

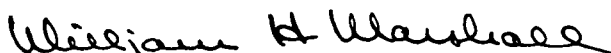
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Summer Session 1969

*Lake Itasca
Biology
Session*

University of Minnesota Bulletin

The Lake Itasca Biology Session presents unexcelled opportunities for biologists to pursue their studies in a broad spectrum of habitats, at a modern and pleasantly situated station, and with the guidance of a dedicated and outstanding staff.

I am sure that the imaginative student or research worker will find that this bulletin is worthy of close evaluation.



WILLIAM H. MARSHALL

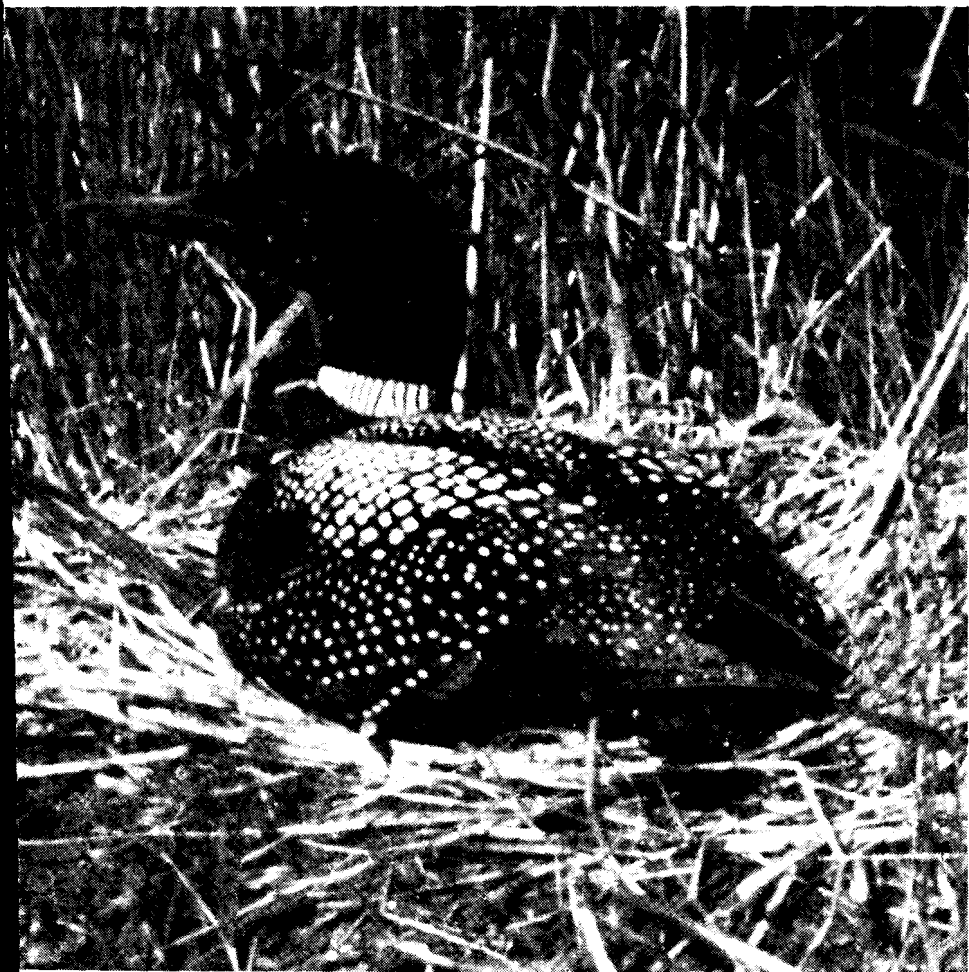
Director, Field Biology Program

UNIVERSITY OF MINNESOTA BULLETIN

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The contents of this bulletin and of other University bulletins, publications, or announcements are subject to change without notice.

Lake Itasca Biology Session



First Term • June 11-July 17

Second Term • July 20-August 25



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 and of the College of Agriculture, Forestry, and Home Economics. By agreement, the University of Wisconsin is participating in the policy and planning of the Biology Session through membership on the advisory committee.

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

RESEARCH AND ACADEMIC OPPORTUNITIES

THE ITASCA HABITATS

Itasca Park — one of national renown — embraces 50 square miles of forests with an excellent system of roads and trails. Within this area are many lakes of different types providing unusual field opportunities for work in limnology, phycology, aquatic insects and 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 never cut — here truly is an unexcelled array of virgin timber stands and the communities developing into similar types.

Forty miles to the west a spectacular 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 not only varied ecosystems, but also a singular range of fauna and flora with southern, northern, and western origins. Opportunities to study 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 behavior and ecological problems for study.

INDEPENDENT INVESTIGATORS

Qualified investigators may arrange with the director for research in various fields of terrestrial and freshwater biology at any season.

COURSE WORK AND RESEARCH

The variety of courses available in both terms I and II allow for an entire summer, either of intensive work in a particular field of interest or a sampling of several types of field experiences.

Graduate and undergraduate students of 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, 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, or zoology.

To teachers of biology in high schools and colleges, the session offers opportunity for course work, advanced study, and improvement through independent research. The necessary training for 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 director.

INSTRUCTIONAL FACILITIES

Ten well-equipped laboratories are located in five buildings. Much of the instruction is in the field where many varied habitats are within walking distance of the campus.

A fine herbarium of the region, 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 with adequate stereoscopic equipment.

The station equipment includes necessary compound and dissecting microscopes, binoculars, collecting equipment, various types of nets, row-boats, and launches, and the minor accessories for instruction and research.

The library has ample room for study and excellent series of journals as well as books basic to field work. Other books and journals are available from the University libraries.

ADMISSION AND REGISTRATION INFORMATION

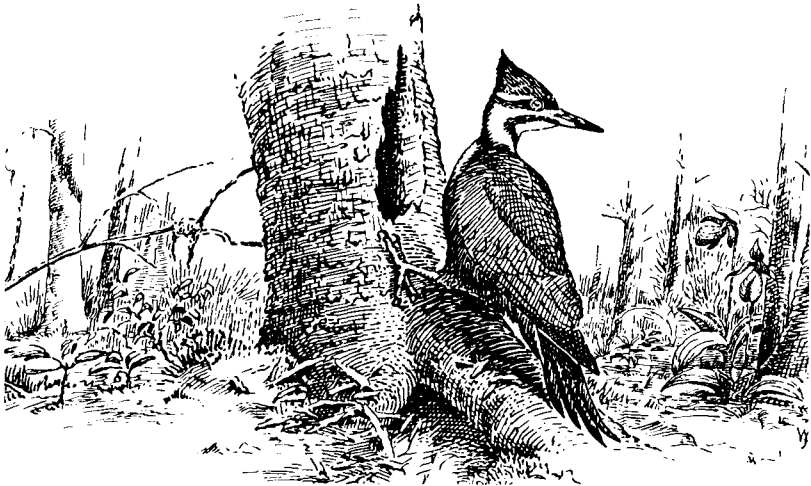
ADMISSION

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

Summer-only students — Students with previous college work, who wish to attend the Summer Session only, may do so without filing applications, provided they are in good standing and are not candidates for a degree.

Graduate students — 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. Graduate students in good standing in a degree program at another recognized graduate school may apply for admission as transient students on Transient Graduate Form 218. All applications must be submitted complete in every detail at least 4 weeks prior to the opening of the summer term in which the student expects to register.

All correspondence related to Graduate School admissions and all applications should be directed to the Graduate School, 322 Johnston Hall, 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. These are available only to persons holding a degree from the University of Minnesota.

The *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.

The *Josephine Herz Fellowship* to encourage an outstanding student in research on avian behavior.

Requests for information and applications for the above fellowships should be made to the Graduate School, University of Minnesota, Minneapolis, Minnesota 55455.

The *Fishery and Wildlife Management Summer Scholarships* for tuition and fees provided by the Minnehaha Chapter, Izaak Walton League, Question Club of Minneapolis, and the Wildlife Managers Club. Write to Director, Field Biology Program, 112 Snyder Hall, University of Minnesota, St. Paul, Minnesota 55101.

BIOLOGICAL RESEARCH STIPENDS

Stipends of three categories are available in the Summer Biological Research Program sponsored by the National Science Foundation at the station as follows: (a) predoctoral graduate students who will enroll in one course and carry out advanced research work for credit; (b) post-doctoral research workers who will enroll in one course and carry out research work under the guidance of a senior staff member; this work may or may not be for academic credit; (c) independent investigators who will carry out field or laboratory work that is best suited to the individual's objectives and the research opportunities available.

The amounts available to individuals will vary by category. Arrangements can be made to engage in research projects all summer. The program includes funds for tuition and fees.

Application forms for these stipends may be secured by writing the Director, Field Biology Program, 112 Snyder Hall, University of Minnesota, St. Paul, Minnesota 55101. They should be completed by March 15, 1969.

RESERVATIONS

Since both the housing facilities and the size of each class are limited, early application for reservations is recommended. Please complete the Request for Reservation form found on page 27 of this bulletin and mail to 112 Snyder Hall, University of Minnesota, St. Paul, Minnesota 55101. *This form must be accompanied by a recent transcript of academic record, a deposit of \$25, and a letter of evaluation from the student's adviser.* The deposit will apply toward tuition fees at the time of registration or will be returned to the student if space is not available.

Assignments to classes and housing will be made as soon as possible after April 1 and will be considered on the basis of prerequisites for the courses desired, scholarship, and date of application.

REGISTRATION

Whenever possible, students should complete their registration at the Office of Admissions and Records on the Twin Cities Campus (either Minneapolis or St. Paul). The IBM class reservation cards may be picked up at 220 Coffey Hall in St. Paul after May 13.

Registration by out-of-town students can be completed at the station on *June 11, First Term* or *July 20, Second Term* where the necessary IBM cards will be held with the reservation.

Tallied Courses — All students must tally for courses given at the station. IBM class reservation cards will be held for students who have been notified of acceptance after submission of the Request for Reservation.

Normal Load — Two courses per term, totaling 10 quarter credits, are considered a normal load. Advanced students may take two courses and in addition, 1 or 2 credits of a well-delimited research problem. Special permission must be secured from the director for a lighter or a heavier load. Students should check the condensed class schedule on page 27 to avoid scheduling two classes on the same day.



TUITION FEES AND OTHER COSTS

Academic Fees — The following fees, per term, are payable by each regular registrant on or before June 11 or July 20:

Tuition fee	\$72.00
Incidental fee	15.25
Laboratory fee	8.50
	<hr/>
	\$95.75 per term

A \$25 deposit is required of all persons making reservations for course work during the *Biology Session*. This fee will be returned if notice of cancellation is received before May 19 for the first term, or July 7 for the second term. When registration is completed, the \$25 will apply to the tuition fee.

Persons registering at the University of Minnesota for the first time will pay a \$1 record service fee.

Students enrolled in the Graduate School who have completed all of their graduate work with the exception of their thesis will be allowed to register for *thesis work only* upon the payment of \$31 tuition per term and the incidental fee.

Independent investigators will pay a research table fee of \$5 per week.

Late Fees — Tuition and fees are payable at the time of registration on or before June 11 or July 20. After June 12 or July 21, late fees will be charged as follows:

June 12-14 or July 21-23	\$3.00
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No registration will be accepted after June 12 or July 21 without the approval of the Director of the Field Biology Program and the payment of the late fee.

Room and Board Costs — There is a \$4 per week service charge for dormitory facilities. An initial payment of \$90 for board is payable to the director at the beginning of each term. The kitchen is run on an actual cost basis.

Transportation Costs — University vehicles are available for class field trips. A charge, on an actual cost basis, will be made to each student using them.



ON-CAMPUS ARRANGEMENTS

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 director for the students who form a cooperative Itasca Dining Club. Meals are carefully planned, well-balanced, and prepared by experienced cooks. Fresh meat, vegetables, and fruit are served daily.

CABINS

There are nine cabins for men, each accommodating eight students, and six 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 on request. The station maintains a tent and trailer camp area with a modern bathhouse and outlets for water and electricity. Students wishing to use this facility should make applications well in advance of the session. The weekly charge for use of this area is \$15.

ACCOMMODATIONS FOR VISITORS

There are no facilities at the station for taking care of guests of students. Students expecting guests must make arrangements for their housing off campus. It is possible to provide meals for guests at the dining hall if prior arrangements are made.

MAIL

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

TRANSPORTATION

Public transportation to the station is by bus to Douglas Lodge — about 4 miles from the station — where students will be met by station transportation. State Highway 92 and U.S. Highway 71 provide easy access by car through the towns of Bagley, Bemidji, or Park Rapids.



PERSONAL NEEDS

Students must provide their own pillows, bed linen, towels, and blankets. Since the nights are often cool, it is suggested that you bring two or three wool blankets. Essential personal equipment includes serviceable clothing, especially shoes or boots for field work, 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.

A branch of the University bookstores is maintained at the station during the sessions to make books and student supplies readily available.

RULES OF CAMP

Rules of camp are kept at a minimum. Students are expected to keep their own quarters clean and orderly. You may bring your car but no garages are provided. Weekend absences and extended field trips must be reported in advance.

Off campus, and within park boundaries, the State Park regulations govern. The State Park entry sticker (\$2) must be bought for private cars at the park entrance. If you bring a boat or canoe, a seasonal use permit (\$5) must be purchased at Park Headquarters.

RECREATION

Opportunities to relax by swimming, fishing, canoeing, and hiking in the park are excellent. Volleyball, soft ball, and horseshoe equipment is available at the station. Evening social events may be planned by the students. Weekly evening lectures by staff or visiting scientists and outstanding films on field biology will be scheduled.

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 director. This will not include such things as physical examinations, treatment of chronic conditions, nor will it include payment for drugs.

Requests for additional bulletins, and specific inquiries as to courses, accommodations, equipment, etc., should be sent to the:

Director of Field Biology
112 Snyder Hall
University of Minnesota
St. Paul, Minnesota 55101

Staff Members

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

J. Roger Bray, Principal Scientific Officer, Grasslands Research Division of the New Zealand Government, formerly taught plant ecology at the University of Toronto and the University of Minnesota. He has special interest in quantitative techniques for sampling and classifying vegetation, and in the productivity of natural and managed terrestrial vegetation.

A. Ralph Cavaliere, assistant professor, Gettysburg College, specializes in marine ascomycetes. He has done extensive research with the fleshy fungi of Arizona.

Edward J. Cushing, assistant professor, University of Minnesota, pursues research in glacial geology and quaternary phytogeography and paleoecology, especially pollen analysis.

Rouse S. Farnham, associate professor, University of Minnesota, conducts research and teaches soil classification and organic soils. He specializes in both basic and applied peat research.

Calvin R. Fremling, professor, Winona State College, specializes in aquatic insect distribution as indices of water quality along the Mississippi River.

David W. French, professor and associate director of the Biology Session, University of Minnesota, specializes in forest pathology and wood products deterioration, and is an author of *An Introduction to Forest Pathology*.

Donald E. Gilbertson, assistant professor, University of Minnesota, has conducted research on the metabolism and biochemical taxonomy of freshwater snails.

Mason E. Hale, curator, Division of Cryptogams, Smithsonian Institution, has published numerous papers on taxonomy, growth, chemistry, phytosociology, and succession of North American lichens and is the author of the *Lichen Handbook*.

Mary K. Hartz, assistant professor, Muskegon Community College, has had extensive research and teaching experience in the Itasca area.

T. W. Johnson, Jr., professor, Duke University, has major research interests in the developmental morphology and taxonomy of marine fungi, with current research on the aquatic fungi of Iceland and the new volcanic island, Surtsey. He is senior author of *Fungi in Oceans and Estuaries*.

William H. Marshall, professor and director of field biology, University of Minnesota, has published articles on ecology of mammals and birds.

Robert O. Megard, assistant professor, University of Minnesota, is studying nutrients and the growth of algae in lakes. Previously he has done research on biostratigraphy and sedimentation in lakes.

Richard L. Meyer, associate professor, University of Arkansas, is engaged in research on the Chrysophytes of the Itasca region and was a member of an expedition investigating the phytoplankton of the Indian Ocean.

Ross D. Moir, professor, Brandon University, has conducted floristic research in New Mexico, the north central plains, and the subarctic of northwestern Ontario.

Thomas Morley, professor, University of Minnesota, is carrying out research on the taxonomy of pondweeds and woody plants related to the myrtle family. He is compiling a spring flora of Minnesota.

Lewis W. Oring, assistant professor, University of North Dakota, has studied the behavior of closely related birds occupying similar niches in Sweden and Canada. He is currently evaluating the efficiency of communication systems with regard to the environment in which they occur.

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.

Donald B. Siniff, assistant professor, University of Minnesota, specializes in analyses of populations and ecological data.

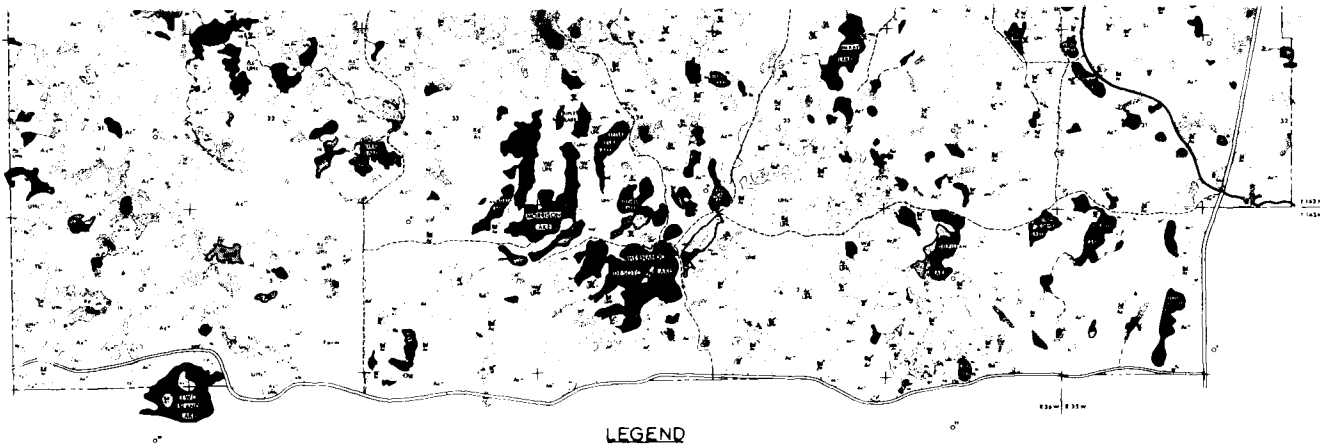
John R. Tester, associate professor, University of Minnesota, has studied plant and animal interrelationships on a native prairie and is actively working in the fields of hibernation, telemetry, and radiation ecology.

James C. Underhill, professor, University of Minnesota, has specialized in distribution problems and the limnological factors influencing the variation of fishes.

Dwain Warner, professor, University of Minnesota, is conducting research on the systematics and ecology of migrant birds, especially black birds and owls.

MINNESOTA
1966





VEGETATION TYPE

Forest

- A -- Aspen, paper birch
- LH -- Lowland hardwoods
- UH -- Upland hardwoods
- O -- Oak
- J -- Jack pine
- R -- Red pine
- W -- White pine
- F -- Balsam fir and/or white spruce
- S -- Black spruce
- T -- Tamarack

(2-1/2 acre minimum used for forest type classification)

Nonforest

- gr -- Upland grass
- ub -- Upland brush
- lb -- Lowland brush
- MS -- Marsh (sedge, cattail)
- /// -- Aquatics

Example of Vegetation Classification

No. 1 -- "Aspen stand, 5-9" dbh (diameter at breast height) class, 65% crown density, no understorey present"

Ac"

No. 2 -- "Red pine overstorey with 9" dbh class, 15% crown density, understorey of 5-9" dbh balsam fir"

Rd

Pc

LEGEND

STAND SIZE CLASS

- a -- 0-1" dia. breast ht
- b -- 1-5" "
- c -- 5-9" "
- d -- 9" "

CROWN DENSITY CLASS

- 0 -- Under 10% (applies to pine only)
- 1 -- 10-30%
- 2 -- 40-70%
- 3 -- Over 70%

OTHER FEATURES

- Stream
- Open water
- Foot trails, abandoned or (limited use roads)
- Park access roads
- Highway
- 0/2 Photo center and photo number
- + Section corner
- GrP Gravel pit
- 234 Sample stand age

SCALE 1:15,840



Project Supervision and Map Compilation

Professor Merle P. Meyer
School of Forestry,
University of Minnesota

Aerial Photo Interpretation

Research Ass't Gary R. Jensen
School of Forestry,
University of Minnesota

Map prepared from 1:15,840 scale infrared minus-blue aerial photographs flown August 16, 1966, with a 60" focal length camera. This project was made possible by a University of Minnesota Graduate School Grant to Professors W. H. Marshall and M. P. Meyer. The following students at the School of Forestry assisted in the compilation, drafting and editing of this map: Dennis R. Bodina, Duane A. Huckell, Joseph J. Ullman.

Courses of Instruction

means consent of instructor.

Botany

112 AQUATIC FLOWERING PLANTS

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*. (5 cr; limited to 20 students; prereq 52 or equiv; MTh; II term) Ownbey

116 SUMMER FLORA OF MINNESOTA

A survey of the summer flowering plants and ferns of the state with particular reference to the local flora. Collection and identification of species; distribution in Minnesota; literature and taxonomic methods. Text: Gleason and Cronquist, *Manual of Vascular Plants of Northeastern United States*. (5 cr; limited to 20 students; prereq 52 or equiv; MTh; I term) Morley

117 AGROSTOLOGY

The study of grasses, based primarily on those of the Lake Itasca region; morphology, classification, relationships, identification. Text: Hitchcock, *Manual of the Grasses of the United States*. (5 cr; limited to 20 students; prereq 52 or equiv or #; WS; II term) Moir

155 FRESHWATER ALGAE

The morphology and taxonomy of freshwater algae with particular attention to the collection and identification of local algae. Text: Smith, *Freshwater Algae of the United States*. (5 cr; limited to 20 students; prereq 10 cr in botany, biology or zoology; MTh; I term) Meyer

159 LICHENS

Taxonomy, ecology, and floristics of the lichens of northern Minnesota; identification, sampling methods, microchemistry as a taxonomic tool. Text: Hale, *Lichen Handbook* (available Division of Publications, Smithsonian Institution, Washington, D.C.). (5 cr; limited to 20 students; prereq 10 cr in botany or zoology; MTh; II term) Hale

299 RESEARCH PROBLEMS

(Cr ar; prereq #) Staff

Ecology and Behavioral Biology

119 AQUATIC ECOLOGY

The conditions for life in the water and distribution of aquatic animals. Text: Ruttner, *Fundamentals of Limnology*. (5 cr; limited to 20 students; prereq 15 cr in biology; WS; II term) Underhill

120 ADVANCED LIMNOLOGY

Current topics in limnological research with emphasis on the analysis of aquatic productivity. Lectures, laboratory, and field work. Text: Goldman, *Primary Productivity in Aquatic Environments*. (5 cr; limited to 15 students; prereq Ecol 119 or 128 or equiv; TF; I term) Megard

135 ECOLOGY OF THE ITASCA REGION

Communities represented in Itasca Park and vicinity and their dynamic relationships. Also, the relationships of local communities to the flora and fauna of Minnesota as a whole. Use of modern methods of community analysis and measurement of environmental factors. (5 cr; limited to 20 students; prereq Biol 80 or equiv; TF; II term) Bray, Tester

136 FIELD ETHOLOGY

Studies of behavioral evolution, motivation, and ontogeny stressing the relationship between environment and behavior by using field research techniques. Texts: Marler and Hamilton, *Mechanisms of Animal Behavior* and Portman, *Animals As Social Beings*. (5 cr; limited to 15 students; prereq Biol 50 or equiv, Zool 75-76 or 135 recommended; TF; I term) Oring

139 PALEOECOLOGY

Problems and techniques in the reconstruction of past plant communities and ecosystems from fossil evidence in deposits of quaternary age. Field and laboratory methods in pollen and plant macrofossil analysis. Text: Faegri and Iversen, *Textbook of Pollen Analysis*. (5 cr; limited to 15 students; prereq Ecol 50 or Biol 80 and Bot 52 or equiv; WS; I term) Cushing

162 VERTEBRATE ECOLOGY

Field work on populations and their relationships to local environments; habitat analysis and ecological research methods. Text: Odum, *Fundamentals of Ecology*. Individual and team research projects, field trips and lectures. (5 cr; limited to 20 students; prereq Biol 80 or equiv; WS; II term) Tester, Siniff, Marshall

163 QUANTITATIVE ECOLOGY

Lectures, discussions, and field studies on populations, communities, and ecosystems. Emphasis on methods of sampling and measuring ecological parameters and on data analysis and interpretation. (5 cr; limited to 15 students; prereq 9 cr in ecology; MTh; II term) Bray, Siniff

299 RESEARCH

(Cr ar; prereq #) Staff

Entomology, Fisheries and Wildlife

59 FIELD ENTOMOLOGY

The insect fauna in various natural habitats of the park and surrounding areas. The course includes field trips, collection and classification of insects, as well as studies of general morphology, life histories and habitats of local species under ecological conditions governing the distribution of insect fauna of the region. Text: Borrer and DeLong, *An Introduction to the Study of Insects*. (5 cr; limited to 15 students; prereq Biol 2 or equiv; TF; I term) Berner

