** (4 cr; 8:00-9:30 TWTh; AndH 270) Samaha  
General criminal law, emphasizing its philosophical underpinnings. Substantive law of homicide, theft, conspiracy, and attempt; defenses of insanity, self-defense, and mistake of fact or law.
- 5102. CRIMINAL PROCEDURE.** (4 cr; 9:30-11:00 TWTh; AndH 270) Samaha  
Processes by which persons are convicted of crime. Police discretion to arrest, the constitutional law of arrest, search and seizure, role of the prosecutor, plea bargaining, sentencing, and postconviction relief.

### SECOND TERM

- 5101. CRIMINAL LAW.** (4 cr; 9:30-11:00 TWTh; AndH 270) Samaha  
See First Term.
- 5102. CRIMINAL PROCEDURE.** (4 cr; 8:00-9:30 TWTh; AndH 270) Samaha  
See First Term.

## East Asian Languages

### *Japanese (Jpn)*

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. Students must register for both terms of the summer session and may not enroll in other summer courses.

- 3031-3032-3033†. INTENSIVE THIRD-YEAR JAPANESE: ADVANCED.** (15 qtr cr for both terms [10 semester cr]; prereq 3023; II-IV MTWThF; KoltH S136)  
Designed to develop competence in hearing, speaking, reading, and writing Japanese; emphasis on reading proficiency in modern Japanese prose and poetry. Formal written Japanese introduced.

## Economics (Econ)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1001. PRINCIPLES OF MACROECONOMICS.** (4 cr, §1004, §1014, §3001, §3002; each section limited to 50 students; prereq 3rd-qtr fr)  
Principles underlying economic activity and the economic institutions within which economic units function. National income, money and banking, business cycles, and international trade.  
Sec 1, I MTWThF, BlegH 440  
Sec 2, II MTWThF, BlegH 440  
Sec 3, III MTWThF, BlegH 440  
Sec 4, IV MTWThF, BlegH 440  
Sec 5, V MTWThF, BlegH 440
- 1002. PRINCIPLES OF MICROECONOMICS.** (4 cr, §1005, §1015, §3001, §3002; each section limited to 50 students; prereq 3rd-qtr fr)  
Demand and supply, competition and monopoly, and the distribution of income.

Sec 1, II MTWThF, BlegH 250  
Sec 2, III MTWThF, BlegH 250  
Sec 3, I MTWThF, BlegH 250

- 3101. MICROECONOMIC THEORY.** (4 cr, §5151; each section limited to 40 students; prereq 1001, 1002, Math 1111 or equiv or #)  
Behavior of firms and industries under competitive and monopolistic conditions; factors influencing production, price, and advertising decisions.  
Sec 1, II MTWThF, BlegH 255  
Sec 2, III MTWThF, BlegH 260
- 3102. MACROECONOMIC THEORY.** (4 cr, §5152; limited to 50 students; prereq 1001, 1002, Math 1111 or equiv or #; IV MTWThF; BlegH 250)  
Determinants of national income, employment, and price level; aggregate consumption and investment.
- 3105. MANAGERIAL ECONOMICS.** (4 cr, §3101, §BGS 3001, for business administration majors only; limited to 50 students; prereq 1001, 1002, 1 qtr calculus; II MTWThF; BlegH 240)  
Theory of the firm, emphasizing managerial decision problems. Demand theory. Production technology and cost concepts. Pricing and output decisions. Investment behavior.
- 3501. LABOR ECONOMICS.** (4 cr, §5531; limited to 40 students; not open to economics majors; prereq 1001, 1002; III MTWThF; BlegH 130)  
Role of labor in economy; labor as a factor of production, population, and the labor force; economics of labor markets; labor market institutions; theories of wages and employment; unions and collective bargaining; public policy.
- 3701. MONEY AND BANKING.** (4 cr, §5721; limited to 40 students; prereq 1001, 1002 or equiv; not open to economics majors; II MTWThF; BlegH 355)  
Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve system, and monetary policy.
- 3711. MACROECONOMIC POLICY.** (4 cr, §5731; not open to economics majors; limited to 40 students; prereq 1001, 1002; III MTWThF; BlegH 155)  
Problems raised by conflicts among the policy objectives of full employment, price stability, desired rate of growth, balance of payments equilibrium, desired mix of public and private sector outputs. Policy instruments: fiscal policy, monetary policy, wage-price guidelines, exchange rate adjustment.
- 3970. DIRECTED STUDIES.** (Cr ar; prereq 1002, #)
- 5151. ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD.** (3 cr, §3101; must be reserved in JohH 12; prereq 1001, 1002, 1 qtr calculus, grad student or #)  
Individual decision making by households and firms under conditions of monopoly, competition; some welfare economics.  
Sec 1, II MTWThF, BlegH 255  
Sec 2, III MTWThF, BlegH 260
- 5152. ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT.** (3 cr, §3102; prereq 1001, 1002, 1 qtr calculus, grad student or #; IV MTWThF; BlegH 250)  
Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding.
- 5401. INTERNATIONAL ECONOMICS.** (4 cr, §5431; limited to 40 students; not open to economics majors; prereq 1001, 1002 or equiv; IV MTWThF; BlegH 135)  
The case for free trade. Effects of tariffs; protection of infant industries; common markets. Balancing international receipts and payments, the role of exchange rate changes, international monetary reform.
- 5431. INTERNATIONAL ECONOMICS.** (4 cr, §5401; limited to 40 students; prereq 3101, 3102 or equiv or #; IV MTWThF; BlegH 135)  
See 5401.
- 5531. LABOR ECONOMICS.** (4 cr, §3501; limited to 40 students; prereq 3101, 3102 or equiv; III MTWThF; BlegH 130)  
See 3501.
- 5611. ECONOMICS OF ENVIRONMENTAL CONTROL.** (4 cr; limited to 50 students; prereq 1001, 1002 or equiv; III MTWThF; BlegH 155)  
Pollution as an external diseconomy; use of taxes and subsidies to reduce pollution. Replenishable resources; maximum sustainable yield; role of the discount rate; taxation to protect yields and minimize harvesting costs. Nonreplenishable resources; controlling rates of depletion.
- 5621. ECONOMICS OF URBAN PROBLEMS.** (4 cr; limited to 50 students; prereq 1001, 1002 or equiv; IV MTWThF; BlegH 155)  
Unemployment and central city decay. Minimum guaranteed income proposals. Low income housing policies. Public policies toward health care. Financing public education. Fiscal problems of cities. Mass transit issues.

**5721. MONEY AND BANKING.** (4 cr, §3701, §5701; limited to 40 students; prereq 3102 or equiv; II MTWThF; BlegH 335)

See 3701.

**5731. MACROECONOMIC POLICY.** (4 cr, §3711; limited to 40 students; prereq 3102; III MTWThF; BlegH 155)

See 3711.

**5970. DIRECTED STUDIES.** (Cr ar; prereq #) Staff

Areas useful to individual programs and objectives not available in regular course offerings.

**8990. INDIVIDUAL GRADUATE RESEARCH.** (Cr ar) Staff

## **SECOND TERM**

**1001. PRINCIPLES OF MACROECONOMICS.** (4 cr, §1004, §1014, §3001, §3002; each section limited to 50 students; prereq 3rd-qr fr)

See First Term.

Sec 1, I MTWThF, BlegH 440

Sec 2, III MTWThF, BlegH 440

**1002. PRINCIPLES OF MICROECONOMICS.** (4 cr, §1005, §1015, §3001, §3002; each section limited to 45 students; prereq 3rd-qr fr)

See First Term.

Sec 1, I MTWThF, BlegH 435

Sec 2, II MTWThF, BlegH 425

Sec 3, III MTWThF, BlegH 425

Sec 4, IV MTWThF, BlegH 425

**3101. MICROECONOMIC THEORY.** (4 cr, §5151; each section limited to 50 students; prereq 1001, 1002, Math 1111 or equiv or #)

See First Term.

Sec 1, II MTWThF, BlegH 240

Sec 2, III MTWThF, BlegH 240

**3102. MACROECONOMIC THEORY.** (4 cr, §5152; limited to 50 students; prereq 1001, 1002, Math 1111 or equiv or #; IV MTWThF; BlegH 120)

See First Term.

**3105. MANAGERIAL ECONOMICS.** (4 cr, §3101, §BGS 3001; for business administration majors only; limited to 50 students; prereq 1001, 1002, 1 qtr calculus; II MTWThF; BlegH 240)

See First Term.

**3131. WELFARE ECONOMICS.** (4 cr; limited to 45 students; prereq 3101 or 3101H or equiv; III MTWThF; BlegH 205)

Introduction to welfare economics. Economic efficiency and the conditions necessary to sustain it. Conflicts between the efficiency and income distribution goals. How market structure and public policies increase or decrease efficiency.

**3801. ELEMENTS OF PUBLIC FINANCE.** (4 cr, §5821; limited to 40 students; prereq 1001, 1002 or equiv; not open to economics majors; II MTWThF; BlegH 435)

Tax and expenditure policies. Impact of tax structure on the distribution of income. Evaluation of public programs. Optimal mix of public and private sector outputs.

**3970. DIRECTED STUDIES.** (Cr ar; prereq 1002, #)

**5151. ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD.** (3 cr, §3101; must be reserved in JohH 12; prereq 1001, 1002, 1 qtr calculus, grad student or #)

See First Term.

Sec 1, II MTWThF, BlegH 240

Sec 2, III MTWThF, BlegH 240

**5152. ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT.** (3 cr, §3102; prereq 1001, 1002, 1 qtr calculus, grad student or #; IV MTWThF; BlegH 120)

See First Term.

**5301. ECONOMIC DEVELOPMENT.** (4 cr, §5331; limited to 40 students; not open to economics majors; prereq 1001, 1002 or equiv; III MTWThF; BlegH 225)

Problems of economic growth in low income countries. Theory of aggregate and per capita income growth. Role of population growth, productivity increases, and capital formation. Allocation of resources between consumption and investment and among sectors. International assistance and trade.

**5331. ECONOMIC DEVELOPMENT.** (4 cr, §5301; limited to 40 students; prereq 3101, 3102 or equiv or #; III MTWThF; BlegH 225)

See 5301.

- 5401. INTERNATIONAL ECONOMICS.** (4 cr, §5431; limited to 40 students; not open to economics majors; prereq 1001, 1002 or equiv; IV MTWThF; BlegH 240)  
See First Term.
- 5431. INTERNATIONAL ECONOMICS.** (4 cr, §5401; limited to 40 students; prereq 3101, 3102 or equiv or #; IV MTWThF; BlegH 240)  
See 5401 First Term.
- 5821. ELEMENTS OF PUBLIC FINANCE.** (4 cr, §3801; limited to 40 students; prereq 3101...3131 recommended; II MTWThF; BlegH 435)  
See 3801.
- 5970. DIRECTED STUDIES.** (Cr ar; prereq #) Staff  
See First Term.
- 8990. INDIVIDUAL GRADUATE RESEARCH.** (Cr ar) Staff

## English

### *English (Engl)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

#### FIRST TERM

- 1012. INTRODUCTION TO THE LITERATURE OF THE RENAISSANCE: 1485-1660.** (4 cr; limited to 40 students; III MTWThF; LindH 215) McClure  
Typical authors: More, Sidney, Spenser, Shakespeare, Donne, Milton.
- 1241. INTRODUCTION TO SHAKESPEARE.** (4 cr; I MTWThF; LindH 302) Clayton  
Lecture survey of Shakespeare's work, treating approximately 10 plays. For students in all colleges of the University.
- 3112. SURVEY OF ENGLISH LITERATURE.** (4 cr; II MTWThF; LindH 215) Rosendahl  
Historical survey of major figures, movements, and trends in English literature. Milton to Johnson, including Dryden, Swift, and Pope.
- 3241. SHAKESPEARE.** (4 cr; IV MTWThF; LindH 215) Steinmann  
Plays from Shakespeare's early and middle periods. All sections will read *A Midsummer Night's Dream*, *Hamlet*, a history play, and three or four other plays.
- 3242. SHAKESPEARE.** (4 cr; III MTWThF; LindH 302) Clayton  
Plays from the middle and late periods. All sections will read *King Lear*, *Macbeth*, *The Tempest*, and three or four other plays.
- 3252. THE KING JAMES BIBLE AS LITERATURE.** (4 cr; I MTWThF; LindH 229) O'Brien  
The Book of Daniel, Apocrypha, and New Testament as documents in the history of literature.
- 3412. AMERICAN LITERATURE.** (4 cr; III MTWThF; LindH 305) Ross  
Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes; lecture course with wide reading. Thoreau and Melville through James.
- 3455. AMERICAN SHORT STORY.** (4 cr; IV MTWThF; Ph 210) Solotaroff  
Readings from the 18th century to present.
- 3851. THE ENGLISH LANGUAGE.** (4 cr, §5851; limited to 50 students; II MTWThF; LindH 305) Brown  
An introduction to the English language including English grammars, phonetics and phonology, British and American dialects, and native-language acquisition.
- 5151. 18TH-CENTURY ENGLISH NOVEL.** (4 cr; I MTWThF; LindH 217) McClure  
Novels by such authors as Defoe, Richardson, Fielding, Smollett, Sterne, and Austen.
- 5261. MILTON.** (4 cr; III MTWThF; LindH 217) O'Brien  
*Paradise Lost*, *Samson Agonistes*, minor poems, *Areopagitica*, and often, although not always, *Paradise Regained*.
- 5312. ROMANTIC WRITERS: Coleridge and Wordsworth.** (4 cr; IV MTWThF; LindH 217) Rosendahl
- 5414. CONTEMPORARY AMERICAN LITERATURE.** (4 cr; II MTWThF; LindH 229) Solotaroff  
Important authors, intellectual currents, movements, conventions, genres, and themes since 1940.

**5610. 20TH-CENTURY WRITERS: POST-WORLD WAR II BRITISH LITERATURE.** (4 cr; III MTWThF; LindH 203)  
Read

A survey of British literature since World War II, concentrating primarily on the novel but with some drama and poetry. The approach is critical, with consideration of technique and form as well as social history.

**5851. STRUCTURE OF MODERN ENGLISH.** (4 cr, §3851; II MTWThF; LindH 203) Steinmann  
Modern English grammar: phonology, syntax, and semantics; variations and change.

**5871. THE LANGUAGE OF LITERATURE.** (4 cr; prereq 5851 or #; IV MTWThF; LindH 302) MacLeish  
The place of linguistic analysis in a theory of literary criticism; stylistic analysis in Europe and America since 1920; theories of linguistic description relevant to critical analysis; applications to texts in prose and poetry.

**5910. TOPICS IN ENGLISH AND AMERICAN LITERATURE: ENGLAND AND THE EUROPEAN RENAISSANCE.**  
(4 cr; II MTWThF; LindH 217) Haley

An approach to the masterpieces of Elizabethan literature from the standpoint of European culture; such topics as the romantic epic, Florentine Platonism, music of the humanistic era, and political theory.

**5940. FIGURES IN ENGLISH AND AMERICAN LITERATURE: THREE 19TH-CENTURY WOMEN NOVELISTS.** (4 cr; I MTWThF; LindH 305) Hirsch

Shared literary techniques, social perspectives, and psychology of Jane Austen, Charlotte Brontë, and George Eliot.

## **SECOND TERM**

**1015. INTRODUCTION TO VICTORIAN LITERATURE: 1832-1901.** (4 cr; limited to 40 students; IV MTWThF; LindH 215) Luke

Typical authors: Tennyson, Browning, Hopkins, Arnold, Dickens, the Brontës.

**1019. INTRODUCTION TO MODERN LITERATURE: DRAMA.** (4 cr; limited to 40 students; II MTWThF; LindH 215) Hurrell

Selected texts; critical discussion and writing.

**3241. SHAKESPEARE.** (4 cr; III MTWThF; LindH 215) Madden  
See First Term.

**3242. SHAKESPEARE.** (4 cr; II MTWThF; LindH 203) Luke  
See First Term.

**3413. AMERICAN LITERATURE.** (4 cr; III MTWThF; LindH 305) Furia  
Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes. Lecture course, with wide reading. Stephen Crane through the 1930's.

**3851. THE ENGLISH LANGUAGE.** (4 cr, §5851; limited to 50 students; I MTWThF; LindH 305) Mitchell  
See First Term.

**5152. 19TH-CENTURY ENGLISH NOVEL.** (4 cr; I MTWThF; LindH 203) Madden  
Novels by such authors as Scott, Dickens, the Brontës, Thackeray, Eliot, and Hardy.

**5221. CHAUCER I: THE CANTERBURY TALES.** (5 cr; I-II MTWThF; LindH 217) McNally  
Reading of *The Canterbury Tales* and introduction to Chaucer's language. This course is a prerequisite to all other courses in Middle English literature (5215-5222).

**5363. JAMES JOYCE.** (4 cr; II MTWThF; LindH 229) Anderson  
Life and early works, particularly *Dubliners*, *A Portrait of the Artist as a Young Man*, and the first four episodes of *Ulysses*.

**5432. AMERICAN POETRY.** (4 cr; III MTWThF; LindH 203) Geffen  
Since 1890. Major figures; historical and intellectual background; poetic theory. Typical authors: Frost, Stevens, Pound, Eliot, Moore, Williams.

**5452. AMERICAN NOVEL** (4 cr; IV MTWThF; LindH 305) Furia  
Late 19th and 20th centuries. Typical authors: James, Dreiser, Cather, Hemingway, Fitzgerald, Faulkner.

**5610. 20TH-CENTURY WRITERS: MODERN DRAMA.** (4 cr; IV MTWThF; LindH 229) Hurrell  
Survey of modern British and European drama from the beginning of the century to the present day, concentrating on plays or dramatists not usually covered in introductory courses (e.g., Galsworthy, Coward, Shaffer, Storey, Handke, Walsler, Mrozek). Some familiarity with modern drama helpful, but not required.

**5651. TECHNIQUES OF POETRY.** (4 cr; III MTWThF; LindH 229) Wright  
Form and sound; meter, stanza, euphony, free verse.

**5950. FIGURES IN ENGLISH AND AMERICAN LITERATURE: CONTEMPORARY WOMEN POETS.** (4 cr; IV MTWThF; LindH 203) Gohlke

Focus on well known poets such as Sylvia Plath, Anne Sexton, and Adrienne Rich; also includes some lesser known writers such as Cynthia McDonald, Marge Piercy, and Mona Van Duyn.



## English Composition (Comp)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1001.<sup>1</sup> INTRODUCTORY COMPOSITION.** (4 cr; each section limited to 28 students; prereq assignment to Category 1, 2, 3 or 5, or 0001...# after first day of class)  
Guided practice in the fundamental structural and stylistic features of exposition and argumentation. Not an introduction to literary studies or to humanities.  
Sec 1, I MTWThF, LindH 203, Reed  
Sec 2, II MTWThF, LindH 302, MacLeish  
Sec 3, III MTWThF, LindH 229, Hirsch  
Sec 4, IV MTWThF, Brown
- 1002.<sup>1</sup> INTRODUCTORY COMPOSITION.** (4 cr; limited to 28 students; prereq 1001...# after first day of class; IV MTWThF; LindH 203) Haley  
See 1001.
- 1027.<sup>1</sup> INTERMEDIATE COMPOSITION.** (4 cr; limited to 25 students; prereq sophomore standing and completion of freshman English or  $\Delta$ ...# after first day of class; I MTWThF; LindH 303) Ross  
Mastery of expository forms (e.g., comparison, analysis, cause-effect) and strategies of tone and diction for clear, accurate style.
- 3085. CONFERENCE COURSE IN ADVANCED COMPOSITION.** (1-4 cr; prereq completion of freshman English,  $\Delta$ ; hrs ar)  
Frequent writing conferences for individual students; lectures and discussion sessions in cooperation with major department; special arrangements for IT and CLA students.

### SECOND TERM

- 1001.<sup>1</sup> INTRODUCTORY COMPOSITION.** (4 cr; limited to 28 students; prereq assignment to Category 1, 2, 3 or 5 or 0001...# after first day of class; II MTWThF; LindH 305) Nelson  
See First Term.
- 1002.<sup>1</sup> INTRODUCTORY COMPOSITION.** (4 cr; each section limited to 28 students; prereq 1001...# after first day of class)  
See 1001 First Term.  
Sec 1, I MTWThF, LindH 229, Geffen  
Sec 2, III MTWThF, LindH 303, Mitchell  
Sec 3, IV MTWThF, LindH 303, Anderson

## Foreign Study (FoSt)

### FIRST AND SECOND TERMS: TEN-WEEK COURSE

- 5960. SEMINAR FOR FOREIGN STUDY I AND II.** (12 cr for both terms; prereq approval before Oct 1976 by a faculty selection committee [grad students must also have approval of adviser]) Fabres, Farrell, Haniff, Stavrou  
Directed field study (SPAN program) in Peru, Ireland, the Fiji Islands, and Greece, investigating current economic, political, educational, cultural, and religious patterns of life. Each participant studies the country carefully before leaving and writes a comprehensive report of his or her findings upon returning. See Special Programs section.

## French and Italian

### French (Fren)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

<sup>1</sup>Any student absent the first day (Tuesday, June 14, for first term, and Tuesday, July 19, for second term) will lose his or her place in class.

## **FIRST TERM**

- 1101. BEGINNING FRENCH.** (5 cr; each section limited to 30 students)  
Sec 1, II-III MTWThF, FoIH 204  
Sec 2, II-III MTWThF, FoIH 205
- 1102. BEGINNING FRENCH.** (5 cr; limited to 30 students; prereq 1101 or 1 yr high school French; I-II MTWThF; FoIH 207)
- 1103. BEGINNING FRENCH.** (5 cr; limited to 30 students; prereq 1102 or 2 yrs high school French; I-II MTWThF; FoIH 208)
- 1104. INTERMEDIATE FRENCH.** (5 cr; limited to 30 students; prereq 1103 or 3 yrs high school French; II-III MTWThF; Jones 2)
- 3015. FRENCH CONVERSATION AND COMPOSITION.** (5 cr; limited to 15 students; prereq 1105; IV MWF, IV-V TTh; FoIH 302) Gelain  
Combines traditional conversational and composition courses. Orthoepic in approach, seeking command of French both in pronunciation and grammar. Includes pastiche work, free composition, and translation from and into French.
- 3303. FRENCH THEATRE.** (5 cr; prereq 3104; limited to 25 students; II-III TTh; FoIH 307) Caplan  
Selected texts; development of notions of convention and genre. Taught in French.
- 3599. THE CONTEMPORARY SCENE IN FRANCE.** (5 cr [cr does not count toward French major]; limited to 25 students; taught in English; IV-V TTh; FoIH 203) Conley  
Exploration of the term culture; French daily life; reduction of ethnocentrism; better understanding of American culture.
- 3601. FRENCH LITERATURE IN ENGLISH TRANSLATION.** (5 cr [cr does not count toward French major]; limited to 25 students; taught in English; IV-V MW; FoIH 203) Akehurst  
Representative works from medieval times to present examined through movements, genres, or themes.
- 3970. DIRECTED READINGS.** (1-5 cr; prereq undergrad, Δ)
- 5380. THE FRENCH NOVEL IN THE 20TH CENTURY.** (5 cr; limited to 25 students; prereq 3209 or above; V-VI MWF; FoIH 103) O'Donnell  
Trends in the novel in France during the 20th century.
- 8970. DIRECTED READINGS.** (1-5 cr; prereq # and consent of dept chair; hrs ar) Staff

## **SECOND TERM**

- 1102. BEGINNING FRENCH.** (5 cr; each section limited to 30 students; prereq 1101 or 1 yr high school French)  
Sec 1, II-III MTWThF, FoIH 203  
Sec 2, II-III MTWThF, FoIH 204
- 1103. BEGINNING FRENCH.** (5 cr; limited to 30 students; prereq 1102 or 2 yrs high school French; I-II MTWThF; FoIH 205)
- 1104. INTERMEDIATE FRENCH.** (5 cr; limited to 30 students; prereq 1103 or 3 yrs high school French; I-II MTWThF; FoIH 207)
- 1105. INTERMEDIATE FRENCH.** (5 cr; limited to 30 students; prereq 1104; II-III MTWThF; FoIH 208)
- 3016. ADVANCED FRENCH COMPOSITION AND CONVERSATION.** (5 cr; limited to 15 students; prereq 3015 or #; III MWF, III-IV TTh; FoIH 205) Soulas
- 3602. FRENCH THEATRE IN ENGLISH TRANSLATION.** (5 cr [cr does not count toward French major]; limited to 245 students; taught in English; IV-V TTh; FoIH 204) Lock  
See 3601 First Term.
- 3970. DIRECTED READINGS.** (1-5 cr; prereq undergrad, Δ) Staff
- 5396. EXISTENTIAL NOVEL.** (5 cr; limited to 25 students; prereq 3209 or above; V-VI MWF; FoIH 204) Bauer  
Novelists since 1930 concerned with what Malraux called the "human condition": Malraux, Céline, Sartre, Camus, Blanchot, and Beckett.
- 8970. DIRECTED READINGS.** (1-5 cr; prereq # and consent of dept chair; hrs ar) Staff

## Italian (Ital)

### FIRST AND SECOND TERMS: TEN-WEEK COURSE

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. Students must register in both terms of the summer session and may not enroll in other summer courses.

**1101-1102-1103†. BEGINNING ITALIAN.** (15 cr for both terms; limited to 30 students, must be reserved in JohH 12; II-IV MTWThF; FolH 103)

A course with speaking objectives based on an audiolingual approach. Students learn to understand and express fundamental structures of the language. Includes audiovisual aids.

## Geography (Geog)

### FIRST TERM

- 1301. HUMAN GEOGRAPHY.** (6 cr, §1302; I MTWThF; BlegH 415) Hart  
Geography of population and principal ways of life; capacity of earth for future population.
- 1425. INTRODUCTION TO METEOROLOGY.** (4 cr, §Soil 1262; IV MTWThF; BlegH 445) Skaggs  
Nature of the atmosphere and its behavior. Atmospheric composition, structure, stability, and motion; precipitation processes, air masses, fronts, cyclones, and anticyclones; general weather patterns; meteorological instruments and observation; plotting and analysis of maps; forecasting.
- 3181. SOVIET UNION.** (4 cr; II MTWThF; BlegH 415) R Adams  
Systematic appraisal by regions of physical resources, population, and economic geography; problems and planning in U.S.S.R. compared with the U.S.
- 3355. ENVIRONMENTAL PROBLEMS.** (4 cr; I MTWThF; BlegH 415) Gersmehl, Squires  
Environmental problems associated with human activities.
- 3970. DIRECTED STUDIES.** (1-15 cr per qtr) Staff
- 5113. CANADA AND ALASKA.** (4 cr; III MTWThF; BlegH 235) Mather  
Physical and human geography. International and external areal relationships.
- 5701. FIELD RESEARCH.** (4 cr; prereq 12 cr in geography and #) Brown  
Field investigation in physical, cultural, and economic geography; techniques of analysis and presentation; reconstruction of environments. See Special Programs section.
- 8700. SEMINAR: HISTORICAL FIELD.** (6 cr; prereq #) Brown  
Field research seminar. See Special Programs section.
- 8970. DIRECTED READINGS.** (1-5 cr) Staff

### SECOND TERM

- 3111. GEOGRAPHY OF MINNESOTA.** (4 cr; III MTWThF; BlegH 415) Rice  
Physical resources, population, and commercial production. Field trips to eastern Minnesota.
- 3161. EUROPE.** (4 cr; I MTWThF; BlegH 415) Rice  
Cultural-economic realms in Europe (excluding the U.S.S.R.); areal organization of each realm.
- 3345. ENERGY AND MINERALS.** (4 cr; II MTWThF; BlegH 415) R Adams  
Sources, production, circulation, and consumption of power, metals, and nonmetallic minerals. Problems of exhaustion, substitution, pollution, costs, trade, and policy. National and local case studies.
- 3421. CLIMATOLOGY.** (4 cr; prereq 1401 or #; IV MTWThF; BlegH 415) Skaggs  
World distribution of climatic elements; methods of arranging climatic data; climatic classification and world distributions of climatic types; general circulation; climatic change and fluctuations.
- 3970. DIRECTED STUDIES.** (1-15 cr per qtr) Staff
- 5132. SOUTH AMERICA.** (4 cr; III MTWThF; BlegH 415) Mather  
Physical resources, population, agriculture, manufacturing, and transportation in countries of South America.
- 8970. DIRECTED READINGS.** (1-5 cr) Staff

## German (Ger)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

The Summer Session and the German Department will sponsor a special program at Ludwig-Maximilians Universität, Munich, Germany. Permission of the German department is required for registration. See Special Programs section.