129 AQUATIC ENTOMOLOGY

Identification and biology of aquatic and littoral insects in all stages. (5 cr; limited to 15 students; prereq 59 or 74 or equiv; MTh; II term) Fremling

196 SPECIAL PROBLEMS IN ENTOMOLOGY, FISHERIES AND WILDLIFE

Advanced work with ample opportunity for individual research, especially in various phases of faunistic studies in terrestrial, aquatic, and forest entomology, fisheries and wildlife. (Cr ar; prereq #) Staff

Plant Pathology

156 INTRODUCTORY MYCOLOGY

General characters of fungi; especially those used in identification; cultural and taxonomic procedures and practices. (5 cr; limited to 15 students; prereq 9 cr in botany; WS; II term) Cavaliere, French

160 AQUATIC FUNGI

The collection, culture, taxonomy, and morphology of freshwater fungi. (5 cr; limited to 12 students; prereq 3 cr in mycology; TF; II term) Johnson

207 PROBLEMS IN MYCOLOGY

Individual research work in taxonomy and biology of special groups of fungi. (Cr ar; prereq 107; II term) Staff

Soil Science

130 SPECIAL PROBLEMS IN SOILS

Research, reading, instruction. (Cr ar; prereq #; I term) Farnham

137 SOILS AND THE ECOSYSTEM

The formation and distribution of soils in relationship to vegetation, climate, and other soil-forming factors. The interrelationships of soils in the ecosystem. (5 cr; limited to 20 students; prereq Bot 50 or equiv; WS; I term) Farnham

Zoology

72 NATURAL HISTORY OF INVERTEBRATES

A taxonomic and ecological survey of the local fauna, including life histories and habitats. Text: Eddy and Hodson, *Taxonomic Keys of the Common Animals of Minnesota*; Pennak, *Freshwater Invertebrates of the United States*. (5 cr; limited to 10 students; prereq Biol 2; MTh, I term; TF, II term) Gilbertson

115 ADVANCED NATURAL HISTORY OF INVERTEBRATES

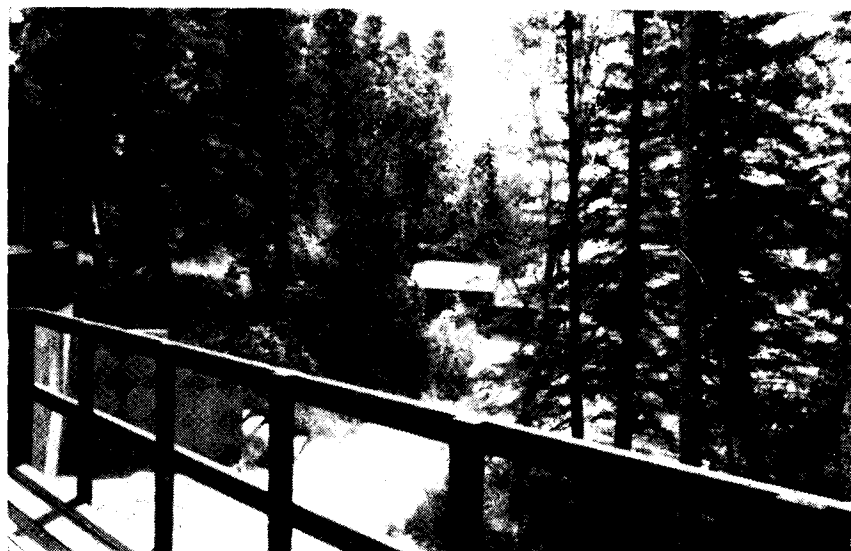
Advanced taxonomic and ecological survey of the local fauna and independent ecological studies of several taxonomic groups. Text: Eddy and Hodson, *Taxonomic Keys of the Common Animals of Minnesota*; Pennak, *Freshwater Invertebrates of the United States*. (5 cr; limited to 10 students; prereq 15 cr in zoology; MTh, I term; TF, II term) Gilbertson

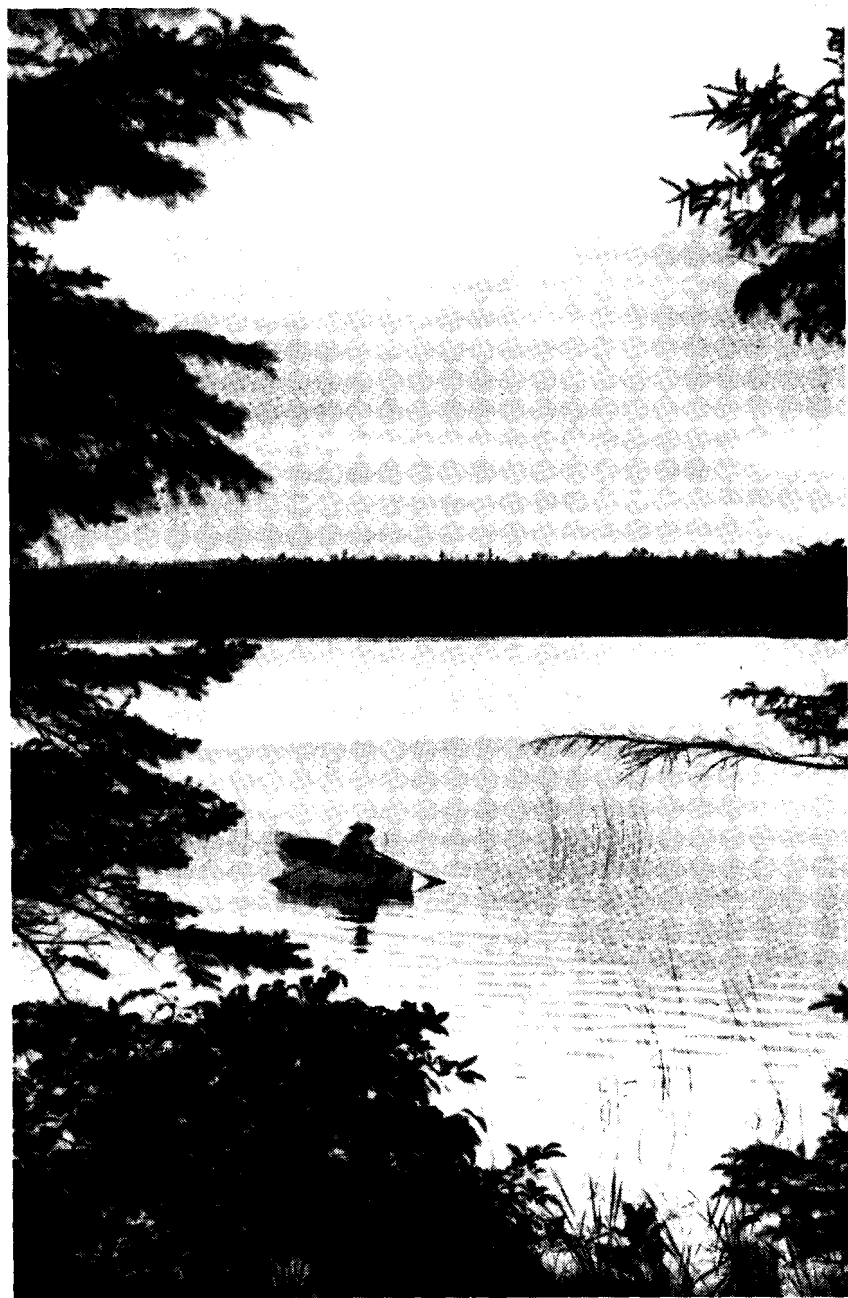
135 FIELD ORNITHOLOGY

Field and laboratory studies of ecology and life histories of the birds in the Itasca Park region. Text: Welty, *Life of Birds*. (5 cr; limited to 15 students; prereq 15 cr in zoology; WS, I term) Warner

299 GRADUATE RESEARCH

(Cr ar; prereq #) Staff





Recent Research Publications

- HERBER, ELMER C. Methods of differentiating Trematodes of the Genus *Notocotylus*. Proc. Pa. Acad. Sci., 38:90-94, 1964.
- GARNER, JASPER H. B. A preliminary survey of fungi on and in the healthy bark of the trembling aspen (*Populus tremuloides*). Phytopathology, 55:1059. 1965.
- BROWDER, LEON W., J. C. UNDERHILL, and D. J. MERRELL. Mid-dorsal stripe in the Wood Frog. J. Hered., 57(2):65-67. 1966.
- DAVIDSON, DONALD W. Some living stumps of red pine (*Pinus resinosa* Ait.) at Itasca State Park, Minnesota. Bulletin of Torrey Botanical Club, 93(6):458-460. 1966.
- FORBES, RICHARD B. Fall accumulation of fat in chipmunks. J. of Mamm., 47(4):715-716. 1966.
- FORBES, RICHARD B. Studies of the biology of Minnesotan Chipmunks. Amer. Midl. Nat., 76(2):290-308. 1966.
- FORBES, RICHARD B. Notes on a litter of Least Chipmunks. J. Mamm., 47(1):159-161. 1966.
- HOHN, BONNIE M. and W. H. MARSHALL. Annual and seasonal weight changes in a thirteen-lined ground squirrel population, Itasca State Park, Minnesota. J. Minn. Acad. Sci., 33(3):102-106. 1966.
- JANSSEN, C. R. Recent pollen spectra from the deciduous and coniferous deciduous forests in northeastern Minnesota — a study in pollen dispersal. Ecology, 45(5):804-825. 1966.
- KIM, KE CHUNG. A quantitative taxonomic study of the *Hoplopleura hesperomydis* complex (Anoplura, Hoplopleuridae), with notes on *A. Posteriori* taxonomic characters. Syst. Zool., 15(1):24-45. 1966.
- LARSON, OMER R. Some helminths of Itasca Park fishes. J. Minn. Acad. Sci., 33(2):99-101. 1966.
- MCANDREWS, JOHN H. Postglacial history of prairie, savanna, and forest in northwestern Minnesota. Mem. Torrey Bot. Club, 22(2):1-72. 1966.
- MEGARD, ROBERT O. and J. SHAPIRO. A mobile limnological laboratory. Limnol. Oceanogr., 11:420-422. 1966.
- ORR, HOWARD D. Behavior of translocated white-footed mice. J. Mamm., 47(3):500-506. 1966.
- FORBES, RICHARD B. Some aspects of the water economics of two species of chipmunks. J. of Mamm., 48(3):466-468. 1967.
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- CLINE, DAVID R. Woodland pond habitat selection in ducks. M.S. Thesis. 1965.
- MEYER, R. L. The cytology, morphology, and life-history of certain chrysophyceae. Ph.D. Thesis. 1965.
- BERNARDIN, PAUL ARTHUR. O.P. A study of some of the ecological factors influencing Jack-Pine Budworm (*Choristoneura Pinus* Freeman) populations. M.S. Thesis. 1966.
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- ZINER, MARVIN DALE. A taxonomic study of *Picea mariana*: *P. Glauca* in the Lake Itasca Region in Minnesota. M.A. Thesis. 1966.
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- COLLINS, THOMAS W. Oxygen-uptake, shell morphology and desiccation of the fingernail clam, *Sphaerium occidentale* Prime. Ph.D. Thesis. 1967.
- KELLEHER, KEVIN EDMOND. Distribution of breeding birds in deciduous forests at the prairie-hardwood forest ecotone in northwestern Minnesota. Ph.D. Thesis. 1967.
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- MEIEROTTO, RICHARD R. The distribution of small mammals across a prairie-forest ecotone. Ph.D. Thesis. 1967.

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Condensed Course Schedule*

I TERM

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Bot 116	Ecol 120	Ecol 139	Bot 116	Ecol 120	Ecol 139
Bot 155	Ecol 136	Zool 135	Bot 155	Ecol 136	Zool 135
Zool 72/115	Ent 59	Soil 137	Zool 72/115	Ent 59	Soil 137

II TERM

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Bot 112	Ecol 135	Bot 117	Bot 112	Ecol 135	Bot 117
Bot 159	PIPa 160	Ecol 119	Bot 159	PIPa 160	Ecol 119
Ecol 163	Zool 72/115	Ecol 162	Ecol 163	Zool 72/115	Ecol 162
Ent 129		PIPa 156	Ent 129		PIPa 156

* To avoid conflict, schedule only one class per day.

Request for Reservation — ITASCA BIOLOGY SESSION

Name _____ Date _____

Current Address _____

_____ Zip Code _____

Telephone _____ (Office, Home — circle one)

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

Univ. or College now attending: _____

If U. of M., college last enrolled in _____ Year _____

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

I Term: Dept. _____ No. _____ and Dept. _____ No. _____

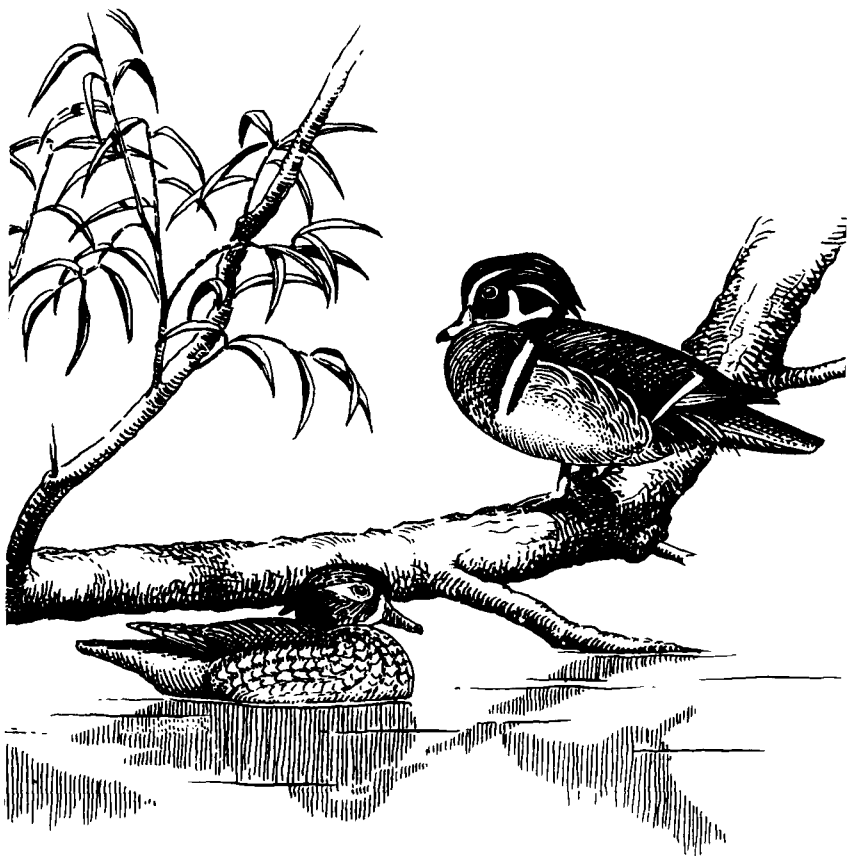
II Term: Dept. _____ No. _____ and Dept. _____ No. _____

(see condensed course schedule to avoid conflicts)

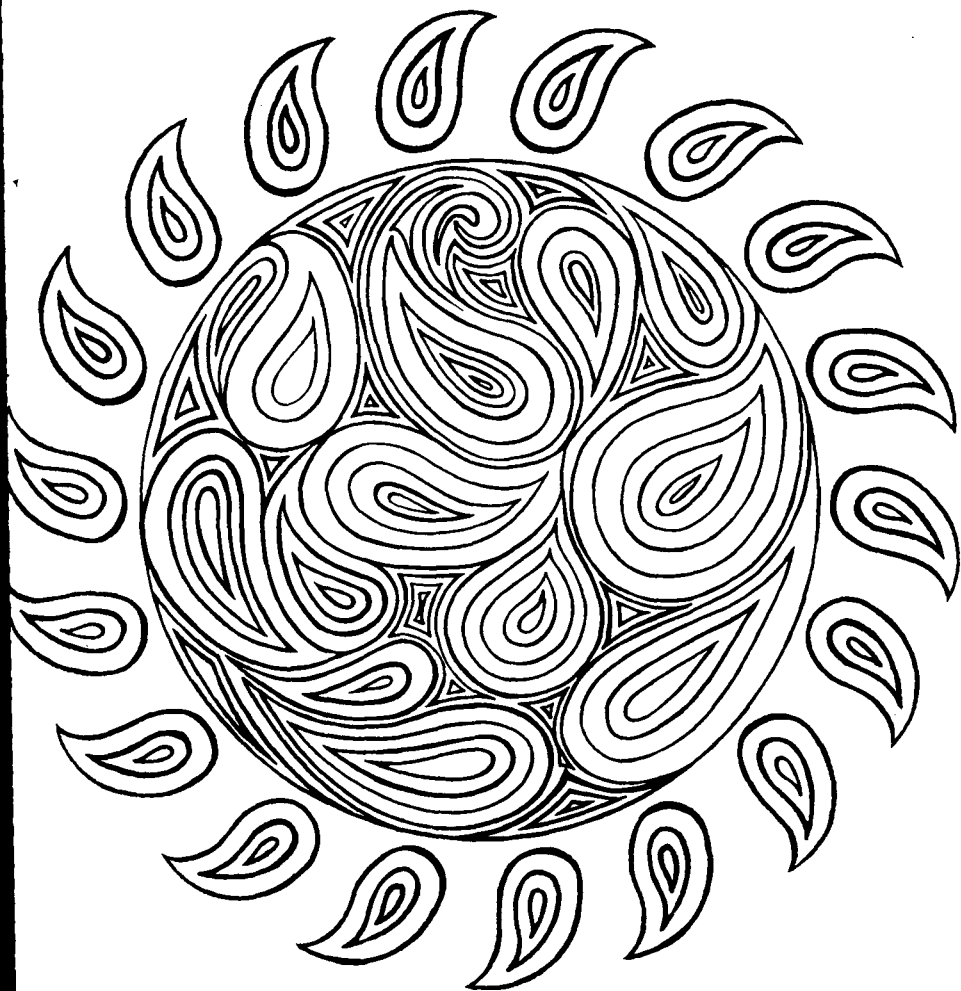
I wish a reservation in a student cabin, campground site, or a resort list
(circle one)

Enclosed find \$25 deposit (check or money order to University of Minnesota) to be credited to the tuition fee on completion of registration. A letter of evaluation from my adviser and a recent transcript of my academic record is enclosed or will be sent directly. (circle one)

Please mail this form to: **Director, Field Biology Program**
112 Snyder Hall
University of Minnesota
St. Paul, Minnesota 55101



The vignettes for this bulletin are the work of Walter J. Breckenridge, Director, James Ford Bell Museum of Natural History.



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Volume LXXII

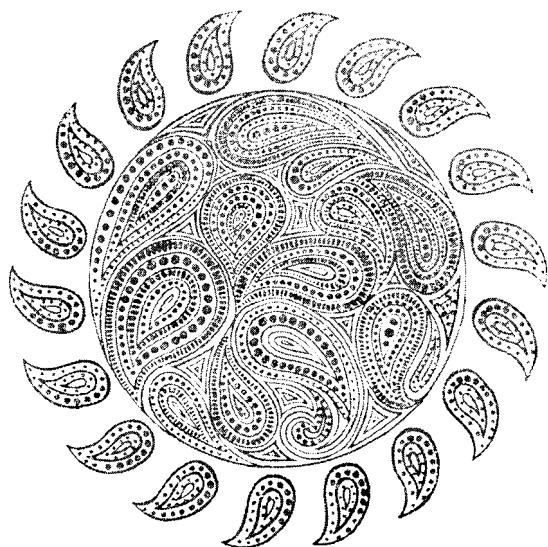
Number 3

March 31, 1969

UNIVERSITY OF MINNESOTA BULLETIN

Published by the University of Minnesota, Office of Admissions and Records, 105 Morrill Hall, Minneapolis, Minnesota 55455, January through September inclusive. One issue in January, one issue in February, two issues in March, four issues in April, four issues in May, three issues in June, four issues in July, two issues in August, and one issue in September. Second class postage paid at Minneapolis, Minnesota. Send change of address notices and other communications to Office of Admissions and Records, Minneapolis, Minnesota 55455.

The contents of this bulletin and of other University bulletins, publications, or announcements are subject to change without notice.



UNIVERSITY OF MINNESOTA

1969
SUMMER
SESSION

FIRST TERM

JUNE 16-JULY 18

SECOND TERM

JULY 21-AUGUST 22

Calendar

First Term

May 26-29	Monday-Thursday	Advance Registration for First Term
June 16	Monday	Orientation and Registration; fees due
June 17	Tuesday	First Term classes begin
July 4	Friday	Independence Day; holiday
July 14-18	Monday-Friday	Advance Registration for Second Term
July 18	Friday	Classes end at close of VI hour Commencement, 4 p.m. First Term closes

Second Term

July 21	Monday	Orientation and Registration; fees due
July 22	Tuesday	Second Term classes begin
August 22	Friday	Classes end at close of VI hour Commencement, 4 p.m. Second Term closes

Convocation, 8 p.m., Thursday
(See Official Daily Bulletin for announcement)

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

Please note that the appropriate late fee will be assessed for registrations subsequent to Monday, June 16, 1969, and registrations subsequent to Monday, July 21, 1969.

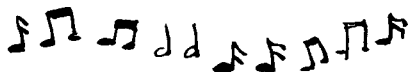
Fee statements *prepared on the Mondays* stipulated above may be paid on the following Tuesday without the penalty for late payment of fees.

LOOKING FOR A FUN 2-CREDIT COURSE ?

music 60

a most unique music appreciation course featuring...

- 9 CONCERT-LECTURES WITH THE FAMED MINNESOTA ORCHESTRA, led by Associate Conductor George Trautwein, plus chamber ensembles, soloists, and outstanding guest lecturers.
- THE EXCITING PREMIERE OF "THE BRAVO MOZART SYMPHONY," composed especially for Music 60 by Dominick Argento.



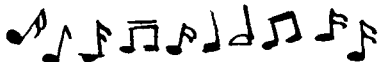
First Term--June 17-July 17
2:00 p.m. Tuesdays and Thursdays
Air-conditioned Northrop Aud.

2 Credits/P-N/or Audit
Can be used as a Humanities
requirement

You don't have to be a music major or a musician to take this course. Music 60 is for people who like music, and seek a better understanding of it.

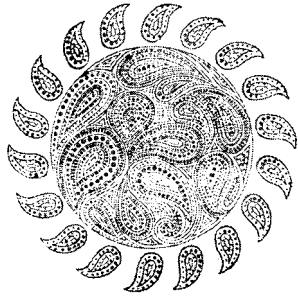
Don't miss out on this unique and fun summer music course. And tell your family and friends about it too!

For more information about Music 60 come in or call: Summer Session, 135 Johnston Hall, 373-2925.



NOTE: When you register for Music 60 be sure it is specifically written on your fee statement when it is made out.

If Music 60 is the only course you plan to take, the tuition fee is just \$25. Pick up the special application in the Summer Session Office.



How to Use This Bulletin

This bulletin contains announcements of the courses offered in the several colleges and schools of the University. Departmental statements also indicate certain requirements as to entrance and credits. For more detailed statements refer to the regular bulletin of the college concerned.

Symbols — The following symbols are used throughout the course descriptions and will not carry any page footnotes:

- * Courses through which it is possible for graduate students to prepare required Plan B papers.
- † All quarters of the course preceding the dagger must be completed before credit will be granted for any quarter of the course.
- ‡ Course may be taken out of sequence.
- § Credit will not be given if the equivalent course listed after the section mark has been taken for credit.
- ¶ Means "concurrent registration" in the course which it precedes.
- # Consent of *instructor* must be obtained.
- △ Consent of *division, department, or school* involved must be obtained.
- ** A special fee is charged. See section on Course Fees.

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

Prerequisites — Before you can enroll in certain courses, you must have completed or be concurrently enrolled in other specified courses or possess some particular qualification or class standing. These requirements are known as prerequisites. If no prerequisites are listed, there are none, except as the course number indicates a class standing requirement.

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

- 1-49 for freshmen and sophomores
- 50-99 for juniors, seniors, and fifth-year students
- 100-199 for juniors, seniors, fifth-year students, and graduate students
- 200 and over for graduate students only

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

Example: prereq 11 or 17 and Psy 2 (you must have had either course 11 or 17 of the same department and Psychology 2).

When no departmental abbreviated prefix precedes the course number listed as a prerequisite, that prerequisite course is in the same department as the course being described. Likewise, a prerequisite reading "6 cr" means 6 credits in courses offered by the same department.

Work equivalent to a prerequisite course (having the same content) is ordinarily accepted in lieu of that prerequisite. You will also note that the instructor may, in some instances, waive prerequisites at his discretion.

Hours and Days — Class hours are identified by Roman numerals, and continue for 50 minutes after the beginning time shown below:

	I	II	III	IV	V	VI	VII	VIII
Minneapolis (East and West Banks) . .	8:00	9:05	10:10	11:15	12:20	1:25	2:30	3:35
St. Paul	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30

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

Missing Information — When hours, days, or places of meeting are missing, consult the instructor or department offering the course.

Changes made subsequent to publication of this bulletin are published in the Official Daily Bulletin in the *Minnesota Daily*.

College and Departmental Abbreviation Code — Following is the list of abbreviated departmental prefixes used in conjunction with course numbers:

Acct, Accounting	Geog, Geography
Aero, Aeronautical Engineering	Geo, Geology and Geophysics
AgEc, Agricultural Economics	Ger, German
AgEd, Agricultural Education	Grk, Greek
AgEn, Agricultural Engineering	
Agro, Agronomy and Plant Genetics	HE, Home Economics
AmSt, American Studies	Heb, Hebrew
Anat, Anatomy	HEd, History and Philosophy of Education
AnCh, Analytical Chemistry	HEEd, Home Economics Education
Anes, Anesthesiology	Hist, History
AnSc, Animal Sciences	Hlth, School Health Education
Anth, Anthropology	Hort, Horticultural Science
Arab, Arabic	Hum, Humanities
Arch, Architecture	Hydr, Hydromechanics
ArEd, Art Education	
Art, Studio Arts	IE, Industrial Engineering
ArtH, Art History	InCh, Inorganic Chemistry
Ast, Astronomy	Ind, Industrial Education
	Ins, Insurance
BFin, Business Finance	IR, Industrial Relations
BioC, Biochemistry (Agricultural)	Ital, Italian
Biol, Biology	
BLaw, Business Law	Jour, Journalism and Mass Communication
Bot, Botany	
BsEd, Business Education	Lat, Latin
	Lib, Library School
CPsy, Child Psychology	Ling, Linguistics
CE, Civil Engineering	LMed, Laboratory Medicine
ChEn, Chemical Engineering	
Clas, Classics	Math, Mathematics
Comm, Communication	MdBc, Biochemistry (Medical)
Comp, Composition	ME, Mechanical Engineering
	MeAg, Mechanized Agriculture
DE, Distributive Education	Med, Medicine
	MedT, Medical Technology
Ecol, Ecology and Behavioral Biology	MetE, Metallurgical Engineering
Econ, Economics	Mgmt, Management
Ed, Education	MicB, Microbiology
EdAd, Educational Administration	MinE, Mining Engineering
EdCl, Curriculum and Instruction	Mktg, Marketing
EdT, Methods and Student Teaching	MM, Mechanics and Materials
EE, Electrical Engineering	MdGk, Modern Greek
EG, Engineering Graphics	Mort, Mortuary Science
Engl, English	MthE, Mathematics Education
Ent, Entomology, Fisheries, and Wildlife	MuEd, Music Education
EPsy, Educational Psychology	Mus, Music
FamS, Family Studies	NPsy, Psychiatry and Neurology
For, Forestry	NSci, Natural Science
Fren, French	NuAd, Nursing Administration
FS, Foreign Study	NuEd, Nursing Education
FScI, Food Science and Industries	Nurs, Nursing
GC, General College	Obst, Obstetrics and Gynecology
GeCh, General Chemistry	OMgt, Office Management
GE, General Engineering	Oph, Ophthalmology
Gen, Genetics	

OrCh, Organic Chemistry
 Otol, Otolaryngology

 PA, Public Administration
 Path, Pathology
 PCh, Physical Chemistry
 Ped, Pediatrics
 PEM, Physical Education for Men
 PetE, Petroleum Engineering
 PEW, Physical Education for Women
 Phcg, Pharmacognosy
 Phcl, Pharmacology
 Phil, Philosophy
 Phsl, Physiology
 Phys, Physics
 PIPa, Plant Pathology
 PMed, Physical Medicine and Rehabilitation
 PO, Personal Orientation
 Pol, Political Science
 Port, Portuguese
 Prod, Production
 Psy, Psychology
 PubH, Public Health (including Biometry)

 QA, Quantitative Analysis

 Rad, Radiology
 Rec, Recreation and Park Administration

 Rhet, Rhetoric
 Russ, Russian

 Scan, Scandinavian
 Soc, Sociology
 Soil, Soil Science
 Span, Spanish
 Spch, Speech
 SSci, Social Science
 SSPA, Speech Science, Pathology, and Audiology
 Stat, Statistics
 Surg, Surgery
 SW, Social Work
 Swed, Swedish

 Th, Theatre
 Tran, Transportation

 VAna, Veterinary Anatomy
 VM, Veterinary Medicine
 VMic, Veterinary Microbiology and Public Health
 VObs, Veterinary Obstetrics
 VPAP, Veterinary Pathology and Parasitology
 VPP, Veterinary Physiology and Pharmacology
 VSR, Veterinary Surgery and Radiology

 Zool, Zoology

Building Name Abbreviations

MINNEAPOLIS

East Bank

A, Armory
Aero, Aeronautical Engineering
AH, Appleby Hall (Pharmacy)
Arch, Architecture
ArtB, Art Building (2020 Wash Ave S)

Bo, Botany
Bu, Burton Hall

C, Chemistry
CD, Child Development
CH, Cooke Hall
ChE, Chemical Engineering
ChRC, Children's Rehabilitation Center
CMU, Coffman Memorial Union

DiehH, Diehl Hall

E, Main Engineering
EdH, Eddy Hall
EE, Electrical Engineering
EltH, Elliott Hall (Psychology)
Ex, Experimental Engineering

FieldHse, University Field House
FolH, Folwell Hall
ForH, Ford Hall
FraH, Fraser Hall (Law)

HL, Hydraulic Laboratory (Hennepin Island)
Hosp, University Hospitals
HS, Health Science Building

J, Jones Hall
Jach, Jackson Hall (Anatomy)
JOAd, Jackson-Owre Addition
JohH, Johnston Hall

Lib, Walter Library
LyonL, Lyon Laboratories

Mayo, Mayo Memorial
ME, Mechanical Engineering
MEx, Mines Experiment Station

MH, Millard Hall
MinMet, Mines and Metallurgy
MMA, Mayo Memorial Auditorium
MNH, Museum of Natural History
MurH, Murphy Hall
MusEd, Music Education

NGW, Norris Gymnasium for Women
NH, Nicholson Hall
NMA, Northrop Memorial Auditorium

Owre, Owre Hall (Medical Sciences)

P, Pillsbury Hall
PeikH, Peik Hall
Ph, Tate Laboratory of Physics
PoH, Powell Hall
Pt, Pattee Hall

ScH, Scott Hall (Music)
SciCB, Science Classroom Building
ShAn, Shops Annex
ShH, Shevlin Hall
Stad, Stadium

TNCE, Temporary, North Court of Engineering
TNM, Temporary, North of Mines
TSF, Temporary, South of Folwell

VCHH, Variety Club Heart Hospital
VH, Vincent Hall

WeH, Wesbrook Hall
WmsA, Williams Arena
WuH, Wulling Hall

Z, Zoology

West Bank

AndH, Anderson Hall

BA, Business Administration Building
BlegH, Blegen Hall

SocSci, Social Sciences Building

SAINT PAUL

AgBot, Agricultural Botany
 AgEng, Agricultural Engineering
 AgLib, Agricultural Library
 Agr, Agronomy

BeH, Berry House (1304 Cleveland Ave N)

CI, Crop Improvement
 CofH, Coffey Hall (Administration)

DinC, Dining Center

EntFW, Entomology, Fisheries, Wildlife

FP, Forest Products Laboratory
 FSI, Food Science and Industries

GH, Green Hall
 GorL, Gortner Laboratory of Biochemistry
 Gy, Gymnasium

HH, Haecker Hall
 Hr, Horticulture

LsPav, Livestock Pavilion

McNH, McNeal Hall (Home Economics)
 MSh, Meat Shop

NorH, North Hall

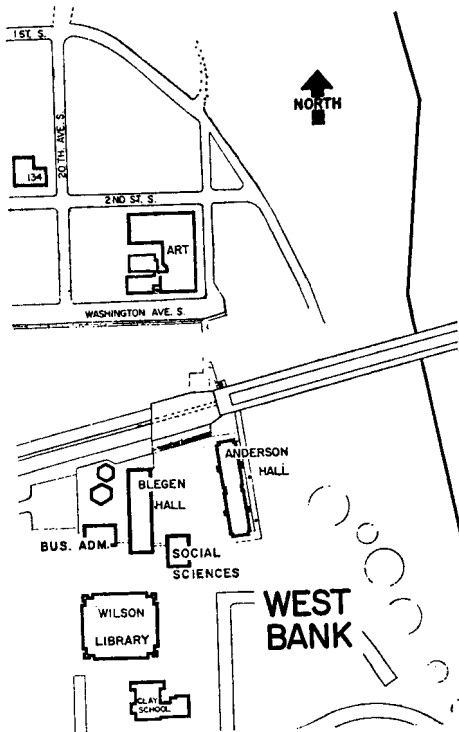
PalmC, Palmer
 PetH, Peters Hall
 PP, Plant Pathology

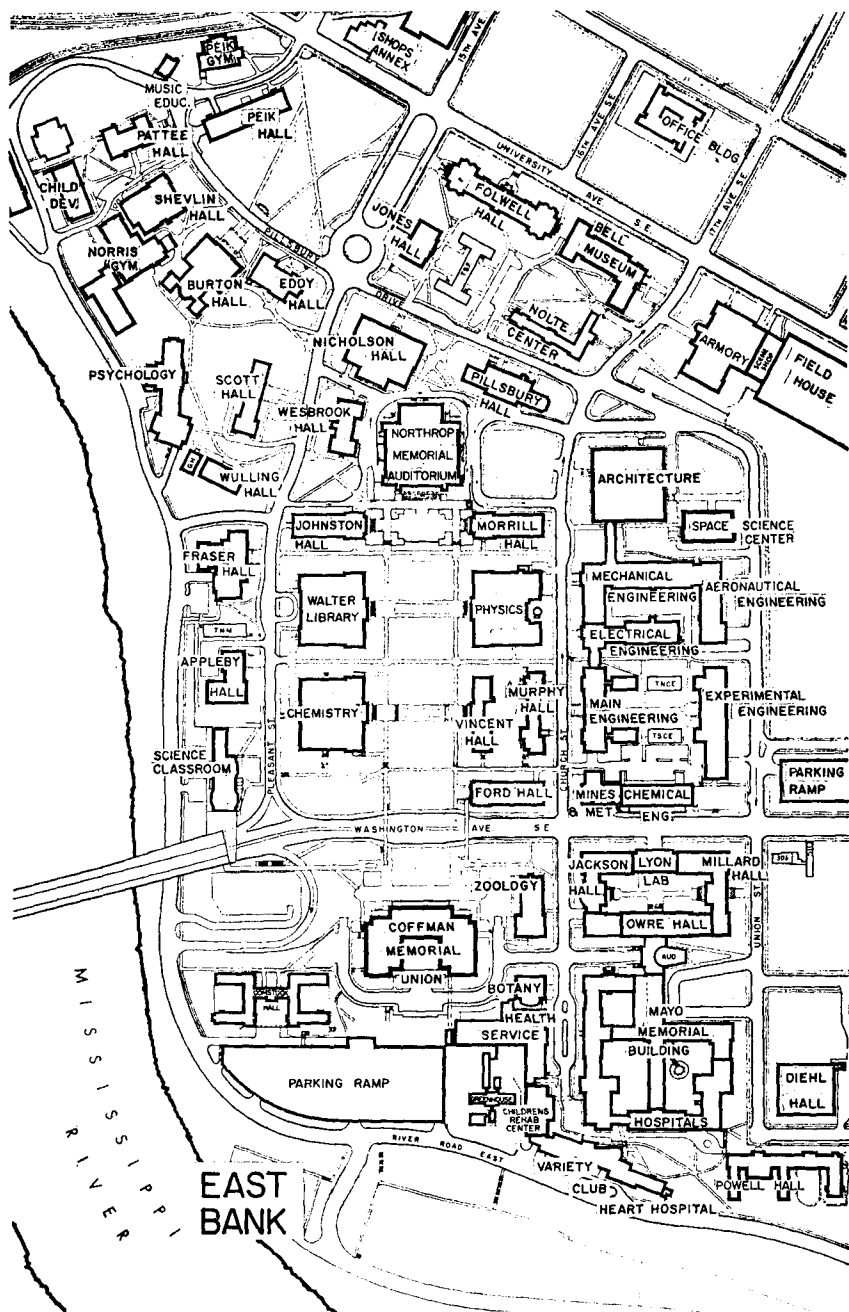
SnH, Snyder Hall
 So, Soils
 StCen, Student Center

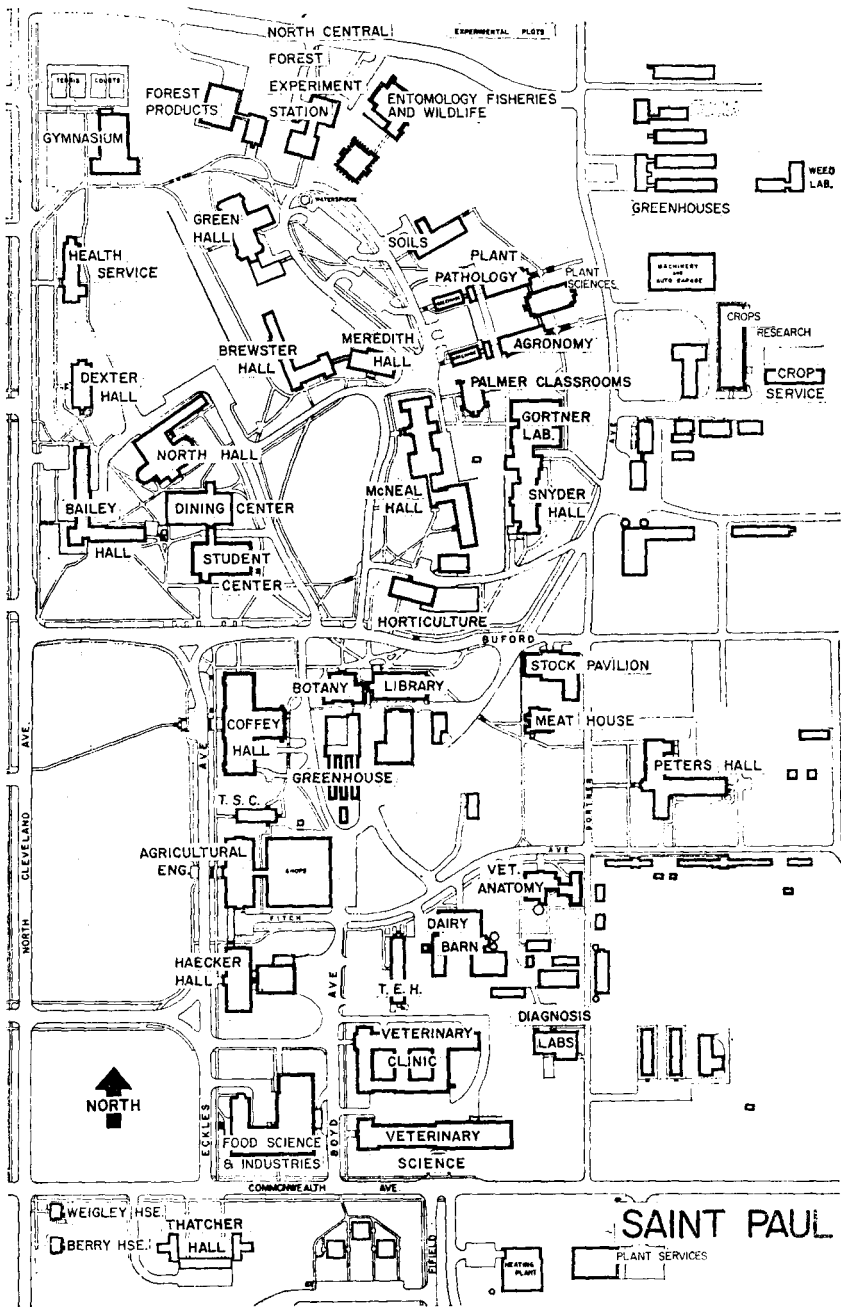
TEH, Temporary, East of Haecker

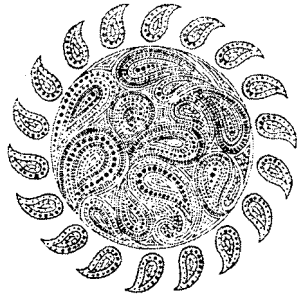
VetA, Veterinary Anatomy
 VetC, Veterinary Clinic
 VetDL, Veterinary Diagnostic Laboratories
 VetS, Veterinary Science

WeiH, Weigley House (1316 Cleveland Ave N)









Admission

Summer Session courses are open to all qualified high school graduates, regularly admitted students of the University including those attending regular session, and those with previous college work.

Incoming Freshmen

Students graduating from high school in June may begin their University studies in the Summer Session. Orientation programs for many of these students are being scheduled prior to the session. Applications for admission should be received by the Admissions and Records Office prior to May 1. All freshman applicants are required to present ACT scores before final admission can be granted. For further information see the *General Information Bulletin* or write to Office of Admissions and Records, University of Minnesota, Minneapolis, Minnesota 55455.

Summer-Only Students

Students with previous college work who wish to attend the Summer-Session only may do so without filing applications if they are not in a "dropped" status at their previous college and do not plan to obtain a degree from the University of Minnesota. Such students will be considered for admission as summer-only students.

Persons 24 years of age or older who have not had previous college work and who do not plan to obtain a degree from the University of Minnesota but wish to complete certain specific college subjects will be considered for admission as summer-only students.

High school graduates under 24 years of age without previous college work will also be considered for admission as summer-only students but must have approval of the Office of Admissions and Records.

Attendance during the summer terms in no way guarantees summer-only students admission to the regular academic year. Summer-only students who wish to be considered for admission to a subsequent term during the regular academic year must file regular admission applications (see *General Information Bulletin*).

Graduate Students

The procedure for admission of graduate students is discussed in the Graduate School section of this bulletin, on page 162.

Degree Candidates

All students who expect to receive a degree from the University must have filed an application for admission and have been regularly admitted to a college of the University. A \$10 credentials examination fee must accompany all applications.

All students should consult the *General Information Bulletin* for detailed requirements governing admission and the granting of degrees. This bulletin and specific college bulletins may be obtained by writing to Office of Admissions and Records, University of Minnesota, Minneapolis, Minnesota 55455. Zip codes *must* accompany requests for bulletins.

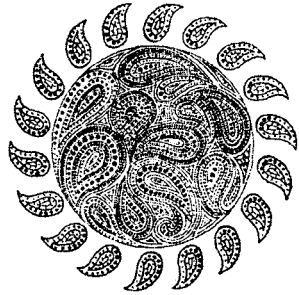
High School Students

Outstanding high school students who have special interests which can be satisfied by attending college before high school graduation may apply for admission to the Summer Session to take work between their junior and senior high school years. Credits earned will be counted toward graduation if the student later enrolls at the University.

Intent to Register

Students who are defined as "summer-only students" in the preceding section may speed their registration process by submitting an Intent to Register found inside the back cover of this bulletin. This does not obligate the student in any way. A confirmation of Intent to Register and registration forms will be sent to qualified students.

Students in attendance Spring Quarter 1969, Graduate School students, new regularly admitted students, or those who have applied for regular admission, and formerly admitted students returning as regular students should *not* submit the Intent to Register.



Registration

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 correct registration period.

FIRST TERM — ADVANCE REGISTRATION

Dates • May 26 to May 29

Students registered for Spring Quarter, or those whose last attendance was at the University and who are returning as degree candidates on the Twin Cities Campus, should register during the advance registration period announced by their colleges.

Other students planning to attend Summer Session on the Twin Cities Campus may register during the period Monday, May 26, through Thursday, May 29, except those newly admitted regular students who have been scheduled for a specific registration period by the University and those Graduate School applicants whose admission is still pending.

Students who register for the First Term and who plan to attend Second Term should register for both terms at the same time.

Registration will not be open between June 2 and June 13.

Place

Currently enrolled students and former students seeking a degree from the University of Minnesota should register through the college in which they were last registered unless they have been approved for change of college. New summer students, former summer students, and former regular students no longer planning to obtain a degree from the University of Minnesota (if eligible to return) should begin registration through the college in which they are taking all or most of their summer courses.

Exceptions — Students in the summer-only student categories and former regular students no longer planning to obtain a degree from the University who plan to register for professional education courses should register through the College of Education. Students whose last college attendance was General College should register through General College. Students admitted to Graduate School must register through Graduate School.

The advance registration for First Term will take place at the college offices as listed below:

Agriculture, Forestry, Home Economics, 225 Coffey Hall (St. Paul)	Science and Math (and Central), 223 Johnston Hall
Biological Sciences, 123 Snyder Hall (St. Paul) or 307 Zoology Building	Social Sciences, 214 Social Sciences Building (West Bank)
Business Administration, 225 Business Administration Building (West Bank)	Honors, 115 Johnston Hall
Dental Hygiene, 360A Millard Hall	Special Students, 216B or 225 Johnston Hall
Dentistry, 136 Owre Hall	Medical Technology, C-205 Mayo Memorial Building
Education, 206 Burton Hall	Medicine, 1360 Mayo Memorial Building
General College, 20 Nicholson Hall	Mortuary Science, 114 Vincent Hall
Graduate School, 316 Johnston Hall	Nursing, 125 Owre Hall
Institute of Technology, 133 Main Engineering Building	Occupational Therapy, 860 Mayo Memorial Building
Liberal Arts	Pharmacy, 115 Appleby Hall
Summer-only Students 122 Johnston Hall	Physical Therapy, 860 Mayo Memorial Building
Regularly Admitted Students	Public Health, 1325 Mayo Memorial Building
Lower Division, 214 Johnston Hall	University College, 106 Nicholson Hall
Upper Division: Humanities, 206 Folwell Hall	Veterinary Medicine, 225 Coffey Hall (St. Paul)

FIRST TERM — FINAL REGISTRATION

Date • Monday, June 16, 8 a.m. to 3:15 p.m.

Registration on Tuesday, June 17, incurs late fee.

Late fees for the First Term are as follows for payment of fees on:

June 18-20	\$ 3.00
June 23-27	5.00
Thereafter	10.00

No registrations accepted by mail.

No provision is made for allowing exemption from the late fee to those who are unable to reach the University during the scheduled registration days.

Place

A. Registration at Coffman Union Ballroom

Education

Graduate School (registration material for students in St. Paul departments should be obtained at 220 Coffey Hall, St. Paul)

Medical School

College of Liberal Arts (Summer-only Students)

B. Registration at College Offices

Agriculture, Forestry, and Home Economics, 225 Coffey Hall (St. Paul)

Biological Sciences, 123 Snyder Hall (St. Paul)

Business Administration, 225 Business Administration Building (West Bank)

Dental Hygiene, 360A Millard Hall

Dentistry, 136 Owre Hall

General College, 20 Nicholson Hall

Institute of Technology

Architecture, Engineering and Mathematics, 133 Main Engineering Building

Chemistry, 139 Chemistry Building

Geology and Geophysics, 108 Pillsbury Hall

Physics, 148 Physics Building

Medical Technology, C-205 Mayo Memorial Building

Mortuary Science, 114 Vincent Hall

Nursing, 125 Owre Hall

Pharmacy, 115 Appleby Hall

Physical and Occupational Therapy, 860 Mayo Memorial Building

Public Health, 1325 Mayo Memorial Building

College of Liberal Arts (regularly admitted students)

Lower Division, 216B Johnston Hall

Upper Division:

Humanities, 206 Folwell Hall

Science and Math (and Central), 223 Johnston Hall

Social Sciences, 214 Social Sciences Building (West Bank)

Honors, 115 Johnston Hall

Adult Special Students, 214 or 225 Johnston Hall

University College, 106 Nicholson Hall

Veterinary Medicine, 225 Coffey Hall (St. Paul)

Registration Procedure at Coffman Union

(Education; Graduate School; Medical School; and Summer Students in College of Liberal Arts)

- Step 1.** Obtain registration material in the balcony (off the first floor — not shown on floor plan) of Coffman Union Ballroom. If you have a Summer Session bulletin, please bring it with you. Bulletins will be available only to students who do not already have a copy. Secure two registration blanks if you will be attending both first and second summer terms. Fill out a separate blank for each term.
- Step 2.** Go downstairs to Main Ballroom on the ground floor. Use the tables located under the balconies for filling out registration blanks. (Green line)
- Step 3.** Obtain adviser's approval of registration at the department table representing your principal interest. (Not required of Summer-Only Students registering through the College of Liberal Arts unless desired.)
- Step 4.** Obtain college approval of your study program at the appropriate college table. Registration blanks must be stamped at your college table. (College tables: Graduate School — Main Ballroom; Education, Liberal Arts, and Medical School — North Star Room. Follow the blue line.)
- Step 5.** **Class reservations** — Ski-U-Mah room. If any of your courses are listed on pages 29-32 of the bulletin, you must obtain a class reservation card for each course to be reserved. Follow the red line. If none of your courses are reserved, skip to step 6.
- Step 6.** Obtain a fee statement at the appropriate fee statement table for the college through which you are registering. Education and graduate students — the Pop Inn, 1st floor, East Wing. All other colleges — Men's Lounge, 2nd floor, East Wing. Turn in your registration blanks and any needed class reservation cards. You will walk away with your fee statement for the First Term. Note that it is due June 17. Your fee statement for the Second Term will be mailed to you on June 30, and it will be payable on or before July 22.