### FIRST TERM

- 1101. BEGINNING GERMAN.** (5 cr, §1001, §1110; each section limited to 20 students)  
Understanding, speaking, reading, and writing. Emphasis on reading.  
Sec 1, I-II MTWThF, FolH 104, Conant  
Sec 2, I-II MTWThF, FolH 105, Alley  
Sec 3, III-IV MTWThF, FolH 207, Alley
- 1103. BEGINNING GERMAN.** (5 cr, §1003, §1110; limited to 25 students; prereq 1102 or 2 yrs high school German; II-III MTWThF; FolH 107) Wakefield  
See 1101.
- 1301. INTERMEDIATE GERMAN.** (5 cr; limited to 25 students; prereq 1003 or 1103 or 3rd qtr of 1110 or 3 yrs high school German; II-III MTWThF; FolH 306) Plummer  
Expansion of basic skills.
- 3104. READING AND ANALYSIS OF LITERARY TEXTS: PROSE.** (4 cr; limited to 25 students; required of all German majors; prereq 1301 or 4 yrs high school German; III MTWThF; FolH 203) Lowry  
Reading fluency; appreciation of literary values through literary interpretation and familiarization with critical terminology.
- 3501. CONTEMPORARY GERMANY.** (4 cr; limited to 30 students; prereq 1 yr college German or 3 yrs high school German; IV MTWThF; FolH 205) Weiss  
Culture and civilization of present-day Germany.
- 3601. GERMAN LITERATURE IN TRANSLATION.** (4 cr [cr does not count toward German major]; limited to 30 students; may be used in fulfillment of Route II, Part B of BA foreign language requirement; requires no knowledge of German; II MTWThF; FolH 305) Liberman  
Representative literary works from medieval to modern times related to other literatures.
- 5601. DRAMA IN TRANSLATION.** (4 cr; limited to 30 students; prereq 8 cr in theatre arts or in literature above 3001; requires no knowledge of German; IV MTWThF; FolH 204) Lowry
- 5970. DIRECTED STUDIES.** (1-5 cr) Weiss  
Guided individual reading or study.

### SECOND TERM

- 1102. BEGINNING GERMAN.** (5 cr, §1002, §1110; each section limited to 25 students; prereq 1101 or 1 yr high school German)  
See 1101 First Term.  
Sec 1, I-II MTWThF, FolH 201  
Sec 2, I-II MTWThF, FolH 105
- 3105. READING AND ANALYSIS OF LITERARY TEXTS: DRAMA AND POETRY.** (4 cr; limited to 25 students; required of all German majors; prereq 1301 or 4 yrs high school German; III MTWThF; FolH 302) Plummer  
See 3104 First Term.
- 3603. GERMAN LITERATURE IN TRANSLATION.** (4 cr [cr does not count toward German major]; limited to 30 students; may be used in fulfillment of Route II, Part B of BA foreign language requirement; requires no knowledge of German; III MTWThF; FolH 207) Taraba  
See 3601 First Term.
- 3610. MODERN GERMAN AUTHORS IN TRANSLATION.** (4 cr [cr does not count toward German major]; limited to 30 students; may be used in fulfillment of Route II, Part B of BA foreign language requirement; requires no knowledge of German; IV MTWThF; FolH 207) Taraba

## Greek—See Classics

**Hebrew**—See Near and Middle Eastern Studies

**Hindi**—See South Asian Studies

## History (Hist)

### FIRST TERM

- 1001. INTRODUCTION TO MODERN EUROPEAN HISTORY.** (4 cr, §1001H, §3001; not open to jrs, srs; III MTWThF; AndH 250) Thayer  
Development of Western Europe to 1715.
- 1003. INTRODUCTION TO MODERN EUROPEAN HISTORY.** (4 cr, §1003H, §3003; not open to jrs, srs; II MTWThF; BlegH 350) Kieft  
1870 to recent times.
- 1051. ANCIENT CIVILIZATION.** (3 cr, §3051; IV MTWThF) Jones  
Near East to 500 B.C.
- 1302. AMERICAN HISTORY.** (4 cr, §1302H; II MTWThF; BlegH 10) Berman  
Modern America.
- 1403. SURVEY OF LATIN-AMERICAN HISTORY.** (4 cr, §3403; I MTWThF; BlegH 215) McCaa  
Contemporary period.
- 3051. ANCIENT CIVILIZATION.** (3 cr, §1051; IV MTWThF) Jones  
See 1051.
- 3468. PEOPLE'S REPUBLIC OF CHINA: THE COMMUNIST REVOLUTION, 1900 TO PRESENT.** (4 cr, §5468; II MTWThF; BlegH 404) Farmer  
Introduction of Marxism to China; rise of Communist party; restructuring Chinese society.
- 3471. 20TH-CENTURY JAPAN.** (4 cr, §5471; III MTWThF; BlegH 430) Marshall  
The modern transformation, 1870s to 1970s.
- 3611. JEWISH-CHRISTIAN RELATIONS IN MEDIEVAL EUROPE.** (4 cr; I MTWThF; BlegH 135) Bachrach  
History of the Jewish minority in medieval Western Europe; relations between Christians; Constantine to Luther, 300-1500 A.D.
- 3812. POLITICS AND SOCIETY IN 19TH-CENTURY AMERICA.** (4 cr; III MTWThF; BlegH 10) Arsenault  
1861-1900. Civil War and Reconstruction. Bossism and the Gilded Age. Populism and the "new South."
- 3822. UNITED STATES IN THE 20TH CENTURY.** (4 cr; II MTWThF; BlegH 430) Spear  
1920 to 1945.
- 3970. DIRECTED STUDIES.** (1-15 cr; prereq #)  
Guided individual reading or study. Open to qualified students for 1 or more quarters.
- 3990. DIRECTED RESEARCH.** (1-15 cr; prereq #)  
Qualified students, with consent of instructor, work on a tutorial basis.
- 5212. FRENCH REVOLUTION AND NAPOLEON.** (4 cr; IV MTWThF; BlegH 220) Bamford  
France and the Revolution: 1789-1799.
- 5821. AMERICAN HISTORY IN THE 20TH CENTURY.** (4 cr; prereq #; VI-VII MTh; BlegH 340) Chambers
- 5970. DIRECTED STUDIES.** (1-15 cr; prereq #)  
Qualified senior and graduate students may register for work on tutorial basis. Guided individual reading or study.
- 5990. DIRECTED RESEARCH.** (1-15 cr; prereq #)  
Qualified senior and graduate students may register for work on tutorial basis.

### SECOND TERM

- 1002. INTRODUCTION TO MODERN EUROPEAN HISTORY.** (4 cr, §1002H, §3002; not open to jrs, srs; III MTWThF; BlegH 125) Noonan  
Revolution, liberalism, and nationalism to 1870.

- 1052. ANCIENT CIVILIZATION.** (5 cr, §3052; II MTWThF; BlegH 245) Kelly  
Greek civilization, 750 to 323 B.C.
- 1301. AMERICAN HISTORY.** (4 cr, §1301H; III MTWThF; BlegH 105) Noble  
Colonial, early national period through sectional crisis.
- 1401. SURVEY OF LATIN AMERICAN HISTORY.** (4 cr, §3401; I MTWThF; BlegH 215) Schwartz  
Colonial period to 1800.
- 1451. ASIAN CIVILIZATION.** (4 cr, §3451; III MTWThF; BlegH 215) Taylor  
Birth of civilization through ancient empires in East, South, and West Asia.
- 3150. TOPICS IN ENGLISH HISTORY: THE AGE OF THE ENGLISH COUNTRY HOUSE.** (4 cr; II MTWThF; BlegH 105) Lehmborg  
Seminar in the history of England.
- 3222. EUROPEAN SOCIAL HISTORY THROUGH LITERATURE.** (4 cr; I MTWThF; BlegH 130) Rudolph  
Use of novels, short stories as main sources.
- 3484. HISTORY OF SOUTHEAST ASIA.** (4 cr; IV MTWThF; BlegH 105) Kopf  
Societies and states in Asian region bordered by cultures and political spheres of China and India.
- 3622. WANING OF THE MIDDLE AGES.** (4 cr; IV MTWThF; BlegH 205) Tracy  
France and the Low Countries, ca. 1300-1570.
- 3970. DIRECTED STUDIES.** (1-15 cr; prereq #)  
See First Term.
- 3990. DIRECTED RESEARCH.** (1-15 cr; prereq #)  
See First Term.
- 5111. EUROPE IN HIGH MIDDLE AGES.** (4 cr; II MTWThF; BlegH 130) Reyerson  
The medieval revival, 900-1150.
- 5245. CENTRAL EUROPE.** (4 cr; prereq 1003 or equiv; III MTWThF; BlegH 130) Wright  
Since 1815.
- 5251. WOMEN IN SCANDINAVIA.** (4 cr; IV MTWThF) Gold  
Women's position in Scandinavia from the 19th century to the present.
- 5342. AMERICAN ECONOMIC HISTORY.** (4 cr; II MTWThF; BlegH 440) Green  
1865 to present.
- 5381. MINNESOTA HISTORY WORKSHOP—July 18-29.** (5 cr; limited to 100 students, must be reserved at 1425 University Ave SE)  
See Special Programs section.
- 5432. PROBLEMS IN CONTEMPORARY AFRICA.** (4 cr; IV MTWThF; BlegH 430) Kaba  
Historical and social developments in Africa since the 1900s.
- 5970. DIRECTED STUDIES.** (1-15 cr; prereq #)  
See First Term.
- 5990. DIRECTED RESEARCH.** (1-15 cr; prereq #)  
See First Term.

## Humanities (Hum)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1001. HUMANITIES IN THE MODERN WORLD I.** (5 cr, §3001, §Rhet 1301; limited to 65 students; I-II MW; Ph 210) Leppert  
Old Regime, French Revolution and Napoleonic era, neoclassicism and romanticism. Pope, Voltaire, Rousseau, Burke, Goethe, and Tolstoy.
- 1101. THE LIFE OF THE MIND: INTRODUCTION TO METHODS IN THE HUMANITIES.** (5 cr; limited to 35 students) Thomas  
Ways of reading or appreciating poetry, sculpture, history, philosophy, painting, rhetoric, music, and film; works by Stevens, Einstein, Henry Moore, Bach, Lincoln, Plato, Genet, Euclid, Joyce, and Fellini.  
Sec 1, II-III TTh, ForH 160  
Sec 2, II-III MW, ForH 160

- 3009. MAN BEFORE HISTORY: THE GOLDEN AGE.** (5 cr; limited to 65 students; III-IV TTh; Owre 11) Ames  
A search for meaning in the myth of a lost terrestrial paradise: the abundant plain of Eden or worldwide technological mastery? Scientific evidence of the cultural advances of prehistoric civilizations. Correlations with literature, folklore, and certain anomalies of archaeology, geography, and psychology. Readings in Campbell, Fairservis, Gordon, Milton, de Santillana.
- 3012. EUROPEAN HERITAGE: ROMAN HERITAGE.** (5 cr, §1012, §Rhet 3322; limited to 65 students; prereq jr or sr; II MTWThF; ForH 120) Hershbell  
Masterpieces of European civilization. Literature, philosophy, theology, arts of Rome. Ideals and forces of continuing importance to modern world.
- 3071. SELF-REALIZATION IN 20TH-CENTURY LITERATURE.** (5 cr; limited to 65 students; prereq jr, sr, or #; III-IV MW; Owre 111) Kliger  
The quest for meaning and the process of individuation explored in works of 20th-century literature.

## **SECOND TERM**

- 3004. HUMANITIES IN THE MODERN WORLD.** (5 cr, §1004, §Rhet 3381; limited to 65 students; prereq jr or sr; II MTWThF; ForH 120) Bryan  
Humanities between the two world wars. Communism, fascism, Freudianism, modern art and philosophy, existentialism. Lenin, Freud, Joyce, T. S. Eliot, Kafka, and others.
- 3101. THE MEANING OF HUMANITY.** (4 cr; limited to 65 students; III MTWTh; ForH 120) Roshwald  
The essence of human existence and the factors determining its course, explored through theories such as those of Marx, Freud, Plato.
- 5030. HUMANITIES PROSEMINAR.** (3 cr; limited to 15 students; prereq sr; IV MTW; ForH 160) Roshwald  
Integrated review of humanities materials: arts, science, and civilization. Social concern in science fiction literature.

## **Indic—See South Asian Studies**

## **Interdepartmental Study (ID)**

ID courses are available under course ID 3970 for 3 to 15 credits. Similar independent study courses may be taken for 1 to 5 credits under Literature and Fine Arts (LFA), Natural Science (NSci), or Social Science (SSci) 3970 (to arrange projects, consult the Office for Special Learning Opportunities, 201A Westbrook Hall, 373-7550), or for varying credit under departmental courses 3970 or 5970.

- 3970. DIRECTED STUDIES.** (3-15 cr; prereq consent of Office for Special Learning Opportunities)  
Individual projects, readings, and research in areas that cross departmental lines.

LFA, NSci, and SSci 3970 descriptions are the same as that of ID 3970 except for credit offering.

## **Italian—See French and Italian**

## **Jewish Studies—See Near and Middle Eastern Studies**

## **Journalism and Mass Communication (Jour)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

## FIRST TERM

- 1005. VISUAL COMMUNICATION.** (3 cr; prereq 3rd-qr fr; III MTWThF; Arch 30) Brown  
Functions of visual communication in news and advertising for print and electronic media. Evaluation and criticism of current typography, photography. Lectures (CCTV), recitations; projects, critiques.
- 1101. REPORTING.** (5 cr; limited to 20 students; prereq C or better in 1001 and 1005 or grad status, a passing score on the Minnesota English Test, type 25 wpm, and  $\Delta$ ...photocommunication students must also pass 1301 with a C or better; I-II MTWThF; MurH 212) Hage  
Study and practice in fact gathering and journalistic writing. Problems in judgment and handling of news and news features.
- 1201. PRINCIPLES OF ADVERTISING.** (4 cr; prereq 1001 recommended for journalism majors; II MTWThF; MurH 311) Freund  
Theory, principles, and functions of advertising; its role in economic, social, and marketing structure. Newspapers, magazines, radio, television as advertising media.
- 5182. PUBLICATION WORKSHOP—June 14–July 1.** (4 cr; for those who plan to advise high school or college newspapers, yearbooks, magazines; not open to journalism majors; 1:00-4:30 MTWThF; MurH 308) Wilson  
Intensive study of the role of high school newspaper and yearbook; analysis of content; study of design and makeup, typography, photography processes. Specially planned for secondary school publication advisers. See Special Programs section.
- 5221. PUBLICATION GRAPHICS.** (4 cr; prereq 3121 or 3231 or 8 cr in 3xxx- or 5xxx-level courses in art and design; \$4 lab fee; II MTWThF; MurH 315-20) Wilson  
Processes in graphic communication. Technique and production of illustration. Significant graphic arts developments.
- 5501. COMMUNICATION AND PUBLIC OPINION I.** (4 cr, §Soc 5355; prereq 15 cr in social science depts; III MTWThF; MurH 308) Carter  
Theories of communication process and of persuasion and attitude change. Functions of interpersonal and mediated communication in diffusion of information and in opinion formation.
- 5601. HISTORY OF JOURNALISM.** (4 cr; IV MTWThF; MurH 308) Emery  
Development of American newspapers and periodicals from beginnings in Europe to present day; rise of radio and television; relation of communications developments to political, economic, and social trends.
- 5721. MASS MEDIA IN A DYNAMIC SOCIETY.** (4 cr; prereq 1201 or 3121 for journalism majors ...others #: I MTWThF; MurH 308) Ismach  
Economic, political, and social determinants of character and content of mass communications. Patterns of operations, effect on content, and relative social utility. Theory of mass society.
- 5970. ADVANCED PROJECTS IN JOURNALISM.** (1-4 cr [may be repeated for max 8 cr]; prereq journalism major, B avg, #) Staff
- 8990. SPECIAL PROBLEMS IN MASS COMMUNICATION.** (4 cr; for grad major or minor in mass communication; prereq #) Staff  
Individual research.

## SECOND TERM

- 1101. REPORTING.** (5 cr; limited to 20 students; prereq C or better in 1001 and 1005 or grad status, a passing score on the Minnesota English Test, type 25 wpm, and  $\Delta$ ...photocommunication students must also pass 1301 with a C or better; III-IV MTWThF; MurH 212) Sim  
See First Term.
- 3121. PUBLIC AFFAIRS REPORTING.** (4 cr; limited to 20 students; prereq 2.50 avg in 1001, 1005, and 1101, Comp 1027 where required by sequence, type 40 wpm, and  $\Delta$ ...or  $\Delta$  where waiver of prereqs is warranted; I MTWThF; MurH 212) Dennis  
Reporting and editing news of courts and municipal, county, state, federal administrative and legislative agencies.
- 3241. ADVERTISING COPYWRITING.** (4 cr; limited to 20 students; prereq 2.50 avg in 1001, 1005, and 1201, Comp 1027 where required by sequence, a passing score on the Minnesota English Test, type 25 wpm, and  $\Delta$ ...or  $\Delta$  where waiver of prereqs is warranted; III-IV MTWThF; MurH 210) Harris  
Advertising appeals and strategy; development and presentation of advertising for print and broadcast. Individual and group projects.
- 3776. MASS COMMUNICATIONS LAW.** (4 cr; prereq 1001 or 1011, 1101 or #; II MTWThF; MurH 308) Gillmor  
Origins and background of principles of press law. The press and the First Amendment. Libel and its defenses. Confidentiality of sources. Pornography, free press and fair trial. Freedom of information or the public's right to know. Access to the media. Privacy. Advertising law, lobbying, antitrust laws. The regulation of broadcasting.



- 5251. PSYCHOLOGY OF ADVERTISING.** (4 cr, \$Psy 5751; prereq Psy 1001; IV MTWThF; SciCB 375) Jones  
Psychological principles, research techniques, and applications in advertising and selling. Consumer attitudes and behavior. Psychological mechanisms upon which effectiveness of advertisements and commercials depends.
- 5549. PUBLIC RELATIONS.** (4 cr; prereq 15 cr in social science depts...# for nonmajors; II MTWThF; MurH 311) Lindsay  
History and development of public relations practice and principles. Process and applications in a variety of institutional settings. Critique of public relations in contemporary society.
- 5970. ADVANCED PROJECTS IN JOURNALISM.** (1-4 cr [may be repeated for max 8 cr]; prereq Journalism major, B avg, #) Staff
- 8990. SPECIAL PROBLEMS IN MASS COMMUNICATION.** (4 cr; for grad major or minor in mass communication; prereq #) Staff  
See First Term.

## Latin—See Classics

## Library School (Lib)<sup>1</sup>

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 5101. INTRODUCTION TO LIBRARIES AND LIBRARIANSHIP.** (5 cr; limited to 50 students; \$4 lab fee; I-II MTWTh, VH 1; lab I-V F) Amundson  
Librarianship as a profession; development of libraries as social agencies; principles of library administration and management.
- 5102. MEDIA CENTER ADMINISTRATION.** (3 cr; prereq 5101, 5221, 5401; IV-V MW; VH 1) Olson  
Organization and administration at the school building level of the library as the single agency that encompasses all forms of instructional materials; philosophy and objectives of services; administration and organization plans, procedures, and relationships.
- 5205. MATERIALS RELATED TO THE CURRICULUM.** (3 cr; prereq 5101, 5204, 5221, 5401; II-III TTh; VH 2) Olson  
Survey of elementary and secondary school curricula with emphasis on a multimedia approach to teaching and optimum use of school libraries by teachers; teacher-librarian relations; exploration in depth of materials in at least one curriculum area.
- 5221. RECORDS OF KNOWLEDGE.** (4 cr; limited to 50 students; \$4 lab fee; V-VI MTWTh, VH 2; lab I-V F) Rohde  
History and development of the records of knowledge in relation to the communication problems of society; principles of selection and dissemination to meet library clientele information needs.
- 8224. SUBJECT BIBLIOGRAPHY.** (4 cr; limited to 25 students; prereq 5101, 5221, 5401; VI-VII MW; WaLib 339) Mahmoodi  
The world of learning and the various disciplines as they have developed in the United States; the bibliographic apparatus in relation to the structure of the disciplines.
- 8241. HISTORY OF BOOKS AND PRINTING.** (4 cr; prereq 5101, 5221, 5401; VI-VII TTh; WaLib 339) Maack  
Bookmaking in its various forms from earliest times to the present. Development of the alphabet and the manuscript book; invention and spread of printing; design of the modern book with emphasis on aesthetic and technical aspects.
- 8402. ORGANIZATION OF INFORMATION II.** (4 cr; limited to 25 students; prereq 5101, 5221, 5401; \$4 lab fee; II-III MW; WaLib 339) Brekhus  
Advanced study of methods and problems in the description, subject organization, and retrieval of records of knowledge and information in bibliographies, library catalogs, and machine-based systems.

<sup>1</sup>The Library School is a professional school that offers only graduate degrees and courses. Courses numbered 8000 and above are open only to graduate students and to librarians who hold a fifth-year degree in library science. Courses numbered below 8000 are open to anyone who has been admitted to the Graduate School or to any undergraduate in the College of Liberal Arts or the College of Education. A student who does not fall in one of the above categories must have registration for any library science course approved by an adviser in the Library School office, 419 Walter Library.

- 8411. LIBRARY MECHANIZATION AND SYSTEMS ANALYSIS.** (4 cr; limited to 25 students; prereq 5101, 5221, 5401; \$4 lab fee; IV-V TTh; WaLib 339) Brekhus  
Systems analysis as applied to library operations; data representation and coding systems; application of technological developments such as microforms and computers to library operations.
- 8970. INDEPENDENT STUDY.** (Cr ar; prereq #) Staff
- 8990. LIBRARY RESEARCH.** (Cr ar; prereq #) Staff  
Graduate students under Plan B may register for at least 4 credits in library research with the approval of the professor who will guide the research project.

## **SECOND TERM**

- 5401. ORGANIZATION OF INFORMATION I.** (4 cr; limited to 50 students; \$4 lab fee; I-II MTWTh; VH 1) Mahmoodi  
Methods and problems involved in the description, subject organization, and retrieval of records of knowledge and information in bibliographies, library catalogs, and machine-based systems.
- 8103. PUBLIC LIBRARIES.** (4 cr; prereq 5101, 5221, 5401; \$4 lab fee; VI-VII MW; WaLib 339) McClaskey  
Development of public library services with emphasis on the growth of cooperative library systems and interrelationships with all types of libraries; social change and problem solving as related to research, literature, organization, administration, and legal factors.
- 8223. GENERAL BIBLIOGRAPHY.** (4 cr; limited to 30 students; prereq 5101, 5221, 5401; II-III MW; WaLib 339)  
Major national and trade bibliographies with emphasis on those of the United States, Great Britain, France, Germany, and Russia; their use in selection and acquisition of print and nonprint materials and in the preparation of bibliographies.
- 8224. SUBJECT BIBLIOGRAPHY.** (4 cr; limited to 25 students; prereq 5101, 5221, 5401; II-III TTh; WaLib 339)  
See First Term.
- 8233. HISTORY OF CHILDREN'S LITERATURE.** (4 cr; prereq 5101, 5221, 5401; VI-VII TTh; WaLib 339) McClaskey  
The history and study of children's literature in relation to social history with special reference to current applications for library services.
- 8402. ORGANIZATION OF INFORMATION II.** (4 cr; limited to 25 students; prereq 5101, 5221, 5401, \$4 lab fee; IV-V TTh; WaLib 339) Mahmoodi  
See First Term.
- 8970. INDEPENDENT STUDY.** (Cr ar; prereq #) Staff
- 8990. LIBRARY RESEARCH.** (Cr ar; prereq #) Staff  
See First Term.

## **Linguistics (Ling)**

### **FIRST TERM**

- 3001. INTRODUCTION TO LINGUISTICS.** (4 cr, §5001, §3005; III-IV MWF, III TTh; FolH 208) Miranda  
Syntax, semantics, phonology; language learning and psychology of language; universals of language; language in society; language change; educational applications; history of linguistics.
- 3301. PHONETICS.** (4 cr, §5003, §5301; prereq 3001 or §3001 or #; VI-VII MTWThF; FolH 104) Houlihan  
Physiology and acoustics of speech sounds; practice and drill in production and perception. Meets with 5003 and 5301.
- 5001. INTRODUCTION TO LINGUISTICS.** (4 cr, §3001, §3005; III-IV MWF, III TTh; FolH 104) Hutchinson  
See 3001.
- 5003. APPLIED PHONETICS.** (4 cr, §3301, §5301; not open to linguistics majors; prereq 5001 or §5001 or #; VI-VII MTWThF; FolH 104) Houlihan  
Primarily for teachers of English as a second language. Meets with 3301 and 5301.
- 5301. PHONETICS.** (4 cr, §3301, §5003; prereq 3001 or 5001 or §5001 or #; VI-VII MTWThF; FolH 104) Houlihan  
See 3301. Meets with 3301 and 5003.

### **SECOND TERM**

- 5721. ENGLISH AS A SECOND LANGUAGE: METHODS.** (4 cr; prereq 3001 or 5001 or #; II-IV MWF; FolH 105) Godfrey  
Linguistics applied to teaching English as a second language.

## Music (Mus)

(See also Music Education under College of Education)

Courses with limited enrollment and others so indicated must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1001. FUNDAMENTALS OF MUSIC.** (4 cr; must be reserved in JohH 12; for nonmusic majors)  
Basic musical symbols, vocabulary, rhythm, design, scale structures, intervals, chords. Development of basic piano skills; playing simple accompaniments.  
Sec 1, I MTWThF, MusEd 200, Baldwin  
Sec 2, V MTWThF, MusEd 200, Anderson
- 1410. BAND.** (1 cr; prereq #: VI-VII MTWThF; NMA 4) Sanford  
Symphony Band Ensemble; performance of standard and contemporary repertory.
- 1507. SURVEY OF MELODIC AND HARMONIC PROCEDURES.** (3 cr; prereq #: I MTWThF; WuH 7A) Gross  
Principles of melodic and harmonic structure.
- 1517. EAR-TRAINING AND SIGHT-SINGING.** (3 cr; prereq #: II MTWThF; WuH 7A) Gross  
Development of aural skills with concentration on sight-singing, interval recognition, melodic and harmonic dictation, and vocal improvisation.
- 3791. INTRODUCTION TO ELECTRONIC MUSIC.** (4 cr; limited to 24 students; prereq 4 cr in music or #: III-IV MWF; ScH 19) Ultan  
Musical literature to which electronic materials contribute. Listeners, discussions, and readings. Exercises in the use of equipment.
- 3970. DIRECTED STUDIES.** (1-15 cr; prereq #, Δ; hrs ar; ScH 104) Ultan, Gross  
Independent research and study under faculty guidance. Subjects selected according to strengths and interests of individual students.
- 5360. WOODWIND ENSEMBLE.** (1 cr; prereq audition; III MTWThF; WuH 320) Anderson  
Practice and performance of chamber music for various combinations of woodwind instruments in small groups (three or more players) and in larger homogeneous instrumental choirs.
- 5372. DICTION FOR SINGERS.** (2 cr; prereq 12 cr of 1204 or #: II MTWThF; MusEd 101) Davis  
International Phonetic Association alphabet; principles used in singing pronunciation of German.
- 5377. THE ADOLESCENT SINGING VOICE.** (3 cr; prereq 3xxx clearance in voice for vocal majors or 6 cr of applied voice for non-vocal majors; IV MTWThF; MusEd 101) Schuessler  
Principles of voice for teaching adolescent singers. Directed teaching, required readings, and study of relevant repertoire.
- 5380. BRASS CHOIR.** (1 cr; prereq #: III MTWThF; ScH 108) Baldwin  
Practice and performance of brass ensemble literature from the antiphonal music of Giovanni Gabrieli to works of the twentieth century.
- 5388. INSTRUMENTAL CONDUCTING.** (4 cr; prereq #: IV MTWThF; WuH 330) Massmann  
Conducting techniques, score analysis, performance practice.
- 5410. BAND.** (1 cr; prereq #: VI-VII MTWThF; NMA 4) Sanford  
See 1410.
- 5551, 5552, 5553. COMPOSITION I.** (2 cr each; prereq 1506; III-IV TTh; ScH 103) Ultan  
Original work in various forms. Various techniques and styles of composition. Development of original approaches.
- 5554, 5555, 5556. COMPOSITION II.** (2 cr each; prereq 3543, 5553; III-IV TTh; ScH 103) Ultan  
Original works in various forms.
- 5664. CHARLES IVES: LIFE AND WORKS.** (4 cr; V MTWThF; WuH 320) Riedel  
Ives' compositions. Ives and American transcendentalism. Ives and the Progressive party. Ives as a 19th- and 20th-century composer.
- 5701. AMERICAN MUSIC.** (4 cr; prereq 1606 or 8 cr in American history or American studies or #: VI MTWThF; WuH 320) Riedel  
From colonial times to present. American Indian music; sacred music in America, Puritan New England to the present time; jazz; music education; the symphony orchestra; contemporary music.
- 5741. VOCAL LITERATURE.** (4 cr; prereq 12 cr in 1104 or 1204 or 1304 or #: VI MTWThF; WuH 7A) Sutton  
Literature and pedagogy; performance of songs from major and minor composers. Vocal techniques from major schools of singing as they relate to song performance.

8551, 8552, 8553. **COMPOSITION III.** (3 cr each; prereq grad students who have completed undergrad major sequence in music theory and composition incl 3543, 5503, 5553, 5563; III-IV TTh; ScH 103) Ultan

8990x.\* **SPECIAL PROBLEMS.** (2-12 cr; prereq 5841; hrs ar; ScH 104) Riedel, Ultan

## *Courses in Applied Music*

Offerings in applied music are classified according to three modes: elective (with or without credit), applied, and performance; and five levels: 0xxx (prefix 0, no credit), 1xxx (prefix 1), 3xxx (prefix 3), and graduate levels 5xxx and 8xxx (prefixes 5 and 8). A student may not register for a course in applied music for credit until he or she has passed the required applied entrance examination. The examining committee will determine the mode(s) for which a student may register. Students should consult a faculty member in the Music Department, 106 Scott Hall, regarding the mode and level of applied music appropriate for fulfillment of specific requirements for their degree program. To register for 3xxx-level credit in applied music, the student must have completed 12 credits at the 1xxx level on the appropriate instrument and must pass a qualifying examination.