If you are a new student who has been admitted for the summer and the ensuing regular session, this is the place and the time to turn in your Registration Permit — and also your Medical Appointment Card, which you should obtain at the University Health Service.

If you are a student enrolling for the Summer Session *only*, you will have a Confirmation of Intent to Register or a Statement of Intent to Register (not required for Graduate School) which should be turned in at this point.

The optional Religious Census Card (if completed) should also be turned in when you obtain your fee statement.

- Step 7.** Pay fees at the Bursar's Office on the first floor of Morrill Hall, or by mail, or (if you are paying by check) a depository is available in Coffman Union. In St. Paul, you can pay at Cashier's Office, Coffey Hall. The hours are 8:15 a.m. to 3:30 p.m. Fees must be paid, or postmarked if mailed, not later than Tuesday, June 17.
- Step 8.** Begin classes Tuesday. Minneapolis classes on the East Bank and on the West Bank begin at 8 a.m. Classes in St. Paul begin at 7:30 a.m.

Registration Procedure at College Offices

(For all colleges not represented at Coffman Union [see page 17] and for regularly admitted or returning students in College of Liberal Arts)

- Step 1.** Obtain registration material at your college office. If you have a Summer Session bulletin, please bring it with you. Bulletins will be available only to students who do not already have a copy. Secure two registration blanks if you will be attending both first and second summer terms. Fill out a separate blank for each term.
- Step 2.** Obtain college approval of your study program at your college office.
- Step 3.** Go to Coffman Union and proceed with steps 5, 6, and 7 listed under "Registration Procedure at Coffman Union."

Exceptions: Students in Agriculture, Forestry, Home Economics, Biological Sciences, and Veterinary Medicine should turn in their registration blanks and class reservation cards and obtain their fee statements at 220 Coffey Hall, St. Paul.

SECOND TERM — ADVANCE REGISTRATION

Dates • July 14 to July 18

Students registered for the First Term who have not registered for Second Term should register during the advance registration period for Second Term, July 14-18. Students who are not registered for the First Term may register during the advance registration period for Second Term or on July 21.

Place

Currently enrolled students and former students seeking a degree from the University of Minnesota should register through the college in which they were last registered unless they have been approved for change of college. New summer students, former summer students, and former regular students no longer planning to obtain a degree from the University of Minnesota (if eligible to return) should begin registration through the college in which they are taking all or most of their summer courses.

Exceptions — Students in the summer-only student categories and former regular students no longer planning to obtain a degree from the University who plan to register for professional education courses should register through the College of Education. Students whose last college attendance was General College should register through General College. Students admitted to Graduate School must register through Graduate School.

The advance registration for Second Term will take place at the college offices as listed below:

Agriculture, Forestry, Home Economics, 225 Coffey Hall (St. Paul)	Social Sciences, 214 Social Sci- ences Building (West Bank)
Biological Sciences, 123 Snyder Hall (St. Paul) or 307 Zoology	Honors, 115 Johnston Hall
Business Administration, 225 Business Administration Building (West Bank)	Special Students, 216B or 225 John- ston Hall
Dental Hygiene, 360A Millard Hall	Medical Technology, C-205 Mayo Memorial Building
Dentistry, 136 Owre Hall	Medicine, 1360 Mayo Memorial Building
Education, 206 Burton Hall	Mortuary Science, 114 Vincent Hall
General College, 20 Nicholson Hall	Nursing, 125 Owre Hall
Graduate School, 316 Johnston Hall	Occupational Therapy, 860 Mayo Me- morial Building
Institute of Technology, 133 Main Engi- neering Building	Pharmacy, 115 Appleby Hall
Liberal Arts	Physical Therapy, 860 Mayo Memorial Building
Lower Division, 214 Johnston Hall	Public Health, 1325 Mayo Memorial Build- ing
Upper Division:	University College, 106 Nicholson Hall
Humanities, 206 Folwell Hall	Veterinary Medicine, 225 Coffey Hall (St. Paul)
Science and Math (and Central), 223 Johnston Hall	

SECOND TERM — FINAL REGISTRATION

Date • Monday, July 21, 8 a.m. to 4 p.m.

Registration on Tuesday, July 22, incurs late fee.

Late fees for the Second Term are as follows for payment of fees on:

July 22-25	\$ 3.00
July 28-August 1	5.00
Thereafter	10.00

No registrations accepted by mail.

No provision is made for allowing exemption from the late fee to those who are unable to reach the University during the scheduled registration days.

Place

A. No special registration at Coffman Union for Second Term

B. Registration at College Offices

Agriculture, Forestry, Home Economics,
225 Coffey Hall (St. Paul)

Biological Sciences, 123 Snyder Hall (St.
Paul)

Business Administration, 225 Business
Administration Building (West Bank)

Dental Hygiene, 360A Millard Hall

Dentistry, 136 Owre Hall

Education, 206 Burton Hall

General College, 20 Nicholson Hall

Graduate School, 316 Johnston Hall

Institute of Technology, 133 Main Engi-
neering Building

Liberal Arts

Regularly Admitted Students

Lower Division, 216B Johnston Hall

Upper Division:

Humanities, 206 Folwell Hall

Science and Math (and Central),
233 Johnston Hall

Social Sciences, 214 Social Sci-
ences Building (West Bank)

Honors, 115 Johnston Hall

Special Students, 216B or 225 Johnston
Hall

Medical Technology, C-205 Mayo Me-
morial Building

Medicine, 1360 Mayo Memorial Building

Mortuary Science, 114 Vincent Hall

Nursing, 125 Owre Hall

Occupational Therapy, 860 Mayo Me-
morial Building

Pharmacy, 115 Appleby Hall

Physical Therapy, 860 Mayo Memorial
Building

Public Health, 1325 Mayo Memorial Build-
ing

University College, 106 Nicholson Hall

Veterinary Medicine, 225 Coffey Hall (St.
Paul)

Procedure

- Step 1.** Obtain registration material at your college office.
- Step 2.** Obtain college approval of your study program at your college office.
- Step 3.** Obtain class reservation cards for reserved courses.
- Step 4.** Turn in registration blanks and class reservation cards and obtain fee statements in Morrill Hall.

Exceptions: Students in Agriculture, Forestry, Home Economics, Biological Sciences, and Veterinary Medicine should turn in their registration blanks and class reservation cards and obtain their fee statements at 220 Coffey Hall, St. Paul.

- Step 5.** Pay fees at the Bursar's office on the first floor of Morrill Hall; Cashier's office, Coffey Hall; or by mail. The hours are 8:15 a.m. to 3:30 p.m. Fees must be paid or postmarked, if mailed, not later than Tuesday, July 22.

Changes in Registration

After a student's registration has been accepted by the University recorder, any change must be approved by the Committee on Student Scholastic Standing or the dean of the college through which the student registered. Forms for changing registration may be obtained in the office of the college in which the student is registered. *Only in exceptional cases will any change be made after classes have begun.*

Friday of the third week of classes is the last day to cancel "with no grade." Thereafter, cancellation is with "F" or "N" if the student is failing and with no grade only if he is passing at the time of cancellation. Cancellation during the fifth week is generally not permitted.

The University of Minnesota reserves the right to cancel any and all courses in which the registration is insufficient to warrant continuation of the course.

Tuition and Incidental Fees

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

	4 credits or less	More than 4 credits
Tuition fee (per term)	\$59.00	\$72.00
Incidental fee‡‡ (per term) ..	16.25	16.25
Total fee (per term) ..	\$75.25	\$88.25

Note — Regular tuition fees as provided during the academic year will be charged all students in medicine and nursing. In veterinary medicine and dentistry, students pay tuition at the summer rate or academic year rate, whichever is higher. Special tuition fees are collected for the Biology Session. All students pay the Summer Session incidental fee.

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 thesis-only for \$20 per summer term with incidental fee optional to maintain required continuous registration. Other graduate students may register for thesis-only upon payment of \$31 tuition per term and required incidental fee.

Summer Session staff members are entitled to the same fee privileges in the summer as during the academic year. Eligible staff members pay at the resident rate in the Graduate School as follows: more than 3 credits, \$52 per term; 3 credits or less or thesis only, \$26 per term plus incidental fee.

For additional fee information, refer to the bulletins of the specific schools and colleges.

‡‡ The incidental fee of \$16.25 per term is charged each student for which the student receives the privileges of the Coffman Memorial Union, the Health Service, and the recreation program including the *Minnesota Daily*.

Course Fees

(All fees are per term unless otherwise indicated)

Students taking the following courses will pay course fees in addition to tuition as follows:

Health Service (field trips and foreign study) \$9.90 per summer term—required of students on University field trips such as anthropology, civil engineering, geology, mines, etc. Students in University-sponsored foreign travel groups are required to enroll in the Blue Cross-Blue Shield program or take out other adequate insurance.

Itasca Biological Station

\$8.50 — Laboratory fee

††\$5.00 per week — Research Table fee

Mathematics

‡‡\$59.00 — Z (Preparatory Mathematics)

Modern Language Residence Houses (Summer Session)

\$40.00 per term — French (100); or German (100)

Music

\$50.00 for two, \$100 for four half-hour individual lessons per week — A, D (no cr)

\$50.00 for two (2 cr), \$100 for four (4 cr) half-hour individual lessons per week — 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 61-80, 100

\$100.00 — 204

\$15.00 — Piano for children, ages 6-16

Students paying \$50.00 or more in music fees pay only the special fees indicated for these courses. Such students may take other courses by paying regular summer tuition and incidental fee in addition to the applied music fee.

Upper Division music majors check with Music Department office about course fees.

Public Health

\$100.00 per year — 169 (Field Work)

\$100.00 — 190 (Field Work)

\$150.00 — 138 (Hospital Problems)

\$200.00 — 230 (September Field Course)

\$251.00 — 231, 232 (Ground Water)

†† In lieu of tuition.

‡‡ Students taking Math Z will pay only a course fee of \$35. Students taking Math Z and additional courses will pay the full-time tuition fee and the incidental fee.

Special Fees

Music Practice Room

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

\$3.50 per term, 10 hours per week for 5 weeks (25¢ per hour for each additional hour per week — all instruments except organ)

.25 per hour — small organ

.50 per hour — large organ

Physical Education††

Cooke Hall

Locker and towel fee — \$4.00 plus \$1.00 deposit

Gym clothing rental fee — \$4.00

Norris Gymnasium

Locker and towel fee — \$4.00 plus \$1.00 deposit

St. Paul Gymnasium

Locker and towel fee — \$4.00

Speech and Hearing Clinic — Nonstudents

Articulatory cases, per 10 weeks — \$15.00 for one, \$25.00 for two, \$30.00 for three, \$35.00 for four, \$40.00 for five lessons per week.

Stuttering, per term — \$100.00 for full-time remediation.

Speech and Hearing Clinic — Students

\$5.00 per term — special clinical treatment

Miscellaneous

\$ 2.50 per term — Foreign student health fee, required of all non-citizens

10.00 — Credential examination fee

5.00 — Large diploma

5.00 — Master's thesis binding

25.00 — Ph.D. thesis binding

5.00 — Special examination

1.00 — Record service fee, required of all new students

†† 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 pursued, subject to all the following conditions:

1. **Curriculum Requirements** — Certification by the University recorder of the completion of all requirements of the course of study as outlined in the college announcement, or its equivalent as determined by the faculty of the college offering the course.

2. **Recommendation by the Faculty.**

3. **Residence Requirement** — The student must earn at least 1 year's credit in residence in 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 under such rules as may be established by each college for such exemptions. In addition, special residence requirements must be met in several of the schools and colleges. Extension courses (not independent study courses) may apply toward the residence requirement.

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

5. **Attendance at Commencement** — A candidate for a degree is required to be present at the commencement exercises at which his degree is conferred. Commencement exercises for Summer Session candidates will be held:

First Term Friday, July 18, 4 p.m.
Second Term Friday, August 22, 4 p.m.

A student who fails to attend may not receive his diploma until the expiration of 1 year, unless in the meantime he attends commencement exercises or unless excused by the dean of the college.

6. **Graduation Fee** — each degree, \$10.

7. **Placement Service Fee** — required of candidates for degrees from:

Duluth	\$10.00
Institute of Technology	5.00
College of Education (except Nursing Education)	15.00
Morris (optional)	10.00

Deposit Cards

Deposit cards may be purchased from the bursar (or from the cashier, Coffey Hall, for agricultural biochemistry). Chemistry cards are \$10; biochemistry (agricultural), art, pharmacy, and biochemistry (medical) cards are \$5.

Laboratory material and breakage will be charged against your deposit card. Any unused balance will be refunded at the end of the course.

You must present your deposit card to be assigned a laboratory desk. Veterans (P.L. 894) will receive information from their instructor concerning deposit cards and laboratory assignments.

Refund of Fees

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

Length of Term	80 Percent Refund for Attendance	60 Percent Refund for Attendance	No Refund for Attendance of More Than
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 classes as auditors may be granted by the dean of the college or school with the consent of the department concerned. The procedure for registration as auditor is the same as for registration for credit, except that "auditor" should be indicated on the registration sheet in the credits column. It is expected that auditors will be registered in at least one course for credit, but this regulation may be waived in exceptional cases.

Amount of Work

A maximum of 9 credits or two 5-credit courses is considered a full program for either term. Registration for a greater number requires special permission from the Committee on Student Scholastic Standing or the dean of the school or college in which the student is registered.

Examinations

Examinations are normally held at the last scheduled class hour for each course.

Courses to Be Reserved

As part of registration, all undergraduate and graduate students must obtain class reservation cards for the courses listed below. Students registering for College of Education and College of Liberal Arts courses on June 16 will obtain class reservation cards for these courses in Coffman Union. Course cards for reserved courses must be attached to the student's registration blank when turned in to obtain a statement of fees.

TWIN CITIES CAMPUS — FIRST TERM

- Accounting**
24, 25, 26—JohH 12
- American Studies**
102-202—JohH 12
- Analytical Chemistry**
All courses under 200—E 136
- Anthropology**
140—JohH 12
- Architecture**
All courses—E 136
- Art Education**
10C, 53C, 184—Bu 206
- Art Studio**
All courses under 193—JohH 12
- Biology**
1—CofH 225 for AFHE, and JohH 205 for other students
- Botany**
See Itasca Biology Session
- Business Education**
130, 132, 157—Bu 206
- Business Law**
58, 158—BA 225
- Curriculum and Instruction**
56, 60, 61, 62, 63, 64, 65, 100A, 100B, 100D, 101A, 101B, 102, 103, 107, 109, 113, 119, 121, 122B, 143A, 150, 153, 153A, 166, 193C, 252—Bu 206
- Distributive Education**
All courses under 238—Bu 206
- Ecology and Behavioral Biology**
See Itasca Biology Session
- Economics**
1, 2, 65, 66, 67, 68, 69, 75, 103, 103A, 165, 166—JohH 12
- Education**
55A, 75A—Bu 206
- Educational Administration**
128, 210, 235—Bu 206
- Educational Psychology**
110, 116, 148, 150, 159, 160, 160A, 170, 177, 184, 192, 193, 209, 216A, 218, 218A, 237, 248, 282—Bu 206
- Electrical Engineering**
All courses—E 136
- Engineering Graphics**
All courses—E 136
- English**
1, 3, 21, 22, 55, 56, 60, 72—JohH 12
- Entomology, Fisheries, and Wildlife**
See Itasca Biology Session
- Family Studies**
1, 1A, 15, 25, 100—JohH 12
- French**
3, 22, 56A—JohH 12
- General Chemistry**
4, 6—CofH 225 for AFHE, E 136 for IT, and JohH 12 for other students
All other courses—E 136 for IT, and JohH 12 for other students
- General College**
All courses—NH 20
- Geography**
71, 81, 157, 182—JohH 12
- Geology and Geophysics**
1, 109C—E 136 for IT, and JohH 12 for other students
- German**
All courses except 149—JohH 12
- History**
139A—JohH 12

History and Philosophy of Education

90, 101—Bu 206

Home Economics

24A, 49, 76, 86, 86A, 172, 184—CofH 225

Home Economics Education

196B, 196D—CofH 225

Humanities

1A, 4, 53, 54, 55, 61B, 62A, 99, 132—JohH 12

Industrial Relations

52—BA 225

Journalism

5, 18, 57, 79, 140—JohH 12

Library

102, 103, 104, 241, 242, 261, 262, 268—JohH 12

Management

60, 70—BA 225

Marketing

57, 295—BA 225

Mathematics

All IT—E 136

All Arts—JohH 12

Mathematics Education

111, 121, 122—Bu 206

Mechanical Engineering

All courses—E 136

Mechanics and Materials

All courses—E 136

Mechanized Agriculture

4—CofH 225

Metallurgical Engineering

All courses under 200—E 136

Methods and Student Teaching

52—Bu 206

Mortuary Science

All courses—VH 114

Music

4—JohH 12

Music Education

56—Bu 206

Natural Science

1—JohH 12

Organic Chemistry

61—CofH 225 for AFHE, E 136 for IT, and JohH 12 for other students

All other courses under 200—E 136

Personal Orientation

1—JohH 12

Philosophy

2A—JohH 12

Physical Chemistry

All courses—E 136

Physical Education for Men

5A, 29A, 36A, 37A—JohH 12

Physical Education for Women

5A, 28A, 29A, 36A, 37A—JohH 12

Professional Physical Education Courses for Men and Women

70, 160—JohH 12

Physics

1A—CofH 225 for AFHE, E 136 for IT, and JohH 12 for other students

All other courses—E 136

Political Science

1, 107, 115, 116, 130, 141, 161, 177, 187—JohH 12

Psychology

4-5—JohH 12

Quantitative Analysis

52, 62—BA 225

Rhetoric

22, 51, 62—CofH 225

47—CofH 225 for AFHE, and JohH 205 for other students

School Health Education

25, 70, 119—Bu 206

Social Science

51, 52, 62, 93—JohH 12

Social Work

91, 100, 101—JohH 12

Sociology

123—JohH 12

Soil Science

See Itasca Biology Session

Speech

5, 6, 50, 51, 52, 65, 81, 82, 106, 170—JohH 12

Theatre Arts

11, 21, 24, 34, 74, 90, 100, 115, 131, 190, 191, 192, 211, 215—JohH 12

Zoology

See Itasca Biology Session

TWIN CITIES CAMPUS — SECOND TERM

- Accounting**
24, 25, 26—JohH 12
- Analytical Chemistry**
All courses under 200—E 136
- Anthropology**
140—JohH 12
- Architecture**
All courses—E 136
- Art Education**
10C, 18C, 80C, 184—Bu 206
- Art Studio**
All courses under 192—JohH 12
- Biology**
2—CofH 225 for AFHE, and JohH 205 for other students
- Botany**
141, 141A—CofH 225
See Itasca Biology Session
- Business Education**
158—Bu 206
- Curriculum and Instruction**
57, 60, 61, 62, 63, 64, 65, 100C, 101A, 101B, 102, 103, 105, 108, 112, 119, 121, 122A, 122B, 143A, 145, 153, 155A, 166, 193B, 250—Bu 206
- Distributive Education**
All courses under 238—Bu 206
- Ecology and Behavioral Biology**
See Itasca Biology Session
- Economics**
1, 2, 65, 66, 68, 104, 104A, 165, 166—JohH 12
- Education**
55B—Bu 206
- Educational Administration**
139—Bu 206
- Educational Psychology**
110, 116, 148, 150, 159, 161, 161A, 193, 208, 217A, 218, 218A, 237, 257, 283—Bu 206
- Electrical Engineering**
All courses—E 136
- English**
1, 2, 55, 56, 73—JohH 12
- Entomology, Fisheries, and Wildlife**
See Itasca Biology Session
- Family Studies**
1—JohH 12
- General Chemistry**
5—CofH 225 for AFHE, E 136 for IT, and JohH 12 for other students
All other courses—E 136 for IT, and JohH 12 for other students
- General College**
All courses—NH 20
- Geology and Geophysics**
2, 122C—E 136 for IT, and JohH 12 for other students
- German**
All courses—JohH 12
- History and Philosophy of Education**
90—Bu 206
- Home Economics**
24B-86—CofH 225
- Humanities**
1A, 2A, 4, 54, 55, 63B—JohH 12
- Industrial Education**
106—PeikH 125
- Industrial Relations**
52, 152—BA 225
- Journalism**
11—JohH 12
- Library**
101, 102, 103, 104, 105, 194, 243, 260, 268—JohH 12
- Management**
70—BA 225
- Marketing**
57, 157—BA 225
- Mathematics Education**
145, 166—Bu 206
- Mechanical Engineering**
All courses—E 136
- Mechanics and Materials**
All courses—E 136
- Mortuary Science**
All courses—VH 114
- Music**
4—JohH 12

- Music Education**
56—Bu 206
- Natural Science**
2—JohH 12
- Organic Chemistry**
62—CofH 225 for AFHE, E 136 for IT,
and JohH 12 for other students
All other courses under 200—E 136
- Personal Orientation**
1—JohH 12
- Philosophy**
2A—JohH 12
- Physical Chemistry**
All courses—E 136
- Physical Education for Men**
27A, 29B, 36A—JohH 12
- Physical Education for Women**
13A, 27A, 36A—JohH 12
- Professional Physical Education Courses
for Men and Women**
45, 70—JohH 12
- Physics**
2A—CofH 225 for AFHE, E 136 for IT,
and JohH 12 for other students
All other courses—E 136
- Plant Physiology**
141A—CofH 225
See Itasca Biology Session
- Political Science**
2, 10B, 14B, 149, 160, 161, 184—JohH
12
- Psychology**
4-5, 190—JohH 12
- Rhetoric**
22, 47, 51—CofH 225
- School Health Education**
70—Bu 206
- Social Science**
93—JohH 12
- Spanish**
2—JohH 12
- Speech**
5, 6, 52, 65, 69, 81—JohH 12
- Theatre Arts**
18, 24, 54, 75, 114, 118—JohH 12
- Transportation**
54—BA 225
- Zoology**
See Itasca Biology Session

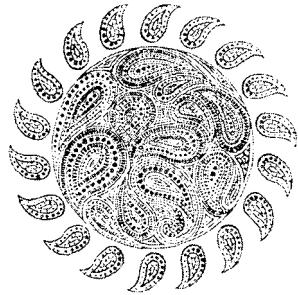
ITASCA BIOLOGY SESSION

FIRST TERM

- Botany**
116, 155—CofH 225
- Ecology and Behavioral Biology**
120, 136, 139—CofH 225
- Entomology, Fisheries, and Wildlife**
59—CofH 225
- Soil Science**
137—CofH 225
- Zoology**
72, 115, 135—CofH 225

SECOND TERM

- Botany**
112, 117, 159—CofH 225
- Ecology and Behavioral Biology**
119, 135, 162, 163—CofH 225
- Entomology, Fisheries, and Wildlife**
129—CofH 225
- Plant Pathology**
156, 160—CofH 225
- Zoology**
72, 115—CofH 225



General Information

Dates of Summer Session

The Summer Session consists of two terms of 5 weeks each — June 16 through July 18, and July 21 through August 22. Students may register for subjects of their choice in either or both terms. Payment of fees for the First Term closes at 3:30 p.m. on Monday, June 16. First Term classes in Minneapolis (East and West Banks) will begin Tuesday, June 17, at 8 a.m. Classes in St. Paul will begin at 7:30 a.m., Tuesday, June 17.

Payment of fees for the Second Term closes at 3:30 p.m. on Monday, July 21. Classes for Second Term will open Tuesday, July 22.

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

Human Rights

The University of Minnesota is guided by the principle that there shall be no differences in the treatment of persons because of race, creed, color, or national origin and that equal opportunity and access to facilities shall be available to all. This principle is particularly applicable in the admission of students in all colleges, and in their academic pursuits. It is also applicable in University-owned or University-approved housing, in food services, student unions, extracurricular activities, and all other student services. It is a guiding policy in the employment of students either by the University or by outsiders through the University and in the employment of faculty and civil service staff.

Library Facilities and Services

The University library system with approximately 2,750,000 volumes, is one of the 10 largest of its kind in the United States. As such it provides the basic resources for the teaching and research needs of the students and faculty of the University. There are many library units on campus, with the O. Meredith Wilson Library serving as headquarters of the Library System. A library handbook will serve to guide the user to the correct location of the materials needed.

O. Meredith Wilson Library

This new library building was occupied in September 1968. It contains the humanities and social sciences collections of the University Library. Located on the West Bank with other new buildings of the expanded campus, it houses the administrative offices, the central processing and resources staffs, as well as the major service units.

Among the many specialized collections within the Wilson Library, particularly noteworthy are the Ames Library of South Asia, the James Ford Bell Library which contains rare volumes dealing with exploration and trade from the 16th through 18th centuries, the East Asian Library, the Middle East Library, and the Special Collections Department which has responsibility for the custody of rare books and unique collections.

Other specialized resources in the Wilson Library are the Newspaper Division, the Map Division, the Documents Division, the Business Reference Service, and a collection of recordings of the spoken word.

Among the services provided in the Wilson Library are a Reserve Room, a Circulation Service, a Reference and Bibliography Service, and an Interlibrary Loan Service.

Walter Library

Until 1968, this large building served as the University's central library. It now contains the Education Library, which serves Education, Psychology, and Library Science; the Chemistry Library, which provides service also for the science and technology needs; a Reserve Book Room serving East Bank classes; and the Music Library, which includes listening facilities.