Courses in applied music carry 2 credits (minimum of 5 hours of private lessons) per summer term. Fees for non-music majors are based on individual lessons: \$80 (0-2 credits). Music and music education majors at the 12xx or 13xx level in their major instrument pay \$55 for 2 credits. Music and music education majors at the 32xx or 33xx level in their major instrument (prerequisite 12 credits of 12xx or 13xx and qualifying exam) are eligible for a reduced rate of \$25 per 2 credits. M.F.A. and D.M.A. students taking applied music at the 83xx level also are eligible for the reduced rate of \$25 per 2 credits.

The music fees are treated as course fees; that is, they are applied *in addition to tuition for all students in all quarters or summer terms.*

## COURSES IN APPLIED MUSIC

Instrument	Non-Cr	Applied: Elective			Applied			Applied: Performance			Instructor
		1xxx Level	3xxx Level	Grad	1xxx Level	3xxx Level	Grad	1xxx Level	3xxx Level	Grad	
Piano	0101	1101	3101	5101	1201	3201	8201	1301	3301	8301	Weiser, McNab, Ivory
Harpsichord	0102	1102	3102	5102	1202	3202	8202	1302	3302	8302	Burris
Organ	0103	1103	3103	5103	1203	3203	8203	1303	3303	8303	Fleischer, Lancaster
Voice	0104	1104	3104	5104	1204	3204	8204	1304	3304	8304	Schuessler, Ware, Davis, Brandstetter, Wilson
Violin	0105	1105	3105	5105	1205	3205	8205	1305	3305	8305	Tartaglia, Adams, Gregorian, Thomson
Viola	0106	1106	3106	5106	1206	3206	8206	1306	3306	8306	Ar
Cello	0107	1107	3107	5107	1207	3207	8207	1307	3307	8307	Heller, Jamieson
Double Bass	0108	1108	3108	5108	1208	3208	8208	1308	3308	8308	Clute
Flute	0109	1109	3109	5109	1209	3209	8209	1309	3309	8309	Eagle, Niosi, Opava, Zeitlin
Oboe	0111	1111	3111	5111	1211	3211	8211	1311	3311	8311	Capps, Holub
Clarinet	0112	1112	3112	5112	1212	3212	8212	1312	3312	8312	Anderson, Haugen, Hedling
Saxophone	0113	1113	3113	5113	1213	3213	8213	1313	3313	8313	Anderson, Haugen
Bassoon	0114	1114	3114	5114	1214	3214	8214	1314	3314	8314	Miller
French Horn	0115	1115	3115	5115	1215	3215	8215	1315	3315	8315	Gaska, Kamminga
Trumpet	0116	1116	3116	5116	1216	3216	8216	1316	3316	8316	Baldwin, Hasselmann, Schlueter, Volpe
Trombone	0117	1117	3117	5117	1217	3217	8217	1317	3317	8317	Zelimer
Baritone	0118	1118	3118	5118	1218	3218	8218	1318	3318	8318	Ricketts
Tuba	0119	1119	3119	5119	1219	3219	8219	1319	3319	8319	Tolbert, Walton
Percussion	0121	1121	3121	5121	1221	3221	8221	1321	3321	8321	Dahlgren
Harp	0122	1122	3122	5122	1222	3222	8222	1322	3322	8322	Miller
Guitar	0123	1123	3123	5123	1223	3223	8223	1323	3323	8323	Pederson
Accordion	0124	1124	3124	5124	1224	3224	8224	1324	3324	8324	Malmberg

## SECOND TERM

- 1001. FUNDAMENTALS OF MUSIC.** (4 cr; must be reserved in JohH 12; for nonmusic majors) Hilley  
See First Term.  
Sec 1, II MTWThF, MusEd 200  
Sec 2, III MTWThF, MusEd 200
- 1508. SURVEY OF MELODIC AND HARMONIC PROCEDURES.** (3 cr; prereq #: I MTWThF; WuH 7A) Fetler  
See 1507 First Term.
- 1518. EAR-TRAINING AND SIGHT-SINGING.** (3 cr; prereq #: II MTWThF; WuH 7A) Fetler  
See 1517 First Term.
- 3807. MUSIC IN ASIAN AND PACIFIC CULTURES.** (5 cr; III MTWThF; WuH 320) Kagan  
Living music; ancient traditions of Asia's civilizations. Music and musical instruments; use and function in Australia, New Guinea, Polynesia, South and East Asia, Southeast Asia, island cultures.
- 3970. DIRECTED STUDIES.** (1-15 cr; prereq #, Δ; hrs ar; ScH 203) Fetler  
See First Term.
- 5371. DICTION FOR SINGERS.** (2 cr; prereq 12 cr of 1204 or #; III MTWThF; MusEd 101) Davis  
International Phonetic Association alphabet; principles used in singing pronunciation of English and Italian.
- 5384. CHORAL CONDUCTING.** (4 cr; prereq #: IV MTWThF; ScH 3) Lancaster  
Hand techniques, sound control, articulation, breath control, intonation, etc.
- 5537. SCORE STUDY (CHORAL).** (4 cr; prereq sr or grad student and #: V MTWThF; ScH 3) Lancaster  
Choral scores ranging from the Renaissance through the 20th century. Reading choral and choral-orchestral scores at the piano, including scores employing C clefs and transposing instruments.
- 5666. STRAVINSKY.** (4 cr; II MTWThF; ScH 103) Cardamone  
Changing styles and aesthetic principles of Stravinsky as seen in representative compositions and writings; contributions to artistic life in Europe and America (particularly ballet).
- 5804. FOLK AND TRADITIONAL MUSIC: CROSS-CULTURAL SURVEY.** (4 cr; V MTWThF; WuH 320) Kagan  
Music of the peoples of the world in topical and geographic format. Comparative study of musical styles, behavior, and concepts in varied societies and cultures. Field recordings and filmed performances.
- 8990x. SPECIAL PROBLEMS.** (2-12 cr; prereq 5841; hrs ar; ScH 203) Fetler

## *Courses in Applied Music*

See First Term.

## COURSES IN APPLIED MUSIC

Instrument	Non-Cr	Applied: Elective			Applied			Applied: Performance			Instructor
		1xxx Level	3xxx Level	Grad	1xxx Level	3xxx Level	Grad	1xxx Level	3xxx Level	Grad	
Piano	0101	1101	3101	5101	1201	3201	8201	1301	3301	8301	Freud
Harpichord	0102	1102	3102	5102	1202	3202	8202	1302	3302	8302	Ar
Organ	0103	1103	3103	5103	1203	3203	8203	1303	3303	8303	Fleischer
Voice	0104	1104	3104	5104	1204	3204	8204	1304	3304	8304	Ware, Brandstetter, Davis
Violin	0105	1105	3105	5105	1205	3205	8205	1305	3305	8305	Adams, Gregorian, Thomson
Viola	0106	1106	3106	5106	1206	3206	8206	1306	3306	8306	Ar
Cello	0107	1107	3107	5107	1207	3207	8207	1307	3307	8307	Heller, Jamieson
Double Bass	0108	1108	3108	5108	1208	3208	8208	1308	3308	8308	Clute
Flute	0109	1109	3109	5109	1209	3209	8209	1309	3309	8309	Eagle, Niosi, Opava, Zeitlin
Oboe	0111	1111	3111	5111	1211	3211	8211	1311	3311	8311	Capps, Holub
Clarinet	0112	1112	3112	5112	1212	3212	8212	1312	3312	8312	Anderson, Haugen, Hedling
Saxophone	0113	1113	3113	5113	1213	3213	8213	1313	3313	8313	Anderson, Haugen
Bassoon	0114	1114	3114	5114	1214	3214	8214	1314	3314	8314	Miller
French Horn	0115	1115	3115	5115	1215	3215	8215	1315	3315	8315	Gaska, McDonald, Rardin
Trumpet	0116	1116	3116	5116	1216	3216	8216	1316	3316	8316	Baldwin, Haselmann, Schlueter, Volpe
Trombone	0117	1117	3117	5117	1217	3217	8217	1317	3317	8317	Zellmer
Baritone	0118	1118	3118	5118	1218	3218	8218	1318	3318	8318	Ricketts
Tuba	0119	1119	3119	5119	1219	3219	8219	1319	3319	8319	Toibert, Walton
Percussion	0121	1121	3121	5121	1221	3221	8221	1321	3321	8321	Ar
Harp	0122	1122	3122	5122	1222	3222	8222	1322	3322	8322	Ar
Guitar	0123	1123	3123	5123	1223	3223	8223	1323	3323	8323	Pederson
Accordion	0124	1124	3124	5124	1224	3224	8224	1324	3324	8324	Ar

## Natural Science (NSci)

### FIRST TERM

- 1004. PHYSICAL WORLD: PHYSICS.** (4 cr, §equiv courses in physics; limited to 48 students; prereq 1 yr high school algebra; \$4 lab fee; II MTWThF and 4 lab hrs per wk ar; Ph 133)  
Topics from astronomy and physics selected to illustrate the methods of science and to acquaint the student with the physical universe.

### SECOND TERM

- 1005. PHYSICAL WORLD: CHEMISTRY.** (4 cr, §Chem 1001-1002, §Chem 1004-1005, §Chem 1031-1032, §Chem 1014; prereq 1 yr high school algebra... high school chemistry and NSci 1004 recommended; II MTWThF; SciCB 175)  
Fundamental concepts of chemistry, the structure of matter, and the important reactions and products of our physical world. Scientific methods and principles are developed from lecture and experiments to help students understand their environment and problems faced in improving it.

## Near and Middle Eastern Studies

### *Ancient Near Eastern and Jewish Studies (ANEJ)*

#### FIRST TERM

- 5970. DIRECTED STUDIES.** (1-4 cr; prereq #)  
Guided individual reading or study.

#### SECOND TERM

- 3101. ANCIENT NEAR EASTERN TEXTS IN TRANSLATION.** (4 cr; III-IV MWF; FoH 209) Reisman  
The Sumero-Akkadian literary and historical tradition. Relationships of the Mesopotamian traditions, particularly to the Old Testament.
- 5970. DIRECTED STUDIES.** (1-4 cr; prereq #)  
Guided individual reading or study.

### *Arabic (Arab)*

#### FIRST TERM

- 5970. DIRECTED READINGS.** (Cr ar; prereq #) Farah

#### FIRST AND SECOND TERMS: TEN-WEEK COURSE

A concentrated program of study in which undergraduate and graduate students may earn 15 credit hours, the equivalent of a full year's sequence in language. Students must register in both terms of the summer session and may not enroll in other summer courses.

- 1101-1102-1103†. BEGINNING ARABIC.** (15 cr for both terms; I-III MTWThF; KoltH S132) Farah  
Fundamentals of Arabic, based on audiolingual method; aural comprehension, pronunciation, practical reading knowledge, and basic grammar.

#### SECOND TERM

- 5970. DIRECTED READINGS.** (Cr ar; prereq #) Farah

### *Hebrew (Heb)*

#### FIRST TERM

- 5970. DIRECTED READINGS.** (Cr ar; for advanced students wishing to work on special problems; prereq 3013 or #)

#### SECOND TERM

- 5970. DIRECTED READINGS.** (Cr ar; for advanced students wishing to work on special problems; prereq 3013 or #)



## FIRST AND SECOND TERMS: TEN-WEEK COURSE

A concentrated program of study in which undergraduate and graduate students may earn 15 credit hours, the equivalent of the full year's sequence in language. Students must register in both terms and may not enroll in other courses during the summer session.

- 1101-1102-1103. BEGINNING HEBREW ("ULPAN")** (15 cr for both terms; I-III MTWThF) Paradise  
Specially designed summer program combining language study with learning experiences in Israeli culture and group activities that stimulate active use of the language. Introduction to speaking, reading, and listening comprehension of modern Hebrew. May serve as a basis for biblical study.

## *Jewish Studies (JwSt)*

### FIRST TERM

- 1034. INTRODUCTION TO JUDAISM.** (4 cr, §3034, §ReIS 1034; II-III MWF; FoIH 209) Zahavy  
Concepts, movements, and institutions in the evolution of classical Judaism as manifested in the literature and festivals of the Jewish people from Second Commonwealth times to the present. Meets with 3034.
- 3034. INTRODUCTION TO JUDAISM.** (4 cr, §1034, §ReIS 1034; II-III MWF; FoIH 209) Zahavy  
Same as 1034, with more paper work and reading.
- 5970. DIRECTED STUDIES.** (1-4 cr; prereq #)  
Guided individual reading or study.

### SECOND TERM

- 5970. DIRECTED STUDIES.** (1-4 cr; prereq #)  
Guided individual reading or study.

## **Personal Orientation (PO)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 1001. HOW TO STUDY.** (2 cr [does not count toward BA degree]; limited to 30 students; I MTWThF; Jones 2)  
Practical assistance in developing efficient study habits, organizing materials, preparing for examinations, and improving speed and comprehension of reading.

### SECOND TERM

- 1001. HOW TO STUDY.** (2 cr [does not count toward BA degree]; limited to 30 students; I MTWThF; Jones 2)  
See First Term.

## **Philosophy (Phil)**

### FIRST TERM

- 1001. LOGIC.** (5 cr; III MTWThF; ForH 155) Lewis  
Application of formal techniques for evaluating arguments.
- 1003. ETHICS.** (5 cr; II MTWThF; ForH 285) Savage  
Problems that arise when human beings attempt to think systematically about conduct and value.
- 3001. GENERAL HISTORY OF WESTERN PHILOSOPHY.** (5 cr; IV MTWThF; ForH 285) Dahl  
Greek philosophy, pre-Socratics, Socrates, Plato, Aristotle.
- 3302. MORAL PROBLEMS OF CONTEMPORARY SOCIETY.** (5 cr; III MTWThF; ForH 285) Root  
Selected problems of current interest.
- 3502. INTRODUCTION TO AESTHETICS.** (5 cr; II MTWThF; ForH 170) Eaton  
Development of aesthetic theories from Plato to Tolstoy.
- 3970. DIRECTED STUDIES.** (1-5 cr; prereq #) Staff
- 5231. PHILOSOPHY OF LANGUAGE.** (5 cr; prereq 1001 or 3201 or 5201 or #; IV MTWThF; ForH 115) Hochberg  
Central topics. Theories of reference, linguistic truth, relation of language and thought, translation and synonymy.

**5911. PHILOSOPHY OF MODERN LITERATURE.** (5 cr; prereq major or concentration in philosophy or literature, or #; III MTWThF; ForH 115) Wallace  
Basic philosophical ideas in modern civilization as expressed in major works of literature. See Special Programs section.

**5970. DIRECTED STUDIES.** (1-5 cr; prereq #) Staff

**8970. DIRECTED STUDY AND RESEARCH.** (1-5 cr; prereq passed written prelim exam for the PhD in philosophy)  
Staff

## SECOND TERM

**1001. LOGIC.** (5 cr; II MTWThF; ForH 155) Hanson  
See First Term.

**1002. INTRODUCTION TO PHILOSOPHY.** (5 cr; IV MTWThF; ForH 115) Mason  
Problems, principal methods and schools of philosophy; historical and contemporary views.

**1410. SELECTED TOPICS IN MORAL AND POLITICAL PHILOSOPHY.** (5 cr per qtr; III MTWThF; ForH 285)  
Sartorius  
Moral and political implications of policies proposed as solutions to pressing social problems in the related areas of overpopulation, resource depletion, environmental pollution, and the development and use of high-risk technologies.

**3003. GENERAL HISTORY OF WESTERN PHILOSOPHY.** (5 cr; IV MTWThF; ForH 170) Gunderson  
Modern philosophy from Descartes through Hume.

**3970. DIRECTED STUDIES.** (1-5 cr; prereq #) Staff

**5076. THOREAU.** (5 cr; prereq 5 cr in philosophy or #; III MTWThF; ForH 170) Dolan  
*Walden* and selected essays.

**5601. PHILOSOPHY OF SCIENCE.** (5 cr; prereq 1001 or 3201 or #; IV MTWThF; ForH 285) Maxwell  
Meaning, methods, and implications of modern science. Basic concepts, presuppositions, and procedures.

**5970. DIRECTED STUDIES.** (1-5 cr; prereq #) Staff

**8970. DIRECTED STUDY AND RESEARCH.** (1-5 cr; prereq passed written prelim exam for the PhD in philosophy)  
Staff

## **Political Science (Pol)**

### FIRST TERM

**1001. AMERICAN GOVERNMENT AND POLITICS.** (5 cr; II-III TWTh; AndH 230) Walcott  
Principles, organization, processes, functions of government, and the interplay of political forces in the United States. Attention throughout to current issues.

**1051. INTRODUCTION TO POLITICAL ANALYSIS.** (5 cr; II-III TWTh; AndH 330) Kvik  
Formation of political communities, political participation, policy making, compliance, legitimacy, political development, types of political systems. Empirical and normative problems. Comparisons among major countries.

**3306. THE AMERICAN PRESIDENCY.** (4 cr; prereq 1001 or #; III MTWThF; BlegH 150) Eyestone  
The office and individual presidents; organizational characteristics of the executive office and individual qualities of decision making; relationships with Congress, the bureaucracy, parties, interest groups, media, and public opinion.

**3661. PROBLEMS OF DEMOCRACY.** (4 cr; prereq 1051 or 9 cr social science or #; II MTWThF; AndH 250) Shaw  
Postulates and implications; moral foundations; democratic theory and the economic order; liberty and authority; equality; representation; participation; majority rule; critics of democracy; social science and democratic theory.

**3773. POLITICAL DEVELOPMENT.** (4 cr; prereq 1051 or #; I MTWThF; BlegH 130) Wynia  
Political problems of new nations; political consequences of breakdown of traditional society; problems of developing new institutional forms and procedures.

**5309. JUDICIAL PROCESS.** (4 cr; prereq 1001 or #; V MTWThF) Krislov  
Structure of American judiciary; selection of judges; process of litigation; influences on judicial decisions; impact of and compliance with decisions; role of Supreme Court in American political system.

**5659. AMERICAN POLITICAL THOUGHT.** (4 cr; prereq 1051 or 9 cr social science or #; IV MTWThF; BlegH 230)  
Ball  
From colonial times to present: Puritanism; Revolution; Constitution; utopianism; sectionalism and pluralism; anarchist, socialist, populist, and syndicalist thought; social Darwinism; conservatism; political thought in law and literature.

- 5737. POLITICAL PARTIES.** (4 cr; prereq 1001 or #; IV MTWThF; BlegH 415) Backstrom  
Role and functions of the party in American government; party composition and organization; process of nomination and policy formulation; regulation of party organization and activities.
- 5884. THE INTERNATIONAL SYSTEM.** (4 cr; prereq 1025 or 1026 or 3825 or 3826; III MTWThF; AndH 350) Job  
Structure of the international system: balance of power, bipolar systems, other international systems; theories of stability, change, conflict, and cooperation as related to contemporary international system.

## SECOND TERM

- 1001. AMERICAN GOVERNMENT AND POLITICS.** (5 cr; III-IV TWTh; AndH 350) Nimitz  
See First Term.
- 1025. WORLD POLITICS.** (4 cr; I MTWThF; BlegH 150) Duval  
Contemporary international relations; forms of state interaction; problems of conflict and cooperation.
- 3308. THE UNITED STATES CONGRESS.** (4 cr; prereq 1001 or #; IV MTWThF; BlegH 220) Morris  
Internal organization, committee system, party leadership, norms, recruitment; legislative policy making; relationship with the president and bureaucracy; interest groups, political party, and constituency influences on the congressional process.
- 3766. POLITICAL PSYCHOLOGY.** (4 cr; prereq 1001 or #; III MTWThF; BlegH 155) Sullivan  
Personality and political behavior; democratic and authoritarian personality; political style and political ideology.
- 5741. POLITICAL BEHAVIOR OF WOMEN.** (4 cr; prereq 1001 or 1051 or #; II MTWThF; BlegH 150) Gray  
Women as political actors. Mass political behavior, women's political movements, women in political parties and elective office, the status of women in different societies.
- 5885. INTERNATIONAL VIOLENCE AND PEACE.** (4 cr, §IntR 5801; prereq 1025 or 1026 or 3825 or 3826...5884 recommended; II MTWThF; BlegH 10) Hopmann  
Normative issues surrounding international violence; causes of violence and mechanisms for creating international peace; alternative structures for limiting future violence and maintaining peace.

## Portuguese—See Spanish and Portuguese

## Psychology (Psy)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

## FIRST TERM

- 1001. GENERAL PSYCHOLOGY.** (5 cr; prereq soph or 3rd-qr fr with B avg; I-II MTWThF; NH 45)  
Introduction to study of human behavior. Prerequisite for all advanced courses in psychology.
- 1004. INTRODUCTORY LABORATORY PSYCHOLOGY.** (4 cr; each section limited to 24 students; prereq soph, 1001 or §1001; \$4 lab fee)  
Experiments illustrating contemporary subject matter such as sensory psychology, psychophysics, perception, motivation, verbal behavior, animal and human learning, problem solving, and psychological measurement.  
Sec 1, II-IV MF, II-III W, E1H 150  
Sec 2, VI-VIII MF, VI-VII W, E1H 160
- 3031. SENSATION AND PERCEPTION.** (4 cr; prereq 1001, 1004; II MTWThF; E1H N119) Burkhardt  
Psychological, biological, and physical aspects of sensory experience in humans and animals. Major emphasis on vision and hearing.
- 3801. INTRODUCTION TO MEASUREMENT AND STATISTICAL METHODS.** (4 cr; prereq 1001 or equiv; III MTWThF; AndH 210)  
Quantification as it pertains to research problems in psychology. Descriptive and inferential statistics, including hypothesis testing and some nonparametric statistics. Examples from various areas of psychology.
- 3970. DIRECTED STUDIES.** (1-8 cr; prereq #; hrs ar) Lofquist  
Independent study or small seminars; designed to permit students to pursue their interests through special reading or study.
- 3990H. HONORS COURSE: PROJECT IN PSYCHOLOGY.** (Cr ar; prereq sr, #; hrs ar) Lofquist  
Individual library study or empirical investigation.

- 5014. PSYCHOLOGY OF HUMAN LEARNING AND MEMORY.** (4 cr; prereq 1005, except for students in honors sequence and grad students; III MTWThF; E1H N119)  
Processes and principles in human learning and memory. Feedback, instruction and learning, individual differences in learning, cognitive processes in learning and retention, theories of human memory.
- 5054. PSYCHOLOGY OF LANGUAGE.** (4 cr; prereq 3011, except for students in honors sequence and grad students; IV MTWThF; E1H N119)  
Theories and experimental evidence involved in past and present conceptions of psychology of language.
- 5125-5126. DIFFERENTIAL PSYCHOLOGY.** (4 cr per qtr; prereq 5862 or #, honors candidate or grad student; I-II MTWThF; Arch 30) Bouchard  
Introduction to methodology. Quantitative studies of nature of psychological traits and influence of age, sex, heredity, and environment in causation of individual and group differences in ability and temperament.
- 8519. PRACTICUM IN REHABILITATION COUNSELING.** (3 cr; prereq 8503 or #; hrs ar)  
Counseling experience with students in an academic setting; emphasis on educational, vocational, and personal problems of college students.
- 8520. FIELDWORK IN APPLIED PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)
- 8560. INTERNSHIP IN COUNSELING PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)
- 8614. PROFESSIONAL METHODS IN CLINICAL PSYCHOLOGY I: ASSESSMENT.** (2 cr; prereq student in clinical psychology program, CI Psy 8206 or #; hrs ar)  
Theory and practice in clinical application of assessment techniques. Observation, administration, scoring, and interpretation is the focus of the laboratory experience.
- 8620. CLERKSHIP IN CLINICAL PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)  
Field experience in professional work in clinical settings.
- 8630. PRACTICUM IN CLINICAL CHILD PSYCHOLOGY.** (3 cr; prereq #; hrs ar)  
Supervised experience in psychodiagnostic work with emotionally disturbed children and their families.
- 8670. INTERNSHIP IN CLINICAL PSYCHOLOGY.** (2-4 cr; prereq PhD candidate in clinical psychology program and consent of director of clinical psychology training program; hrs ar)
- 8970. SEMINAR, SPECIAL AREAS OF PSYCHOLOGY: HUMAN FACTORS AND APPLIED EXPERIMENTAL PSYCHOLOGY.** (4 cr; prereq #; hrs ar) Kanarick  
Discussion of practical applications of research on learning, sensation, perception and cognitive processes.
- 8990.\* RESEARCH PROBLEMS.** (Cr and hrs ar) Lofquist

## **SECOND TERM**

- 1001. GENERAL PSYCHOLOGY.** (5 cr; prereq soph or 3rd-qtr fr with B avg; I-II MTWThF; NH 45)  
See First Term.
- 1005. INTRODUCTORY LABORATORY PSYCHOLOGY.** (4 cr; each section limited to 24 students; prereq soph, 1004; \$4 lab fee)  
See 1004 First Term.  
Sec 1, II-IV MF, II-III W, E1H 50  
Sec 2, VI-VIII MF, VI-VII W, E1H 60
- 3011. INTRODUCTION TO PSYCHOLOGY OF LEARNING.** (4 cr; prereq 1001, 1005 or Biol 1107 or #; III MTWThF; NH 45) Peterson  
Basic methods in study of learning. Fundamental concepts and principles governing the learning process.
- 3101. INTRODUCTION TO PERSONALITY.** (4 cr, §5101; prereq 1001; II MTWThF; SciCB 325) Tellegen  
Concepts of personality, personality theory, empirical research in the field of personality, personality assessment.
- 3201. INTRODUCTION TO SOCIAL PSYCHOLOGY.** (4 cr; prereq 1001; III MTWThF; MMA 100) Snyder  
Theories and research in social psychology. Effects upon the individual's attitudes and behavior of other persons, mass communications, and group membership.
- 3604. INTRODUCTION TO ABNORMAL PSYCHOLOGY.** (4 cr, §5604-5605; prereq 1001; II MTWThF; SciCB 375)  
Leon  
Surveys the field of abnormal psychology. Etiologies of behavioral disorders; available treatment.
- 3970. DIRECTED STUDIES.** (1-8 cr; prereq #; hrs ar) Lofquist  
See First Term.
- 3990H. HONORS COURSE: PROJECT IN PSYCHOLOGY.** (Cr ar; prereq sr, #; hrs ar) Lofquist  
See First Term.
- 5011. THEORIES OF LEARNING AND COGNITION.** (4 cr; prereq 3011, except for students in honors sequence and grad students; III MTWThF; E1H N119)  
Major theories of learning and contemporary theories of information processing and cognition.

- 5071. ANIMAL PSYCHOLOGY.** (4 cr; prereq 1001, 1005, or equiv in another science; I MTWThF; E1th N119) Historical, philosophical, and biological foundations; consciousness; motivation; learning; reasoning; judgment; abnormal behavior; social influences.
- 5751. PSYCHOLOGY OF ADVERTISING.** (4 cr, §Jour 5251; prereq 1001; IV MTWThF; SciCB 375) Jones Psychological principles, research techniques, and applications in advertising and selling. Relevant consumer attitudes and behavior. Psychological mechanisms upon which effectiveness of advertisements and commercials depends.
- 8519. PRACTICUM IN REHABILITATION COUNSELING.** (3 cr; prereq 8503 or #; hrs ar)  
See First Term.
- 8520. FIELDWORK IN APPLIED PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)
- 8560. INTERNSHIP IN COUNSELING PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)
- 8614. PROFESSIONAL METHODS IN CLINICAL PSYCHOLOGY I: ASSESSMENT.** (2 cr; prereq student in clinical psychology program, †CIPsy 8206 or #; hrs ar)  
See First Term.
- 8620. CLERKSHIP IN CLINICAL PSYCHOLOGY.** (Cr ar; prereq #; hrs ar)  
See First Term.
- 8630. PRACTICUM IN CLINICAL CHILD PSYCHOLOGY.** (3 cr; prereq #; hrs ar)  
See First Term.
- 8670. INTERNSHIP IN CLINICAL PSYCHOLOGY.** (2-4 cr; prereq PhD candidate in clinical psychology program and consent of director of clinical psychology training program; hrs ar)
- 8990.\* RESEARCH PROBLEMS.** (Cr and hrs ar) Lofquist

## Public Affairs (PA)

### FIRST TERM

- 5114. WORKSHOP ON MINNESOTA GOVERNMENT.** (3 cr; VI-VII TWTh; BlegH 335) Warp, others Background study through lecture, panel discussion, and seminar sessions of selected public policy issues that currently confront Minnesota's governmental units.
- 5771. ADMINISTRATIVE INTERNSHIP.** (3 cr; prereq Δ; hrs ar) Warp Fieldwork in an approved administrative agency under the joint supervision of an employee of the agency and a member of the faculty. Rotation through various assignments, solution of special problems, seminar discussion of experiences, and preparation of an internship report.

### SECOND TERM

- 5115. WORKSHOP ON MINNESOTA GOVERNMENT.** (3 cr; VI-VII TWTh; BlegH 335) Warp, others  
See 5114 First Term.
- 5781. ADMINISTRATIVE INTERNSHIP.** (3 cr; prereq #; hrs ar) Warp  
See 5771 First Term.

## Religious Studies (ReIS)

### SECOND TERM

- 1001. INTRODUCTION TO RELIGIOUS STUDIES.** (4 cr, §5001; III MTWThF; ForH 55) Spencer Individual and social religious behavior; methodologies for studying it; emergence of modern religious studies. Theistic Western religions (Judaism, Christianity, Islam) and nontheistic Buddhism.
- 5970. DIRECTED STUDIES.** (3-5 cr; prereq Δ)

## Russian—See Slavic and East European Languages

## Scandinavian (Scan)

### FIRST TERM

- 3601. SCANDINAVIAN LITERATURE IN TRANSLATION.** (4 cr [no cr toward major]; I MTWThF; FoiH 103) Mishler Major literary works from the Middle Ages to the present.
- 3602. THE TALES OF HANS CHRISTIAN ANDERSEN.** (4 cr; III MTWThF; FoiH 304) Mishler Hans Christian Andersen's stories and tales (read in English).