Specialized services in the Walter Library include the Technical Information Service, the University Archives, Immigrant Archives, and Architecture Archives.

Departmental Libraries

The library needs of students in some of the specialized scientific and professional fields generally are met through the collections of the various departmental libraries. On the East Bank are the Art, Architecture, Mathematics, Physics, Chemistry, Music, Mines and Metallurgy, Journalism, Geology, and Pharmacy Libraries. Also on the East Bank are

the more extensive collections of the Biomedical Library, the Engineering Library, and the Law Library. On the West Bank there is a Public Administration Library.

St. Paul Campus Libraries

The St. Paul Campus is served by a central library which houses publications relating to agriculture and home economics. Outlying specialized collections are in departmental libraries for Forestry, Biochemistry, Plant Pathology, Entomology, and Veterinary Medicine.

Library Hours

During the Summer Session, hours of service for libraries are posted in the individual libraries concerned and are also published in the Official Daily Bulletin. In general, except for holidays and the vacation period following Second Term, the major libraries are open from 8:00 a.m. to 11:00 p.m. on weekdays; from 8:00 a.m. to 5:00 p.m. on Saturdays; and from 2:00 p.m. to 11:00 p.m. on Sundays.

University Health Service

The University Health Service provides an outpatient and a hospital service 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 being on duty. Through the University Health Service, the University makes available to students medical care, health consultations, and hospitalization. General service is provided without further charge to all students who have paid the incidental fee. For certain services such as dentistry, drugs, prolonged hospitalization, surgical operations, etc., special fees are charged. Surgical care for preexisting conditions is not provided.

Student Employment Service

If you are a student on the Twin Cities Campus and need a job to help meet school expenses, the Student Employment Service, 30 Wulling Hall, will help you find part-time work either on or off campus. Apply in person at the office after you have enrolled and know your class schedule. Your chances of being placed depend on the supply of jobs, your qualifications, your need, and the hours you have available. Very frequently a job will provide valuable experience as well as financial assistance. Work for board and room is usually available for girls, and sometimes for men or married couples.

Dormitory counseling opportunities are also available for men and women in the Residence Halls Counseling Program. Write to the Student Employment Service for further information.

Student Counseling Bureau

The services of the Student Counseling Bureau, 101 Eddy Hall, are provided for those who wish to learn more about themselves as they develop in an educational setting. These services include counseling, testing, assistance in the development of reading and study skills, and an occupational library. About one-third of our University students will talk at some time with a professional and experienced counselor about courses they wish to take, vocations they are considering, personal stress situations, reading, study skills, and spelling improvement, personal or family relations, and the like.

A student is urged to seek these services early and not to delay until grades are seriously affected. If you wish to review your progress or obtain assistance in planning your future, you are urged to talk with a counselor at the bureau.

Precollege counseling is available at a small fee to those who have not yet entered the University (no fees are charged University of Minnesota students). When you consider applying for admission to the University, you are encouraged to come to the Student Counseling Bureau for information about the different colleges in the University, courses available to you, and various University services for students.

Intracampus Bus

All students and staff desiring transportation between the Minneapolis and St. Paul areas of the campus may ride the intracampus bus free. Passengers boarding or exiting at any of the stops can purchase tickets at the Bursar's Office in Minneapolis or the Cashier's Office in St. Paul.

University Post Office

The University post offices are located on the ground floor of Coffman Memorial Union in Minneapolis, and in Coffey Hall in St. Paul. All regular post office services are available at these stations.

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

Parking Facilities

For the summer, some space will be available in the University garages and lots at Summer Session rates for either or both terms. Reservations may be made in advance by writing to the Department of Police, Parking Facilities, 2030 University Avenue S.E., University of Minnesota, Minneapolis, Minnesota 55455.

Parking is also available on a daily basis and at reasonable rates in the University's outdoor parking lots which are located on and adjacent to the campus.

Official Daily Bulletin

Throughout the Summer Session an Official Daily Bulletin is published in the *Minnesota Daily*, the University student newspaper. Each morning that the *Daily* is published, it is delivered to boxes strategically placed on the campus. Students and staff members are urged to read the Official Daily Bulletin and are held accountable for notices that affect them.

Religious Activities

Thirty-nine student religious organizations, representing 36 faiths and denominations, function on the Twin Cities Campus. There are 12 religious center buildings in the University area which maintain programs of study, discussion, worship, and recreation. Information may be secured from the office of the Coordinator of Students' Religious Activities, 306 Walter Library (telephone 373-4076).

Housing and Food Service

Minneapolis Residence Halls

Ada Comstock Hall for women is a modern residence hall reserved for the use of Summer Session students and will offer comfortable living in large double and single rooms with well-planned and tasty meals prepared and served under the direction of a trained food manager. Meals will be served in both terms 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 made as early as possible. For additional information and application forms write to: Director of Comstock Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Centennial Hall, an ultramodern men's residence, offers comfortable living in large double and single rooms. A room and 5-day board contract will be offered. Meals will be served in both terms on the first day of regularly scheduled classes. Early application is suggested. For application forms and additional information write to: Director of Centennial Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Middlebrook Hall (West Bank) is the newest of the University's co-educational dormitories. Fully air-conditioned double and single rooms are available on a *room only* basis. For an application write to: Director of Middlebrook Hall, 180 Westbrook Hall, University of Minnesota, Minneapolis, Minnesota 55455. If circumstances should prevent the opening of Middlebrook, room-only contracts will be provided in Territorial Hall.

St. Paul Residence Hall

Bailey Hall is a new attractive residence hall offering comfortable accommodations in large double rooms. It has one wing for men and a separate wing for women, joined by a common lounge. A room and 7-day board contract will be offered. Meals will be served beginning on the first day of regularly scheduled classes. For application forms and information, write to: Director of Bailey Hall, University of Minnesota, St. Paul, Minnesota 55101.

Off-Campus Housing — Private Residences

Rooms in private homes, rooming houses, fraternities, sororities, and a newly remodeled private coeducational residence hall, Andrew House, are available. Rooms in Andrew House may be arranged in advance, but vacancy listings for the other types of off-campus housing are generally secured after arrival on campus. Upon request, lists of summer sublets in housekeeping units such as apartments and houses are available beginning in May. Residences of regularly enrolled students are inspected throughout the year for health, safety, and study conditions.

The Student Housing Bureau provides counseling service in the residence halls during the Summer Session. Counselors are available to assist with individual and group activities and problems.

Information about housing facilities and assistance in locating residence accommodations may be secured from the Student Housing Bureau, 209 Eddy Hall in Minneapolis, and 101 Coffey Hall in St. Paul.

Food Service

Cafeterias, lunchrooms, and a soda fountain are available to students in Coffman Memorial Union. The main cafeteria is located on the ground floor. Also there are commuters' lunchrooms for students who bring their lunches. Banquet, party, and private dining room facilities are available. Limited cafeteria service is offered in the St. Paul Dining Center and snack bar and vending facilities are available in the St. Paul Student Center.

A lunchroom with a full line of vending machines is located in the basement of each classroom building on the West Bank in Minneapolis, as well as in the Science Classroom Building on the East Bank. Milk

and other vending machines are located in many of the other academic buildings on the Twin Cities Campus.

Privately operated restaurants are located near all areas of the campus.

Recreation

The University of Minnesota, aware of the need for relaxation during the intensive accelerated summer academic program, has planned a variety of recreational and cultural activities on campus at very little or no cost to the student.

The location of the University makes possible the use 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.

Sports Program

Summer Session students may participate in a variety of recreational activities such as archery, badminton, golf, swimming, table tennis, and volleyball at Cooke Hall, Norris Gymnasium, and the St. Paul Gymnasium.

Tournaments for men in bowling, golf, horseshoes, fast and slow pitch softball, and tennis are arranged each summer.

Special clinics are held for men and women students in selected activities such as archery, golf, swimming, and tennis.

Most of the activities included in the program involve no extra charge with the exception of locker-towel service.

Sports Facilities

Facilities offered by the University include:

Gymnasiums and swimming pools for men and women in Cooke Hall, Norris Gymnasium for Women, and the St. Paul Gymnasium. Swimming pools are open Monday through Friday at scheduled hours.

Baseball and softball facilities on Bierman Field.

One *18-hole golf course* and *tennis courts* may be used by regularly enrolled Summer Session students upon presentation of a fee statement and a small fee. The golf courses can be reached by intracampus bus.

University Gallery

The University Gallery, located on the third and fourth floors of Northrop Memorial Auditorium, stresses a program of frequently changing major exhibitions which provide the opportunity to both students and staff to have contact with large numbers of original works of art from all periods and in all media.

For the student who seeks a liberal education in the arts, the University Gallery with its exhibition program and growing permanent collection provides a unique opportunity to supplement experiences in the lecture room, studio, and library. For the student who seeks training in the arts, the gallery provides research facilities and specialized exhibitions.

The University Gallery also maintains a rental program of framed prints to students and a loan program to provide original art works for public spaces on campus.

During the Summer Session, a special exhibition program on the Art of India is planned in conjunction with the C.I.C. South Asian Program. Exhibits will include sculpture and painting from the 2nd century B.C. through the 18th century. Lectures as well as a comprehensive catalog of the show will be offered.

Gallery hours are 8:30 a.m. to 4 p.m., Monday through Friday. The gallery's main office is located in 316 Northrop Memorial Auditorium (phone 373-3424).

St. Paul Campus Student Center

The St. Paul Student Center will be open throughout the Summer Session. Complete information about the Student Center and campus activities may be obtained at the Program Information Center on the ground floor and at the Information Desk on the first floor.

Facilities include lounges, a ballroom, a craft shop, television, magazines, conference rooms, and a games area with bowling lanes, table tennis, and billiards tables.

The Rouser Room is open for those who wish breakfast, a light lunch, or a between-meal snack.

Coffman Memorial Union

Summer Session students will find an informal, friendly spirit in the Coffman Memorial Union which offers a pleasant respite from the rigors of classroom activities. Comfortable lounges, a variety of dining areas, and recreational facilities give the union a pleasant setting for informal, social, and recreational activities. Rooms can be reserved for group meetings or luncheons. The Coffman Information Center, on the first floor, is open from 7:30 a.m. to 10 p.m. daily to assist you. The union is open 7 a.m.-10 p.m. Monday through Friday.

Facilities

Facilities include billiards and table tennis . . . bowling lanes with automatic pinspotters . . . an Art Craft Studio for general hobby craft (woodworking, leather work, ceramics, jewelry, photography) . . . a large cafeteria and fountain grill for dining . . . a commuter's lunchroom with vending machines . . . men's, women's, and coeducational lounges for resting and studying . . . an outdoor terrace for lounging or dining . . . a spacious ballroom for informal dancing, parties, lectures, and special activities . . . the University Post Office and Union Bookstore . . . and barber and beauty shops. The union is joined to the parking ramp by an enclosed walkway.

Union Program

Coffman Memorial Union provides a diversified program during the summer which includes instruction in crafts and sailing. Art exhibits, band concerts, jazz programs, and dances are some of the events for the summer student. Consult the *Minnesota Daily* for specific program events.

Students are encouraged to serve on planning committees and provide leadership for events. Visit the program office, Room 229, for committee opportunities and information on programs.

West Bank Union

West Bank Union committees sponsor a series of cultural and recreational activities throughout the Summer Session. Schedules and information may be obtained in the West Bank Union office, 110 Anderson Hall.

Facilities of the West Bank Union include lounge rooms in Anderson Hall and the Business Administration Building.

Excursions

Conducted excursions may be taken to points of historical, industrial, educational, and recreational interest. The transportation fee is the only cost of these tours.

Concerts and Lectures

Through the Department of Concerts and Lectures, the Summer Session provides varying experiences in music and the Dance, including symphonies, solo recitals, chamber music, opera, and dance presentations. In addition, lecturers offer their expert observations on the arts, science, national, and international affairs.

James Ford Bell Museum of Natural History

Nearly 100 lifelike displays of Minnesota plants and animals mounted in their typical environments are open to the public without charge in the James Ford Bell Museum of Natural History, located at 17th and University Avenues S.E. in Minneapolis. In addition, many thousands of specimens of reptiles, amphibians, fishes, birds, and mammals are available for those interested in more careful study in these fields.

A guide will be furnished, upon appointment, to a visiting group of 15 or more. Teachers or discussion leaders can indicate to the guide those topics or biological factors of particular concern to the group.

A bookstore is located off the lobby with books, prints, and recorded bird call albums selected to meet the needs of museum patrons, both young and old.

The museum's modern auditorium is widely used by many campus departments. The exhibition corridors are open to the public from 9 a.m. to 5 p.m., Monday through Saturday, and from 2 to 5 p.m. on Sundays.

Summer Film Program

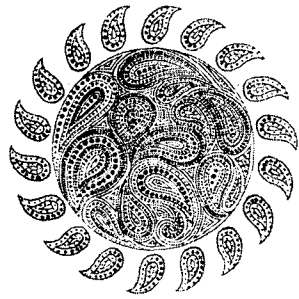
Each year the Summer Session sponsors a film program which centers around a theme of current interest or current study. This summer the series will provide additional material for the Inter-University Rotating Summer Program in South Asian Studies. The films will center particularly on India and Pakistan. They will be shown once weekly at lunch time. Check the campus bulletin boards for the exact time and location of these showings.

University Theatre

The University Theatre has won world-wide acclaim with its presentation of exceptionally fine plays on campus, its International Touring Companies, and the Minnesota Centennial Showboat. The Showboat will again be operated on the Mississippi River by the University Theatre, producing two plays — tentatively selected are Sheridan's *The School for Scandal* and Aristophanes' *The Birds*.

Presentations in the newly air-conditioned Scott Hall Auditorium during the coming summer will probably include Lorca's *Blood Wedding* and another play, both featuring black as well as white actors.

A gala season of three plays for children's audiences is also being developed for presentation by the Peppermint Tent Players on the Mississippi River bank beside the Showboat.



Course Descriptions

First Term

College of Agriculture, Forestry, and Home Economics

For general information on the College of Agriculture, Forestry, and Home Economics, see section on Schools, Colleges, and Special Programs.

Agricultural Economics (AgEc)

111 AGRICULTURAL ECONOMIC ANALYSIS

The economic behavior of households, firms, and industries with special applications to agriculture; competition and monopoly power; factors affecting pricing and production decisions. (3 cr; prereq 3; I-II MTWThF [meets June 9-27 only]; HH 100) Helmberger

113 LAND RESOURCE USE

Land as a factor of production; rural and urban utilization; rents and land values; land classification, taxation, exchange; public land management. (3 cr; not available for Ag Econ majors; prereq 111 or §; III-IV MTWThF [meets June 9-27 only]) Staff

200 GENERAL SEMINAR: AGRICULTURAL ECONOMICS

Special problems for individual work by qualified students. (3 cr; prereq § in advance of regis; hrs and room ar) Staff

Agricultural Engineering (AgEn)

Mechanized Agriculture (MeAg)

4 AGRICULTURAL SHOP-METAL WORK

Arc and oxyacetylene welding, soldering, use and conditioning of metal working tools, and the identification and characteristics of metals used in farm machinery. (4 cr; prereq GeCh 4 or §; I-III MTWTh, I-IV F; AgEng 35 and 20) Schroeder

130 INSTRUCTIONAL METHODS IN FARM MECHANICS

Planning high school farm shops including building layouts, equipment organization, tool and supply selection, and storage methods. Administering farm mechanics programs, demonstrations, job records, and farm mechanics problems related to the student's farming program. (3 cr; prereq 10 cr in mechanized agriculture, AgEd 91 or §AgEd 91 or §) Bear

131 PROBLEMS AND FIELD STUDIES IN ADVANCED FARM MECHANICS

Principles and practices pertaining to the implementation of an instructional program in farm mechanics. (3 cr per term [9 cr max]; prereq 130; VI-VIII M, VI-IX TWTh, VI F; AgEng 35 and 20) Bear

Agronomy and Plant Genetics (Agro)

Agronomy

201* RESEARCH IN FARM CROPS

Problems in physiology, production, and classification of crop plants. (Cr and hrs ar) Staff

Plant Breeding

- 241* **RESEARCH IN PLANT GENETICS**
May be taken as major or minor work. (Cr and hrs ar) Staff
- 244 **LABORATORY METHODS IN PLANT BREEDING**
Field study of plant breeding programs and techniques. (1 cr total for both terms; prereq 132 or §) Lambert

Animal Science (AnSc)

- 153 **NONRUMINANT NUTRITION**
Nutrient requirements of nonruminants (poultry and swine); nutrient content of feedstuffs, primarily cereals, their by-products, and other concentrates; utilization of feedstuffs to formulate adequate diets. (3 cr; prereq 44 or 52; III-IV MTWThF [concentrated course, June 9-27]; PetH 110) Meade
- 209* **RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY**
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. (Cr and hrs ar; prereq §) Staff
- 210* **RESEARCH IN ANIMAL SCIENCE**
Research including experimental studies in the disciplines associated with animal production and research with special emphasis on interdisciplinary studies embracing environmental and managerial considerations. (Cr and hrs ar; prereq §) Staff
- 211* **RESEARCH IN ANIMAL GENETICS**
Research in quantitative genetics, cytogenetics, and other areas related to animal breeding. (Cr and hrs ar; prereq §) Staff
- 212* **RESEARCH IN ANIMAL NUTRITION**
Research in selected areas of animal nutrition. Research topics and animal species determined by consultation. (Cr and hrs ar; prereq §) Staff
- 231* **RESEARCH IN ANIMAL PHYSIOLOGY**
Individual research under faculty direction. Topics to be determined by consultation and may be a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser. (Cr and hrs ar; prereq §) Staff

Entomology, Fisheries, and Wildlife (Ent)††

Ample opportunity for research work in various phases of entomology, fishery biology, and wildlife biology will be afforded properly qualified students. This work will be on an individual basis.

- 55 **ENTOMOLOGICAL TECHNIQUES**
Practical laboratory instruction in mounting, preservation of insect larvae; preparation of microscopic mounts of minute insects; labeling, classifying, and cataloguing specimens of insects for scientific study. (1-3 cr; prereq 74 or equiv) Cook
- 243* **RESEARCH IN ENTOMOLOGY**
(Cr ar) Hodson, Chiang, Cook, Cutkomp, Harein, Peterson, Richards, Brooks, Furgala, Kulman, Price, Radcliffe
- 267* **RESEARCH IN FISHERY BIOLOGY**
(Cr ar) Smith, Waters, Underhill

†† For additional courses, see index for Biology Session.

- 280* RESEARCH IN WILDLIFE BIOLOGY**
(Cr ar) Marshall, Beer, Tester, Erickson, Mackie

Food Science and Industries (FSci)

- 170* SPECIAL PROBLEMS IN FOOD MANUFACTURING**
Individual laboratory or library research on chemical, physical, and engineering problems involved in processing and utilization of food products. (1-3 cr; prereq sr or #; hrs ar) Staff
- 180* SPECIAL PROBLEMS IN DAIRY AND FOOD MICROBIOLOGY**
Laboratory or library research on problems related to the microbiology of dairy and other food products. (1-5 cr; prereq sr or #; hrs ar) Staff

Forestry (For)

Offered on the St. Paul Campus

- 200* RESEARCH PROBLEMS IN SILVICULTURE**
(Cr ar) B Brown, Hansen, Bakuzis, Scholten, Tappelner
- 203* RESEARCH PROBLEMS IN FOREST MANAGEMENT**
(Cr ar) B Brown, Irving, Meyer, Winsness, Hughes, Hallgren
- 205* RESEARCH PROBLEMS IN FOREST ECONOMICS**
(Cr ar) Skok, Hughes
- 207* RESEARCH PROBLEMS IN FOREST PRODUCTS ENGINEERING**
(Cr ar) Haygreen, Hossfeld, Kaufert, Erickson, Gertjeansen
- 213* RESEARCH PROBLEMS IN FOREST UTILIZATION**
(Cr ar) Haygreen, Hossfeld, Kaufert, Erickson, Gertjeansen, Thompson
- 215* RESEARCH PROBLEMS IN FOREST TREE PHYSIOLOGY**
(Cr ar) Sucoff
- 217* RESEARCH PROBLEMS IN REMOTE SENSING AND PHOTOGRAMMETRY**
(Cr ar) John, Meyer, Gerrard
- 218* RESEARCH PROBLEMS IN FOREST MEASUREMENTS**
(Cr ar) John, Meyer, Gerrard
- 219* RESEARCH PROBLEMS IN FOREST RECREATION**
(Cr ar) Hansen, Merriam, Skok, Hughes
- 220* RESEARCH PROBLEMS IN FOREST TREE GENETICS**
(Cr ar) Pauley
- 221* RESEARCH PROBLEMS IN FOREST INFLUENCES**
(Cr ar) Mace
- 222* RESEARCH PROBLEMS IN FOREST POLICY**
(Cr ar) Irving, Merriam, Skok, Winsness, Hughes

Home Economics (HE)

- 3 CLOTHING CONSTRUCTION I**
Principles of fit and pattern alterations. Study of various basic clothing construction methods. (3 cr; prereq I; VI-VII MTWThF; McNH 328) Wilson
- 21 COLOR**
Study of color theory and its application to problems in dress and interiors; experiments in paint mixing, color in light, color illusion. Emphasis on development of sensitivity and awareness. (3 cr; prereq 20, 21, 24A; IV-V MTWThF; McNH 342) Nagle
- 24A HOME PLANNING AND FURNISHINGS I**
Problems involved in choosing location and in planning or selecting a dwelling unit and its furnishings. Emphasis on design and appraisal of individual

and family needs. (3 cr, §FamS 15 or §GC 3D; prereq soph; III MTWThF; McNH 227) Nagle

31 PRINCIPLES OF NUTRITION

Quantitative and qualitative aspects of nutritional requirements. Interrelationships between physiological processes and dietary requirements. Problem of food faddism. (3 cr, §GC 3B; not open to sr; VI MTWThF; McNH 103)

49 HOUSEHOLD EQUIPMENT

The principles that should guide in the selection, operation, care, and convenient arrangement of equipment in the home. (3 cr; prereq soph, GC 7A or NSci 4 or Phys 1 or ‡; I-II MTThF; McNH 128)

50 TEXTILES

Basic physical, chemical, and biological characteristics of fiber, yarn, and fabric structures; interrelationship with choice, maintenance, and performance of consumer textiles. (4 cr; prereq 3rd qtr soph, GeCh 5 or NSci 2 or NSci 5, or ‡; VI-VII MTWThF; McNH 303) Ar

58A FIELD EXPERIENCES

Supervised work-study program with professional firm, agency, or institution such as interior design studio, art museum, or housing authority. (3 cr; prereq Psy 2, completion of one-half of professional sequence and ‡; hrs and rm ar) Ar

58B FIELD EXPERIENCES

Supervised work-study program in display design and/or crafts. (3 cr; prereq completion of one-half of professional sequence and ‡; hrs and rm ar) Ar

76 CURRENT PROBLEMS IN NUTRITION

A study of the major nutritional problems facing the world today. Included are considerations of protein-calorie malnutrition, obesity, the nutritional status of adolescents, and special nutritional problems of infants and the aged. (3 cr, §170, §171; prereq 31, physiology or human biology; IV MTWThF; McNH 303) Rey

86 HOME MANAGEMENT LABORATORY

(Students should not register for a first-period class) Residence for 5 weeks with direct experience in management and sharing of various activities and responsibilities involved in group living of the students in residence. (4 cr; limited to 12 students; prereq 85 or †85...40, 41 recommended; deposit of \$10 required)

86A HOME MANAGEMENT LABORATORY

(4 cr; prereq ‡; II-III TTh and ar; McNH 303) Ar

119 CULTURAL RESOURCES OF THE TWIN CITIES

Study of the broad range of arts represented in the Twin Cities area. Lectures by instructor and practicing professional artists. Field trips, selected readings. (2-3 cr; VIII MTWThF; McNH 342) Myren

121 TEXTILE DESIGN (WORKSHOP)

Designing textiles. Printing and dyeing techniques such as silk screen, batik, block printing, tie dye. (3 cr; prereq 21, 23, or ‡; meets June 16-July 1; II-VIII MTWThF; LsPav 203) Abell

126A PROBLEMS IN RELATED ART (WORKSHOP)

Independent study in related art under tutorial guidance. (3 cr; prereq permission of division chairman; meets July 2-18; II-VIII MTWThF; LsPav 203) Abell

127 PURCHASING HOME FURNISHINGS

Detailed study of home furnishings in terms of use, cost, and appearance. Includes furniture, dinnerware, floor and wall coverings, fabrics, and accessories. Actual materials, slides, and references used. Field trips. (3 cr; prereq 24A or equiv, 50; VI MTWThF; McNH 360) Ludwig

153 RECENT DEVELOPMENTS IN CLOTHING CONSTRUCTION (WORKSHOP)

Discussion, demonstration, and laboratory work with emphasis on management of time and materials, including newer construction techniques. (3 cr; prereq 53 or ‡; II-VIII MTWThF; McNH 327) Ar