- 5501. SCANDINAVIAN MYTHOLOGY.** (4 cr; IV MTWThF; NH 122) Liberman  
Scandinavian myths based on the Poetic Edda and the Prose Edda. Readings in translation.
- 5614. THE DRAMA OF IBSEN AND STRINDBERG.** (4 cr; prereq # for majors; II MTWThF; FoH 302) Stockenström  
Selected plays of Scandinavia's two major dramatists, in the context of modern theatre (readings in translation for nonmajors).

## Slavic and East European Languages

### *Russian (Russ)*

#### **FIRST AND SECOND TERMS: TEN-WEEK COURSE**

Concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. Students must register in both terms of the summer session and may not enroll in other summer courses.

- 1101-1102-1103†. BEGINNING INTENSIVE RUSSIAN.** (15 cr for both terms; I-III MTWThF; EITH N631)  
Speaking, reading, and understanding Russian through acquisition of basic patterns of speech.

### **Social Work (SW)**

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 1001. INTRODUCTION TO SOCIAL WELFARE AND COMMUNITY SERVICES.** (5 cr; limited to 100 students; III-IV MTWTh; Owre 113) Frumkin  
A sampling of the fields of community-based social services, representative of societal responses to needs. Characteristics of such services reviewed historically, dynamically, and comparatively.
- 3984. INTRODUCTION TO COMMUNITY DEVELOPMENT.** (4 cr; limited to 35 students; prereq 1001 or #; VI-VII MTW; ForH 285) Frumkin  
The trends, pace, and dynamics that dominate urban communities; strategies used to achieve neighborhood goals; factors that control and influence change in planning. Action on the community level.
- 5010. SEMINAR: SPECIAL TOPICS—A Comparative Study of Racial and Cultural Diversity as It Pertains Specifically to Minority Groups in our Society.** (3 cr; limited to 30 students; prereq 1001, 3005 and jr, sr, or grad student in social work; V-VI TTh; ForH 175) Miranda  
Cultural factors and their implications for understanding personality development and normal behavior; emphasis on recent research.
- 5201. THEORIES OF HUMAN GROWTH AND CHANGE: IMPLICATIONS FOR SOCIAL WORK.** (3 cr, §3004; limited to 30 students; open to entering social work grad students who have not completed a CSWE-accredited undergrad social work concentration; prereq # for undergrads; III-III TTh; ForH 359) Miranda  
Concepts of human growth and change; theories of human behavior and their implications for social work practice; frame of reference within which students may view individuals in their life's cycle.
- 8010. FIELD INSTRUCTION I.** (4 cr or cr ar by #; prereq #; hrs ar) Adkins
- 8020. FIELD INSTRUCTION II.** (4 cr or cr ar by #; prereq 8010; hrs ar) Adkins
- 8250. SPECIAL TOPICS IN HUMAN GROWTH AND BEHAVIOR AND THE SOCIAL ENVIRONMENT: Family Stress—Coping and Development.** (3 cr; limited to 30 students; prereq #; V-VI MW; ForH 175) McCubbin  
Family theories as they relate to family development, family structure, and family functioning in response to social and psychological stress. Normal and dysfunctional family behavior; social and cultural factors that affect the contemporary family.
- 8310. SEMINAR: SOCIAL WORK ADMINISTRATION—PERSONNEL MANAGEMENT.** (ar cr; prereq 8301 or #; limited to 20 students; 3:00-6:00 p.m. M;) Van Soest  
Focus of the seminar will be on personnel management, theory and principles, with application to large bureaucratic systems.
- 8901. SCIENTIFIC INQUIRY IN SOCIAL WORK.** (3 cr; limited to 30 students; II-III MW; ForH 160) McCubbin  
Logic, methods, and techniques of scientific inquiry in social work. The nature and functions of theory, models, assumptions, problem formulation, causal analysis, conceptualization, operationalization, and hypothesis formulation.

## SECOND TERM

- 8010. FIELD INSTRUCTION I.** (4 cr or cr ar by #; prereq #; hrs ar) Yesner
- 8020. FIELD INSTRUCTION II.** (4 cr or cr ar by #; prereq 8010; hrs ar) Yesner
- 8310. SEMINAR: SOCIAL WORK ADMINISTRATION—PERSONNEL MANAGEMENT.** (ar cr; prereq 8301 or #; limited to 20 students; 3:00-6:00 p.m. M.; Van Soest  
Focus of the seminar will be on personnel management, theory and principles, with application to large bureaucratic systems.
- 8407. SOCIAL CASEWORK: FAMILY THERAPY.** (3 cr; limited to 30 students; prereq 8401 or #; V-VI MW; ForH 175) McCubbin  
Seminar on methods of helping families cope with interpersonal problems.
- 8902. THE DESIGN OF SOCIAL WORK RESEARCH.** (3 cr; limited to 30 students; prereq 8901; II-III MW; ForH 160) McCubbin  
Translates the content of 8901 into feasible research designs to test propositions relevant to social work practice. Sampling, descriptive and analytic research designs, question formulation, introduction to scaling, data collection methods, tabulation procedures, statistical rationales, and conclusion drawing.

## **Sociology (Soc)**

### FIRST TERM

- 1001. INTRODUCTION TO SOCIOLOGY.** (4 cr; IV MTWThF; BlegH 150) Grasmick  
A survey of the main fields of sociology and current social problems.
- 3103. CRIMINOLOGY.** (4 cr, §3101; prereq 1001 or equiv...3102 recommended; VI MTWThF; BlegH 150) Cohen  
General survey of field of criminology.
- 3405. INEQUALITY: INTRODUCTION TO STRATIFICATION.** (4 cr; prereq 1001; V MTWThF; BlegH 150) Carter  
Inequality—causes and consequences. Inequality in American society. Related concepts of class, class cultures, status, aggregates; the social forms of inequality, their consequences for life changes and lifestyles.
- 3505. PRINCIPLES OF SOCIAL ORGANIZATIONS.** (5 cr; prereq 1001 and 3801 or equiv; two 1-hr labs will be assigned first day of class; lect II MWF; RarigC 616) Carter  
Basic concepts, substantive materials, and general issues in the area of social organization.
- 3506. PRINCIPLES OF SOCIAL PSYCHOLOGY.** (5 cr; prereq 1001 and 3801 or equiv; \$4 lab fee; one 2-hr lab [T or Th] to be assigned first day of class; lect I MWF; BlegH 255) Wolfe  
Ideas and findings related to social psychology; experience in developing empirically based knowledge in social science.
- 3801. SOCIOLOGICAL METHODS I: DESCRIPTIVE STATISTICS.** (5 cr; prereq basic algebra or Math 0009; \$4 lab fee; two 1-hr labs to be assigned first day of class; lect II MTWThF; AndH 210) Grasmick  
Descriptive statistics as utilized in analysis of sociological data, measures of central tendency, deviation, correlation and regression graphs, simple treatment of three and four variables, probability.
- 5111. SOCIOLOGY OF DEVIANT BEHAVIOR.** (4 cr; prereq 3103 or #; III MTWThF; AndH 370) Lauderdale  
Sociological conceptions of the nature of deviant behavior, social processes associated with the careers of deviants, and the relationship of deviancy to the problems of social control.
- 5711. ELEMENTS OF SOCIOLOGICAL ANALYSIS.** (4 cr; prereq 3505, 3506 or 5201, 5401 or equiv or #; IV MTWThF; BlegH 335) Reynolds  
Premises upon which social theories are developed. Construction of social theory.
- 5951. MINORITY GROUP RELATIONS.** (4 cr; prereq 3505, 3506 or 5201, 5401 or equiv or #; VI MTWThF; BlegH 115) Sykes  
Systems of ethnic stratification; race relations in American society.
- 5957. SOCIOLOGY OF AGING.** (4 cr; prereq 3505, 3506 or 5201, 5401 or equiv or #; III MTWThF; BlegH 350) McTavish  
Situations and problems facing aging people in modern societies; devices developed or possible to meet such situations and problems.

### SECOND TERM

- 1001. INTRODUCTION TO SOCIOLOGY.** (4 cr; IV MTWThF; BlegH 150) Johnson  
See First Term.
- 1002. AMERICAN COMMUNITY.** (4 cr; VI MTWThF; BlegH 155) Kennedy  
Sociological analysis of modern American society. Distribution of population, urban-rural differences, social factors in business systems, occupational groups, determination of social status, and minority group adjustment.

- 3103. CRIMINOLOGY.** (4 cr, §3101; prereq 1001 or equiv...3102 recommended; II MTWThF; BlegH 250) Friedman  
See First Term.
- 3405. INEQUALITY: INTRODUCTION TO STRATIFICATION.** (4 cr; prereq 1001; V MTWThF; BlegH 120) Friedman  
See First Term.
- 3505. PRINCIPLES OF SOCIAL ORGANIZATIONS.** (5 cr; prereq 1001 and 3801 or equiv; two 1-hr labs to be assigned first day of class; lect III MWF; BlegH 335) Grohoski  
See First Term.
- 3802. SOCIOLOGICAL METHODS II: STATISTICAL INFERENCE.** (5 cr; prereq 3801 or equiv; \$4 lab fee; two 1-hr labs to be assigned first day of class; lect IV MTWThF; BlegH 225) T Anderson  
Statistical inference probability, hypothesis tests, use of statistical reasoning in analysis of sociological data.
- 5401. SOCIAL ORGANIZATION.** (4 cr [no cr for sociology majors], §3505; prereq 8 cr in sociology, anthropology, psychology, political science, or economics; VI MTWThF; BlegH 225) Grohoski  
Organization and structure of social groups; basic culture patterns of economic, political, and social institutions. Integration and disintegration of social groups and institutions. Essentials of social dynamics.

## Spanish and Portuguese

### *Spanish (Span)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

#### FIRST TERM

- 1101. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; each section limited to 25 students)  
Emphasis on speaking and understanding Spanish; pronunciation; writing and reading skills; basic grammar; cultural aspects of language and civilizations of Spain and Spanish America.  
Sec 1, I-II MTWThF, FolH 102  
Sec 2, I-II MTWThF, KoltH S133  
Sec 3, I-II MTWThF, KoltH S135
- 1102. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; limited to 25 students; prereq 1101 or 1 yr high school Spanish; II-III MTWThF; KoltH S137)  
See 1101.
- 1103. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; limited to 25 students; prereq 1102 or 2 yrs high school Spanish; II-III MTWThF; KoltH S138)  
See 1101.
- 1104. INTERMEDIATE SPANISH, ORAL APPROACH: INTERPRETATION OF MODERN PROBLEMS.** (4 cr; limited to 25 students; prereq 1103 or 3 yrs high school Spanish; 9:40-11:05 MTWThF; KoltH S139)  
Speaking and comprehension; development of reading and writing skills based on materials from Spain and Spanish America dealing with current issues. Grammar review; frequent compositions and oral presentations to build vocabulary.
- 3001. SPANISH PRONUNCIATION: STANDARD, COLLOQUIAL, DIALECTAL.** (2 cr; limited to 20 students; prereq 1105 or #; II MWF; FolH 307) Narvaez  
Correct contemporary standard Spanish pronunciation; listening and imitation exercises, weekly progress recordings, and private interviews. Introduction to local, regional, and social variants of the language of Spain and Spanish America.
- 3014. SPANISH COMPOSITION AND COMMUNICATION SKILLS: EVERYDAY SPEECH, ARGOT, DIALOGUE** (5 cr; prereq 1105 or #; III MTWThF; FolH) Floripe  
Further development of speaking and writing skills with aid of native speakers; emphasis on cultural comparisons, current events, topics of concern to Spanish and American students; continuing grammar review; daily discussions; writing workshops.
- 3602. THE PICARESQUE WAY OF LIFE IN SPAIN AND EUROPE: LITERATURE AND THE DELINQUENT.** (4 cr [cr does not count toward Spanish or Portuguese major but may be used toward Route II language requirement]; limited to 25 students; taught in English; V MTWThF; FolH 108) Spadaccini  
The picaresque novel: Spanish origins (16th century), zenith (17th century), and evolution to present day. Literary and sociological examination of picaresque novels; modern directions.
- 3614. DON QUIJOTE: A STUDY OF LOST ILLUSIONS.** (4 cr [cr does not count toward Spanish or Portuguese major but may be used toward Route II language requirement]; limited to 25 students; taught in English; IV MTWThF; FolH 107) Jones  
Study of the novel in many facets: the "madness" of its characters, the relation of their actions and attitudes to the theme of reality/illusion and to the society of their times.



- 5732. SPANISH DIALECTOLOGY: REGIONAL AND SOCIAL DIALECTS OF MODERN SPANISH AMERICA.** (4 cr; prereq 5729 or #; IV MTWThF; FolH 105) Narvaez  
Major dialect areas in modern Hispanic America. Norm, speech, and language related to former political and religious divisions of Hispanic America and to new national boundaries.
- 5910. TOPICS IN SPANISH AND SPANISH-AMERICAN LITERATURE: Avant-Garde Poetry in Spain and Latin America.** (4 cr; prereq 3104 or Δ; V MTWThF; FolH 204) Ramos  
Major issues in or approaches to Spanish or Spanish-American literature; important groups, movements, trends, issues, methods, genres.
- 5970. DIRECTED READINGS.** (1-5 cr; prereq # and Δ; hrs ar) Staff  
To fill gaps in students' preparation, especially when courses in certain indispensable topics, figures, periods, or issues have not been offered. Readings in Spanish and/or Spanish-American areas. For M.A., Ph.D. candidates.
- 8970. DIRECTED READINGS IN ROMANCE LANGUAGES.** (Cr and hrs ar) Staff  
Authors and topics not otherwise offered. Weekly meetings based on student's research and analysis. Student and instructor agree on plan of reading or particular topics, figures, issues, etc. Readings in Spanish and/or Spanish-American areas. Mainly for Ph.D. candidates.

## FIRST AND SECOND TERMS: TEN-WEEK COURSE

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. Students must register in both terms of the summer session and may not enroll in other summer courses.

- 1101-1102-1103†. BEGINNING SPANISH.** (15 cr for both terms; limited to 20 students; I-II MTWThF; KolH S134)  
See First Term. Students register for section 5 both terms.

## SECOND TERM

- 1101. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; limited to 25 students; I-II MTWThF; KolH S133)  
See First Term.
- 1102. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; each section limited to 25 students; prereq 1101 or 1 yr high school Spanish; II-III MTWThF; KolH S137)  
See 1101 First Term.
- 1103. BEGINNING SPANISH: ORAL APPROACH.** (5 cr; limited to 25 students; prereq 1102 or 2 yrs high school Spanish; II-III MTWThF; KolH S138)  
See 1101 First Term.
- 1105. INTERMEDIATE SPANISH, ORAL APPROACH: DISCUSSIONS OF MODERN LITERATURE AND THE PRESS.** (4 cr; limited to 25 students; prereq 1104 or 4 yrs high school Spanish; 9:40-11:05 MTWThF; KolH S139)  
See 1104 First Term.
- 3610. TOPICS: SPANISH, SPANISH-AMERICAN LITERATURE IN TRANSLATION.** (4 cr [cr does not count toward Spanish or Portuguese major but may be used toward Route II language requirement]; each section limited to 25 students; taught in English)  
Hispanic and/or Latin American groups of writers; universal themes, literary motifs, relationships between literature and other disciplines.  
**Sec 1, Macho Mystique in Hispanic Literature,** V MTWThF, FolH 203, Sullivan  
**Sec 2, Spanish-American Drama in Translation,** IV MTWThF, FolH 203, Vidal
- 3721. ORIGINS AND HISTORY OF SPANISH AND PORTUGUESE.** (4 cr, §Port 3721; limited to 25 students; prereq 3014 or Port 3014; III MTWThF; FolH 107) Mantini  
Principal stages in the growth and development of the languages and their role as expression of specific cultures. Concepts and methodology of Iberian historical linguistics.
- 5015. METHODS OF TRANSLATION.** (4 cr; prereq 3021 or #; IV MTWThF; FolH 107) Sousa  
Meaning, use, and theories of translation. Techniques and problems of translation from Spanish and Portuguese to English and vice versa. Translation patterns, use of special vocabularies and other adjuncts needed to understand both languages. Practical vocabulary and usage for various fields of work.
- 5910. TOPICS IN SPANISH AND SPANISH-AMERICAN LITERATURE.** (4 cr; prereq 3104 or Δ)  
Major issues in or approaches to Spanish or Spanish-American literature; important groups, movements, trends, issues, methods, genres.  
**Sec 1, Autobiographical Forms in Spanish Literature,** V MTWThF, FolH 103, Zahareas  
**Sec 2, Ensemble Theatre as Social Praxis in Spanish America,** VI MTWThF, FolH 107, Vidal

**5970. DIRECTED READINGS.** (1-5 cr; prereq # and Δ; hrs ar) Staff  
See First Term.

**8970. DIRECTED READINGS IN ROMANCE LANGUAGES.** (Cr and hrs ar) Staff  
See First Term.

## *Portuguese (Port)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

**3603. MODERN, CONTEMPORARY BRAZILIAN PROSE FICTION: POLITICAL, SOCIAL CONTENT.** (4 cr [cr does not count toward Spanish or Portuguese major but may be used toward Route II language requirement]; for students who do not speak Portuguese; limited to 25 students; IV MTWThF; FoIH 201) Hamilton

The novel and the short story as a reflection of contemporary Brazilian society and as an innovative art form within the broad confines of world literary expression. Modern Brazilian fiction translated into English.

**5210. TOPICS IN BRAZILIAN LITERATURE: The Brazilian Novel After 1945.** (4 cr; prereq 3211 or 3212 or 3213 or equiv, or three 3xxx or 5xxx Spanish literature courses and Δ; VI MTWThF; FoIH 201) Hamilton  
Important authors, movements, currents, genres, socioaesthetic questions, literary techniques.

### FIRST AND SECOND TERMS: TEN-WEEK COURSE

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. Students must register in both terms of the summer session and may not enroll in other summer courses.

**1001-1002-1003†. BEGINNING PORTUGUESE.** (15 cr for both terms; limited to 20 students; II-III MTWThF; KoltH S140)

Emphasis on speaking and understanding Portuguese; pronunciation (Brazilian speech stressed); writing and reading skills; basic grammar; cultural aspects of language and civilizations of Portuguese-speaking world.

## *Speech-Communication (Spch)*

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

For special department offerings see the High School Forensics Workshop and Small Group Communication Workshop in the Special Programs section.

### FIRST TERM

**1101. FUNDAMENTALS OF SPEECH COMMUNICATION: ORAL COMMUNICATION.** (4 cr; each section limited to 24 students)

Study and application of essential elements in oral communication. Criticism and response to oral discourse. Individual speaking.

Sec 1, I MTWThF, FoIH 406

Sec 2, II MTWThF, FoIH 406

**1102. FUNDAMENTALS OF SPEECH COMMUNICATION: COMMUNICATION PROCESS.** (4 cr; II MTWThF; FoIH 308) Garvin

Intrapersonal, interpersonal, and group communication.

**3201. INTRODUCTION TO BROADCASTING PRODUCTION.** (4 cr; limited to 20 students; \$4 lab fee; V MTWThF; RrigC 610) Goldstein

Fundamentals of practice and theory. Projects and exercises in performance and scripting; studio equipment and procedures.

- 3211. DETERMINANTS OF BROADCAST PROGRAMMING.** (4 cr; II MTWThF; FoIH 304) Browne  
Historical development and contemporary aspects of broadcast programming. Roles of governmental, industrial, and public organizations in influencing programming decisions. "Problem" areas in programming.
- 3401. THEORIES OF INTERPERSONAL COMMUNICATION.** (4 cr; prereq 1102, Psy 1001, or #; III MTWThF; RarigC 616) Geizer  
Theories of interpersonal communication and their usefulness for particular purposes.
- 3641. DISCUSSION AND CONFERENCE METHODS.** (4 cr; limited to 26 students; prereq 1101 or 1101H or #; I MTWThF; FoIH 304) Jensen  
Cooperative thinking in task-oriented groups. Planning, preparing for, participating in, and leading private and public meetings.
- 3970. DIRECTED STUDIES.** (Cr ar [cr does not count toward speech-communication major]; prereq at least one course in speech-communication, #, Δ)  
Individual study projects in speech-communication. Consultation with an instructor who agrees to supervise the project is required.
- 3980. DIRECTED INSTRUCTION.** (1-4 cr per qtr [max 8 cr... cr does not count toward speech-communication major]; prereq #, Δ)  
Students work with an instructor in planning and teaching an undergraduate course.
- 5404. LANGUAGE, CULTURE, AND EDUCATION.** (4 cr, §SeEd 5404; limited to 20 students; prereq 1102, 3401 or #; III MTWThF; PeikH 225) Michlin  
Psychological and social-psychological perspectives for study of language-communication; dimensions of language variation (dialects, codes, registers); implications for program development and instructional practices.
- 5405. NONVERBAL COMMUNICATION.** (4 cr; I MTWThF; BlegH 120) Geizer  
Nonverbal (extralinguistic) elements and dimensions of interpersonal communication: gesture, facial expression, posture, clothing, and environment.
- 5414. AUTHORITY AND POWER IN TASK-ORIENTED COMMUNICATION—June 14-26, July 11.** (4 cr; limited to 60 students; S-N only; prereq 3641 or #; 4:00-6:00 June 14-17, 20-24, July 11; 9:00-5:00 June 18-19, 25-26; FoIH 206) Shapiro  
Authority and power in task-oriented groups. Tavistock-type small group, intergroup, and large group laboratory experiences. Verbal and nonverbal processes that operate in and among groups to facilitate or inhibit effective leadership and followership. See Special Programs section.
- 5617. HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS.** (4 cr; prereq 1101 or 1101H, Psy 1001; V MTWThF; FoIH 406) Bormann  
Survey; history and criticism of religious and reform speechmaking in the United States from 1620 to 1920.
- 5621. FEMINIST RHETORIC.** (4 cr; prereq 5615 or #; IV MTWThF; FoIH 406) Garvin  
History and criticism of feminist rhetorical activity in the United States, focusing on major issues of women's liberation.
- 5970. READINGS IN SPEECH.** (Cr ar; prereq 9 cr in 3xxx-5xxx-level speech courses, #, Δ)  
Directed reading and preparation of reports on selected subjects.
- 8621. SEMINAR: HISTORY AND CRITICISM OF PUBLIC ADDRESS.** (3 cr; prereq 5617, 5618 or #; VI-VII TTh; FoIH 406) Bormann  
Methods of rhetorical criticism. Application of method in individually selected research projects.
- 8990. RESEARCH.** (Cr ar)  
Open to graduate students engaged in research on special problems.

## **SECOND TERM**

- 1101. FUNDAMENTALS OF SPEECH COMMUNICATION: ORAL COMMUNICATION.** (4 cr; limited to 24 students; I MTWThF; FoIH 306)  
See First Term.
- 1102. FUNDAMENTALS OF SPEECH COMMUNICATION: COMMUNICATION PROCESS.** (4 cr; II MTWThF; FoIH 308) Scott  
See First Term.
- 3201. INTRODUCTION TO BROADCASTING PRODUCTION.** (4 cr; limited to 20 students; \$4 lab fee; V MTWThF; RarigC 610) Bart  
See First Term.
- 3204. TELEVISION PRODUCTION.** (4 cr; limited to 20 students; prereq 3201; \$4 lab fee; VI MTWThF; RarigC 610) Bart  
Problems of production. Equipment and staff organization; interrelationships with program design. Exercises in production.

- 3601. APPROACHES TO PUBLIC DISCOURSE.** (4 cr; prereq 1101; I MTWThF; FoIH 406) Scott  
Theoretical systems intended to explain or direct the creation and practice of public discourse. From traditional rhetoric to contemporary perspectives.
- 3970. DIRECTED STUDIES.** (Cr ar [cr does not count toward speech-communication major]; prereq at least one course in speech-communication, #, Δ)  
See First Term.
- 3980. DIRECTED INSTRUCTION.** (1-4 cr per qtr [max 8 cr... cr does not count toward speech-communication major]; prereq #, Δ)  
See First Term.
- 5110. PROBLEMS IN SPEECH-COMMUNICATION THEORY—July 19-30.** (4 cr [may be repeated for cr with #]; limited to 40 students; prereq, whichever is relevant to the topic, 3211, 3401, 3601; 3:00-5:00 July 19-22, 25-29; 9:00-5:30 July 23, 24, 30; FoIH 406) Howell  
Circumstances that demand theoretical advance explored through applicability of existing theory. See instructor for a prospectus.
- 5402. PROBLEMS IN INTERPERSONAL COMMUNICATION.** (4 cr; prereq 3401 or #; III MTWThF; FoIH 406) Cashman  
Factors that contribute to misunderstanding, disagreement, and cessation of contact in dyads.
- 5451. INTERCULTURAL SPEECH COMMUNICATION.** (4 cr; prereq 3401, Anth 1002, or other course in cultural anthropology or #; IV MTWThF; FoIH 406) Howell  
Factors important in successful interpersonal communication across cultures. Linguistic and nonverbal variables. Emphasis on North Americans abroad, communication with host nationals.
- 5970. READINGS IN SPEECH.** (Cr ar; prereq 9 cr in 3xxx-5xxx-level speech courses, #, Δ)  
See First Term.
- 8130. SEMINAR: ADVANCED SPEECH PROBLEMS.** (3 cr; prereq undergrad major in speech or equiv, #; V-VI MW; FoIH 406) Scott  
Evaluation of research methods in speech communication.
- 8423. SEMINAR: SEXUAL COMMUNICATION.** (3 cr; prereq 3401, 5402, and #; V-VI TTh; FoIH 406) Cashman  
Designed for those who work in professional settings in which significant sexual communication is likely to occur. Human sexual communication in interpersonal, management, and various professional settings.
- 8990. RESEARCH.** (Cr ar)  
See First Term.

## Statistics (Stat)

### FIRST TERM

- 1051. INTRODUCTION TO IDEAS OF STATISTICS.** (4 cr; prereq high school higher algebra; II MTWThF and III WF; VH 313)  
Presentation and analysis of data. Probabilistic models for inference. Types of inference and decision procedures. Emphasis on concepts rather than computation.
- 5121. THEORY OF STATISTICS.** (4 cr, §5131-5132-5133; prereq Math 1231 or equiv; III TTh, IV MTWThF; VH 313) Gilat  
Random variables and probability distribution, moments, central limit theorem, sampling, estimation.

### SECOND TERM

- 3091. INTRODUCTION TO PROBABILITY AND STATISTICS.** (4 cr, §5121, §5131; prereq differential and integral calculus; II MTWThF, III WF; VH 313)  
Elementary probability and probability distributions, sampling and elements of statistical inference. More mathematical treatment than 1051.
- 5122. THEORY OF STATISTICS.** (4 cr, §5131-5132-5133; prereq Math 1231 or equiv; III TTh, IV MTWThF; VH 313) Gilat  
Confidence intervals, testing hypotheses, regression, ANOVA, sequential and nonparametric methods.

## Studio Arts—See Arts, Studio

# Theatre Arts (Th)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

## FIRST TERM

- 1101. INTRODUCTION TO THEATRE ARTS.** (4 cr; II-III TWTh; RarigC 190) Ballet  
History and theory of plays and playwrights.
- 1321. BEGINNING ACTING: CREATIVE APPROACH.** (4 cr; limited to 25 students; prereq 1504 or ¶1504 and soph or 3rd-qr tr; VI-VII MTWThF; RarigC 10)  
Creation and presentation of original scenes and skits. Response to imaginative situations.
- 1405H. HONORS COURSE: INTRODUCTION TO THE THEATRE.** (2 cr; limited to 20 students; prereq 1101 and #; IV TTh; RarigC 275; lab ar) Ballet  
Enrichment course for students who have completed 1101 with outstanding work.
- 1504. ELEMENTS OF TECHNICAL THEATRE.** (4 cr; prereq 1101 or ¶1101; II-III MF [class meets June 13]; RarigC 190; lab ar) Montgomery  
The practice of the arts and crafts of the theatre: scenery construction and painting, stage operation, theatre lighting, costuming.
- 3311. VOICE PRODUCTION FOR THE THEATRE.** (2 cr; limited to 25 students; prereq 1321 or ¶1321; \$4 lab fee; III MTWThF; RarigC 20) Nash  
Speech and vocal exercises to free the human voice from inhibitions and tensions. Work on prose, poetry, drama, and song.
- 3312. VOICE PRODUCTION FOR THE THEATRE.** (2 cr; limited to 25 students; prereq 3311; \$4 lab fee; IV MTWThF; RarigC 20) Nash  
See 3311.
- 3326. THEATRE DANCE.** (2 cr; limited to 25 students; prereq 1326; \$4 lab fee; IV MTWThF; RarigC 10) Moulton  
Dance techniques for actors; practice and performance of dances in the theatre.
- 3412H. HONORS COURSE: TUTORIAL SEMINAR IN THEATRE ARTS.** (0-3 cr [limited to 3 cr for cum laude and magna cum laude ... 3412x up to 3 cr for summa cum laude]; prereq theatre arts honors candidate and Δ)  
Independent reading and research in selected fields in preparing honors thesis or creative project.
- 3513. TECHNICAL THEATRE PRODUCTION I.** (4 cr; prereq 1504; IV-V MTWTh; RarigC 190; lab ar) Brockman, Herst  
Theory and practice of design and execution of stage scenery and properties.
- 3880. DIRECTED INSTRUCTION.** (1-3 cr per qtr [8 cr max]; prereq completion of course in which teaching will be done and Δ) Staff
- 5100. THEATRE PRACTICUM.** (2-6 cr; prereq written Δ, consent of theatre practicum committee) Montgomery  
Arranged individual creative projects in production of a play, meeting approval of faculty committee in one or more of these areas: playwriting, directing, acting, and design.
- 5110. THEATRE PERFORMANCE.** (1 cr; prereq written permission; S-N only) Moulton  
Participation in the rehearsals and performances of a major University Theatre production.
- 5519. SOUND FOR THE THEATRE.** (2 cr; prereq 1504, #; II MTWThF; RarigC 210; lab ar) Brockman  
Theory and technique of producing and amplifying sound for the theatre.
- 5716. STAGE MANAGEMENT FOR THE THEATRE.** (4 cr; prereq written permission; hrs ar) Montgomery  
Stage management as a specialized area of theatre. Theory and technique of rehearsal and performance, organization and management in educational, repertory, and regional theatre.
- 5760. ADVANCED STAGE MANAGEMENT.** (2-4 cr per qtr [max 6 cr for undergrad]; prereq 5716 and written permission) Montgomery  
Practical experience in stage management for specific University Theatre productions with emphasis on rehearsal and performance.
- 5803. ORAL INTERPRETATION OF DRAMA.** (4 cr; limited to 25 students; prereq 1504, 3801 or grad student; II-III MTWTh; RarigC 90) Congdon  
Study of selected plays. Solo and group readings.
- 5950. TOPICS IN THEATRE.** (1-5 cr per qtr [max 12 cr]; prereq # and Δ)  
**Sec 1, Special Problems in Costuming,** 4 cr, II-III MTWTh, RarigC 275, Crellin  
Lecture/laboratory experience in construction methods for costume armor, stage jewelry, masks, and shoemaking.  
**Sec 2, Storytelling: Theory and Performance,** 2 cr, IV MTWTh, RarigC 210, Congdon  
Study and solo-group presentation of representative folktales, myths, and short stories.

- 5970. DIRECTED READINGS.** (2-6 cr; prereq 9 cr in theatre, # and Δ) Staff  
Directed reading and preparation of reports on selected subjects.
- 8311. VOICE PRODUCTION FOR THE THEATRE.** (3 cr; limited to 25 students; prereq grad theatre major; written permission only; \$4 lab fee; II MTWThF; RarigC 20) Nash  
See 3311.
- 8980. DIRECTED INSTRUCTION.** (1-3 cr) Staff  
Teaching experience in an area in which the student does not hold a teaching assistantship but in which he/she may be required to teach as a professional. Limited to students qualified by course work in the area to be taught.
- 8990. RESEARCH.** (Cr ar; prereq # and Δ) Staff  
Open to graduate students engaged in research on special problems.

**SECOND TERM: THREE-WEEK COURSES (July 18-August 5)  
AND ONE-WEEK WORKSHOPS (DATES SPECIFIED)**

- 3321. ADVANCED ACTING: CHARACTERIZATION.** (4 cr; prereq 1326; III-IV TTh, III-V MWF; RarigC 190) Adey  
Presentation of scenes from plays with emphasis on characterization.
- 3412H. HONORS COURSE: TUTORIAL SEMINAR IN THEATRE ARTS.** (0-3 cr [limited to 3 cr for cum laude and magna cum laude... 3412x up to 3 cr for summa cum laude]; prereq theatre arts honors candidate and Δ)  
See First Term.
- 3801. ORAL INTERPRETATION OF FICTION.** (4 cr; prereq 1504 or 1804 or Spch 1101; III-V MWF, III-IV TTh; RarigC 210) Fredricks  
Selected short stories. Solo and group readings.
- 3980. DIRECTED INSTRUCTION.** (1-3 cr per qtr [8 cr max]; prereq completion of course in which teaching will be done and Δ) Staff
- 5100. THEATRE PRACTICUM.** (2-6 cr; prereq written Δ, consent of theatre practicum committee) Josal  
See First Term.
- 5110. THEATRE PERFORMANCE.** (1 cr; prereq written permission; S-N only) Adey  
See First Term.
- 5172. HISTORY OF THEATRE.** (4 cr; prereq sr or grad theatre major or #; I-III MTWThF; RarigC 20) Nolte  
Plays, arts, and crafts of the theatre from Renaissance through mid-19th century. Reports and projects.
- 5186. AMERICAN THEATRE.** (4 cr; prereq sr or grad theatre major or #; III-IV MTWThF; RarigC 20) Nolte  
The theatre as an aspect of American culture from 1752 to present.
- 5518. ADVANCED PROBLEMS IN STAGE PROPERTIES.** (4 cr; prereq 3513 or #; III-V MWF, III-IV TTh; RarigC 275; lab ar) Josal  
Theory and design of stage properties. Special projects and reports.
- 5718. THEATRE MANAGEMENT AND PROMOTION.** (4 cr; prereq 1504, sr or grad student or #; VI-VII MTWTh; RarigC 75)  
Theory and practice in ticket office procedures, house management, publicity, and promotion; special problems in college, community, children's, and professional theatre.
- 5720. PLAYS IN PRODUCTION AND PERFORMANCE.** (2-4 cr per qtr [max 6 cr for undergrads]; prereq 5712 and written permission) Adey  
Work with a community, high school, touring, or professional theatre group or on campus to develop expertise as a stage director.
- 5950. TOPICS IN THEATRE.** (1-5 cr per qtr [max 12 cr]; prereq # and Δ)  
Selected topics.
- Sec 1, Scene Painting,** 4 cr, III-IV TTh, III-V MWF, RarigC 130, Brockman  
Beginning techniques in texturing and in realistic simulation of three-dimensional objects. Use of dry pigments, caseins, glazes, and dyes.
- Sec 2, Workshop: Problems in Directing, July 18-22,** 2 cr, VI-IX MTWThF, RarigC 190, Adey  
Theory of direction: concept, analysis, and problems in producing the play. Exercises in craft and experimental techniques, production of short scenes.
- Sec 3, Workshop: Scenery on a Limited Budget, July 25-29,** 2 cr, VI-IX MTWThF, RarigC 30, Josal  
Theories of minimum forms of scenery and practical, economical methods and materials to construct these scenic forms for the nonprofessional theatre.
- Sec 4, Workshop: Stage Properties on a Limited Budget, August 1-5,** 2 cr, VI-IX MTWThF, RarigC 30, Brockman  
New materials and methods and established sources and solutions for providing the set, trim, and hand props for nonprofessional theatrical productions.

**Sec 5, Workshop: Special Problems in Stage Makeup, July 18-22, 2 cr, VI-IX MTWThF, RarigC 275, Crellin**

Facial casting, latex prosthetics, and ventilating techniques for making facial pieces.

**Sec 6, Workshop: Theatrical Textile Design, July 25-29, 2 cr, VI-IX MTWThF, RarigC 275, Crellin**  
Creation and enhancement of textiles for stage use through stencil, silk-screen, and direct painting processes.

**Sec 7, Workshop: Theatrical Wigs and Hats, August 1-5, 2 cr, VI-IX MTWThF, RarigC 275, Crellin**  
Construction methods for hats and headdresses. Design and execution of both realistic and stylized wigs.

**5970. DIRECTED READINGS.** (2-6 cr; prereq 9 cr in theatre; # and Δ) Staff  
See First Term.

**8980. DIRECTED INSTRUCTION.** (1-3 cr) Staff  
See First Term.

**8990. RESEARCH.** (Cr ar; prereq # and Δ) Staff  
See First Term.

## Urban Studies (UrbS)

### FIRST TERM

**3900. INTERNSHIP.** (1-6 cr per qtr [15 cr max]; prereq jr or sr and Δ) Dewar  
A weekly seminar integrating the internship experience with the academic program. Should be taken during or immediately after the internship.

### SECOND TERM

**3900. INTERNSHIP.** (1-6 cr per qtr [15 cr max]; prereq jr or sr and Δ) Dewar  
See First Term.

## Women's Studies (WoSt)

Courses with limited enrollment must be reserved in 12 Johnston Hall (see instructions under "Reserved Courses").

### FIRST TERM

**1005. INTRODUCTION TO WOMEN'S STUDIES.** (4 cr; limited enrollment; V MTWThF; ForH 285)  
History of feminism, nationally and locally; women's issues; biological and learned behaviors.

**3103. THE MODERN FEMINIST NOVEL.** (4 cr; limited enrollment; prereq fr English or equiv; III MTWThF; ForH 170) Wanhala  
Selected twentieth-century novels by British and American women.

### SECOND TERM

**1006. INTRODUCTION TO WOMEN'S STUDIES.** (4 cr; limited enrollment; V MTWThF; ForH 285)  
See 1005 First Term.

**3301. WOMEN: A SENSE OF IDENTITY.** (4 cr, §5301; limited enrollment; VI-VIII TTh; ForH 285)  
Sex roles: social expectations, personal values, and personal behaviors. Applications of success analysis, strength identification, communication training, goal setting, and behavior rehearsal to affirm and develop the potential of women.

**5301. WOMEN: A SENSE OF IDENTITY.** (4 cr, §3301; limited enrollment; VI-VIII TTh; ForH 285)  
See 3301.

# Military Science

The Army Reserve Officers' Training Corps (ROTC) summer program offers University students three ways to qualify for ROTC through an accelerated program: 1) entry into the Basic Course (compress 4 years into 3); 2) entry into the Advanced Course (compress 4 years into 2); 3) an alternative to the Two-Year Basic Camp that permits students to remain in the Twin Cities during the summer (compress 4 years into 2). No military obligation is incurred through participation in any of the summer programs. Eligible students who enroll in the Advanced Course receive \$100 per month beginning the next academic year. For information, call 373-2212.

## Military Science (Mil)

Courses with limited enrollment must be reserved in 108 Armory (see instructions under "Reserved Courses").

### FIRST TERM

**1014. WORLD MILITARY HISTORY.** (5 cr, §1011, §1012, §1013, §Hist 1951, §1952, §1953, §1954; limited to 50 students; prereq Δ, Leadership Laboratory<sup>1</sup>; I-II MTWThF; Armory 116) Fieldman  
Basic concepts of military history. Principles of war, military definitions, and relationship of geography, economics, diplomacy, and technology to military history—from antiquity to present.

### SECOND TERM

**1024. FOUNDATIONS OF NATIONAL POWER.** (5 cr; limited to 50 students; prereq Δ, Leadership Laboratory<sup>1</sup>; I-II MTWThF; Armory 116) Collins  
Introduction to contemporary international relations; basic factors involved in a nation's capacity for developing power; varying levels of military force available to implement policy.

<sup>1</sup>Leadership Laboratory is taught concurrently to all cadets during the summer terms. The laboratory is designed so that students can demonstrate their ability in individual and group drill. Progressive and extensive practice in voice and exercise of command, unit formations, bearing, posture, and physical fitness is emphasized. Designed to assist in identification and development of individual traits and qualities of character.



# Institute of Technology

## SCHOOL OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE

### Architecture (Arch)

All courses must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

#### FIRST TERM

- 1021. ARCHITECTURAL THEORY AND HISTORY.** (4 cr; reserved course; 1021 is prereq to all architectural history courses; III-IV MWF; Arch 35) Winterowd, Ohlhausen  
The philosophy and principles of architecture as an art, development of architecture from ancient times to the present.
- 5055. AMERICAN ARCHITECTURE AND THE 19TH CENTURY.** (4 cr; reserved course; prereq 1021 or #; III-IV T, Arch 35; III-IV ThF, Arch 25) Winterowd  
History of pre-Columbian and colonial architecture in America and Europe through the early 19th century.

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 3082-3083. ARCHITECTURAL DESIGN I.** (6 cr; limited enrollment; prereq 3082; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Holloway, Blair, LaVine  
Basic exercises in composition of line, form, proportion, color, and texture. Elements of architectural design. Architectural drawing. Model making.
- 3092-3093. ARCHITECTURAL DESIGN II.** (6 cr per qtr; limited enrollment; prereq 3083; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Holloway, Blair, LaVine  
Architectural problems with emphasis on development of structure as an integral part of design; site planning.
- 5111. ARCHITECTURAL DESIGN III.** (6 cr; limited enrollment; prereq 3093; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Blair, LaVine  
Advanced architectural problems of complex requirements, involving thorough study and detailed solution; electrical and mechanical equipment and structure as an integral part of design; research techniques. Individual effort and group collaboration.
- 5112. ARCHITECTURAL DESIGN III.** (6 cr; limited enrollment; prereq 5111; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Blair, LaVine  
See 5111.
- 5113. ARCHITECTURAL DESIGN III.** (6 cr; limited enrollment; prereq 5112; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Blair, LaVine  
See 5111.
- 5121. ARCHITECTURAL DESIGN IV.** (9 cr; limited enrollment; prereq 5113, CE 3062; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Holloway, Blair, LaVine  
Building design and development in the urban context. Individual and collaborative effort; urban problems; reporting on and preparation of large-scale proposals.
- 5122. ARCHITECTURAL DESIGN IV.** (9 cr; limited enrollment; prereq 5121; register for both terms at beginning of first term; \$4 lab fee; VI-X MTWThF; Arch 210) Holloway, Blair, LaVine  
See 5121.

## SECOND TERM

**5056. MODERN ARCHITECTURE.** (4 cr; reserved course; prereq 1021 or #; IV MTWThF; Arch 25) Winterowd History of architecture in America and Europe from the late 19th century until the present time.

## SCHOOL OF CHEMISTRY

### Chemistry (Chem)

Courses with limited enrollment must be reserved in 105 Lind Hall by IT students and in 12 Johnston Hall by other students unless otherwise indicated (see instructions under "Reserved Courses").

A deposit card is necessary for all laboratory courses; see page 23.

### FIRST TERM

**1001. CHEMICAL PRINCIPLES AND COVALENT SYSTEMS.** (5 cr, 1001-1002†, §1004-1005, §1014, §1031-1032; primarily for forestry and nursing students; a terminal course; limited enrollment, reserved in JohH 12; prereq 2 yrs high school mathematics, high school chemistry recommended; \$4 lab fee; lect 7:50-9:00 MTWThF, SciCB 325; rec V MWF; lab VI-VIII MWF, SmithH ar)

Introduction to principles of chemical change including structural concepts of nuclei, atoms, molecules; laws governing dynamic behavior of matter including equilibrium concepts, especially those relevant to living systems; applications of principles with emphasis on organic and biological species.

**1004. GENERAL PRINCIPLES OF CHEMISTRY.** (5 cr, 1004-1005†, §1001-1002, §1014, §1031, §1032; limited enrollment, reserved in CofH 130 for Ag, For, HE...LindH 105 for IT...JohH 12 for other students; primarily for non-chemistry majors; prereq placement index of Yor predicted mathematics GPA 1.90 on ACT, Math 0009 or college course in algebra...4 yrs high school mathematics...high school chemistry and physics recommended; \$4 lab fee; lect 7:50-9:00 MTWThF, SciCB 375; rec V MWF; lab VI-VIII MWF, SmithH ar)

Introduction to chemistry from the standpoint of atomic structure; periodic properties of elements and compounds derivable from structural considerations; laws governing behavior of matter, theories of solutions, acids, bases, and equilibrium.

**1006. PRINCIPLES OF SOLUTION CHEMISTRY.** (4 cr; limited enrollment, reserved in CofH 130 for Ag, For, HE...LindH 105 for IT...JohH 12 for other students; prereq 1005 or 1032; \$4 lab fee; lect II MTWThF, SciCB 325; lab V-VIII MWF, SmithH ar)

Lecture and laboratory work related to chemistry of selected cations and anions. Detection and behavior of these ions; heterogeneous and homogeneous equilibria systems. Oxidation-reduction systematics; complex ion formation as it relates to aqueous solution chemistry; general metal ion chemical phenomena interrelated with structure.

**3100. QUANTITATIVE ANALYSIS.** (3 cr, 3100-3101†; limited enrollment; for non-chemistry majors; prereq 1005; V-VI MWF; Owre 15)

(Lecture) Modern quantitative methods of analysis.

**3101. QUANTITATIVE ANALYSIS.** (2 cr; limited enrollment; prereq 3100 or †3100; \$4 lab fee; I-III MTWThF; SmithH 310)

(Laboratory) Modern quantitative methods of analysis including elementary physicochemical procedures.

**3301. ELEMENTARY ORGANIC CHEMISTRY.** (3 cr; limited enrollment; prereq 1005 or 1032 or equiv; I MTWTh, II TThF, III F; SmithH 100)

Important classes of organic compounds, both aliphatic and aromatic, and heterocyclic compounds.

**3305. ELEMENTARY ORGANIC CHEMISTRY LABORATORY.** (2 cr; limited enrollment; prereq 3301 or †3301; \$4 lab fee; lect III T, SmithH 100; lab II-V MW [1st wk of term lab will meet II-V WF], SmithH 349, Kolth 398)

See 3301.

**3499. SENIOR THESIS.** (Cr ar; must be reserved in LindH 105; prereq #, 4th yr; \$4 lab fee)

Written final senior thesis report.

**5520. ELEMENTARY PHYSICAL CHEMISTRY.** (3 cr; limited enrollment, reserved in LindH 105; prereq 1 yr college chemistry, Phys 1291 and 1295 or †Phys 1291 and †1295 or 1106 with #, Math 3211; I-II MWF; SmithH 225)

Brief general survey. Chemical thermodynamics.

**8990. RESEARCH IN CHEMISTRY.** (Cr and hrs ar; prereq Δ)

**8991. SPECIAL TOPICS.** (Cr and hrs ar; prereq Δ)

## **SECOND TERM**

**1002. CHEMICAL PRINCIPLES AND COVALENT SYSTEMS.** (5 cr, 1001-1002†, §1004-1005, §1014, §1031-1032; primarily for forestry and nursing students; a terminal course; limited enrollment, reserved in JohH 12; prereq 2 yrs high school mathematics, high school chemistry recommended; \$4 lab fee; lect 7:50-9:00 MTWThF, SciCB 325; rec IV MWF; lab VI-VIII MWF, SmithH ar)

See 1001 First Term.

**1005. GENERAL PRINCIPLES OF CHEMISTRY.** (5 cr, 1004-1005†, §1001-1002, §1014, §1031, §1032; limited enrollment, reserved in CofH 130 for Ag, For, HE... LindH 105 for IT... JohH 12 for other students; primarily for non-chemistry majors; prereq placement index of Yor predicted mathematics GPA 1.90 on ACT, Math 0009 or college course in algebra... 4 yrs high school mathematics... high school chemistry and physics recommended; \$4 lab fee; lect 7:50-9:00 MTWThF, SciCB 375; rec V MWF; lab VI-VIII MWF, SmithH ar)

See 1004 First Term.

### **NSci 1005. NATURAL SCIENCE—STRUCTURE AND PROPERTIES**

See Natural Science under College of Liberal Arts.

**3302. ELEMENTARY ORGANIC CHEMISTRY.** (3 cr; limited enrollment; prereq 3301 or equiv; I MTWTh, II TThF, III F, SmithH 100)

See 3301 First Term.

**3306. ELEMENTARY ORGANIC CHEMISTRY LABORATORY.** (2 cr; limited enrollment; prereq 3302 or 13302; \$4 lab fee; lect III T, SmithH 100; lab II-V MW [1st wk of term, lab will meet II-V WF], SmithH 349, KoltH 398)

See 3301 First Term.

**3499. SENIOR THESIS.** (Cr ar; must be reserved in LindH 105; prereq #, 4th yr; \$4 lab fee)

See First Term.

**5126. MODERN ANALYTICAL CHEMISTRY.** (4 cr; limited enrollment, reserved in LindH 105; primarily for chemical engineering majors; prereq 3332 and 3335; \$4 lab fee; lect V-VI TTh, KoltH S137; lab I-IV MTWTh, KoltH 297, 299)

Strategies and techniques for solving modern analytical problems and the use of modern instruments in analysis.

**5133. CHEMICAL INSTRUMENTATION AND ANALYSIS.** (5 cr, §5126; limited enrollment, reserved in LindH 105; prereq 1133, 5534; \$4 lab fee; lect V-VI TTh, KoltH S137; lab I-IV MTWThF, KoltH 297, 299)

An introduction to the methodology and practices of solving analytical problems. Application of modern instrumental techniques to analysis.

**5521. ELEMENTARY PHYSICAL CHEMISTRY.** (3 cr; limited enrollment, reserved in LindH 105; prereq 1 yr college chemistry, Phys 1291 and 1295 or 1Phys 1291 and 11295 or 1106 with #, Math 3211; I-II MWF; SmithH 225)

See 5520 First Term.

**8990. RESEARCH IN CHEMISTRY.** (Cr and hrs ar; prereq Δ)

**8992. SPECIAL TOPICS.** (Cr and hrs ar; prereq Δ)

## **COMPUTER SCIENCE (CSci)**

All courses must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

**3101. A FORTRAN INTRODUCTION TO COMPUTER PROGRAMMING.** (4 cr; prereq Math 1231 or Math 1331 or Math 1621 or #; intended for non-CSci majors; \$4 lab fee; IV MTWThF; Arch 50) Ibarra

FORTRAN computer language with extensions; applications; programming techniques. Designed to bring students to advanced-level competence in FORTRAN programming. Integral nonscheduled laboratory.

**3105. FUNDAMENTALS OF ALGORITHMS AND LANGUAGES I.** (4 cr; prereq 1100 or equiv programming knowledge or #, Math 1231 or Math 1331 or Math 1621 or #; informal lab; \$4 lab fee; III MTWThF; Arch 55) Maly

Algorithms, their properties and representation. Elementary concepts in linguistics: syntax, semantics, ambiguities. FORTRAN as a language; applications of FORTRAN to different algorithms; e.g., iteration and recursion, sequential and binary searching, numerical methods.

- 5101. STRUCTURE AND PROGRAMMING OF SOFTWARE SYSTEMS I.** (4 cr, §3107; prereq 1101 or 3101 or 3105 or #; informal lab; intended for non-CSci majors; \$4 lab fee; III-IV MW, IV F; Arch 60) Schneider  
Organization and logical structure of computer systems. Representation of programs and data. Topics: number systems, primitive computer systems, programming in machine language. Extensions to more sophisticated systems, assembly language, sequencing, decision making, arithmetic, logical operations, character manipulation, iteration, subroutines, data description, introduction to assembler software.
- 5121. INTRODUCTION TO DATA STRUCTURES.** (4 cr; prereq 3106 or #; \$4 lab fee; III-IV TTh, III F; Arch 60) Sahni  
Basic concepts of data and their representation. Linear lists and strings. Array structures and allocations. Symbol tables and searching techniques; hash coding techniques. Tree structures. Storage systems and structures. Storage allocation. Multilinked structures. Sorting.
- 5301. NUMERICAL ANALYSIS.** (4 cr, §Math 5472; prereq Math 3221, or 3142 and 3211, or a knowledge of FORTRAN is assumed; informal lab; \$4 lab fee; III MTWThF; Arch 50) Leavitt  
General concept of iteration formulas. Solution of equations. Newton's method. Linear systems. Finite differences. Interpolation. Numerical differentiation and integration. Introduction to initial value problems.

## **SECOND TERM**

- 3101. A FORTRAN INTRODUCTION TO COMPUTER PROGRAMMING.** (4 cr; prereq Math 1231 or Math 1331 or Math 1621 or #; intended for non-CSci majors; \$4 lab fee; IV MTWThF; Arch 50) Moher  
See First Term.
- 3106. FUNDAMENTALS OF ALGORITHMS AND LANGUAGES II.** (4 cr; prereq 3105 or #; informal lab; \$4 lab fee; III MTWThF; MechE 212) Frankowski  
Algorithms for nonnumerical data types. Tree structures, lists, strings, simulations, sorting, hashing, elementary graph theory, game playing. Languages for string processing and symbol manipulation; SNOBOL. Language translation. Students will write FORTRAN and SNOBOL programs in several of the above areas.
- 5102. STRUCTURE AND PROGRAMMING OF SOFTWARE SYSTEMS II.** (4 cr; prereq 3107 or 5101 or #; informal lab; \$4 lab fee; III-IV MW, IV F; LindH 217) Franta  
Subroutine coding conventions; argument transfer; interrupts and traps; macros; I/O equipment and operations; buffers; conditional assembly and program segmentation. Students will write assembly language programs for an existing, modern computer.

# **SCHOOL OF EARTH SCIENCES**

## **Geology and Geophysics (Geo)**

All courses must be reserved in 105 Lind Hall unless otherwise indicated (see instructions under "Reserved Courses").

### **FIRST TERM**

- 1001. PHYSICAL GEOLOGY.** (5 cr; limited to 52 students, reserved in LindH 105 for IT and JohH 12 for others; \$4 lab fee; lect II-MTWThF; PillsH 110) Sloan  
Introduction to scientific method and nature of the earth. Main features of the physical world and processes that have formed them.  
Lab 1, III-IV MWF, ForH 180  
Lab 2, VI-VII MWF, ForH 180
- 3099. PROBLEMS IN GEOLOGY AND GEOPHYSICS.** (1-6 cr; prereq # and Δ)  
Individual research or problem selected on the basis of individual interests and background.
- 5051. PHYSICAL GEOLOGY FOR TEACHERS.** (4 cr, §1001, §1111; limited to 8 students, reserved in LindH 105 for IT and JohH 12 for others; only for students holding degrees in education; prereq 1 term college chemistry or physics; \$4 lab fee; lect II MTWThF, seminar V TTh; PillsH 110) Sloan  
Scientific methods and nature of the earth. Main features of the physical world and of the processes that have formed them.  
Lab 1, III-IV MWF, ForH 180  
Lab 2, VI-VII MWF, ForH 180

**5110. FIELD GEOLOGY.** (9 cr; limited to students majoring in geology, geophysics or geoen지니어ing; prereq 3103 and #; \$4 lab fee)

Measurement of stratigraphic sections; fossils and igneous, sedimentary, and metamorphic rocks. Geological surveying on aerial photographs and topographic maps. Preparation of geologic maps and cross sections. Structural and geomorphic features and geologic setting of mineral deposits.

## **SECOND TERM**

**1002. HISTORICAL GEOLOGY.** (4 cr; limited to 40 students, reserved in LindH 105 for IT and JohH 12 for others; prereq 1001; \$4 lab fee; lect II MTWThF; PillsH 110) Sloan

Evolution of earth from its origin to present; the succession of physical and biological events of the past 600 million years.

Lab 1, III-IV MWF, ForH 85

Lab 2, VI-VII MWF, ForH 85

**3099. PROBLEMS IN GEOLOGY AND GEOPHYSICS.** (1-6 cr; prereq # and Δ)

See First Term.

**3401. INTRODUCTORY MINERALOGY.** (5 cr; prereq 1001 or 1111 or #, 1 term college chemistry, Math 1441; \$4 lab fee; lect III MTWThF, PillsH 110; lab V-VII MTWTh, PillsH 100) Zoltai

Introduction to crystallography, crystal chemistry, and mineralogy. Descriptive and determinative mineralogy. Minerals in natural rock systems.

**5004. MINERALOGY.** (4 cr, §3401; not open to geology, geophysics, geological mineral, or metallurgical engineering majors; open to agriculture and forestry students and postgrad students in education; prereq 1001 or 1111 or #, 1 term college chemistry, Math 1441; \$4 lab fee; lect III MTWThF, PillsH 110; seminar V TTh, PillsH 125; lab VI-VII MTWTh, PillsH 100) Zoltai

See 3401.

**5052. HISTORICAL GEOLOGY FOR TEACHERS.** (4 cr, §1002, §3112; limited to 8 students, reserved in LindH 105 for IT and JohH 12 for others; open only to students holding degrees in education; prereq 1001 or 1111 or 5051 or #; \$4 lab fee; lect II MTWThF, seminar V TTh, PillsH 110; lab III-IV MWF, ForH 85) Sloan

Origin of the earth, physical evolution of its crust through geological time, and biological changes that occurred during its history.

**5110. FIELD GEOLOGY.** (9 cr; limited to students majoring in geology, geophysics, and geoen지니어ing; prereq 3103 and #; \$4 lab fee)

See First Term.

## **COLLEGE OF ENGINEERING**

### **Aerospace Engineering and Mechanics (AEM)**

All courses must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

**1015. STATICS.** (4 cr, §1011; prereq Phys 1271, Math 1231; I-II MWF, II TTh; Aero 225)

Vector algebra. Principles of statics. Application of equations of equilibrium to analysis of simple structures and machines. Statically determinate beams. Cables. Nature and influence of friction.

**3036. DYNAMICS.** (4 cr; prereq 1011 or 1015, §Math 3221; III-IV MWF, III TTh; Aero 225)

Review of particle dynamics. Mechanical systems and the rigid-body model. Equilibrium. Kinematics and dynamics of plane systems. Technical applications.

**5001. AEROSPACE ENGINEERING WORKSHOP FOR ELEMENTARY AND SECONDARY TEACHERS—July 5-16.** (4 cr; enrollment limited to 30 students; 1:00-5:30 MTWThF; MechE 212) Kaldahl, Aerospace Engineering and Mechanics faculty

Lectures, film reviews, construction and demonstration of classroom aids, involvement with the NASA spacemobile, flight experience, and field trips cover such topics as satellites and probes, model rocketry including a launch, astronaut in space, principles of flight, conventional aircraft, space age education tools. Visits to local aerospace facility and to major aerospace installation in the country. See Special Programs section.