- 172 CURRENT DEVELOPMENTS IN NUTRITION (WORKSHOP)**
 Fundamental facts and techniques for solving current nutrition problems. (3 cr; prereq sr, 31, 40, BioC 1A, Phsl 51, or #; meets June 16-July 1; II-VIII MTWThF; McNH 239) Doyle
- 179 READINGS IN NUTRITION**
 Survey of literature in the field; oral and written reports. (2 cr; prereq 170, #; hrs and rm ar) Sirny
- 181 HOUSING PROBLEMS OF THE FAMILY**
 Plans for both urban and rural homes with evaluation of the economic, art, and social aspects. Discussions, field trips, and classroom analyses. (3 cr; prereq 24A; hrs and rm ar) Esteros
- 183 FAMILY IN WORLD PERSPECTIVE**
 Comparison of family organization and modes of functioning in selected major world civilizations. Emphasis on adaptation of the family to urbanization and industrialization, and family influences on personality formation. (3 cr; prereq HEEd 90 or #; III MTWThF; McNH 303) Bender
- 184 HOME MANAGEMENT PRINCIPLES**
 A study and discussion of managerial aspects of homemaking; work simplification of household activities; financial records and budget-making for the individual and the family. (3 cr; prereq 40, 41 advised; V MTWThF; McNH 227) Jeary
- 295-296 HOME ECONOMICS PROBLEMS**
 Food, nutrition, textiles and clothing, home management and family relationships, household equipment, related art. Independent study and written reports. (1-5 cr per qtr; prereq #; hrs and rm ar) Graduate faculty in Family Economics, Foods, Nutrition, Related Art, Textiles and Clothing

Horticultural Science (Hort)

- 190-191-192 SPECIAL PROBLEMS**
 Written report based on library, laboratory, or field research. (1-4 cr per qtr; prereq #) Staff
- 251* ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING**
 Written report based on library, laboratory, or field research. (3-9 cr; prereq #) Staff
- 252* ADVANCED PROBLEMS IN PHYSIOLOGY OF HORTICULTURAL CROPS**
 Written report based on library, laboratory, or field research. (3-9 cr; prereq #) Staff

Plant Pathology (PIPa)

- 201* RESEARCH IN NEMATOLOGY**
 Taxonomy, or ecology, of plant parasitic and free-living terrestrial or aquatic nematodes. (Cr ar; prereq PIPa 101 or #) Kernkamp, MacDonald
- 203* RESEARCH IN PLANT PATHOLOGY**
 Special assignment of work in laboratory and field problems in pathological research. (Cr ar) Kernkamp, Christensen, Eide, French, King, Kommedahl, Wilcoxson, Calpouzos, MacDonald, Mirocha, Moore, Anderson, Kennedy, Rowell, Bantari
- 207* PROBLEMS IN MYCOLOGY**
 Research along lines such as taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; investigations of fungi involved in industrial or natural processes; morphology or physiology of special forms. (Cr ar; prereq 105, 106, 107) Christensen, Anderson, French

Rhetoric (Rhet)

22 PUBLIC SPEAKING

A practical course in the fundamentals of speechmaking. Particular emphasis upon organizing the speech and projecting it to the audience. (3 cr; limited to 20 students; prereq satisfaction of freshman communication requirements; IV MTWThF; AgEng 307) McBride

47 EFFICIENT READING

Designed for students, teachers, business or professional people of average reading ability wishing to improve speed, comprehension, and vocabulary. Techniques valuable in achieving or maintaining superior scholastic or professional status. 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. (3 cr; limited to 30 students) Wright, Marchand

Sec 1, I MTWThF, ForH 115
 Sec 2, II MTWThF, ForH 115
 Sec 3, III MTWThF, ForH 115
 Sec 4, IV MTWThF, ForH 115

51 EXPOSITION

Essays and articles, technical writing, application letters, review of English usage. (3 cr; limited to 25 students; prereq jr) McBride, White

Sec 1, II MTWThF, AgEng 307
 Sec 2, III MTWThF, AgEng 307

62 HUMANITIES: RELIGION IN AMERICAN THOUGHT AND EXPERIENCE

Examination of the diverse values centered in American religious and philosophical thinking from the 17th century to the present. Readings in Jonathan Edwards, Emerson, William James, John Dewey, and others. (3 cr; limited to 40 students; III MTWThF; AgEng 315) Dorr

Soil Science (Soil)

130* SPECIAL PROBLEMS IN SOILS

Research, readings, instruction. (1.5 cr per qtr [10 cr max]; prereq 18 or 19 or 119) Martin, Burson, Blake, Arneman, Rust, Farnham, Grava, Caldwell, MacGregor, Schmidt, Adams, Baker, Ham

137* SOILS AND THE ECOSYSTEM

The formation and distribution of soils in relationship to vegetation, climate, and other soil-forming factors. The interrelationships of soils in the ecosystem. (5 cr; limited to 20 students; prereq course in ecology; taught at Itasca Biology Session) Farnham

202* RESEARCH PROBLEMS IN SOILS

Individual laboratory or field work on special problems in a phase of soils other than student's major thesis. Arrangements must be made in advance. (2.5 cr; hrs ar) Martin, Burson, Blake, Arneman, Rust, Farnham, Grava, Caldwell, MacGregor, Schmidt, Adams, Baker, Ham

College of Biological Sciences

Biochemistry (BioC)

204 TRACER TECHNIQUES

Laboratory work on the application of radioisotopes to the study of metabolic processes. (3 cr; prereq § and 143 or MdBc 144, 146...MeAg 127 recommended; hrs and rm ar) Kirkwood

298 GRADUATE SEMINAR

Reports on recent development in biochemistry and on research projects in the department. (1 cr; prereq Δ; hrs ar) Staff

299 GRADUATE RESEARCH

Research problems in various fields in biochemistry represented by staff interests. (2-5 cr; prereq §; hrs ar) Dagley, Gander, Henderson, Jenness, Kirkwood, Liener, Schultze, Glass, Warner, Anderson, Chapman, Klein, Lovrien

Biology (Biol)

1 GENERAL BIOLOGY

See section on 10-week courses, pages 142-148.

110 GENERAL PHYSIOLOGY

A quantitative approach to the study of cell function with an emphasis upon those cellular properties which are common to all biological systems. (3 cr; limited to 20 students; prereq 50, 51, 52, 60, Math 44 or 31, Phys 9 or equiv; lect I MTWThF, II F; Z 211) Rhea

111 LABORATORY IN GENERAL PHYSIOLOGY

(2 cr; prereq 110 or ¶110; discussion II MW, lab II-V TTh; Z 18) Rhea

120 DEVELOPMENTAL BIOLOGY

The study of developing systems and of the control mechanisms of development, from the molecule to the organism. (3 cr; limited to 30 students; prereq 70; VI MTWThF; Z 211) Stetler

121 LABORATORY IN DEVELOPMENTAL BIOLOGY

(2 cr; limited to 10 students; prereq 120 or ¶120; VII-IX ar; Z 202) Stetler

Botany (Bot)††

121 DEVELOPMENTAL PLANT ANATOMY

Microscopic structure of vascular plants; development in root, stem, and leaf. (5 cr; prereq Biol 2 or 51 or equiv; lect II MTWThF, Bo 3; lab III-IV MTWThF, Bo 5) Abbe

299 RESEARCH PROBLEMS

(Cr ar; prereq §) Staff

†† For additional courses, see index for Biology Session.

Genetics (Gen)

66 PRINCIPLES OF GENETICS

The mechanisms of heredity; their implications for biological populations and application to practical problems. (3 cr; prereq Biol 2 or equiv or 10 cr in botany or zoology; II MTWThF; one 2-hr quiz section, hrs ar; Bo B-6) Ar

101 BASIC GENETICS

For correction of deficiencies in background course work. (Cr ar; prereq grad only) Ar

Zoology (Zool)††

99 INDIVIDUAL WORK IN SOME SPECIAL DISCIPLINE

(Cr ar; prereq Biol 2 or 50 and §) Staff

101 BASIC ZOOLOGY

(Cr ar; prereq grad only; hrs ar) Staff

299 RESEARCH

(Cr ar)

†† For additional courses, see index for Biology Session.

Biology Session

Held at Lake Itasca Forestry and Biological Station

For general information on the Biology Session at Lake Itasca, see section on Schools, Colleges, and Special Programs, or write for Biology Session bulletin, Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Botany (Bot)

- 116 **SUMMER FLORA OF MINNESOTA**
(5 cr; limited to 20 students; prereq 52 or equiv; MTh) Morley
- 155 **FRESHWATER ALGAE**
(5 cr; limited to 20 students; prereq 10 cr in botany, biology, or zoology; MTh) Meyer
- 299 **RESEARCH PROBLEMS**
(Cr ar; prereq #) Staff

Ecology and Behavioral Biology (Ecol)

- 120 **ADVANCED LIMNOLOGY**
(5 cr; limited to 15 students; prereq 119 or 128 or equiv; TF) Megard
- 136 **FIELD ETHOLOGY**
(5 cr; limited to 15 students; prereq Biol 50 or equiv...Zool 75-76 or 135 recommended; TF) Oring
- 139 **PALEOECOLOGY**
(5 cr; limited to 15 students; prereq 50 or Biol 80 and Bot 52 or equiv; WS) Cushing
- 299 **RESEARCH**
(Cr ar; prereq #) Staff

Entomology, Fisheries, and Wildlife (Ent)

- 59 **FIELD ENTOMOLOGY**
(5 cr; limited to 15 students; prereq Biol 2 or equiv; TF) Berner
- 196 **SPECIAL PROBLEMS IN ENTOMOLOGY, FISHERIES, AND WILD LIFE**
(Cr ar; prereq #) Staff

Soil Science (Soil)

- 130 **SPECIAL PROBLEMS IN SOILS**
(Cr ar; prereq #) Farnham
- 137 **SOILS AND THE ECOSYSTEM**
(5 cr; limited to 20 students; prereq Bot 50 or equiv; WS) Farnham

Zoology (Zool)

- 72 **NATURAL HISTORY OF INVERTEBRATES**
(5 cr; limited to 10 students; prereq Biol 2; MTh) Gilbertson

- 115 ADVANCED NATURAL HISTORY OF INVERTEBRATES**
(5 cr; limited to 10 students; prereq 15 cr in zoology; MTh) Gilbertson
- 135 FIELD ORNITHOLOGY**
(5 cr; limited to 15 students; prereq 15 cr in zoology; WS) Warner
- 299 GRADUATE RESEARCH**
(Cr ar; prereq #) Staff

School of Business Administration

For general information on the School of Business Administration, see section on Schools, Colleges, and Special Programs.

Accounting (Acct)

24 PRINCIPLES OF ACCOUNTING

Recording, reporting, and interpreting business events. Use of accounting as a tool of business management. (3 cr, §55A; limited to 30 students; prereq 3rd qtr fr)

- Sec 1, I-II MWF, BlegH 115
- Sec 2, II-III MWF, BlegH 210
- Sec 3, III-IV MWF, BlegH 115
- Sec 4, IV-V MWF, BlegH 210

25 PRINCIPLES OF ACCOUNTING

Continuation of Acct 24. (3 cr, §55B; limited to 30 students; prereq 24)

- Sec 1, 8:00-9:15 MTWTh, CCTV, BlegH 130
- Sec 2, 9:30-10:45 MTWTh, CCTV, BlegH 130
- Sec 3, 11:00-12:15 MTWTh, CCTV, BlegH 130

26 PRINCIPLES OF ACCOUNTING

Third quarter of Acct 24-25-26 (see Acct 24). (3 cr, §55B; limited to 30 students; prereq 24; I-II MWF; BlegH 205)

55C MANAGERIAL COST

General survey of cost accounting from the point of view of the executive who must use cost information in conduct of his business. (3 cr, §103, §265A; not for accounting majors; prereq 25, 26; III-IV MWF; BlegH 140)

101 ACCOUNTING THEORY AND PRACTICE I

The search for principles and postulates of accounting, concepts of income, measurement and valuation methodology. (4 cr; prereq 25, 26, or equiv; III-IV MTWTh; BlegH 245)

103 ACCOUNTING THEORY AND PRACTICE III

Accounting for liabilities and other equities, long-range planning, fiduciary accounts, nonprofit organization accounts. (4 cr; prereq 102; III-IV MTWTh; BlegH 205)

175B DATA PROCESSING SYSTEMS

Analysis of business information systems. Includes application of manual, tabulating, and electronic processing systems. (3 cr; prereq 25, 26, QA 62 or MIS 209A; I-II MWF; BlegH 245)

185A ADVANCED ACCOUNTING

Consolidated statements, fiduciary and fund accounting, partnership accounting, foreign exchange. (3 cr; prereq 102; III-IV MWF; BlegH 255)

305A SEMINAR IN ACCOUNTING THEORY: VALUATION AND PRINCIPLES

See section on 10-week courses, pages 142-148.

Business Finance (BFin)

56 FINANCE FUNDAMENTALS

Deals with the problems of acquiring, allocating, and managing funds within the firm. The following concepts of internal financial management are considered in depth: determining financial goals of the firm; analyzing and controlling fund flows through the firm; measuring the expected return on

individual investment projects; selecting optimal "portfolios" of projects; determination of capital costs, and the way these costs vary with financing mix; and evaluating the performance of the firm and its components. (3 cr, §156; prereq Acct 26; I MTWThF; BlegH 110) Nelson

66 INVESTMENT FUNDAMENTALS

An introduction into the appraisal of securities and the management of investment funds, essentially from the viewpoint of an individual investor. Stresses principles of value determination and risks associated with investment in the various types of securities. Includes appraisal of bonds and preferred stocks, with main attention to appraisal of common stocks. Coverage includes industrials, utilities, financial institutions and investment companies, and government units. (3 cr; prereq 56; IV MTWThF; BlegH 125) Ar

76 CAPITAL MARKETS AND INSTITUTIONS

Study of the characteristics and institutional structure of the money and capital markets and their interrelationship through interest rates and prices. Observation of price behavior of the market as a whole and of specific types of securities. Attention to new issue markets and to secondary trading on over-the-counter and national exchanges. (3 cr; prereq 56; III MTWThF; BlegH 145) Ar

296A READINGS IN BUSINESS FINANCE

Readings useful to student's individual program and objectives but not available in regular course offerings. (3 cr; prereq consent of adviser and § in field covered) Ar

Business Law (BLaw)

58 BUSINESS LAW: INTRODUCTION TO LAW AND THE LAW OF CONTRACTS

The origin of law, its place in and effect upon society; the history of the development of law; the systems of course; and legal procedure. An extensive study of the law of contracts as the basic law effecting the business transaction. (3 cr, §158; prereq Econ 2 or equiv) Wright

Sec 1, I MTWThF, BlegH 235

Sec 2, II MTWThF, BlegH 235

158 BUSINESS LAW: CONTRACTS

(See BLaw 58) (3 cr, §58; prereq Econ 2 or equiv) Wright

Sec 1, I MTWThF, BlegH 235

Sec 2, II MTWThF, BlegH 235

Industrial Relations (IR)

52 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

Introduction to current employment relationships; and economic approach and analysis. The application and conservation of human resources in employment, related social and economic problems. Labor marketing, collective bargaining, unions and employer associations, industrial unrest and conflict, employment and unemployment, wage problems. (3 cr, §152; prereq Econ 2 or equiv) Smythe

Sec 1, II MTWThF, BlegH 110

Sec 2, III MTWThF, BlegH 125

72 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT

Personnel management and labor relations, the development and application of effective work-teams within firms and agencies. Overview of policy and practice in major manpower management functions of staffing, training, communications, motivation, compensation, and morale maintenance. (3 cr, §172; prereq Econ 2 or §; II MTWThF; BlegH 155) Weitzel

152 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

(See IR 52) (3 cr, §52; prereq Econ 2 or equiv or §; III MTWThF; BlegH 125) Smythe

172 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT
(See IR 72) (3 cr, §72; prereq Econ 2 or §; II MTWThF; BlegH 155) Weitzel

202 ORGANIZATION AND STAFFING
Translation of organization goals and objectives to specific manpower goals and objectives, and staffing to meet an organization's manpower needs. Techniques for recruitment, selection, and assignment of manpower resources for optimal utilization. (3 cr; prereq 72 or 172 or §; III-IV TTh; BlegH 150) England

210 ORGANIZATION THEORY
Survey of theories of organization. Theories and research concerning work organizations, theories of structuring personal and functional relationships, informal and social organizations within work groups, and impact of alternative approaches to organization upon individual behavior and performance. (3 cr; prereq 72 or 172 or §; III-IV MWF; BlegH 150) Mahoney

Insurance (Ins)

53 RISK MANAGEMENT AND INSURANCE
The nature and economic significance of risk. The recognition, measurement, and treatment of risk with particular emphasis upon insurable risks and insurance. Application of these concepts to the property, liability, and personnel risks faced by a business firm or by a family. The risk management function in business and its relationship to other business management functions. Public policy and risk management with special emphasis on the problem of the uncompensated automobile accident victim, social insurance, and government regulation of insurance. (3 cr, §153; prereq Econ 2 or equiv; III MTWThF; BlegH 135) Williams

93 PROPERTY AND LIABILITY INSURANCE I
Nature and relative importance of insurable property and liability risks; analysis of property and liability insurance contracts; insurance surveys—optimum property and liability insurance protection. (3 cr, §223; prereq 53; I MTWThF; BlegH 135) Whitman

153 RISK MANAGEMENT AND INSURANCE
(See Ins 53) (3 cr, §53; prereq Econ 2 or equiv; III MTWThF; BlegH 135) Williams

223 PROPERTY AND LIABILITY INSURANCE I
(See Ins 93) (3 cr, §23; prereq 53; I MTWThF; BlegH 135) Whitman

Management (Mgmt)

60 BUSINESS POLICY: STRATEGY FORMULATION AND IMPLEMENTATION
Undergraduate level integrating course designed to develop skill in the general management function of determining corporate or divisional goals and in designing programs of action for achieving these goals. Class time is devoted almost exclusively to case analysis and discussion. Students are asked to apply data supplied in the case, as well as concepts and theories presented in this and other courses to the solution of goal selection and strategy implementation problems. The viewpoint of the general line manager (department, division, or executive level) will be taken. (3 cr; limited to 30 students; prereq sr and completion of business core or ¶final core course) Mauriel

Sec 1, 7:30-8:40 MTWThF, BlegH 425
Sec 2, 8:50-10:00 MTWThF, BlegH 425

70 FUNDAMENTALS OF MANAGEMENT
Study of concepts, theory, research, and operational problems. Includes the principal functional areas of management. Examines provisions of necessary factors and relationships to achieve organizational objectives: establishment of goals, policies, procedures; organizational structure and behavior; leader-

ship; control systems. (3 cr; limited to 40 students; III MTWThF; BlegH 425) Wickesberg

150 FUNDAMENTALS OF MANAGEMENT

A first course in management at the graduate level. Study of concepts, theory, research, and operational problems of management. Examines provisions of necessary factors and relationships to achieve organizational objectives: goals, policies, procedures; organizational structure and behavior; leadership; control systems. Case studies to develop analytic skills and to provide insights into management problems. (3 cr, §70; IV MTWThF; BlegH 425) Wickesberg

Marketing (Mktg)

57 PRINCIPLES OF MARKETING

The social, economic, legal, and other environmental aspects of marketing. Special emphasis on the changing environment and the resulting impact on marketing strategy and marketing policies including product development, pricing, marketing channels, and promotion. (3 cr, §157; prereq Econ 2 or equiv) Ar

Sec 1, I MTWThF, BlegH 250

Sec 2, II MTWThF, BlegH 135

65 RETAIL MANAGEMENT

Retailing principles and methods; relations of retailing to other parts of the economy; problems associated with operation of stores of various types. (3 cr; prereq 57; II MTWThF; BlegH 240) Werner

95 MARKET ANALYSIS AND RESEARCH

Techniques used in marketing research. Emphasis on marketing information which can aid in the solution of marketing problems and on survey research techniques. (3 cr; prereq 57, QA 53 or equiv; I MTWThF; BlegH 240) Ar

157 MARKETING

Basic concepts as reflected by the environment and market forces. Includes the behavioral, economic, legal, and ethical aspects. Cast in this framework, direction of the marketing effort and marketing activities include product, pricing, market development, and physical distribution policies. (3 cr, §57; prereq Econ 2 or equiv; II MTWThF; BlegH 135) Ar

265 RETAIL MANAGEMENT

(See Mktg 65) (3 cr; prereq 57; II MTWThF; BlegH 240) Werner

295 MARKET ANALYSIS AND RESEARCH

(See Mktg 95) (3 cr; prereq 57, QA 53 or equiv; I MTWThF; BlegH 260) Ar

Production (Prod)

50 PRODUCTION MANAGEMENT

The techniques, the managerial problems and the decision-making processes in planning and controlling the production activity. Production as a function of the enterprise rather than as a strictly manufacturing activity. Research and development, the role of standards, physical facilities, systems and procedures analysis, work measurement, materials control, quality control, and production planning and control. (3 cr, §150; prereq QA 54 or IQA 54; II MTWThF, BlegH 150, CCTV; discussion III TTh, BlegH 140) Hoffmann

150 ADMINISTRATION OF PRODUCTION

Fundamentals of production from management point of view. Techniques, managerial problems, and decision-making processes in administration of production function. Limited use of case material and/or field study to observe practical difficulties in utilizing operating principles. (3 cr, §50; prereq QA 151 or equiv; II MTWThF, BlegH 150, CCTV; discussion III TTh, BlegH 140) Hoffmann

Quantitative Analysis (QA)

- 52 QUANTITATIVE METHODS FOR ADMINISTRATION I**
Introduction to quantitative models; measurement and statistical description; probability and probability distributions; sampling and sampling distributions. (3 cr; prereq Math 40A, or Math 43, or §; I MTWTh, BlegH 150, CCTV; lab II MTWTh, BlegH 120) Willis
- 62 BASIC COMPUTER SYSTEMS**
See section on 10-week courses, pages 142-148.
- 151 ELEMENTS OF STATISTICS**
Statistical description, frequency distributions, probability, sampling, introduction to statistical estimation, and decision making. (3 cr, §54; prereq 150 or ¶150 or Math 40A or ¶Math 40A; I MTWTh, BlegH 150, CCTV; lab II MTWTh, BlegH 145) Willis

Transportation (Tran)

- 164A BUSINESS LOGISTICS I**
Organization and control of transportation services for the firm. Topics covered include transportation alternatives, documentation, cost levels and rate negotiation, warehousing, and introduction to the logistics concept. (3 cr; prereq 54 or 154; I MTWThF; BlegH 105) Beier

College of Education

For general information on the College of Education, see section on Schools, Colleges, and Special Programs.