## **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

- 5840. INDUSTRIAL ASSIGNMENT.** (2 cr; prereq regis in engineering intern program)  
Engineering intern industrial laboratory. A formal technical report, covering the work during the industrial assignment, is required.
- 5841. INDUSTRIAL ASSIGNMENT.** (2 cr; prereq regis in engineering intern program)
- 5842. INDUSTRIAL ASSIGNMENT.** (2 cr; prereq regis in engineering intern program)

## **SECOND TERM**

- 3016. DEFORMABLE BODY MECHANICS.** (4 cr; prereq 1011 or 1015, ¶Math 3221; III-IV MWF, III TTh; Aero 225)  
Principles of statics; equilibrium conditions. Uniaxial loading and deformation. Stress and strain at a point. Material behavior; linear elasticity. Torsion. Bending of beams of symmetrical section.

## **Chemical Engineering and Materials Science**

### *Chemical Engineering (ChEn)*

Courses so designated must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 5901-5902-5903. SPECIAL PROBLEMS.** (Cr ar; reserved course)
- 8901-8902-8903. RESEARCH.** (Cr ar)

#### **SECOND TERM**

- 5901-5902-5903. SPECIAL PROBLEMS.** (Cr ar; reserved course)
- 8901-8902-8903. RESEARCH.** (Cr ar)

### *Metallurgy/Materials Science (MatS)*

Courses so designated must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 3400. MECHANICAL PROPERTIES: MATERIALS.** (4 cr; reserved course; prereq 2nd-year IT student; I MTWThF, V Th; MinMet 116) Gerberich  
Structure and properties of metals, alloys, and polymers; heat treatment; alloy selection and metal processing.
- 5481-5482-5483. SPECIAL PROBLEMS.** (Cr ar; reserved course; prereq sr)
- 8480-8481-8482. SELECTED TOPICS: MATERIALS SCIENCE, ENGINEERING.** (Cr ar)

#### **SECOND TERM**

- 5481-5482-5483. SPECIAL PROBLEMS.** (Cr ar; reserved course; prereq sr)
- 8480-8481-8482. SELECTED TOPICS: MATERIALS SCIENCE, ENGINEERING.** (Cr ar)

## **Civil and Mineral Engineering (CE)**

Courses so designated must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

## **SECOND TERM**

- 5097. ADVANCED DESIGN, ANALYSIS, RESEARCH, OR TUTORIAL IN CIVIL ENGINEERING.** (Cr or; reserved course; prereq #) Bowers  
Planning, design, or analysis of complex civil engineering systems. Individual laboratory research problems, literature, studies, and reports supervised by staff. Studies may be conducted in any discipline within civil engineering including but not limited to hydraulics and hydrology, land development, materials, environmental engineering, soil and rock mechanics, structures, and transportation.
- 8097. CIVIL ENGINEERING RESEARCH.** (3-5 cr; prereq #) Bowers  
Original work in concrete, structural steel, soils, hydraulics, municipal, sanitary, or transportation problems. Investigations, reports, tests, designs.
- 8497. ADVANCED HYDRAULIC LABORATORY.** (2 cr; prereq #) Bowers  
Experimental and analytical studies of hydraulic phenomena relating to fluid measurement, pumps, spillways, stilling basins, wave absorption, flow transients, and other selected topics.

## **Electrical Engineering (EE)**

Courses with limited enrollment must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

### **FIRST TERM**

- 1510. ELEMENTS OF ELECTRICAL ENGINEERING.** (5 cr; each section limited to 14 students; prereq Math 3221, Phys 1291 or ¶Phys 1291; \$4 lab fee; I-II MTWThF; MechE 202)  
Physical principles underlying the modeling of circuit elements. Characterization of two- and three-terminal resistive elements. Kirchhoff's laws. Simple resistive circuits. Linearity in circuits. Characterization of storage elements. First-order circuits.  
Lab 1, III-V TTh, ElectE 121  
Lab 2, V-VII WF, ElectE 121
- 3000. CIRCUITS.** (4 cr; each section limited to 14 students; not for EE majors; prereq Phys 1291, Math 3221 or ¶Math 3221; \$4 lab fee; lect I-II MWF; Arch 10)  
Linear passive circuits; natural and forced response. Steady-state ac analysis; resonance.  
Lab 1, I-II TTh, ElectE 118  
Lab 2, VI-VII WF, ElectE 118  
Lab 3, I-II TTh, ElectE 121  
Lab 4, V-VI TTh, ElectE 121

### **FIRST AND SECOND TERMS: TEN-WEEK COURSES**

- 3010. CIRCUITS, SIGNALS, AND SYSTEMS I.** (4 cr, §1501; limited enrollment; prereq 1510; IV MWF, VI-VII M; Arch 15)  
Modeling of lumped-parameter networks. Second-order circuits. Sinusoidal steady-state analysis. Two-port networks.
- 3012. CIRCUITS, SIGNALS, AND SYSTEMS III.** (4 cr, §5001; limited enrollment; prereq 3011; II MWF, I-II T; Arch 60)  
Continuous, discrete-time systems. Feedback: stability, applications.
- 3050. ELECTRONICS.** (4 cr; limited enrollment; prereq 3010 or ¶3010; I MWF, VI-VII W; Arch 15)  
Diode circuits and applications. Semiconductor properties. P-N junctions. Junction diodes; JFET characteristics; MOSFET characteristics, FET amplifiers; biasing.
- 3100. ELECTROMAGNETIC FIELDS I.** (4 cr; limited enrollment; prereq Phys 1291, Math 3231 or ¶Math 3231 with #; III MWF, III-IV Th; Arch 10)  
Electrostatic, magnetostatic, and electromagnetic field theory based on fundamental experimental laws, including properties of dielectric and magnetic materials.
- 3400. JUNIOR ELECTRICAL ENGINEERING LABORATORY.** (3 cr; each section limited to 12 students; prereq 3050 or ¶3050; \$4 lab fee)  
Lab 1, I-IV T, ElectE 205  
Lab 2, V-VIII Th, ElectE 205
- 3402. JUNIOR ELECTRICAL ENGINEERING LABORATORY.** (2 cr; each section limited to 12 students; prereq 5050 or ¶5050; \$4 lab fee)  
Lab 1, V-VIII T, ElectE 216  
Lab 2, I-IV Th, ElectE 216  
Lab 3, V-VIII Th, ElectE 216

- 3476. INDUSTRIAL ASSIGNMENT I.** (2 cr; limited enrollment; prereq regis in engineering intern program)  
Industrial work assignment in engineering intern program. Grade based on formal written report covering the quarter's work assignment.
- 3478. INDUSTRIAL ASSIGNMENT III.** (2 cr; limited enrollment; prereq 3477)  
See 3476.
- 5050. NONLINEAR ELECTRONIC CIRCUITS.** (4 cr; limited enrollment; prereq 3051, 3012 or §3012; IV MWF, VI-VII M; Arch 10)  
Linear wave-shaping circuits. Piece-wise linear circuit analysis. Switching models of diodes and transistors. Transistor logic circuits. Bistable multivibrators. Astable multivibrators. Nearly sinusoidal oscillators.
- 5051. INTRODUCTION TO LOGIC DESIGN.** (4 cr, §5060, §5350; limited enrollment; prereq 3051 or #; III MWF, III-IV T; Arch 15)  
Integrated logic circuits. Design using logic circuits, memory elements, sequential circuits. Transmission lines and digital signals.
- 5100. ELECTROMAGNETIC FIELDS III.** (4 cr; limited enrollment; prereq 3101; I MWF, VI-VII W; Arch 60)  
Plane-wave propagation, transmission lines, antennas, and other topics.
- 5101. ELECTROMAGNETIC FIELDS LABORATORY.** (1 cr; each section limited to 12 students; prereq 3401, 5100 or §5100; \$4 lab fee)  
Lab 1, V-VIII alt T, ElectE 204  
Lab 2, I-IV alt Th, ElectE 204

## **SECOND TERM**

- 3001. ELECTRONICS.** (4 cr; each section limited to 14 students; not for EE majors; prereq 3000 or 3010; \$4 lab fee; lect I-II MWF; Arch 40)  
Network theorems; two-ports, active device models; vacuum diodes, semiconductors, amplifiers, nonlinear devices; logic circuits.  
Lab 1, I-II TTh, ElectE 118  
Lab 2, VI-VII MW, ElectE 118  
Lab 3, III-IV MW, ElectE 118

## **Mechanical Engineering**

### *Industrial Engineering/Operations Research (IEOR)*

Courses with limited enrollment must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

#### **FIRST TERM**

- 5030. QUALITY CONTROL AND RELIABILITY.** (4 cr; limited to 30 students; prereq 5000, Math 1231, ME 3900; lect IV-V MTWTh; MechE 108) White  
History of quality control, quality policies and objectives, economics of quality, design for system effectiveness, reliability and maintainability, statistical aids to reliability, quality specifications, inspection, acceptance sampling, vendor relations, process control, motivation for quality, quality assurance, and quality control engineering.

#### **FIRST AND SECOND TERMS: TEN-WEEK COURSE**

- 5040. INTRODUCTION TO OPERATIONS RESEARCH.** (4 cr; limited to 30 students; prereq 5000, Math 1231; lect III MTWTh; MechE 108) White, Arora  
Linear programming, algebra and geometry of linear models, simplex method, sensitivity testing and duality; network models, network algorithms, and dynamic models.

#### **SECOND TERM**

- 5000. INTRODUCTION TO INDUSTRIAL ENGINEERING ANALYSIS.** (4 cr; limited to 30 students; prereq Math 1231; lect I-II MTWTh; MechE 108) Arora  
Scientific management, mathematical models, methods engineering, work measurement, worker satisfaction and participation, wage payment plans, break-even analysis, incremental costs, the time value of money and the present value concept; cost quality and inventory control; production scheduling, plant locations, and layout; linear programming, PERT, and the systems approach to management problems.



## Mechanical Engineering (ME)

Courses with limited enrollment must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 3201. MECHANICAL ENGINEERING SYSTEMS ANALYSIS.** (4 cr; limited to 30 students; prereq Math 3221; lect V MTWThF, rec VII-VIII TTh; MechE 102) Frohrib  
Modeling and analytic description of mechanical systems. Properties of linear models with emphasis on automatic computation solution. Necessary background includes differential equations.
- 3205. ENGINEERING SYSTEMS DESIGN.** (4 cr; limited to 30 students; prereq engineering system dynamics and kinematics [3201, 3203]; lect III MTWThF, MechE 102; rec VII-VIII TTh, MechE 314) Kleinhenz  
Application of fundamental concepts to the design of typical mechanical components. Engineering approach to the analysis and synthesis of machines and systems. Specification of materials in engineering design. Optimum design criteria.
- 3301. THERMODYNAMICS.** (4 cr; limited to 30 students; prereq introductory thermodynamics and basic calculus, Chem 1014, or Phys 1281, Math 3221 or equiv; lect III TWTh, IV MTWThF; MechE 202) Scott  
Properties, equations of state, processes, and cycles for various thermodynamic systems. Development of first and second laws of thermodynamics, correlating heat, work, and mass transfer. Equilibrium irreversibility and mixtures.
- 5460. INTERNAL COMBUSTION ENGINES.** (4 cr; limited to 30 students; prereq 3301 or equiv; lect V MTWThF, rec VI MWF; MechE 321) Murphy  
Principles of power production, fuel consumption, and emissions of gasoline and diesel engines; fuel-air cycle analysis, combustion flames, knock phenomena, air flow and volumetric efficiency, mixture requirements, ignition requirements, and performance.

### FIRST AND SECOND TERMS: TEN-WEEK COURSE

- 3740. INDUSTRIAL ASSIGNMENT.** (2 cr per qtr [may be repeated for cr]; must be reserved in LindH 105; prereq regis in engineering intern program) Springer  
Engineering intern industry laboratory assignment (work quarter). Grade based on formal written report covering the industrial work assignment.

### SECOND TERM

- 3303. APPLIED THERMODYNAMICS.** (4 cr; limited to 30 students; prereq 3301; lect III TWTh, IV MTWThF; MechE 321) Murphy  
Application of laws of thermodynamics to chemically reacting systems and engineering systems. Analysis of vapor cycles, gas engine cycles, propulsion systems, refrigeration, and air-water vapor mixture.
- 5203. ADVANCED ANALYSIS AND SYNTHESIS OF MECHANISM SYSTEMS.** (3-4 cr; must be reserved in LindH 105; prereq 3203 or equiv. . . computer programming desirable; lect VI MTWThF, 1 hr ar; MechE 108) Erdman  
Analytical methods of kinematic, dynamic, and kinetoelastodynamic analysis and synthesis of mechanisms. Computerized design for function, path, and motion generation based on Burmester theory.
- 5342. HEAT TRANSFER.** (4 cr; limited to 30 students; prereq Math 3221, CE 3400 or equiv; lect I MWF, rec II MTWThF, 1 hr ar; MechE 321) Scott  
Steady and unsteady conduction of heat. Convection heat transfer in boundary layer and duct flows; forced and free convection; condensation and boiling; heat exchangers. Heat transfer by thermal radiation; radiative properties of black bodies and real surfaces.

## INSTITUTE OF TECHNOLOGY (I of T)

Courses with limited enrollment must be reserved in 105 Lind Hall (see instructions under "Reserved Courses").

### FIRST TERM

- 3501. MEASUREMENT AND THE METRIC SYSTEM.** (2 or 4 cr; limited to 40 students; III-IV TTh; MechE 221) Wenberg  
Concepts, history, tools, techniques of measurement. The SI metric system: units, prefixes, standard writing practices. Communicating in the metric language. The transition to metrics in the U.S. and abroad. Research project required of students registering for 4 credits. For information, see or write the instructor at the Minnesota Metric Center, 111 Mechanical Engineering, 111 Church Street S.E., Minneapolis, MN 55455.

# SCHOOL OF MATHEMATICS

## Mathematics (Math)

Courses with limited enrollment must be reserved in 105 Lind Hall or 12 Johnston Hall unless otherwise indicated (see instructions under "Reserved Courses").

### FIRST TERM

**0009. PREPARATORY MATHEMATICS.** (No cr; limited enrollment, reserved in JohH 12)

Designed to supplement the background in algebra for those whose background is insufficient. Covers most of the material of high school elementary and higher algebra courses, with emphasis on the latter.

Sec 1, I-II MTWThF, VH 301

Sec 2, III-IV MTWThF, VH 301

**1005. FOUNDATIONS OF ARITHMETIC.** (3 cr [not available for CLA cr]; limited enrollment, reserved in JohH 12; prereq 1 yr elementary algebra and 1 yr high school geometry or equiv, or  $\Delta$ ; III MTWThF; KoItH S133)

Logical and axiomatic basis of the rules for arithmetical operations with integers, rational numbers, and real irrational numbers as necessary background for teaching arithmetic in elementary school. History of the subject and its role in our culture and civilization.

**1008. TRIGONOMETRY.** (3 cr [open for cr if taken before 1201, even to students with high school trigonometry]; limited enrollment, reserved in JohH 12; prereq plane geometry and high school algebra or 0009 or 11111 allowed; II MTWThF; MecheE 221)

Analytic trigonometry emphasizing identities, equations, and properties of the functions; right and oblique triangles without logarithmic computation.

**1111. COLLEGE ALGEBRA AND ANALYTIC GEOMETRY.** (5 cr, §1131, §1141, §1201; limited enrollment, reserved in JohH 12; prereq 0009 or high school higher algebra and satisfactory math placement score)

(For students requiring only some analytic geometry and college algebra without trigonometry, or for those whose background does not include logarithms. Students who plan to take several quarters of mathematics should take 1201 if they qualify.) Functions and graphs, quadratic equations, progressions, inequalities, complex numbers, theory of equations, permutations and combinations, probability, systems of equations, determinants, graphing of linear and quadratic equations, conics in standard position, logarithms.

Sec 1, I-II MTWThF, Arch 45

Sec 2, III-IV MTWThF, Arch 40

**1131. FINITE MATHEMATICS.** (5 cr, §1111, §1141, §1201; limited enrollment, reserved in JohH 12; prereq 0009 or high school higher algebra and math placement score; III-IV MTWThF; VH 207)

(For students in the social sciences, behavioral sciences, and pre-business administration.) Elementary computer programming, logical analysis, probability and stochastic models, Markov chains, linear systems and programming, matrix operations, and applications.

**1142. INTRODUCTION TO CALCULUS.** (5 cr, §1211; limited enrollment, reserved in JohH 12; prereq 1111 or 1131 or 1141 or 1201 or math placement score)

(For students in pre-business administration, pre-pharmacy, and others requiring a minimal amount of calculus. Students who plan to take several quarters of mathematics should register for the sequence 1211, 1221, 1231.) Derivatives, integrals, differential equations, maxima and minima, introduction to partial differentiation, applications.

Sec 1, I-II MTWThF, VH 20

Sec 2, III-IV MTWThF, VH 20

**1201. PRE-CALCULUS.** (5 cr, §1111, §1131, §1141; limited enrollment; prereq 0009 or high school higher algebra and 1008 or high school trigonometry)

(For students who intend to take a calculus sequence.) Inequalities, analytical geometry, complex numbers, binomial theorem, mathematical induction, functions and graphs, and trigonometric, exponential, and logarithmic functions.

Sec 1, I-II MTWThF, VH 311

Sec 2, III-IV MTWThF, VH 209

**1211. ANALYSIS I.** (5 cr; limited enrollment; prereq grade of C or better in 1201 or high school higher algebra, trigonometry, geometry and math placement score)

Analytic geometry and calculus of one variable, applications infinite series and sequences.

Sec 1, I-II MTWThF, Arch 35

Sec 2, III-IV MTWThF, Z 313

- 1221. ANALYSIS II.** (5 cr, limited enrollment; prereq grade of C or better in 1211 or equiv)  
See 1211.  
Sec 1, I-II MTWThF, VH 16  
Sec 2, III-IV MTWThF, VH 16
- 1231. ANALYSIS III.** (5 cr; limited enrollment; prereq grade of C or better in 1221 or equiv)  
See 1211.  
Sec 1, I-II MTWThF, Arch 5  
Sec 2, III-IV MTWThF, Arch 5
- 3211. ANALYSIS IV.** (5 cr, §3411, §3521; limited enrollment; prereq grade of C or better in 1231 or equiv)  
Partial differentiation, chain rule, implicit functions, applications. Multiple integrals in two and three dimensions.  
Sec 1, I-II MTWThF, VH 211  
Sec 2, III-IV MTWThF, VH 311
- 3221. INTRODUCTION TO LINEAR ALGEBRA AND LINEAR DIFFERENTIAL EQUATIONS.** (5 cr, §3142, §3511; limited enrollment, reserved in LindH 105; prereq grade of C or better in 1231 or equiv; III-IV MTWThF; VH 211)  
Vectors, systems of linear equations, matrices, determinants, bases, eigenvalues. Linear differential equations and systems with constant coefficients, initial value problem and general solution, variation of parameters for inhomogeneous equations.
- 3231. VECTOR ANALYSIS.** (4 cr, §1260, §5601-5602; limited enrollment, reserved in LindH 105; prereq grade of C or better in 3211 or equiv; I MWF, II MTWThF; VH 364)  
Scalar and vector products, derivatives, geometry of space curves, del operator, line and surface integrals, divergence and Stokes' theorem, transformation of coordinates, dyadics, applications. Mostly a technique course, intended mainly for students whose interests are not theoretical but who wish to learn the relevant mathematical facts and methods.
- 5209. THEORY OF NUMBERS.** (4 cr; limited enrollment, reserved in JohH 12; prereq 3211 or 3411; II MTWThF, III MW; Arch 20)  
Elementary properties of integers; prime and composite numbers; Euclid's algorithms; congruences; theorems of Fermat and Wilson; primitive roots; indices; Diophantine equations.
- 5242. LINEAR ALGEBRA WITH APPLICATIONS.** (4 cr, §5283, §5284; limited enrollment; prereq 3221 or 3142 or 3511; II MTWThF, III MW; Vh 206)  
Systems of linear equations, finite dimensional linear spaces, bases, linear transformations, matrices, determinants, eigenvalues, reduction to canonical forms, quadratic and bilinear forms, applications.
- 5457. METHODS OF APPLIED MATHEMATICS.** (4 cr; limited enrollment, reserved in LindH 105; prereq 3211 and 3221 or equiv; III TTh, IV MTWThF; Kolth S134)  
Integrated study of analytic tools used in applications of mathematics; emphasis on technique. Real and complex variables, matrices, ordinary and partial differential equations, calculus of variations, asymptotic expansions, etc.
- 5567. FOURIER SERIES AND BOUNDARY VALUE PROBLEMS.** (4 cr §5571; limited enrollment, reserved in LindH 105; prereq 3211 and 3221 or equiv; III TTh, IV MTWThF; Kolth S135)  
Partial differential equations of theoretical physics. Fourier series, proof of convergence, orthogonal systems. Sturm-Liouville systems, solution of boundary value problems by separation of variables, applications.
- 5601. ADVANCED CALCULUS.** (4 cr; limited enrollment; prereq 3211 or 3411 or equiv; III TTh, IV MTWThF; Arch 20)  
Differentiation of functions of several variables; vector algebra; curves in three dimensions; directional derivative and gradient; inverse transformation and implicit function theorems; change of variables in multiple integrals.
- 5701. INTRODUCTION TO COMBINATORICS.** (4 cr; limited enrollment; prereq 3211 or 3411 and 3rd-yr standing; II MTWThF, III MW; VH 113)  
Basic concepts in combinatorics. Enumeration including binomial counting, permutations, generating functions, inclusion-exclusion principle, recurrence relations. Emphasis on application. Matching theory and designs.

## **SECOND TERM**

- 0009. PREPARATORY MATHEMATICS.** (No cr; limited enrollment, reserved in JohH 12; I-II MTWThF; VH 211)  
See First Term.
- 1006. FOUNDATIONS OF ARITHMETIC.** (3 cr; limited enrollment, reserved in JohH 12; prereq 1005; III MTWThF; Kolth S133)  
Includes topics from the following: Definitions of rational and irrational numbers, definitions of addition, subtraction, multiplication, and division of fractions; methods for operations on rational and real numbers; the real number line and inequalities; topics from geometry and congruences.

- 1008. TRIGONOMETRY.** (3 cr [open for cr if taken before 1201, even to students with high school trigonometry]; limited enrollment, reserved in JohH 12; prereq plane geometry and high school algebra or 0009 ... §1111 allowed)  
 See First Term.  
 Sec 1, II MTWThF, KolH S135  
 Sec 2, IV MTWThF, KolH S135
- 1111. COLLEGE ALGEBRA AND ANALYTIC GEOMETRY.** (5 cr, §1131, §1141, §1201, §1411; limited enrollment, reserved in JohH 12; prereq 0009 or high school higher algebra and satisfactory math placement score)  
 See First Term.  
 Sec 1, I-II MTWThF, VH 20  
 Sec 2, III-IV MTWThF, VH 20
- 1142. INTRODUCTION TO CALCULUS.** (5 cr, §1211; limited enrollment, reserved in JohH 12; prereq 1111 or 1131 or 1141 or 1201 or math placement score)  
 See First Term.  
 Sec 1, I-II MTWThF, VH 206  
 Sec 2, III-IV MTWThF, BlegH 10
- 1201. PRE-CALCULUS.** (5 cr, §1111, §1131, §1141; limited enrollment; prereq 0009 or high school higher algebra and 1008 or high school trigonometry)  
 See First Term.  
 Sec 1, I-II MTWThF, VH 2
- 1211. ANALYSIS I.** (5 cr, §1111, §1141, §1411; limited enrollment; prereq grade of C or better in 1201 or high school higher algebra, trigonometry, geometry and math placement score)  
 See First Term.  
 Sec 1, I-II MTWThF, VH 311  
 Sec 2, III-IV MTWThF, VH 311
- 1221. ANALYSIS II.** (5 cr, §1142, §1421; limited enrollment; prereq grade of C or better in 1211 or equiv)  
 See 1211 First Term.  
 Sec 1, I-II MTWThF, Arch 35  
 Sec 2, III-IV MTWThF, Z 313
- 1231. ANALYSIS III.** (5 cr; limited enrollment; prereq grade of C or better in 1221 or equiv)  
 See 1211 First Term.  
 Sec 1, I-II MTWThF, VH 16  
 Sec 2, III-IV MTWThF, VH 16
- 3142. LINEAR ALGEBRA.** (4 cr, §3221, §3511; limited enrollment; prereq 2 qtrs calculus; II MTWThF, III MW; VH 207)  
 Vectors, system of linear equations, matrices, determinants, eigenvalues, applications. Emphasizes techniques but does include some proofs of theorems.
- 3211. ANALYSIS IV.** (5 cr, §3411, §3521; limited enrollment; prereq grade of C or better in 1231 or equiv; III-IV MTWThF; Arch 5)  
 See First Term.
- 3221. INTRODUCTION TO LINEAR ALGEBRA AND LINEAR DIFFERENTIAL EQUATIONS.** (5 cr, §3142, §3511; limited enrollment, reserved in LindH 105; prereq grade of C or better in 1231 or equiv)  
 See First Term.  
 Sec 1, I-II MTWThF, Arch 5  
 Sec 2, III-IV MTWThF, VH 211
- 3231. VECTOR ANALYSIS.** (4 cr, §5601-5602; limited enrollment, reserved in LindH 105; prereq grade of C or better in 3211 or equiv; III MTWThF, IV MWF; VH 206)  
 See First Term.
- 5243. LINEAR ALGEBRA WITH APPLICATIONS.** (4 cr, §5283, §5284; limited enrollment; prereq 5242; II MTWThF, III MW; Arch 20)  
 See 5242 First Term.
- 5458. METHODS OF APPLIED MATHEMATICS.** (4 cr; limited enrollment, reserved in LindH 105; prereq 5457, or 3211 and 3221, or equiv; III TTh, IV MTWThF; KolH S134)  
 See 5457 First Term.
- 5602. ADVANCED CALCULUS.** (4 cr; limited enrollment; prereq 5601; III TTh, IV MTWThF; Arch 20)  
 Line and surface integrals; Stokes' theorem; convergence of infinite series; orthogonal functions; uniform convergence; integration and differentiation of series.

- 5879. PROBABILITY.** (4 cr, §5681; limited enrollment; prereq 3211 or 3411 or 3521; II MTWThF, III MW; VH 113) Elementary principles of probability, total and compound probability, expectation, repeated trials. Other possible topics: Stirling's formula, the probability integral, geometrical probability, probability of causes, Bayes' theorem, errors of observation, principle of least squares.

## SCHOOL OF PHYSICS AND ASTRONOMY

### Astronomy (Ast)

Ast 1008 and 1009 will be offered for the last time during the first 5-week summer term of 1977. Beginning in the summer of 1978, Ast 1011 (4 cr) and 1015 (a1-cr lab) will be offered as 10-week courses that cover the same content as during the academic year. Together 1011 and 1015 satisfy the CLA laboratory science requirement.

#### FIRST TERM

- 1008. SOLAR SYSTEM.** (3 cr, §1011; \$4 lab fee; II MTWThF and 1 clear evening per wk for observations with telescope; Ph 166) Kaufmanis  
The properties and motions of planets and their satellites, comets, and meteors; description of the universe. Nonmathematical course.
- 1009. STARS AND GALAXIES.** (3 cr, §1011; §1008 permitted; \$4 lab fee; III MTWTh and 2 clear evenings per wk for observation; Ph 166) Kaufmanis  
Constellations, properties and motions of stars, and the structure of the sidereal universe. Nonmathematical course.

### Physics (Phys)

Courses with limited enrollment must be reserved in 105 Lind Hall by IT students and in 12 Johnston Hall by others (see instructions under "Reserved Courses").

#### FIRST TERM

- 1031. GENERAL PHYSICS.** (5 cr; limited to 96 students; primarily for students interested in technical topics; prereq high school algebra and plane geometry; \$4 lab fee; I MTWThF, II MWF and two 2-hr labs per wk ar; Ph 170)  
Demonstration lectures, problem sessions, and laboratory exercises. Applications of physics. Mechanics, random processes, gases and fluids, electrical circuits, feedback and control, waves, light, optical instruments, atoms and spectra, nuclei, and radioactivity.

#### FIRST AND SECOND TERMS: TEN-WEEK COURSES

- 1271. GENERAL PHYSICS.** (4 cr; prereq Math 1221 or §Math 1221 or Math 1321 or §Math 1321 or Math 1621 or §Math 1621; may be taken with or without lab 1275; I MTWThF; Ph 166)  
Mechanics.
- 1275. PHYSICS LABORATORY.** (1 cr; S-N only; limited to 64 students; prereq 1271 or §1271; \$4 lab fee; 2 lab hrs per wk ar)  
Laboratory exercises in mechanics.
- 1281. GENERAL PHYSICS.** (4 cr; prereq 1271, Math 1231 or §Math 1231 or Math 1331 or §Math 1331 or Math 1621 or §Math 1621; may be taken with or without lab 1285; III MTWThF; Ph 170)  
Heat and electricity.
- 1285. PHYSICS LABORATORY.** (1 cr; S-N only; limited to 48 students; prereq 1281 or §1281; \$4 lab fee; 2 lab hrs per wk ar)  
Laboratory exercises in heat and electricity.
- 1291. GENERAL PHYSICS.** (4 cr; prereq 1281; may be taken with or without lab 1295; III MTWThF; Ph 133)  
Magnetism and optics.
- 1295. PHYSICS LABORATORY.** (1 cr; S-N only; limited to 64 students; prereq 1291 or §1291; \$4 lab fee; 2 lab hrs per wk ar)  
Laboratory exercises in magnetism and optics.