Agricultural Education (AgEd)

170 INDEPENDENT STUDY

Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure. (1-3 cr; prereq sr; hrs and rm ar) Peterson, Marvin, Persons

171 PROCEDURES IN TEACHING AGRICULTURE

New developments in methodology; assessment of innovations and procedures; consideration of various levels of instruction. (3 cr; prereq #: June 9 to June 27; I-II MTWThF; Hr 301) VanTries

173 FARM BUSINESS MANAGEMENT EDUCATION

Administration, organization, and operation of programs for adults. Development and utilization of curriculum materials based on farm business record data. (3 cr; prereq 103 or #: June 9 to June 27; III-IV MTWThF; Hr 301) Persons

221 FIELD PROBLEMS

Making investigations, gathering data, and formulating plans regarding agricultural education. (3 cr; hrs ar) Peterson, Marvin, Swanson, Persons

232* RESEARCH IN AGRICULTURAL EDUCATION

Selecting problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts. (Cr and hrs ar; prereq 15 cr in education) Peterson, Marvin, Swanson, Persons

Art Education (ArEd)

10C SURVEY OF ART ACTIVITIES

Introduction to pictorial expression, design, and the function of art in the social environment. (3 cr; each section limited to 30 students)

Sec 1, I-II MTWThF, WuH 240, Olson
Sec 2, III-IV MTWThF, WuH 220, Holland

53C INTRODUCTION TO WEAVING

Equipment, design, setting up, and operation of table and floor looms. (3 cr; limited to 30 students; III-IV MTWThF; WuH 340) Smits

153 CURRICULUM BUILDING IN ART EDUCATION

Programs for exceptional children. Selection, evaluation, and organization of material for teaching units and projects. (3 cr; I MTWThF; WuH 130) Hastie

156 INTERCULTURAL EDUCATION THROUGH ART

Approaches to international understanding through recognition of aesthetic contributions of diverse peoples to American life. (3 cr; IV MTWThF; WuH 110) Gayne

184 IMPROVING ART PROGRAMS IN THE ELEMENTARY SCHOOL

Evaluating research findings and introducing new materials; developing cooperation between classroom teachers and art education specialists. (3 cr; limited to 36 students; prereq tchg exper or #: III MTWThF; WuH 220) Olson

- 189 APPLICATION OF AESTHETIC THEORY IN EDUCATION**
Contemporary theories of art, their psychological and philosophical foundations. Open to teachers, supervisors, and administrators concerned with art in general education at all levels. (3 cr; III MTWThF; WuH 130) Hastie
- 284 RESEARCH IN ART EDUCATION**
(3 cr; II MTWThF; WuH 110) Gayne
- 295* PROBLEMS: ART EDUCATION**
(Cr ar; prereq #) Gayne, Hastie, Olson
- 296 SEMINAR: ART EDUCATION**
(1 cr; VI T; WuH 130) Olson

Institute of Child Development

Child Psychology (CPsy)

- 80 CHILD PSYCHOLOGY**
Introduction to the science of child behavior; emphasis on a critical review of theories and research in child psychology. (3 cr; prereq Psy 2; II MTWThF; SciCB 325) Faust
- 100 PROCESSES OF SOCIALIZATION OF CHILDREN**
Processes of social learning; identification, imitation, reward and punishment, internalization, object choice. (3 cr; prereq 80 or grad; II MTWThF; AH 350) Masters
- 126 CASE STUDY OF CHILDREN**
Supervised intensive study of intellectual, personality, and social development and functioning of individual normal children. (3 cr; prereq 80, #; III MTW and ar; CD 105) Faust
- 132 ADOLESCENT DEVELOPMENT**
Growth; mental, social, emotional, and personality development. (3 cr, §81; prereq sr, 12 cr in psychology, child psychology, or educational psychology; I MTWThF; Arch 5) Masters
- 140 BEHAVIOR PROBLEMS**
Types, origin, development, and treatment of behavior difficulties in normal children. (3 cr; prereq 80 or equiv; II MTWThF; NH 211) Sroufe
- 142 THE PSYCHOLOGY OF HANDICAPPED CHILDREN**
Research related to sensory, speech, language, physical disabilities of children. (3 cr; prereq 80 or equiv; VI MWF; CD 218) Templin
- 143 PROBLEMS OF MENTAL DEFICIENCY**
Diagnosis, care, training; social and vocational problems. (3 cr; prereq 80 or equiv; III MTWThF; AH 150) Glick
- 179 CLINICAL PROCEDURES WITH CHILDREN**
Survey of methods of clinical psychology; basic concepts and research problems in clinical work with children. Primarily for students not majoring in clinical psychology. (3 cr; prereq 12 cr in psychology, educational psychology, sociology, or child psychology; I MTWThF; Arch 70) Sroufe
- 180 PERSONALITY DEVELOPMENT**
Psychoanalytic and behavior theory formulations and related research literature. (3 cr; prereq 100; IV MTWThF; AH 350) J Turnure
- 183 LANGUAGE DEVELOPMENT**
Development of the structure and function of language; methodological problems; speech and language development; language scales; theories of language development. (3 cr; prereq 80; IV MTWThF; CD 218) Templin
- 186 COGNITIVE DEVELOPMENT**
Development of cognitive processes; theories of intelligence and intellectual functioning; related research literature. (3 cr; prereq 80 or equiv; II MTWThF; CD 218) C Turnure

- 190 **TOPICS: CHILD PSYCHOLOGY**
(Cr and hrs ar; prereq #) Templin, Masters, Sroufe
- 223 **SEMINAR: DEVELOPMENTAL PSYCHOLOGY**
(Cr and hrs ar; prereq #) Ar

Educational Administration (EdAd)

- 128†† **WORKSHOP: EDUCATIONAL ADMINISTRATION**
Section 1: Problems encountered in the administration of junior colleges and the role of the administrator in such institutions. (1-6 cr; limited to 35 students; prereq practicing educ admin or #; June 16-July 2; V-VII MTWThF; Pt 111) Ammentorp
- Section 2: Analysis of the collective bargaining process in public education in terms of its substance, procedures, determinants, and socio-political and economic impacts. (1-6 cr; limited to 35 students; prereq practicing educ admin or #; July 2-July 18; V-VII MTWThF; Pt 214) Davis
- 139†† **LABORATORY IN DECISION MAKING**
Emphasizes decision making, recent research and theory related to everyday school problems, participants' self-evaluation as administrators, relation of human behavior to administration. Using the technique of "simulation" the workshop participants will be placed in the role of the secondary principal. During the workshop each person will make more than 110 decisions relative to operation of the simulated school. (1-4 cr; June 16-July 2; V-VII MTWThF; FraH B25) Nickerson
- 201 **FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
Foundation for all students preparing for administrative positions in schools. Sources, meaning, and application of administrative theory, organizational structure, human relations, and leadership roles as they relate to the conduct of school organizations. (3 cr; II MTWThF; Arch 45) Ammentorp
- 202 **FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
Foundation for all students preparing for administrative positions in school organizations. Aspects of federal, state, and local relationships as they relate to the coordination and operation of public elementary and secondary schools. (3 cr; III MTWThF; Arch 45) Alkire
- 210 **PUBLIC SCHOOL FINANCE**
Current practices; sources of revenue, types of taxes, theory of taxation, and formulas used for distribution of school aids. Federal, state, and local support of education. (3 cr; II MTWThF; NH 107) Mueller
- 215 **THE ELEMENTARY SCHOOL PRINCIPALSHIP**
Specific problems in elementary school administration and the principal's role of leadership. (3 cr; prereq 201 and 202 or #; I MTWThF; Pt 110) Cross
- 216 **RECENT RESEARCH: ELEMENTARY SCHOOL ADMINISTRATION**
An examination of current and pertinent research literature. (3 cr; prereq 215; IV MTWThF; NH 107) Cross
- 218 **SEMINAR: SECONDARY SCHOOL ADMINISTRATION**
Problems in school units treated in a tridimensional framework of social system theory, structural-functional analysis, and institutional perspective. Focus on the interrelation of values, roles, technical functions, and goal attainment in the school organization. (3 cr; limited to 15 students; prereq 201 and 202 or #; III MTWThF; Arch 140) Popper
- 224 **LEGAL ASPECTS OF PUBLIC SCHOOL ADMINISTRATION**
Constitutional, statutory, and common law bases of school administration; principles growing out of fundamental legal procedures. (3 cr; IV MTWThF; Arch 45) Hooker

†† Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

- 226 SCHOOL PLANT PLANNING**
 Planning educational facilities for public and private school systems and institutions of higher education; emphasis on writing educational specifications. (3 cr; I MTWThF; NH 107) Alkire
- 227 PUBLIC SCHOOL PERSONNEL PROGRAMS**
 Selection, assignment, evaluation, and development of school personnel; salary and conditions of service, policies of administrative, instructional, and noninstructional personnel. (3 cr; III MTWThF; NH 107) Davis
- 228* PROBLEMS: EDUCATIONAL ADMINISTRATION**
 For superintendents and principals qualified to make intensive studies of specific problems of the administration of a school system. (1-3 cr; hrs ar) Hooker, Popper, Davis, Mueller, Nickerson, Ammentorp, Cross, Sederberg
- 235 SEMINAR: EDUCATIONAL ADMINISTRATION**
 Decision making through case method. Cases and concepts covering human relations, curriculum, school community relations, instructional problems; students analyze processes involved and use research and writings in the fields covered. (1-3 cr; limited to 15 students; prereq master of arts in educational administration or §; IV MTWThF; Arch 140) Popper
- 236 FIELD STUDY**
 Required for the 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. (0-10 cr; prereq §; hrs ar) Hooker, Popper, Davis, Lambert, Mueller, Nickerson, Ammentorp, Cross, Sederberg
- 265 ADMINISTERING THE HIGH SCHOOL PROGRAM**
 Practices and procedures in scheduling, improving the curriculum, community relations, records and reports, school services, and program evaluation. (3 cr; II MTWThF; NH 122) Nickerson
- 270A* PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION**
 (Cr and hrs ar; prereq §) Lambert, Alkire, Cross
- 270B* PROBLEMS: SECONDARY SCHOOL ADMINISTRATION**
 (Cr and hrs ar; prereq §) Hooker, Popper, Davis, Mueller, Nickerson, Sederberg

Educational Psychology (EPsy)

- 110 EDUCATIONAL MEASUREMENT IN THE CLASSROOM**
 Principles and methods for construction, evaluation, and improvement of classroom instruction. (3 cr; each section limited to 35 students) Terwilliger
 Sec 1, IV MTWThF, WuH 130
 Sec 2, VI MTWThF, Bu 123
- 116 INTRODUCTORY STATISTICAL METHODS**
 Basic statistical techniques; comprehension of literature using elementary statistical concepts and methods. Not equivalent to EPsy 216, 216A. (3 cr; each section limited to 60 students) Collier
 Sec 1, I MTWThF, WuH 230
 Sec 2, III MTWThF, WuH 230
- 117 BASIC PRINCIPLES OF MEASUREMENT**
 Principles underlying construction of achievement examinations; developments in educational and psychological measurement; theory and practice related to statistical methods; types and uses of derived scores; factors influencing reliability and validity. (3 cr; prereq 116 or 216 or Psy 70 or equiv; VI MTWThF; Bu 125) D Anderson
- 133 INTRODUCTION TO GUIDANCE**
 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. (3 cr; prereq 9 cr in education; II MTWThF; WuH 230) Tennyson

- 134 COUNSELING PROCEDURES**
For persons whose professional work includes counseling and interviewing; not for persons seeking certification as school counselors. Emphasis on counseling relationship and principles of interviewing; utilizes case studies, role playing, and demonstration. (3 cr; IV MTWThF; Bu 125) Blocher
- 140 INSTRUMENTS AND TECHNIQUES OF MEASUREMENT**
Measuring intelligence, achievement, interests, attitudes, and personality traits; use in educational guidance, personnel work, administration, and supervision. (3 cr; prereq 110 or 117; III MTWThF, IV TTh; FraH 20) Ar
- 148 CLINICAL DIAGNOSIS OF READING DIFFICULTIES**
Relationship to psychological factors and clinical remedial correction. (3 cr; each section limited to 25 students; prereq EdCI 145) Roberts
Sec 1, III MTWThF, CD 218
Sec 2, IV MTWThF, CD 105
- 150 CLINICAL PRACTICE IN REMEDIAL TEACHING**
Remedial tutoring of individual children who have difficulty in school learning. (3 cr; limited to 45 students; prereq EdCI 145 or 151 and §; I-II MTWThF; rm ar) Brown, Weis
- 159 PERSONALITY DEVELOPMENT AND MENTAL HYGIENE**
Examines theory and research in personality development and mental functioning in the light of knowledge concerning the psychology of stress and the concept of mental health as constructive behavior in response to change and stress. (3 cr; each section limited to 40 students)
Sec 1, III-IV MW, III F, Arch 15
Sec 2, III-IV TTh, IV F, Arch 15
- 160 DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY I**
Survey, demonstration, and evaluation of special techniques for diagnosis and remediation of severe learning deficits appearing in reading and written language (including dyslexia) and basic quantitative concepts. (3 cr; limited to 30 students; prereq 110 and EdCI 145 or §; June 16-August 8; V-VI MTWTh; NH 107) Enfield
- 160A PRACTICUM: DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY I**
Clinical practice in prescriptive teaching using a selected range of techniques presented in 160. (3 cr; limited to 30 students; prereq ¶160 or §; June 16-August 8; I-IV MTWThF; rm ar) Deno, Briggs, Enfield
- 165 SEMINAR: PROBLEMS AND ISSUES IN THE EDUCATION OF LEARNING-DISABLED CHILDREN**
Exploration of issues involved in design and conduct of services for learning-disabled children. (3 cr; prereq experience or professional responsibility in the SLD field and §; V MTWThF; Pt 102) Deno
- 170 PSYCHOLOGY OF THE INTELLECT I: COGNITION AND PEDAGOGY**
Overview and introduction to intellectual structure and functioning and implications for pedagogy. (3 cr; prereq 192 or §; III MTWThF; NH 122) Murray
- 177 CHILDHOOD LANGUAGE DEVELOPMENT: CLASSROOM IMPLICATIONS**
Recent trends and findings in the study of language acquisition; classroom implications for the education of exceptional children. (3 cr; I MTWThF; Arch 135) Moores
- 182 EDUCATION OF EXCEPTIONAL CHILDREN**
Introduction to the field of special education for classroom teachers and other school personnel. (3 cr; IV MTWThF; WuH 230) Reynolds
- 183 EDUCATION OF GIFTED CHILDREN**
Abilities, characteristics, and education of intellectually gifted children and adults. (3 cr; prereq Ed 55B or 75B or equiv; III MTWThF; AH 350) Feldman
- 184 INTRODUCTION TO EDUCATION OF THE MENTALLY RETARDED**
Issues which relate to educational practices; community planning; educational philosophy, administration, organization, and programming. (3 cr; prereq 182; II MTWThF; WuH 130) Bruininks

- 186 EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN**
Discussion and evaluation of curricula, materials, and methods for instruction of disturbed and delinquent children in hospital, training school, and public school settings. (3 cr; prereq grad or #; II MTWThF; Arch 35) Wilderson
- 188 EDUCATION OF THE CULTURALLY DISADVANTAGED CHILD**
Educational needs of children handicapped by behavior related to deficiencies of physical and/or cultural environment; adaptations of educational programs. (3 cr; prereq 12 cr in psychology, educational psychology, or sociology; II MTWThF; Arch 5) Wood
- 192 INTRODUCTION TO LEARNING AND COGNITION**
History, models, and theories; research methods of educational psychology; conditioning, learning, and cognition. (3 cr; limited to 40 students; III MTWTh; Bu 125; lab ar) P Johnson
- 193 PSYCHOLOGICAL ANALYSIS OF INSTRUCTION**
Use of psychological concepts and principles in analysis of instructional problems and development of teaching strategies; consideration of behavior modification; behavioral objectives; task analysis. (3 cr; each section limited to 60 students)

Sec 1, II MTWThF, FraH 120, Murray
Sec 2, III MTWThF, FraH 120, Neale
Sec 3, IV MTWThF, FraH 120, Ar
- 208* METHODS IN EDUCATIONAL RESEARCH**
Methods and techniques employed in investigation and report of educational problems. (3 cr; II MTWThF; CD 105) Hoyt
- 209 SEMINAR: RESEARCH PLANNING**
A functional approach to planning empirical research projects appropriate for the basis of a Ph.D. thesis. Students develop outlines of projects and present these for critical review of members of the seminar. (1 cr; limited to 12 students; VI MWF; CD 105) Hoyt
- 216 STATISTICAL METHODS**
Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems. (3 cr; prereq 116 or Psy 70; I MTWThF; Arch 35) MacEachern
- 216A STATISTICAL METHODS LABORATORY**
For students who wish more experience in solution of problems and use of machines than is obtained in 216. (2 cr; limited to 22 students; prereq #216; II-III TWTh; WuH 330) Proshek
- 218 STATISTICAL METHODS (PART I)**
See section on 10-week courses, pages 142-148.
- 218A STATISTICAL METHODS LABORATORY (PART I)**
See section on 10-week courses, pages 142-148.
- 225* COUNSELING THEORY AND PROCEDURE I**
Definition of counseling; theoretical approaches to counseling and vocational choice theories; measurement versus appraisal; diagnostic principles utilized. (3 cr; prereq 133 or 250, 259 or #259; II MTWThF; AH 101) Blocher
- 233* PROBLEMS: GUIDANCE AND PERSONNEL WORK**
Independent study. (1-9 cr) Blocher, Borow, Parker, Tennyson, A Anderson, Shaffer
- 237 PRACTICUM IN GROUP COUNSELING (PART I)**
See section on 10-week courses, pages 142-148.
- 248 SEMINAR: SCHOOL PSYCHOLOGY**
One year of continuous enrollment required of all students in the Specialist and Ph.D. programs in School Psychology. (3 cr; limited to 15 students; prereq Ph.D. or Specialist Candidate and #; II MTWThF; Arch 140) Hall

- 253* RESEARCH PROBLEMS**
 (Cr and hrs ar; prereq §) Collier, Deno, Duker, Hoyt, Reynolds, Force, Hall, P Johnson, MacEachern, Neale, Terwilliger, Wilderson, Wood, D Anderson, Bruininks, Feldman, Juliar, Moores, Murray, Rynders
- 257 CLINICAL PRACTICE IN EDUCATIONAL DIAGNOSIS**
 Supervised work with children referred to the Psycho-Educational Clinic for diagnosis of learning disabilities and school-related problems. Parent and child interviewing, testing, and preparation of case reports. (3 cr, §151; limited to 2 students; prereq 210 or equiv, EdCI 145, §; hrs ar; Pt 210) Briggs
- 268 SEMINAR: THE CULTURALLY DISADVANTAGED**
 Psychological theory and research with implications for educational planning and procedures. (3 cr; prereq §; VII-VIII TTh; Pt 102) Wood
- 282 COUNSELING PRACTICUM: INTRODUCTORY**
 Laboratory experience in interviewing and counseling. (1-3 cr, §282A; limited to 12 students; prereq §; VI-VIII MTWThF; West High School) Parker, Shaffer
- 286 ADVANCED COURSE: EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN**
 Techniques of behavior modification, analysis of teacher-pupil interaction in study of classroom groups, and classroom management strategies with disturbed and delinquent children. Current literature review; individual assignments. (3 cr; prereq §; I MTWThF; CD 105) Wilderson
- 288 PRACTICUM: SPECIAL EDUCATION**
 Supervised experience in supervision, administration or coordination, teaching, and related work in schools, agencies, institutions, and other facilities for exceptional children. (3-9 cr; prereq §; hrs ar) Deno, Reynolds, Force, Wilderson, Grismer
- 297* SEMINAR: PSYCHOLOGY OF KNOWLEDGE ACQUISITION**
 Theory and research; psychological foundations of the structures that constitute curriculum content. (3 cr; limited to 10 students; prereq 197 or §; V MTWThF; Bu 125) P Johnson
- 299 INTERNSHIP: SCHOOL PSYCHOLOGICAL SERVICES**
 Advanced field experience; for doctoral candidates in School Psychology. (5-15 cr; prereq 287, §; hrs and rm ar) Duker, Hall

General Education

Business Education (BsEd)

- 130 INSTRUCTION IN BUSINESS DATA PROCESSING**
 Teaching electronic data processing in the business education program. (3 cr, §EdCI 130; limited to 25 students; I MTWThF; PeikH 215) Hopkins
- 132 TEACHING THE BASIC BUSINESS SUBJECTS**
 Recent trends and developments in teaching general business, economic geography, marketing, business law, and consumer education. (3 cr, §EdCI 132; limited to 15 students; II MTWThF; PeikH 255) Price
- 157 ORGANIZATION AND SUPERVISION OF BUSINESS EDUCATION**
 Examination of evaluative criteria for business education departments, teacher selection and supervision, and organization of business education in the United States. (3 cr, §EdCI 200; limited to 15 students; prereq §; III MTWThF; PeikH 255) Hopkins
- 237 SEMINAR: RESEARCH IN BUSINESS, DISTRIBUTIVE, AND ECONOMIC EDUCATION**
 Primarily for Master's degree candidates. Planning and evaluation of research and of individual projects. (No cr, §EdCI 237; prereq §; hrs and rm ar) Price, Meyer
- 239* PROBLEMS: BUSINESS EDUCATION**
 Investigations in fields of students' interest. (Cr and hrs ar, §EdCI 239; prereq §) Price

Curriculum and Instruction (EdCI)

EdCI (GENERAL)

- 100A†† WORKSHOP: EDUCATION OF TRAINABLE RETARDED CHILDREN**
Curriculum and materials for teaching trainable mentally retarded children. (6 cr; limited to 25 students; prereq §; I-VIII MTWThF; rm ar) Force
- 100B†† WORKSHOP: EDUCATION OF EDUCABLE RETARDED CHILDREN**
Curriculum and materials for teaching educable mentally retarded children. (6 cr; limited to 25 students; prereq §; I-VIII MTWThF; rm ar) Bruininks, Rynders
- 100D†† WORKSHOP: THE SPECIAL EDUCATION RESOURCE MODEL FOR EDUCABLE MENTALLY RETARDED IN ELEMENTARY SCHOOLS**
For experienced teachers of the retarded; development of the resource model of service in elementary schools; practicum, materials, individualized instruction. (6 cr; limited to 25 students; prereq §; I-VIII MTWThF; rm ar) Grismer
- 105 AUDIO-VISUAL MATERIALS IN EDUCATION**
(3 cr; prereq sr; 1 MTWTh and 2 hrs lab ar; NH 211) Pearson
- 107 RADIO AND TELEVISION IN EDUCATION**
(3 cr; limited to 30 students; prereq 9 cr in education; III MTWThF; WeH 202) Pearson
- 109 PROJECTED AUDIO-VISUAL MATERIALS AND EQUIPMENT LABORATORY**
Planning and making projected materials for audio-visual education; use of materials and equipment. (3 cr; each section limited to 15 students; prereq 105 or ¶105; lect IV MTWThF; WeH 206) Alton Jensen
Sec 1, VI MW, WeH 206
Sec 2, VI TTh, WeH 206
- 115 INTRODUCTION TO EDUCATION OF VISUALLY HANDICAPPED CHILDREN**
Educational programs, services, and resources for blind and partially seeing children; historical background, philosophy, sociological and psychological problems. (3 cr; prereq §; IV MTWThF; NH 122) Ar
- 118 METHODS OF TEACHING VISUALLY HANDICAPPED CHILDREN**
(3 cr; II MTWThF; JohH 18) Ar
- 128 INTRODUCTION TO THE EDUCATION OF HEARING-IMPAIRED CHILDREN**
Educational programs, services, and resources; historical background; philosophy; sociological and psychological problems. (3 cr; prereq §; III MTWThF; FraH B20) Ar
- 145 READING DIFFICULTIES**
(3 cr; each section limited to 50 students; prereq 143A or 144) Schreiner
Sec 1, II MTWThF, Bu 123
Sec 2, IV MTWThF, Pt 214
- 151 DIAGNOSIS AND TREATMENT OF LEARNING DIFFICULTIES**
Evaluation of the results of teaching; diagnosis of pupil difficulty; development and prevention; tests as aids to teaching; following up a testing program. (3 cr; III MTWThF; Arch 10) Ar
- 174-175-176 CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY**
(See course listings under Speech Science, Pathology, and Audiology, page 111) Case history and analysis; testing and diagnosis of speech defects; techniques and work programs for treatment; practical clinical work. (3 cr each; limited to students attending full time spring qtr 1969; prereq SSPA 141, 142, 143, and §; hrs ar) Starr
- 178 STRUCTURE AND FUNCTION OF THE EYE — EDUCATIONAL IMPLICATIONS**
An ophthalmologist discusses anatomy and physiology of the eye. An educator presents the educational implications. Vision screening, visual efficiency, aids; field trips, films, observations. (3 cr; prereq §; I MTWThF; Bu 125) Fink

†† Graduate students planning to register for any workshop should consult their advisors concerning the possibility of using credit for the workshop in their graduate program.