#### SECOND TERM

- 1032. GENERAL PHYSICS.** (5 cr; limited to 96 students; primarily for students interested in topics useful in various technical areas; prereq 1031; \$4 lab fee; I MTWThF, II MWF and two 2-hr labs per wk ar; Ph 170)

See 1031 First Term.

## University College

University College offers four nontraditional degree programs and two nondegree programs designed to promote flexible learning experiences.

The oldest of the degree programs is the Inter-College Program. It has no fixed curriculum and draws upon the entire University for its courses. Its purpose is to provide flexibility in the educational program of the undergraduate who finds none of the standard curricula of the other schools and colleges of the University suited to his or her particular interests or objectives. The student may arrange a study program including suitable amounts of work in two or more schools or colleges. Upon completing this approved program, the student is granted either a B.A. or a B.S. degree. An applicant for admission should be at least a third-quarter sophomore who has completed at least 1 full quarter, or its equivalent, at the University of Minnesota.

The other three degree programs are experimental in nature. The Foreign Studies Program (room 301, 1507 University Avenue S.E.) assists students in integrating a period of foreign study during the course of completing a University of Minnesota degree. Students may choose a currently existing major or may design an intercollege degree.

University Without Walls (201 Westbrook) serves students who have met barriers in participation in traditional undergraduate programs. The UWW staff assists students in defining educational goals and in locating University and other appropriate resources for reaching those goals.

The University Scholars Program (105 Walter Library) allows a student and faculty adviser the freedom to construct a baccalaureate degree program based on individually tailored educational goals and learning experiences. To be eligible, a student should have completed 2 years of college work and must be nominated by a faculty sponsor who agrees to serve as the student's adviser in the program, supervising and assessing the student's work.

The two nondegree programs sponsored by University College are an independent study program and the Students' College in Duluth.

University College makes available to students regularly enrolled in any undergraduate college of the University an opportunity for independent study when intercollegiate in nature. A student may earn from 3 to 15 degree credits registering for independent study projects under UC 3075. The student designs his or her own project and works with an appropriate faculty member who supervises and evaluates the project.

The Students' College on the Duluth campus gives students the opportunity to create, implement, and manage human services programs on the UMD campus and in the city of Duluth.

University College also sponsors a variety of pilot experimental programs and cross-college course work. Information on any of the above programs, or current pilot programs, may be obtained at 105 Walter Library.

## University College (UC)

### FIRST TERM

- 5501. SCIENCE AND THE HUMANITIES.** (3 cr; I MTWThF; Ph 133) Penn  
Issues raised by the relation between the "scientific" and "humanistic" sectors.
- 5504. RACE AND CULTURE: A CONCEPTUAL SURVEY.** (3 cr; III MTWThF; Ph 210) Penn  
Major patterns in the development of the "race" issue.



# College of Veterinary Medicine

*(All classes scheduled by arrangement)*

## College of Veterinary Medicine (CVM)

### FIRST TERM

**5760. CLINICS.** (6 cr; prereq sr vet med major, 5751; I-IX MTWThF; VetH) Staff  
Medical, obstetrical, radiological, surgical, and laboratory examination of diseases of animals.

### SECOND TERM

**5761. CLINICS.** (6 cr; prereq sr vet med major, 5751; I-IX MTWThF; VetH) Staff  
See 5760 First Term.

## Large Animal Clinical Sciences (LACS)

### FIRST TERM

**5276. POISONOUS PLANTS.** (1 cr; prereq regis vet med, 4th yr or grad student or #) Stowe  
Important plants poisonous to animals; identification, toxicology, diagnosis, and treatment.

**5562. INFERTILITY CLINICS.** (Cr ar; prereq 5560, 5570 or #) Staff  
Investigation of hospital cases and field problems of infertility in domestic animals. Includes clinical examination, discussion of diagnosis, prognosis, and therapy. Assignment of special study of certain reproductive disorders.

**5670. COMPARATIVE MEDICINE AND PUBLIC HEALTH.** (2 cr; prereq #) Anderson, Diesch, Robinson  
Human relationship to the biologic environment, interrelationship of animal and human health, occurrence of animal diseases, ecology of zoonoses, food production and hygiene, laboratory animal medicine.

**5680. PROBLEMS IN VETERINARY EPIDEMIOLOGY AND PUBLIC HEALTH.** (Cr ar; prereq 5650 or equiv or #)  
Anderson, Diesch, Robinson, Pullen  
Individual study arranged with faculty member.

**8291.\* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (Cr ar; prereq 5503, 5172)  
Sorensen, E Mather, Larson, Usenik, Diesch, staff  
Detailed examination, discussion, treatment, and prevention of animal disease problems.

**8590. ADVANCED DIAGNOSTIC METHODS IN REPRODUCTIVE DISEASES.** (Cr ar; prereq 5570 or #) Staff  
Detailed discussion and laboratory practices of methods for determination of fertility status of female and male animals.

**8594. SPECIAL PROBLEMS IN ANIMAL REPRODUCTION.** (Cr ar; prereq 5570 or #) Staff  
Detailed discussion and laboratory study of specific reproductive disorders.

### SECOND TERM

**5276. POISONOUS PLANTS.** (1 cr; prereq regis vet med, 4th yr or grad student or #) Stowe  
See First Term.



- 5562. INFERTILITY CLINICS.** (Cr ar; prereq 5560, 5570 or #)  
See First Term.
- 5670. COMPARATIVE MEDICINE AND PUBLIC HEALTH.** (2 cr; prereq #) Anderson, Diesch, Robinson  
See First Term.
- 5680. PROBLEMS IN VETERINARY EPIDEMIOLOGY AND PUBLIC HEALTH.** (Cr ar; prereq 5650 or equiv or #)  
Anderson, Diesch, Robinson, Pullen  
See First Term.
- 8291.\* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (Cr ar; prereq 5503, 5172)  
Sorensen, E Mather, Larson, Usenik, Diesch, staff  
See First Term.
- 8590. ADVANCED DIAGNOSTIC METHODS IN REPRODUCTIVE DISEASES.** (Cr ar; prereq 5570 or #)  
See First Term.
- 8594. SPECIAL PROBLEMS IN ANIMAL REPRODUCTION.** (Cr ar; prereq 5570 or #)  
See First Term.

## Small Animal Clinical Sciences (SACS)

### FIRST TERM

- 8291.\* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (Cr ar; prereq 5503, 5172)  
Sorensen, E Mather, Larson, Usenik, Diesch, staff  
Detailed examination, discussion, treatment, and prevention of animal disease problems.
- 8391. ADVANCED SMALL ANIMAL SURGERY.** (Cr ar; prereq 5350 or equiv, #) Brasmer, Wallace, Braden  
Surgery of the various systems in small animals with preoperative and postoperative evaluation and treatment.
- 8490. ADVANCED VETERINARY RADIOLOGY.** (Cr ar) prereq 5450 or equiv, #) Lord, Jessen, Hanlon  
Lecture and laboratory. Radiological diagnostic procedures and interpretation as applied to veterinary medicine.

### SECOND TERM

- 8291.\* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (Cr ar; prereq 5503, 5172)  
Sorensen, E Mather, Larson, Usenik, Diesch, staff  
See First Term.
- 8391. ADVANCED SMALL ANIMAL SURGERY.** (Cr ar; prereq 5350 or equiv, #) Brasmer, Wallace, Braden  
See First Term.
- 8490. ADVANCED VETERINARY RADIOLOGY.** (Cr ar; prereq 5450 or equiv, #) Lord, Jessen, Hanlon  
See First Term.

## Veterinary Biology (VB)

### FIRST TERM

- 5149.\* TOPICS OF ORGANOLGY.** (1-5 cr [may be repeated for cr]; prereq 8110 or equiv, #) Staff  
Lecture and laboratory presentation of selected organ systems of domestic and laboratory animals.
- 5920. INDEPENDENT RESEARCH IN VETERINARY BIOLOGY.** (Cr ar; prereq #) Staff  
Individual research under supervision of a faculty member.
- 8112, 8113, 8114. RESEARCH PROPOSITIONS IN MORPHOLOGY.** (2 cr per qtr; prereq #) Staff  
Each student defines an unsolved morphologic problem, hypothesizes a solution, and proposes an experimental approach to test the hypothesis. Written and oral presentation of proposition are evaluated by departmental graduate faculty.
- 8134, 8135. COMPARATIVE VETERINARY NEUROLOGY.** (4 cr per qtr; prereq 5100, #) Fletcher  
Correlated studies of the central nervous system of domestic animals. Emphasis on relating neuroanatomy to neurophysiology.
- 8136. EXPERIMENTAL COMPARATIVE VETERINARY NEUROLOGY.** (3 cr; prereq 8135, #) Fletcher  
Principles, methods, and laboratory exercises in investigating the central nervous system of domestic animals.

- 8349. RESEARCH IN PHYSIOLOGY.** (Cr ar, §AnSc 8830; prereq #) Staff  
Individual research under faculty direction. Topics to be determined by consultation; may be a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser.
- 8448. PROBLEMS IN VETERINARY PHARMACOLOGY.** (Cr ar; prereq 5401 or equiv, #) Staff

## SECOND TERM

- 5149.\* TOPICS OF ORGANOLGY.** (1-5 cr [may be repeated for cr]; prereq 8110 or equiv, #) Staff  
See First Term.
- 5920. INDEPENDENT RESEARCH IN VETERINARY BIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.
- 8112, 8113, 8114. RESEARCH PROPOSITIONS IN MORPHOLOGY.** (2 cr per qtr; prereq #) Staff  
See First Term.
- 8134, 8135. COMPARATIVE VETERINARY NEUROLOGY.** (4 cr per qtr; prereq 5100, #) Fletcher  
See First Term.
- 8136. EXPERIMENTAL COMPARATIVE VETERINARY NEUROLOGY.** (3 cr; prereq 8135, #) Fletcher  
See First Term.
- 8349. RESEARCH IN PHYSIOLOGY.** (Cr ar, §AnSc 8830; prereq #) Staff  
See First Term.
- 8448. PROBLEMS IN VETERINARY PHARMACOLOGY.** (Cr ar; prereq 5401 or equiv, #) Staff

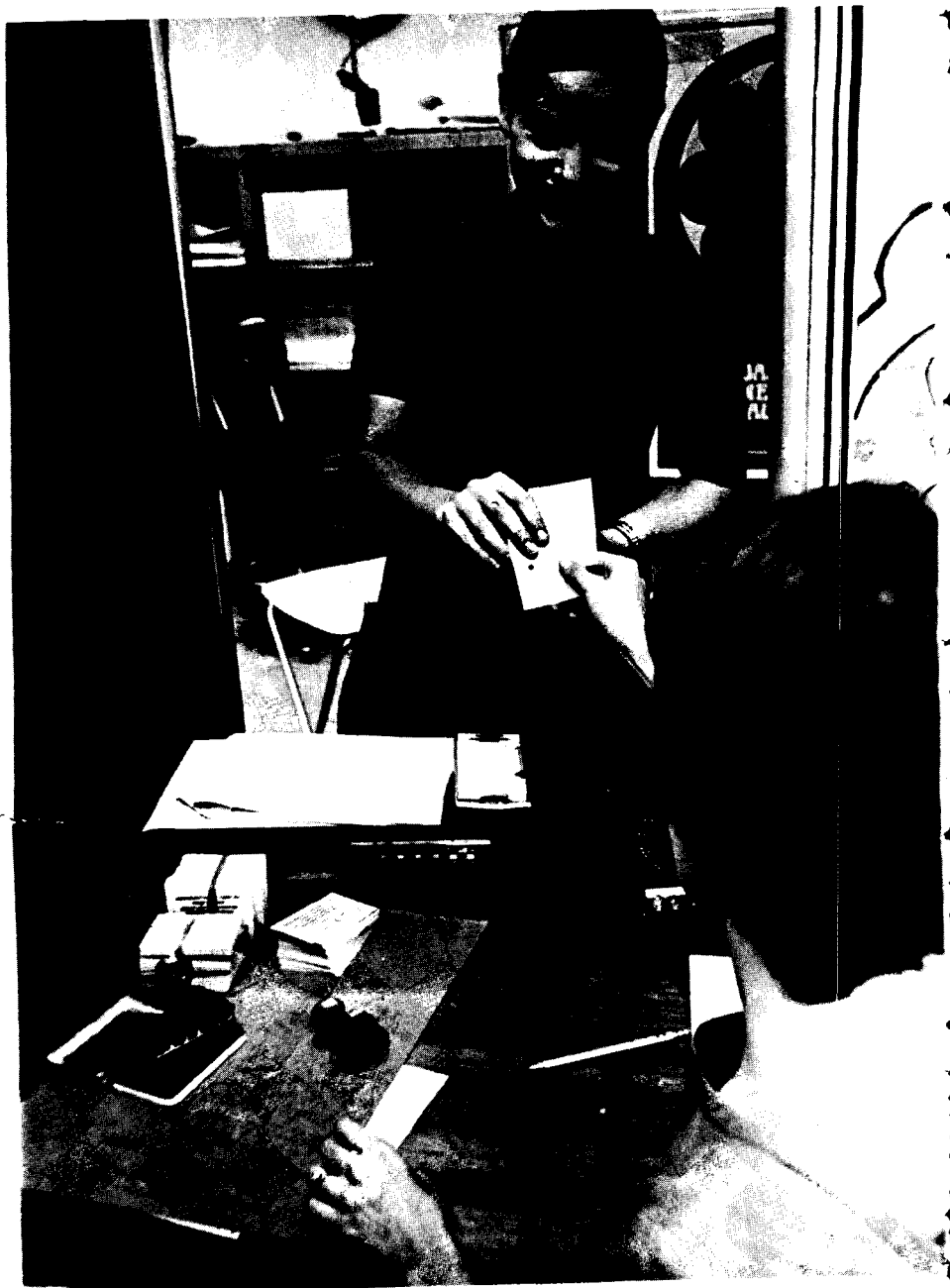
# Veterinary Pathobiology (VPB)

## FIRST TERM

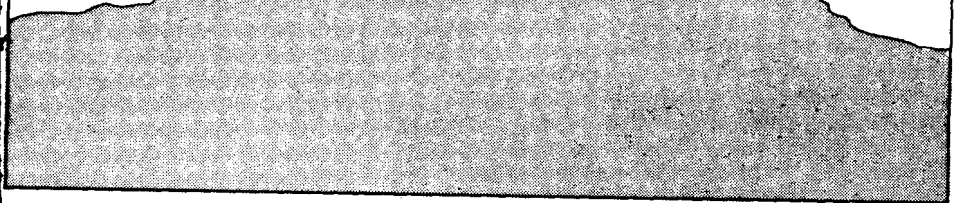
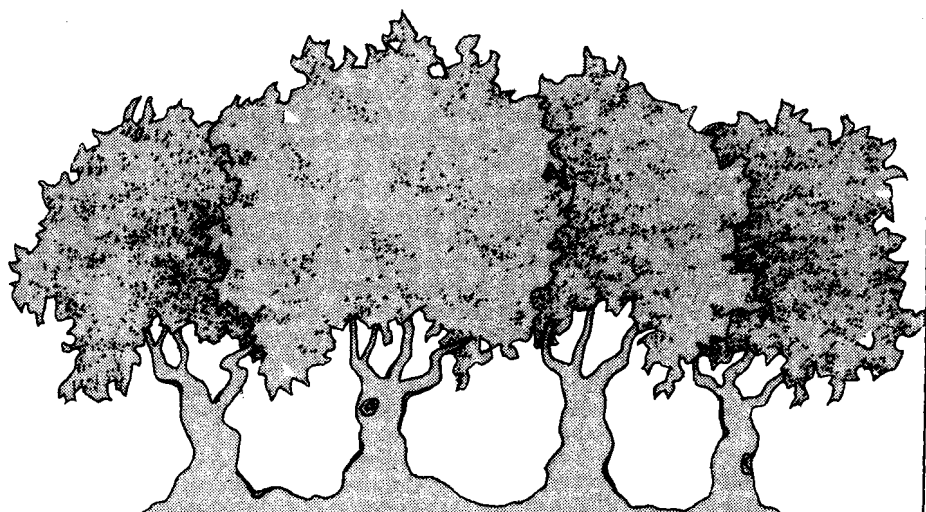
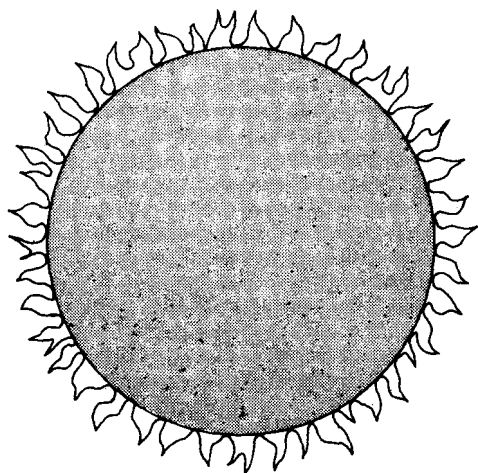
- 5748. PROBLEMS IN VETERINARY MICROBIOLOGY AND PUBLIC HEALTH.** (Cr ar; prereq 5703 or equiv, #)  
Staff
- 8530. ONCOLOGY.** (4 cr; prereq #) Kurtz
- 8531. VETERINARY NECROPSIES.** (1-5 cr; prereq 5503 or equiv) Staff  
Necropsy techniques, examination of tissue sections, and preparation of records.
- 8533. PROBLEMS: PATHOLOGY.** (Cr ar; prereq #) Johnson, staff
- 8534. PROBLEMS: CLINICAL PATHOLOGY.** (Cr ar; prereq #) Perman, Stevens
- 8648. PROBLEMS IN VETERINARY PARASITOLOGY.** (Cr ar; prereq 5602 or equiv, #) Griffiths
- 8720. ADVANCED VETERINARY MICROBIOLOGY.** (Cr ar; prereq #) Staff  
Special topics, techniques, collateral reading, and conferences.
- 8721. ADVANCED POULTRY DISEASES.** (Cr ar; prereq 5704, #) Pomeroy, staff  
Investigation of infectious disease problems of poultry.
- 8725. CELL CULTURE TECHNIQUES.** (2 cr; prereq 5703 or equiv, #) Shope  
Laboratory exercises and discussions on culture of vertebrate cells; proper preparation of all materials necessary for handling cell cultures; establishment of primary cell cultures by various techniques and maintenance of cells as monolayers or in suspension. Animal viruses used for plaque assays, neutralization tests, limited fluorescent antibody techniques and microtitration. Laboratory work in student's specific area of interest.

## SECOND TERM

- 5748. PROBLEMS IN VETERINARY MICROBIOLOGY AND PUBLIC HEALTH.** (Cr ar; prereq 5703 or equiv, #)  
Staff
- 8531. VETERINARY NECROPSIES.** (1-5 cr; prereq 5503 or equiv) Staff  
See First Term.
- 8533. PROBLEMS: PATHOLOGY.** (Cr ar; prereq #) Johnson, staff
- 8534. PROBLEMS: CLINICAL PATHOLOGY.** (Cr ar; prereq #) Perman, Stevens
- 8648. PROBLEMS IN VETERINARY PARASITOLOGY.** (Cr ar; prereq 5602 or equiv, #) Griffiths
- 8720. ADVANCED VETERINARY MICROBIOLOGY.** (Cr ar; prereq #) Staff  
See First Term.
- 8721. ADVANCED POULTRY DISEASES.** (Cr ar; prereq 5704, #) Pomeroy, staff  
See First Term.



*Duluth  
and  
Morris*



# University of Minnesota, Duluth

The Duluth campus is an exciting location for summer study. Situated on a 244-acre site overlooking Lake Superior, the campus enjoys pleasant summer temperatures, allowing the student to study and relax in comfort.

UMD, located near the center of Duluth, is but a short drive from parks, golf courses, swimming beaches, the famous Skyline Drive, Duluth's new Arena-Auditorium, the Lake Superior Marine Museum, the St. Louis County Heritage and Arts Center, Duluth International Harbor, and Spirit Mountain.

The many lakes in the deeply forested Arrowhead region and the North Shore and Circle Route drives are popular for overnight or weekend camping and fishing trips.

The UMD summer session social calendar is planned to fit the recreational needs of both the individual student and entire family. Bridge and golf lessons, family swimming, concerts, lectures, theatrical productions, group discussions, dances, harbor and historical tours, films, a steak cookout, sailing on Lake Superior, and a wilderness canoe trip are a few of the regularly sponsored activities.

More than 300 courses are scheduled for the summer terms at the undergraduate and graduate levels. Students may earn credits for 72 majors to apply toward the degrees of associate in arts, associate in vocational teacher education, associate in science in dental hygiene, bachelor of arts, bachelor of science, bachelor of applied arts, bachelor of applied science, bachelor of accounting, bachelor of business administration, bachelor of music, bachelor of fine arts, or bachelor of social development, and for 17 areas of concentration for the master of arts, master of science, master of business administration, master of industrial safety, master of social work, and master of education degrees, and the specialist certificate in educational administration.

A separate Summer Session bulletin, including all courses offered on the Duluth campus, is available. For a copy of this bulletin and for more detailed information, write: UMD Summer Session, 305 Administration Building, University of Minnesota, Duluth, Minnesota 55812.

## GRADUATE PROGRAM

The Graduate School on the Duluth campus offers a master of arts degree with majors in art, education (elementary-secondary), education (emphasis art), education (emphasis music), educational administration, educational psychology (counseling), English, history, and communicative disorders. These studies provide advanced work for individuals now in teaching or for those interested in progressing toward a general degree in the discipline. Students may complete all course work at Duluth.

Master of science degree programs are offered in biology, botany, chemistry (analytical, inorganic, organic, physical, or biochemistry), geology, physics, and zoology. These programs are designed for secondary and college teachers and for those planning additional graduate study or careers in these fields. The specialist certificate in educational administration may be obtained with emphasis in either elementary, secondary, or general school administration. Also offered are a master of social work program with emphasis on social development and a master of business administration program.

The graduate program is under the jurisdiction of the dean of the Graduate School and is similar to parallel programs on the Twin Cities campus. A complete description of graduate requirements and courses is available in the current *University of Minnesota, Duluth, General Bulletin*, which may be obtained by writing to the UMD News Service, 301 Administration Building, University of Minnesota, Duluth, Minnesota 55812.

Students who have not already applied for admission to the Graduate School and who contemplate a program of graduate studies at Duluth may request information and application forms from the Graduate School Office, 431 Administration Building, University of Minnesota, Duluth, Minnesota 55812. Information concerning selection of courses and other degree requirements can also be obtained from the Graduate School assistant dean.

Applications for summer 1977 admission must be submitted *complete in every detail*—two official transcripts from each college attended and the credentials examination fee and test results, if required—by May 16 for first term and June 15 for second term. Students who wish to become a candidate for the master's degree or who wish to receive graduate credit for their course work must make application for admission to the Graduate School (see section on Graduate School).

Students previously admitted to the Graduate School who have not registered within the last 2 years in the Graduate School must apply for readmission. Students who have completed a degree program must apply for readmission to the Graduate School. Individuals enrolled in a graduate program at another university may be granted transient graduate student standing, but an application for that status must be in the Graduate School office prior to the beginning of class. Forms may be obtained from the Graduate School office.

Students in graduate-level courses or workshops in Continuing Education and Extension must meet Graduate School or transient graduate student status requirements before the Graduate School will recognize their participation.

### **Master's Degree in Art**

A graduate major emphasizing studio work is offered leading to the master of arts degree in art. The program is designed to accommodate individuals interested in either the teaching or practice of art. Both art history and art education are available as related fields. Inquiries concerning the specific program should be directed to: Department of Art, University of Minnesota, Duluth, Minnesota 55812.

### **Master's Degree in Chemistry**

Programs in chemistry are offered under both Plan A and Plan B. For Plan A, thesis research is available in analytical, inorganic, organic, or physical chemistry or

in biochemistry. For Plan B, 44 credits in approved courses and three papers in the major or related fields are required.

The programs are suited for students who wish to go on for further study elsewhere, for those who plan to make a career of teaching chemistry in liberal arts colleges, junior colleges, and state colleges, and for those who desire advanced training for a career in industry. Summer work on the Duluth campus will involve the research phase of the M.S. degree.

### **Master's Degree in Communicative Disorders**

A graduate major under Plan B is offered leading to the master of arts degree in communicative disorders. Summer session offerings are designed to integrate academic, research, and clinical endeavors. Correspondence may be addressed to the Department of Communicative Disorders, University of Minnesota, Duluth, Minnesota 55812.

### **Master's Degree in Education**

The M.A. program in education, open to elementary and secondary teachers, permits students to major in the following areas: Education (Educ), Education (Art Education, ArEd), Education (Music Education, MuEd), Elementary Education (EIEd), and Secondary Education (SeEd).

The work in related fields may include areas such as Educational Administration (EdAd), Psychological Foundations (PsyF), Psychological Applications (PsyA), Special Education (SpEd), Physical Education (PE), Industrial Education (Ind), Health Education (Hlth), Home Economics Education (HEEd), as well as courses in other subjects that are ordinarily taught in the schools.

Inquiries should be addressed to: Director of Graduate Study in Education, Department of Elementary Education, or Director of Graduate Study, Department of Secondary Education, University of Minnesota, Duluth, Minnesota 55812.

### **Master's Degree in Educational Administration**

A master of arts degree with a major in educational administration is available to students interested in this area. A wide variety of courses is offered during the summer. Inquiries should be addressed to: Director of Graduate Study in Educational Administration, College of Education, University of Minnesota, Duluth, Minnesota 55812.

### **Specialist Program in Educational Administration**

Advanced graduate programs leading to the specialist certificate in school administration have been developed for elementary and secondary school principals and superintendents. Several courses, workshops, and seminars are offered this summer. An announcement describing these programs will be sent upon request to: Director of Graduate Study in Educational Administration, College of Education, University of Minnesota, Duluth, Minnesota 55812.

## **Master's Degree in Educational Psychology**

A master's degree program in guidance and counseling is available on the Duluth campus. Courses in psychological foundations and psychological applications as well as other required related courses are offered during both summer terms.

Certain courses in this program have limited enrollments or require special arrangements. Therefore, students interested should make every effort to consult with their adviser prior to or during registration. In addition, course descriptions and prerequisites should be studied carefully. Correspondence should be addressed to: Director of Graduate Study in Educational Psychology, University of Minnesota, Duluth, Minnesota 55812.

## **Master's Degree in English**

Two programs lead to a master of arts degree in English. One offers a broad study of literature, and the second emphasizes preparation for teaching, particularly in the 2-year college. The master's program is suitable for secondary school English teachers and for students preparing for doctoral studies. Courses carrying graduate credit are offered during all academic quarters and during both summer terms. Courses not scheduled in the *UMD Summer Session Bulletin* are often available through independent study. Requirements for the degree can be completed in 5 or 6 regular terms or in 3 or 4 summers. Inquiries concerning the details of the program should be directed to: Department of English, University of Minnesota, Duluth, Minnesota 55812.

## **Master's Degree in Geology**

The M.S. degree in geology is offered under Plan A and Plan B. These programs are designed for those wishing to prepare for professional employment, for further graduate study leading to the Ph.D. degree, or for teaching geology at the college or junior college level. Although no graduate-level courses for the master's degree program, other than graduate research, are offered in this field during the summer session, students interested in beginning their course work in the fall are reminded that the application deadline is August 15. Details concerning prerequisites for the M.S. degree in geology may be obtained from: Director of Graduate Study, Geology Department, University of Minnesota, Duluth, Minnesota 55812.

## **Master's Degree in History**

The master's degree in history is awarded upon fulfillment of either of two alternative programs—Plan A (with thesis) or Plan B (without thesis). The programs are designed for students who are preparing for doctoral study, for those who plan to make a career of teaching history in secondary schools and junior colleges, and for those who plan to enter public service.

Requirements may be completed (by the full-time student) in 1 academic year or in equivalent summer work. Inquiries should be addressed to: Director of Graduate Study, Department of History, University of Minnesota, Duluth, Minnesota 55812.



## **Master's Degree in Physics**

The M.S. in physics is a Plan A program that requires a research thesis. Current departmental research interests include atmospheric physics, atomic and molecular physics, Lake Superior water research, solid-state physics, and theoretical particle physics. Summer work on the Duluth campus involves the research phase of degree work.

## **SOCIAL DEVELOPMENT PROGRAM**

The School of Social Development offers programs designed to prepare students for careers in regional and national social development. Programs concentrate on institutional change planned to bring about a better correspondence between human needs and social policies and programs. Emphasis is placed on community organization; social policy formulation and analysis; social program administration, coordination, and evaluation; and regional planning. A master of social work (M.S.W.) degree program, normally requiring 6 quarters, commences in September and January of each year. Students with appropriate qualifications may be admitted to the 4-quarter advanced standing program, which also begins in September. Specific information may be obtained from: School of Social Development, University of Minnesota, Duluth, Minnesota 55812.

## **MASTER OF EDUCATION DEGREE**

This professional graduate degree program is designed specifically to meet the needs of classroom teachers. It is performance oriented; each student's program is tailored to his or her specific goals, and research and development on the job is emphasized. Programs can combine almost any mix of work in specific disciplines, learning, curriculum, educational technology, and similar areas. For more information, write to: Director, Master of Education Degree Program, University of Minnesota, Duluth, Minnesota 55812.

## **MASTER OF INDUSTRIAL SAFETY DEGREE PROGRAM**

The master of industrial safety degree program is designed to prepare qualified personnel for safety supervisory and management positions in business, government, and industry. Candidates must complete a program of 45 quarter credits at the graduate level and must maintain an overall graduate grade point average of 3.00 or better. The minimum residence requirement for the degree is 3 academic quarters or its equivalent in summer terms. In addition, an industrial internship or field research project is required. For more information write to: Office of Admissions, 104 Administration Building, University of Minnesota, Duluth, Minnesota 55812.

## **MEDICAL SCHOOL SUMMER COURSES**

The Duluth School of Medicine, established in 1969, was designed to offer 2-year basic sciences medical curriculum. The program is oriented toward broadly based training of general or family practice physicians.

A number of Medical School summer courses are open to nonmedical students.

## **SIXTH-YEAR CERTIFICATION PROGRAM IN EDUCATIONAL ADMINISTRATION**

A "sixth year" program in educational administration, leading to certification of elementary school principals, secondary school principals, and school superintendents, is available. This program is not a Graduate School program and does not lead to a graduate degree, but does provide training for certification by the state of Minnesota. The program is administered through the College of Education at UMD. Inquiries should be addressed to: Director, Sixth-Year Certification Program in Educational Administration, College of Education, University of Minnesota, Duluth, Minnesota 55812.

## **SPECIAL EDUCATION**

**Learning Disabilities (SLBP)**—A program leading to endorsement as a certified SLBP teacher is conducted on the Duluth campus. The program consists of course work and practicums conducted during the academic year only. Elective courses are available during the summer. Enrollment in certain courses is limited. Students must obtain formal admission to the program prior to enrollment for course work. Due to anticipated heavy demands, prospective applicants should communicate their interest as early as possible. For information, write to: Special Education Programs, Department of Psychology, University of Minnesota, Duluth, Minnesota 55812.

**Mental Retardation (TMR)**—Undergraduate students and experienced teachers may obtain certification as teachers of the trainable mentally retarded by successful completion of an approved program of studies. For information about admission to the program and program requirements, write to: Special Education Programs, Department of Psychology, University of Minnesota, Duluth, Minnesota 55812.

## **SPEECH AND HEARING CLINIC**

Opportunity is provided for observation at the annual clinic for children with speech and hearing disorders, scheduled June 13 to July 16. Supervised clinical experience is available for University credit if the student has the appropriate teaching experience and course background. Interested students may obtain details from the clinic director.

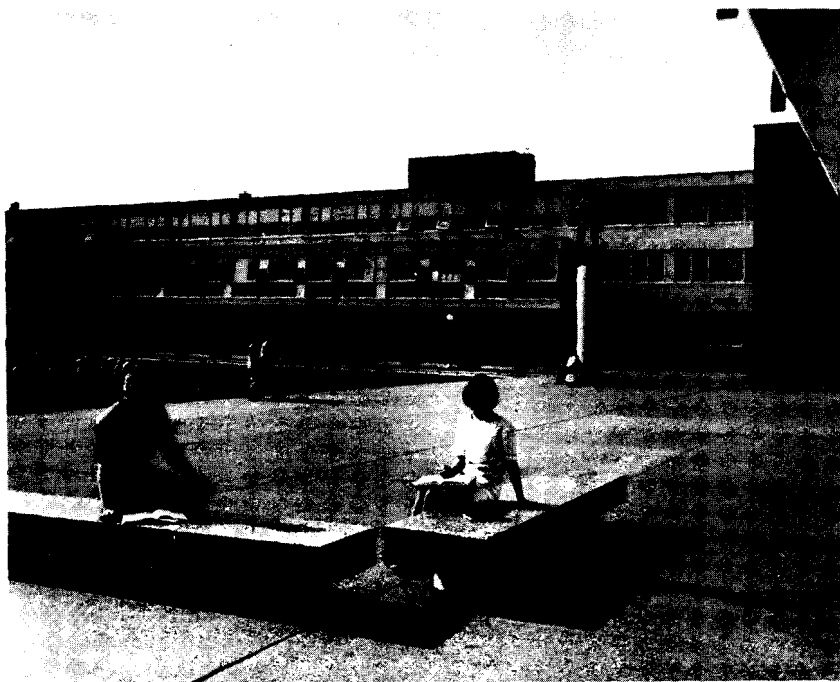
## SUMMER THEATRE

This University Summer Theatre program provides a concentrated experience in all aspects of theatre. Rehearsal, production, and performance activities occupy students 7 days each week of the first summer term. Plays are offered in a regular schedule for the enjoyment of University students, staff, and the community. All productions take place in the new Marshall Performing Arts Center. Ten graduate or undergraduate credit hours in theatre courses are offered through program participation. Small scholarships are available to selected experienced actors and technicians who are expected to provide leadership for the company.

## CONTINUING EDUCATION AND EXTENSION PROGRAMS

A number of noncredit, short-term programs will be offered on the UMD campus through the Duluth Continuing Education and Extension Center during the summer session. For information and a brochure describing the offerings contact: Director of Continuing Education and Extension, 403 Administration Building, University of Minnesota, Duluth, Minnesota 55812.

Accommodations should be secured by participants through the Housing Office at UMD.



# *University of Minnesota, Morris*

The University of Minnesota, Morris, is located in west central Minnesota, near some of the state's finest resort and fishing areas. Morris, a community of 5,300, offers many recreational facilities including tennis courts, a swimming beach, a nine-hole golf course, and a lighted baseball park located in a 25-acre municipal recreation area.

The UMM campus occupies 45 acres on the eastern side of Morris. The cultural and recreational facilities of the community are available to students, and the University also has a variety of recreational facilities and cultural activities geared toward summer students.

The 1977 session schedule includes liberal arts and sciences courses as well as courses designed to meet requirements for the competency-based social science major and the human services major. Students working on general education requirements or on courses to satisfy the most recent state regulations for secondary school social studies certification will find the 1977 UMM summer session of particular interest.

A separate Summer Session bulletin describing UMM summer procedures and course offerings is available from: UMM Summer Session, 226 Community Services Building, University of Minnesota, Morris, Minnesota 56267; telephone (612) 589-2482.

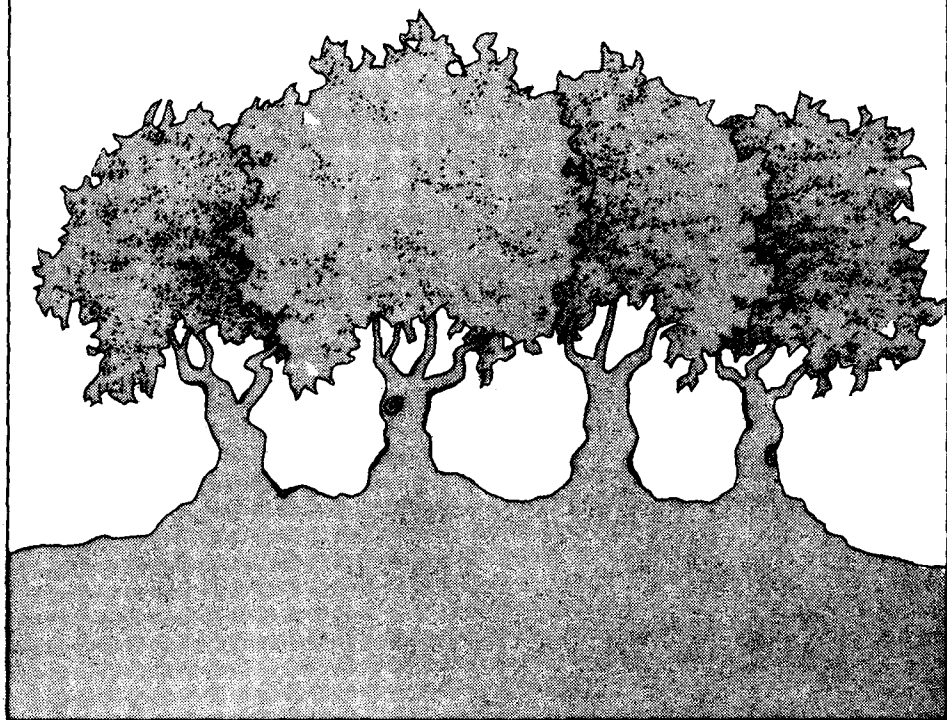
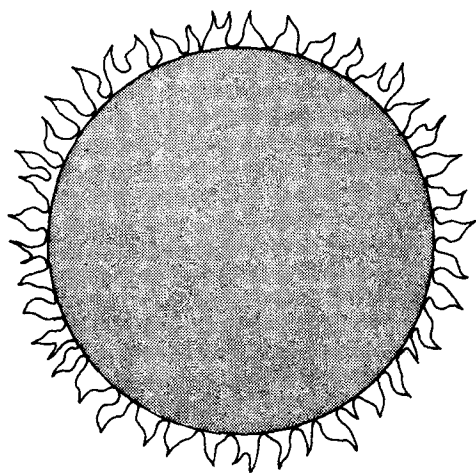
## **LIBERAL ARTS CURRICULUM**

As a 4-year liberal arts college of the University of Minnesota, UMM shares in the instruction, research, and service objectives of the entire University system. Students may pursue one of three degree programs:

1. A 4-year curriculum in liberal education leading to the bachelor of arts degree.
2. A 4-year curriculum that combines liberal education with teacher preparation and leads to the bachelor of arts degree and certification as an elementary or secondary school teacher.
3. A 1-, 2-, 3-, or 4-year curriculum in liberal education that meets the preprofessional liberal arts requirements of the professional schools of the University of Minnesota or of other institutions.



*Maps and  
Building  
Abbreviations*



# BUILDING ABBREVIATIONS

## MINNEAPOLIS

### East Bank

Aero, Aeronautical Engineering Building  
AH, Appleby Hall  
Annex, Music Annex (321½ 14th Ave SE)  
Arch, Architecture Building  
Armory, Armory Building

BFAB, Bierman Field Athletic Building  
Bo, Botany Building  
BoG, Botany Greenhouse  
BoynHS, Boynton Health Service  
Bu, Burton Hall

CD, Child Development Building  
CenH, Centennial Hall  
CH, Cooke Hall  
ChEng, Chemical Engineering Building  
ChRC, Children's Rehabilitation Center  
CMU, Coffman Memorial Union  
ComH, Comstock Hall

DieIH, Diehl Hall

ECDO, Education Career Development Office  
(1425 University Ave SE)  
EconRes, Economics Research Building  
EdH, Eddy Hall  
ElectE, Electrical Engineering Building  
EltH, Elliott Hall  
Ex, Experimental Engineering Building

FieldHse, University Field House  
FolH, Folwell Hall  
Forth, Ford Hall  
FraH, Fraser Hall  
FronH, Frontier Hall

HL, St. Anthony Falls Hydraulic Laboratory  
(Mississippi River at 3rd Ave SE)  
HolB, Holman Building  
HSUnitA, Health Sciences Unit A  
HSUnitK-E, Health Sciences Unit K-E

Jach, Jackson Hall  
JOAd, Jackson-Owre Addition  
JohH, Johnston Hall  
Jones, Jones Hall

KlaCt, Klaeber Court  
Kolth, Kolthoff Hall (Smith Hall Annex)

LindH, Lind Hall (formerly Main Engineering)  
LinL, Linac Laboratory  
LyonL, Lyon Laboratories

MasonH, Masonic Memorial Hospital  
Mayo, Mayo Memorial Building  
MDH, Minnesota Department of Health  
MechE, Mechanical Engineering Building  
MinMet, Mines and Metallurgy Building

MirdH, Millard Hall  
MMA, Mayo Memorial Auditorium  
MNH, Bell Museum of Natural History  
MorH, Morrill Hall  
MRRC, Mineral Resources Research Center  
MUHi, Marshall-University High School  
(1313 5th St. SE)  
MurH, Murphy Hall  
MusEd, Music Education

NCCE, Nolte Center for Continuing Education  
NH, Nicholson Hall  
NMA, Northrop Memorial Auditorium  
NorrisH, Norris Hall (formerly Norris  
Gymnasium for Women)

Owre, Owre Hall

PB, Poucher Building  
PeikG, Peik Hall Gymnasium  
PeikH, Peik Hall  
Ph, Tate Laboratory of Physics  
PiH, Pioneer Hall  
PillsH, Pillsbury Hall  
PoH, Powell Hall  
PolDB, Police Department Building  
Pt, Pattee Hall

RampA, Parking Ramp (Washington Ave at  
Union St)

RampB, Parking Ramp (South of Coffman  
Union)

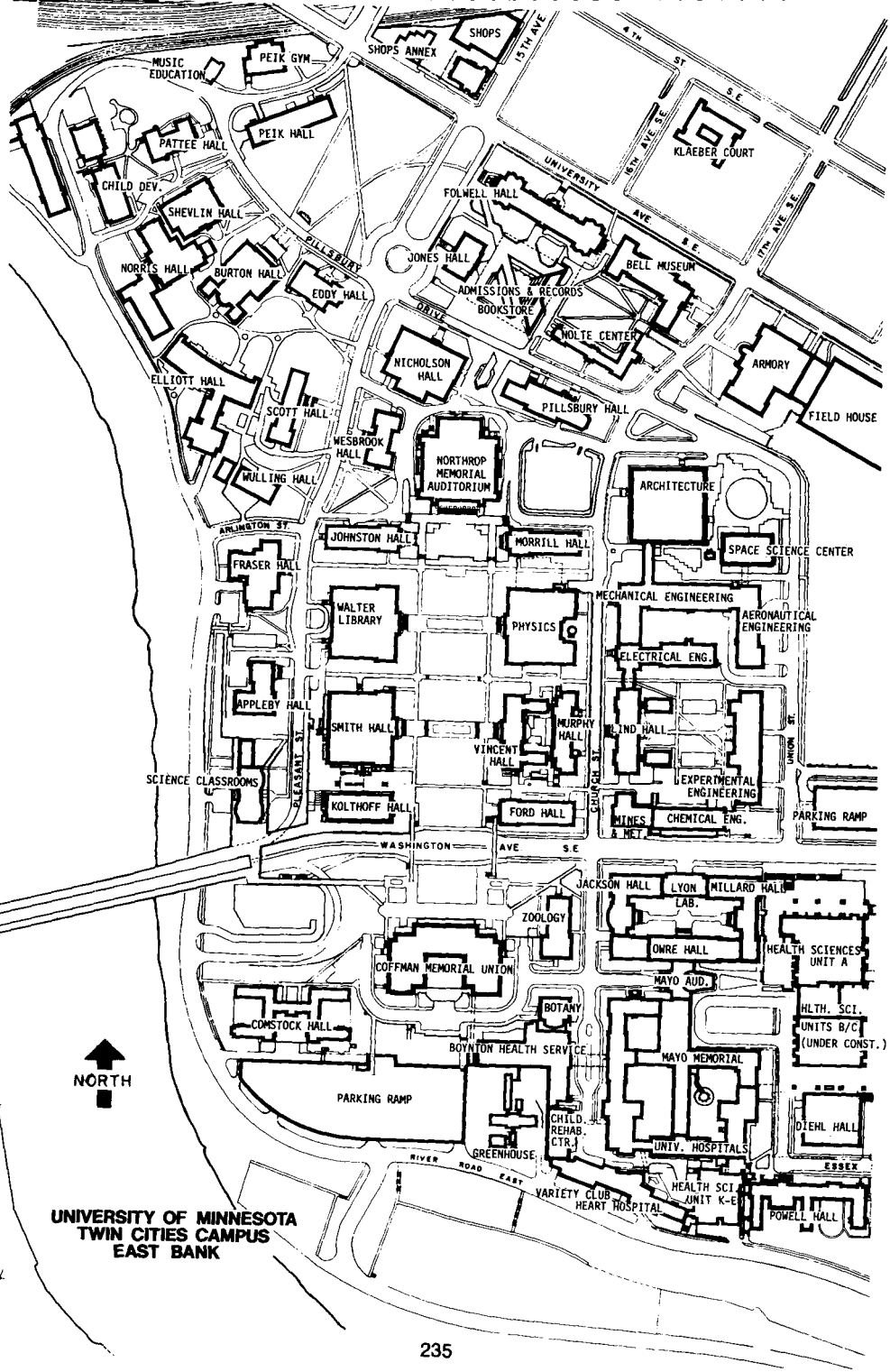
SaH, Sanford Hall  
ScH, Scott Hall  
SciCB, Science Classroom Building  
ShAn, Shops Annex  
ShH, Shevlin Hall  
SmithH, Smith Hall  
SpSci, Space Science Center  
Stad, Stadium

TerH, Territorial Hall  
TNCE, Temporary, North Court of Engineering  
TNM, Temporary, North of Appleby  
(formerly Mines)  
TSCE, Temporary, South Court of Engineering

VCHH, Variety Club Heart Hospital  
VFWCRC, VFW Cancer Research Center  
VH, Vincent Hall

WaLib, Walter Library  
WeH, Westbrook Hall  
WmsA, Williams Arena  
WuH, Wulling Hall

Z, Zoology Building



UNIVERSITY OF MINNESOTA  
TWIN CITIES CAMPUS  
EAST BANK



**West Bank**

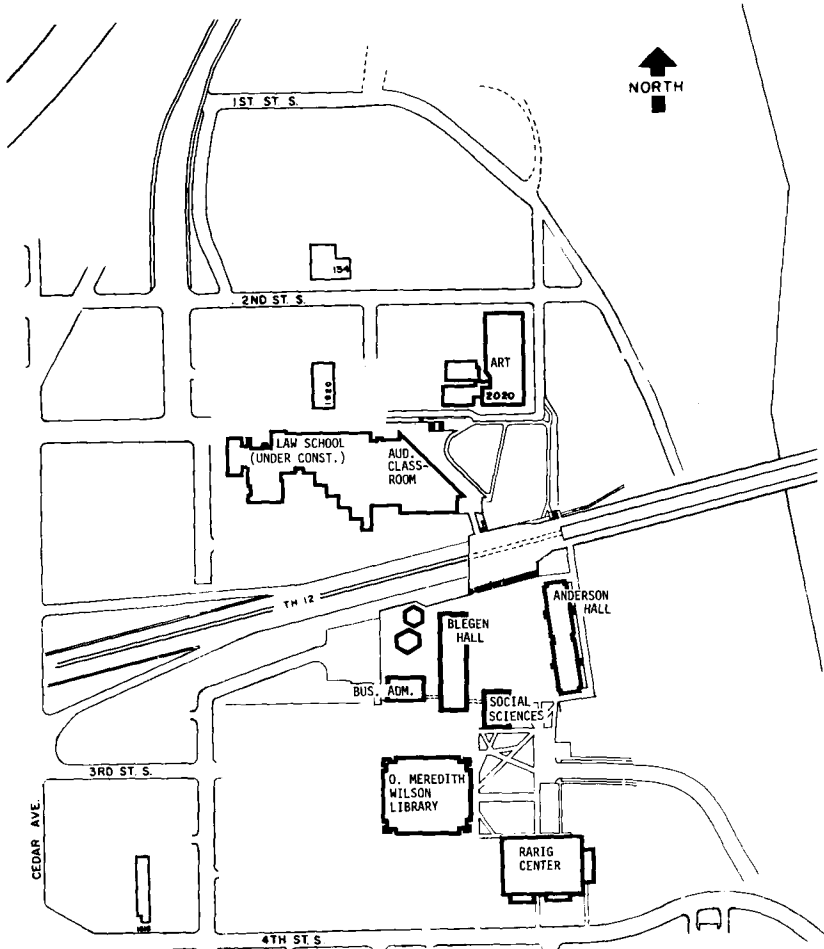
AndH, Anderson Hall  
ArtB, Art Building  
AudCB, Auditorium Classroom Building

MdbH, Middlebrook Hall  
OMWL, O Meredith Wilson Library

BA, Business Administration Building  
BlegH, Blegen Hall

RarigC, Rarig Center

SBkSt, Smith Bookstore  
SocSci, Social Sciences Building



**UNIVERSITY OF MINNESOTA  
TWIN CITIES CAMPUS  
WEST BANK**

## ST. PAUL

AdmServ, Administrative Services Building  
(2610 University Ave)

AgEng, Agricultural Engineering Building  
AgLib, Agriculture Library  
Agr, Agronomy Building  
AgrSH, Agronomy Seed House

BaH, Bailey Hall

BB, Bull Barn

BCB, Beef Cattle Barn

BeH, Berry House (1304 Cleveland Ave N)

BFH, Botany Field House

BioSci, Biological Sciences Center

CI, Crop Improvement Building

CISS, Crop Improvement Seed Stocks Building

ClaOff, Classroom-Office Building

CoffH, Coffey Hall

CrRes, Crops Research Building

DCB, Dairy Cattle Barn

DinC, Dining Center

EntFW, Entomology, Fisheries, and Wildlife  
Building

FCFH, Farm Crops Field House

FP, Forest Products Building

FScN, Food Science and Nutrition

GH, Green Hall

GorL, Gortner Laboratory of Biochemistry

Gym, Gymnasium

HB, Horse Barn

HckrH, Haecker Hall

HortS, Horticultural Sciences Building (new)

HS, Health Service Building

LsPav, Livestock Pavilion

McNH, McNeal Hall

MS, Machinery Shop

NCFor, North Central Forest Experiment  
Station

NorH, North Hall

NWGH, Northwest Greenhouses

PalmC, Palmer Classroom Building

PavAn, Pavilion Annex

PetH, Peters Hall

PG, Poultry Group

PISci, Plant Sciences Building

PM, Post-Mortem

PPFL, Plant Pathology Field Laboratory

RustL, Rust Laboratory (USDA)

SB, Swine Barn

ShB, Sheep Barn

SheepR, Sheep Research

ShH, Snyder Hall

So, Soils Building

StakH, Stakman Hall of Plant Pathology

StCen, Student Center

TH, Thatcher Hall

TSC, Temporary, South of Coffey Hall

VB, Veterinary Barn

VetA, Veterinary Anatomy Building

VetDL, Veterinary Diagnostic Laboratories

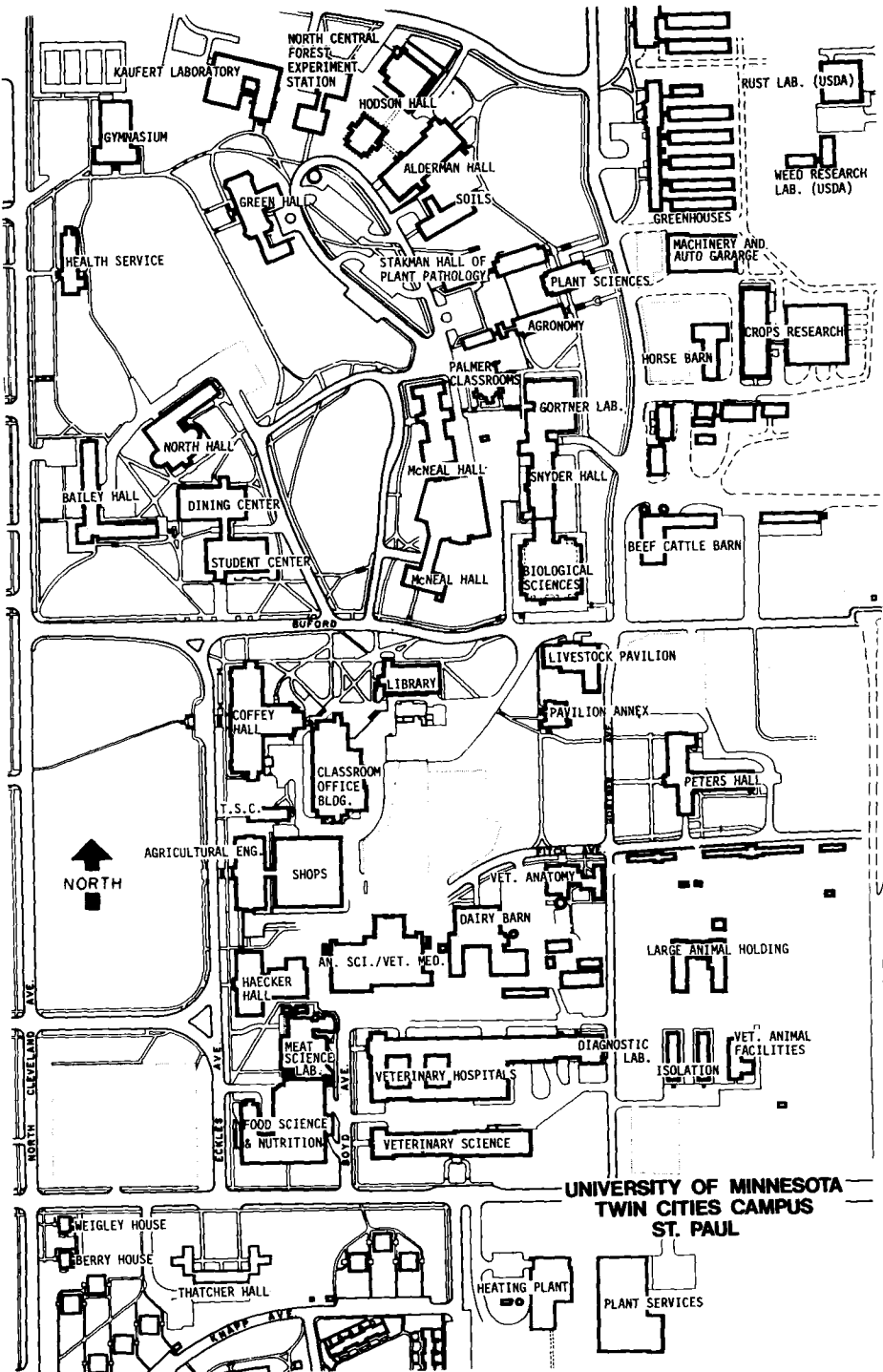
Veth, Veterinary Hospitals

VetIB, Veterinary Isolation Building

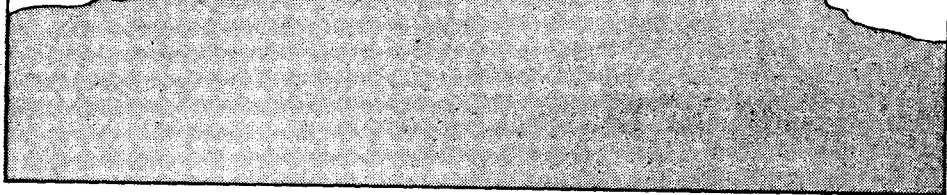
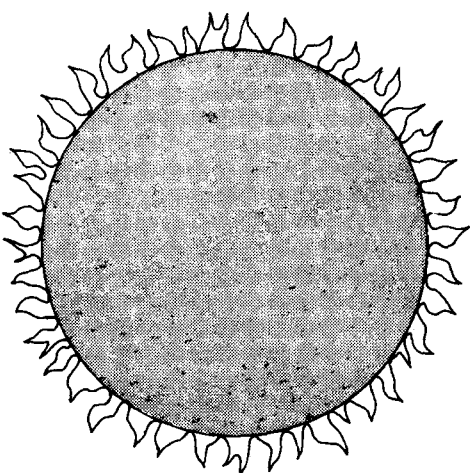
VetS, Veterinary Science Building

WeiH, Weigley House

WRL, Weed Research Laboratory



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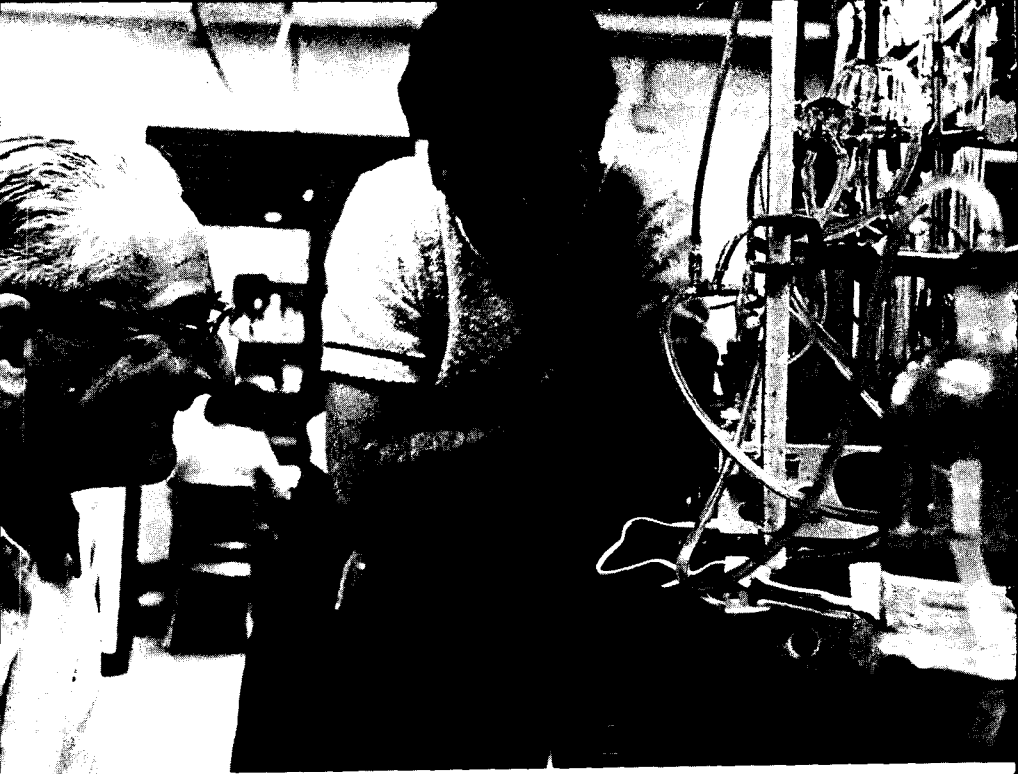
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