- 183 SPECIAL EDUCATION INSTRUCTIONAL MATERIALS CENTERS**
Procedures for establishing centers in communities or colleges. (3 cr; prereq §; hrs and rm ar) Juliar
- 185 ADVANCED COURSE IN THE TEACHING OF MODERN LANGUAGES**
New curricula, classroom procedures; use of language laboratory and other media and evaluation techniques. Open to teachers of modern languages and registrants in language institutes. (3 cr; I MTWThF; PeikH 155) Lange
- 189 MATERIALS AND CURRICULUM CONSTRUCTION IN MODERN LANGUAGES**
Curriculum development, preparation of units, testing techniques; materials for classroom, language laboratory, televised instruction, and programmed learning. (3 cr; prereq 185 and §; III MTWThF; PeikH 155) Lange
- 201* PROBLEMS: TEACHING SOCIAL STUDIES**
Individual research. (Cr and hrs ar; prereq 102 or 155 or 168, 204 or §) Gardner, Ellis, Ryan
- 205* PROBLEMS: AUDIO-VISUAL EDUCATION**
(Cr and hrs ar; prereq §) Pearson
- 207* PROBLEMS: RADIO-TELEVISION EDUCATION**
(1-3 cr; prereq 107; hrs ar) Pearson
- 271* PROBLEMS: CURRICULUM CONSTRUCTION**
(Cr and hrs ar; prereq §) Boeck, Gardner, Lange, Hill
- 273* PROBLEMS: READING**
(Cr and hrs ar; prereq 143A, or 144, or §) Odland, Chase, Dykstra, Manning, Schreiner
- 296* PROBLEMS: TEACHING ENGLISH**
(Cr and hrs ar) Chase, Dykstra, Piché

EdCI (ELEMENTARY EDUCATION)

- 56 NURSERY SCHOOL-KINDERGARTEN — CURRICULUM I**
The first part of the kindergarten endorsement program which satisfies the kindergarten certification requirements and is intended only for elementary education majors or those working toward nursery school endorsements. (3 cr; limited to 40 students; III MTWThF; Pt 102) H Hansen
- 60 TEACHING READING IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A; I MTWThF; Bu 123) Ar
- 61 TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A; II MTWThF; Pt 214) Ryan
- 62 TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, Math 5A-B; II MTWThF; Pt 111) Kirkpatrick
- 63 CHILDREN'S LITERATURE**
(3 cr; each section limited to 40 students) Biesbrock
Sec 1, III MTWThF, Bu 120
Sec 2, IV MTWThF, Bu 120
- 64 TEACHING ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, Engl 60; III MTWThF; Bu 123) Dykstra
- 65 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, 10 cr in natural science; IV MTWThF; Pt 102) Humphreys
- 102 TEACHING AND SUPERVISION OF SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
For graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should register for EdCI 61. (3 cr; limited to 50 students; prereq Ed 75B or elem tchg exper; I MTWThF; Pt 214) Ellis
- 103 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
For graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should regis-

ter for EdCI 65. (3 cr; limited to 48 students; prereq sr, Ed 75B or elem tchg exper; II MTWThF; Pt 102) Humphreys

- 119 ELEMENTARY SCHOOL CURRICULUM**
(3 cr; limited to 50 students; prereq Ed 75B or equiv; I MTWThF; Bu 120) Ryan
- 121 LITERATURE FOR THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; II MTWThF; Bu 120) Odland
- 143A TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOL**
For graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should register for EdCI 60. (3 cr; each section limited to 50 students; prereq 9 cr in education)
Sec 1, II MTWThF, Pt 110, Manning
Sec 2, IV MTWThF, Pt 110, Ar
- 150 SUPERVISION AND IMPROVEMENT OF INSTRUCTION**
(3 cr; limited to 50 students; prereq 9 cr in education; IV MTWThF; Bu 123)
- 153 TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq 64 or elem tchg exper; III MTWThF; Pt 110) Chase
- 153A MATERIALS LABORATORY FOR TEACHING ENGLISH IN ELEMENTARY SCHOOLS**
Examination and evaluation of textbooks, programmed materials, and audio-visual resources for language arts instruction. (3 cr; limited to 30 students; prereq 64 or elem tchg exper; I MTWThF; Pt 102) Dykstra
- 166 CURRENT TRENDS, KINDERGARTEN EDUCATION**
Continuing needs of children in our changing culture; current practices and recent research; not intended for kindergarten certification requirements. (3 cr; limited to 35 students; prereq tchg exper kindergarten or nursery school or #; IV MTWThF; Pt 111) H Hansen
- 179 EDUCATION OF MENTALLY RETARDED CHILDREN IN THE ELEMENTARY SCHOOL**
Curriculum content, materials, and methods of instruction for educable mentally retarded children; preparation of units and development of teaching aids. (3 cr; prereq EPsy 184; I MTWThF; AH 350) Rynders
- 186 LABORATORY IN ELEMENTARY INSTRUCTIONAL PRACTICE**
Daily observation of elementary classes with discussion of techniques; emphasis on activity units, visual aids, materials, and individual differences. Students enrolling in this class must carry at least one other course in the College of Education. (2 cr; prereq experienced teachers only; observation 4 hrs per wk ar MTWThF, Tuttle School; lect VI TTh, CD 18) Arthur Jensen
- 206 CURRICULUM CONSTRUCTION IN ELEMENTARY SOCIAL STUDIES**
Detailed analysis of curriculum building; goals, selection of content, grade level placement, development of teaching procedures and evaluation. (3 cr; prereq 61 or 102 or #; III MTWThF; Pt 214) Ellis
- 261* PROBLEMS: IMPROVEMENT OF INSTRUCTION**
(Cr and hrs ar; prereq #) Odland, Chase, Dykstra, Humphreys, Lambert, Manning, Biesbrock, Ellis, H Hansen, Post, Ryan, Schreiner

EdCI (SECONDARY EDUCATION)

- 51 DISTRIBUTIVE OCCUPATIONAL EXPERIENCE**
Observation and practice in distributive businesses combined with weekly seminars on application to the teaching and guidance of high school and post-high school students. (3-9 cr; prereq jr, sr, dist ed majors only, #; hrs ar) Ashmun
- 101A†† DRIVER EDUCATION I**
Materials and methods of driver education, building a plan for driver education for a specific school; behind-the-wheel training. Valid Minnesota driver

†† Advance application required; for information write to Dean's Office, College of Education, 204 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

- license required. (4 cr; limited to 32 students; prereq Δ ; 1:00-2:20 MTWThF; Bu 120) Gebhard
- 101B†† DRIVER EDUCATION II**
(4 cr; limited to 32 students; prereq 101 or 101A and Δ ; 2:30-3:50 MTWThF; Bu 120) Gebhard
- 113 PRINCIPLES OF SECONDARY SCHOOL CURRICULUM**
Fundamental principles; curricular concepts, special services, student activity programs, instructional instruments, administrative systems, and future trends. (3 cr; limited to 30 students; prereq Ed 55B or equiv; III MTWThF; JohH 122) Kimpston
- 114 INTERDISCIPLINARY APPROACHES TO CURRICULUM**
Rationale, status and trends, design, operation, and evaluation of the core curriculum. (3 cr; IV MTWThF; J2) Kimpston
- 122A TEACHING LITERATURE IN THE SECONDARY SCHOOLS**
(3 cr; limited to 45 students; prereq Ed 55B or jr-sr high school tchg exper; IV MTWThF; Arch 10) Kemp
- 122B TEACHING RHETORIC AND COMPOSITION IN SECONDARY SCHOOLS**
(3 cr; limited to 30 students; III MTWThF; PeikH 215) Piché
- 124 FOUNDATIONS OF CAREER DEVELOPMENT**
Evaluation of 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. (3 cr; III MTWThF; NH 201) Borow
- 125 OCCUPATIONAL INFORMATION LABORATORY**
Using, reviewing, and evaluating occupational information; sources and types of material, occupational filing plans, and practical techniques at secondary school level. (3 cr; prereq $\#$; IV MTWThF; JohH 122) Borow
- 144 TEACHING READING IN SECONDARY SCHOOLS**
(3 cr; prereq 9 cr in education; II MTWThF; Bu 125) Chase
- 155 MATERIALS LABORATORY FOR SOCIAL STUDIES TEACHERS**
(3 cr; prereq $\#$; IV MTWThF; PeikH 155) Rockler
- 172 SUPERVISION OF SECONDARY INSTRUCTION**
Achievement of appropriate teaching expectations focusing on problems of personnel responsible for their improvement. (3 cr; prereq 113; II MTWThF; PeikH 155) Hill
- 177 DIRECTING SECONDARY SCHOOL SPEECH ACTIVITIES**
Philosophy, organization, and administration of extemporaneous speaking, oratory, interpretative reading, and debate. (3 cr; prereq Spch 5 or 2 and 6 or $\#$; III MTWThF; FolH 105) Brock
- 186B PRACTICUM: TEACHING GREEK**
Supervised teaching experience in pilot program or demonstration center; emphasis on innovative methods, techniques, and materials; includes course planning materials, preparation, and evaluation. (3 cr; prereq EPDA fellow in classical languages, Grk 101, 102, or $\#$; hrs and rm ar) Erickson
- 193C METHODS AND MATERIALS FOR TEACHING EARTH SCIENCES**
Individualized instruction in laboratory techniques and equipment with applications to classroom use. (3 cr; limited to 20 students; prereq EdT 68C or 68M or equiv; II TTh; lab hrs ar; PeikH 375) Boeck
- 195A CURRICULUM DEVELOPMENTS IN SECONDARY ENGLISH AND SPEECH**
Analysis and evaluation of curricula and trends; emphasis on articulation. (3 cr; prereq EdT 75C or equiv; II MTWThF; Lib 14) Kemp
- 225* PROBLEMS: SECONDARY SCHOOL SUPERVISION**
An individual problems course on improvement of instruction. (Cr and hrs ar; prereq $\#$) Hill

†† Advance application required; for information write to Dean's Office, College of Education, 204 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

287* RESEARCH FOUNDATIONS OF SECONDARY SCHOOL SCIENCE TEACHING
(3 cr; III MTWThF; PeikH 375) Boeck

295 READINGS IN ENGLISH AND MODERN LANGUAGE EDUCATION
(1-3 cr; hrs and rm ar) Piché, Lange

EdCI (HIGHER EDUCATION)

228* PROBLEMS: HIGHER EDUCATION AND TEACHER EDUCATION
Selected topics on college programs, instruction, organization, and administration. (Cr and hrs ar; prereq #) Williams

252 EFFECTIVE COLLEGE TEACHING
Teaching-learning relationship; study and appraisal of methods employed to encourage, guide, and appraise students' learning. (3 cr; prereq yr of grad study in any field or 18 cr in education; III-IV TTh and hrs ar; AH 101) Williams

254 DIRECTED EXPERIENCE IN COLLEGE INSTRUCTION
Individualized program under guidance of an instructor or department; understandings, procedures, and skills related to application of instructional theory, curriculum development, and evaluation practices. (Cr and hrs ar; prereq #; may also count toward grad major in sociology) Neale

Distributive Education (DE)

136 ORGANIZATION AND ADMINISTRATION OF DISTRIBUTIVE EDUCATION
Principles, practices, and legislation followed in developing cooperative part-time and adult programs under federal vocational acts. Basic course for teacher coordinators and vocational administrators. (3 cr, §EdCI 136; limited to 30 students; II MTWThF; PeikH 275) Meyer

137A MATERIALS AND METHODS IN COOPERATIVE PART-TIME CLASSES
For cooperative part-time distributive, office, miscellaneous trades, and diversified occupations classes. (3 cr, §EdCI 137A; limited to 30 students; I MTWThF; PeikH 275) Ashmun

146 ISSUES AND TRENDS IN DISTRIBUTIVE EDUCATION
Identification, analysis, and discussion of recent issues and trends; review and synthesis of research. (3 cr, §EdCI 146; limited to 30 students; prereq sr or grad and #; IV MTWThF; PeikH 275) Meyer

148 POST-SECONDARY BUSINESS AND DISTRIBUTIVE EDUCATION
Determining needs, curriculum, facilities, admission practices, placement and follow-up of students, teacher qualifications, interorganizational relations in junior college and area technical school programs. (3 cr, §EdCI 148; limited to 30 students; III MTWThF; PeikH 275) Ashmun

238* PROBLEMS: DISTRIBUTIVE EDUCATION
Individual research. (Cr ar, §EdCI 238; prereq #) Meyer, Ashmun

Education (Ed)

55A INTRODUCTION TO SECONDARY SCHOOL TEACHING
Open only to those students accepted for the regular degree program in the College of Education. Those not previously registered as regular students should apply for admission to the College of Education not later than May 8 in order to allow time for tests, interviews, and approval by the major department. Designed principally for those who have finished the junior year with sufficient work in the teaching major to permit their entrance in the fall. (5 cr; each section limited to 30 students; prereq Psy 2; lect I MTWThF; Ph 166) Williams

Sec 1, II MTWThF; FolH 104, Hill
Sec 2, II MTWThF, FolH 303, Ar
Sec 3, II MTWThF, TSF 153, Ar
Sec 4, III MTWThF, FolH 104, Ar
Sec 5, III MTWThF, FolH 102, Ar
Sec 6, IV MTWThF, FolH 303, Ar

75A INTRODUCTION TO ELEMENTARY SCHOOL TEACHING

Limited to students accepted for the Bachelor's degree with a major in elementary education in the College of Education. Those not previously registered as regular students should apply for admission to the College of Education not later than May 8 in order to allow time for tests, interviews, and approval by the major department. (5 cr; each section limited to 30 students; prereq Psy 2; lect I MTWThF; Arch 25) Ar

- Sec 1, II MTWThF, Arch 10, Ar
 Sec 2, II MTWThF, Arch 60, Ar
 Sec 3, II MTWThF, Arch 40, Ar
 Sec 4, II MTWThF, Arch 135, Ar

History and Philosophy of Education (HEd)**90 THE SCHOOL AND SOCIETY**

(3 cr; each section limited to 75 students; prereq sr)

- Sec 1, I MTWThF, AH 150, Harkins
 Sec 2, II MTWThF, AH 150, Landsverk
 Sec 3, III MTWThF, Arch 40, Clark
 Sec 4, IV MTWThF, AH 150, Landsverk

101 HISTORICAL FOUNDATIONS OF MODERN EDUCATION

Analysis and interpretation of important elements in modern education derived from the Greeks, Romans, the Middle Ages, and the Renaissance. Background for all other courses in the history and philosophy of education. (3 cr; II MTWThF; FraH B1) Beck

141 CRITICAL ISSUES IN CONTEMPORARY EDUCATION

Introduces graduate students to ideas involved in current theory and practice. (3 cr; III MTWThF; Arch 130) Beck

190 SOCIOLOGY OF EDUCATION

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. (3 cr, §Soc 195; IV MTWThF; JohH 18) Clark

241* PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION

For graduate students interested in research and work in these areas. (Cr and hrs ar; prereq §) Beck, Clark, Harkins

Mathematics Education (MthE)**111 TEACHING AND SUPERVISION OF MATHEMATICS IN THE ELEMENTARY SCHOOL**

Present practices and trends in methods, evaluation, and diagnosis; objectives, psychology, and philosophy related to improvement of instruction. (3 cr, §EdCI 149A; limited to 48 students; prereq EdCI 62 or §; I MTWThF; Pt 111) Post

112 TEACHING AND SUPERVISION OF MATHEMATICS IN THE SECONDARY SCHOOL

Methods, materials, and curriculum development; principles of learning; review of research; preparation and evaluation of tests, units, and materials of instruction. (3 cr, §EdCI 191; II MTWThF; PeikH 315) Donovan Johnson

121 MATERIALS LABORATORY FOR ELEMENTARY SCHOOL MATHEMATICS INSTRUCTION

Printed and programmed materials, audio-visual aids, community resources; laboratory projects and techniques of using mathematical devices and instruments. (3 cr, §EdCI 149B; limited to 30 students; prereq 111 or EdCI 62 or §; III MTWThF; Pt 111) Post

122 MATERIALS LABORATORY FOR SECONDARY SCHOOL MATHEMATICS INSTRUCTION

Sources and types of materials, laboratory projects, and techniques of using mathematics devices and instruments, visual aids, and community resources. (3 cr, §EdCI 192 or 192A; limited to 20 students; prereq grad or tchg exper; IV-V MTWTh; PeikH 315) Donovan Johnson

- 202* RESEARCH IN SECONDARY SCHOOL MATHEMATICS EDUCATION**
Recent issues, problems, and findings; criteria for evaluating research; design and preparation of reports on special problems. (3 cr, §EdCl 291; prereq 112; hrs ar) Donovan Johnson
- 280* PROBLEMS: MATHEMATICS EDUCATION**
Surveying the most recent literature, designing and preparing research reports on special problems. (Cr and hrs ar, §EdCl 232; prereq 200 or 201 or 202) Donovan Johnson, Post

Home Economics Education (HEEd)

- 161 METHOD IN TEACHING HOME ECONOMICS: THEORY AND TECHNOLOGY**
Derivation of theory for educational method from relevant research; application to educational objectives; analysis of technology related to teaching method. (3 cr, §191; prereq 61, 63 or §; VII MTWThF; McNH 102) Brown
- 164 ADULT EDUCATION IN HOME ECONOMICS**
Planning a community program; teaching procedures; special problems. For teachers and supervisors of adult education. (3 cr, §194B; prereq 64 or §; II MTWThF; McNH 103) Ford
- 190 READINGS IN HOME ECONOMICS EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq §; hrs and rm ar) Brown, Ford, Whiteford
- 196B†† WORKSHOP: CHILD DEVELOPMENT AND HUMAN RELATIONS (July 1-July 18)**
Recent emphasis on growth and guidance of individuals; materials and techniques for high school and adult levels to attain better understanding. (4 cr; limited to 25 students; prereq grad; 8:30-11:30 a.m. MTWThF, afternoons ar; McNH 102) Newkirk, Christensen
- 196D†† WORKSHOP: MATERIALS FOR INSTRUCTION (June 11-June 27)**
Problems in selection and use of new materials for instruction in home economics. (4 cr; limited to 25 students; prereq grad; 8:30-11:30 a.m. MTWThF, afternoons ar; McNH 102) Whiteford
- 201* PROBLEMS: HOME ECONOMICS EDUCATION**
Independent study of current educational problems. (1-3 cr, §293; prereq 200A, §; hrs ar) Brown, Ford, Whiteford

Industrial Education (Ind)

- 100 INDUSTRIAL INSTRUCTION**
Concepts and techniques of instruction in industrial arts, trade and industrial schools and classes, and training-within-industry programs. (3 cr; prereq 40, Ed 55B or §; I MTWThF; PeikH 65) Miletich
- 105 ADMINISTRATION OF INDUSTRIAL EDUCATION**
General and vocational phases; objectives, programs, and practices; laws, rulings, and standards for aid; significant literature. (3 cr; prereq 35 or §; II MTWThF; PeikH 65) Nelson
- 125 PHILOSOPHY AND PRACTICE OF INDUSTRIAL EDUCATION**
History, objective, development, and current practices of the field. (3 cr, §35; IV MTWThF; PeikH 65) Miletich
- 155 CRITICAL ISSUES IN INDUSTRIAL EDUCATION**
Identification, analysis, and discussion of major current problems in the field. (3 cr; III MTWThF; PeikH 65) Moss

†† Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

200* RESEARCH PROBLEMS

Independent work for the degrees, master of arts, Plan B; and master of education, Plan Y. Individual conferences. (3, 6, or 9 cr; prereq approval of candidacy for Master's degree; hrs ar MTWThF; PeikH 125) Nelson, Moss

251 RESEARCH

Critical analysis of existing research; selection of problems; organization and presentation of projects. (3 cr; prereq #: I MTWThF; PeikH 60) Moss

Methods and Student Teaching (EdT)**50 JUNIOR PRACTICUM IN SPECIAL EDUCATION**

Supervised observation and participation in classroom and related school activities for exceptional children. A pre-student teaching exploratory experience. (3 cr; prereq #: hrs ar) Reynolds, Grismer

52†† STUDENT TEACHING

Open only to students who need a limited number of credits in student teaching to graduate at the end of the First Term. (Cr and hrs ar; limited to 20 students) Bruning

53A TEACHING HANDICAPPED CHILDREN

Observing work with special classes; teaching under direction. (3 cr; prereq #) Reynolds, Grismer

69J†† STUDENT TEACHING IN THE SOCIAL STUDIES

(1 cr; prereq jr, ††Ed 55A) Gardner

77†† STUDENT TEACHING IN THE NURSERY SCHOOL

Five half days per week in supervised classroom participation. (3 cr; prereq sr, #: hrs ar) McWilliams

Music Education (MuEd)

See also *Music in the section on College of Liberal Arts.*

56 TEACHING MUSIC IN THE ELEMENTARY SCHOOL

For nonmusic majors. Methods and materials in teaching singing, rhythm, music reading, creativity, classroom instruments, fundamentals, appreciation in K-6. (3 cr; each section limited to 20 students; prereq Mus 4 or exemption)

- Sec 1, I MTWThF, ScH 4, Swanson
- Sec 2, II MTWThF, ScH 4, Swanson
- Sec 3, III MTWThF, ScH 4, Dickinson
- Sec 4, IV MTWThF, ScH 4, Dickinson

103 PSYCHOLOGICAL FOUNDATIONS

Analysis and interpretation of psychologies of music and education as applied to the teaching of music. (3 cr; prereq #: IV MTWThF; ScH 104) Turrentine

118 ADVANCED WIND AND PERCUSSION TECHNIQUES

Research reports, practical performances and lectures. (3 cr; prereq Bachelor's degree in music education or #: VI MTWThF; ScH 4) Turrentine

121 MUSIC FOR EXCEPTIONAL CHILDREN

Trends; methods and materials for a functional program of singing, playing, rhythm, listening, and creative activities for mentally and physically handicapped and gifted children. (3 cr; prereq 56 or #: II MTWThF; ScH 104) Borg

†† Student teaching is open only to students in the College of Education regular degree programs. Application must be made prior to May 15. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

124 SELECTION, CONDUCTING OF CHORAL MATERIALS

Student conducting with class as performing ensemble; criteria for selecting choral and combined choral and instrumental materials; rehearsal techniques. (3 cr; prereq sr; III MTWThF; ScH 104) Caswell

151 SUPERVISION AND ADMINISTRATION OF ELEMENTARY MUSIC

Analysis and evaluation of instructional techniques; supervisory and administrative techniques; readings; new trends. (3 cr; prereq major or minor in music or music education; I MTWThF; ScH 104) Caswell, Borg

224* RESEARCH PROBLEMS

(3-9 cr; prereq knowledge of elementary statistics; hrs ar; ScH 214) Caswell, Borg, Turrentine

Physical Education

For Special Fees — See page 26.

Nonprofessional Physical Education — Students interested in meeting a college requirement in physical education or in taking activity courses for elective credit may register for PEW 5A, 13A, 27A, 28A, 29A, 36A, and 37A; for PEM 5A, 27A, 28A, 29A, 29B, 36A, and 37A.

Professional Physical Education — Courses are offered for men and women at the advanced and graduate level and in the undergraduate major and minor in physical education. Many of these courses apply toward meeting the certification requirements for teaching physical education in the state of Minnesota. For men, courses are offered that will apply toward the athletic coaching credential requirements. Courses offered this summer that apply toward meeting the requirements in the various programs are as follows:

1. An Advanced Degree in Physical Education for Men and Women — PE 100, 101, 102, 118E, 124, 130, 135, 136, 137, 140, 155, 160, 224A, 224B, and 290.
2. Undergraduate Major in Physical Education for Women — PEW 5A, 13A, 28A, 29A, and 36A; PE 51 and 102; and Hlth 25.
3. Undergraduate Major in Physical Education for Men — PEMP 50, 80, 81, and 82; PE 51 and 102; and Hlth 25.
4. Undergraduate Minor in Physical Education for Women — PEW 5A, 13A, 28A, 29A, and 36A; PE 51 and 102; and Hlth 25.
5. Undergraduate Minor in Physical Education for Men — PEMP 50, 71, 80, 81, 82, and 99; and PE 51 and 160.
6. State of Minnesota Coaching Credential — PEMP 50, 71, 80, 81, 82, and 99; PE 51, 101, and 160.

Elementary School Majors — PEWP 45 and 70 are offered to accommodate elementary school education majors and classroom teachers wishing help with the planning and selection of appropriate units of instruction and methods in health and physical education for children of elementary school age.

Physical Education for Men (PEM, PEMP, PE)**ACTIVITY COURSES (PEM)**

- 5A†† SWIMMING**
(1 cr; limited to 24 students; VI MTWTh; CH Pool) Walker
- 28A†† FENCING**
(Co-ed, see PEW 28A)
- 29A†† GOLF**
(1 cr; each section limited to 24 students)
Sec 1, 12:30-1:45 MW, Golf Course, Bolstad
Sec 2, 12:30-1:45 TTh, Golf Course, Bolstad
- 36A†† TENNIS**
(1 cr; limited to 24 students; 12:30-1:45 TTh; CH 215) Piper
- 37A†† TRACK AND FIELD**
(1 cr; limited to 24 students; IV MTWTh; CH 214; co-ed, see PEW 37A) Griak

PROFESSIONAL COURSES OPEN TO MEN ONLY (PEMP)

- 50 HUMAN ANATOMY**
Emphasizes bones, nerves, and muscles and their significance in physical education. (3 cr; II MTWThF; CH 206) Serfass
- 71 PHYSIOLOGICAL APPLICATIONS TO SPORTS**
Consideration of muscular contraction with applications 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. (3 cr, §PubH 91, §PubH 92; prereq 50 or Anat 27; V MTWThF; CH 206) Serfass
- 80 BASEBALL COACHING**
Techniques of playing each position, batting, coaching runners, and team play; study of rules; officiating methods and practice; organization of practices. (2 cr, §72; prereq 9; III MTWThF; CH 206) Kindall
- 81 BASKETBALL COACHING**
Techniques, styles of offense and defense, conditioning, and handling of players. (2 cr, §68; prereq 10 or §; III MTWThF; CH 214) Kundla
- 99 INDEPENDENT STUDY**
Self-directed study preceded by classroom study and possession of basic competence. (1-9 cr; prereq Δ; hrs ar) Serfass

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PEMP)

- 70 TEACHING HEALTH AND PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL**
(See PEWP 70)

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)

- 101 FOUNDATIONS OF PHYSICAL EDUCATION**
Establishment of guide lines for individual and group professional action; examination of pertinent social forces, educational philosophies, and general ethics. (3 cr; prereq grad or MEd student; 6:30-9:00 p.m. MW; CH 215) McAdam
- 102 CURRICULUM**
(See PEW 102)
- 118E PROBLEMS**
Focus on teaching of physical education. (Cr and hrs ar; prereq MEd candidate, §) Donnelly, McAdam, Alexander

†† Health Service approval must be secured for participation in this course.

- 130 CONTRIBUTION OF BASIC SCIENCE TO PHYSICAL EDUCATION**
(See PEW 130)
- 136 INTRODUCTION TO RESEARCH**
Methods and design for research in health, physical education, and recreation. (3 cr; prereq #: 7:00-7:50 a.m. MTWThF; CH 215) Alexander
- 137 READINGS: PHYSICAL EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq grad, #: hrs ar) Donnelly, McAdam, Alexander
- 155 INSTRUCTIONAL AIDS IN HEALTH, PHYSICAL EDUCATION, AND RECREATION**
Evaluation, construction, and use of materials stressing audio-visual aids. (3 cr; III-IV TTh, 1 hr ar; CH 215) Piper
- 160 PRACTICUM: PREVENTION AND CARE OF ATHLETIC INJURIES**
An overview of problems (recognition, principles, responsibilities) related to athletic injuries in girls' and in boys' secondary and college programs. Demonstration and practice in training techniques and familiarity with the use of instruments for athletic rehabilitation. (3 cr; prereq #: limited to 50 students; June 17-July 3; 2:30-5:00 MTWThF; CH 215) McAdam, Stein
- 224A* RESEARCH PROBLEMS**
Designing, reporting on individual problems; required of all M.A. and Ph.D. candidates. (3 cr; prereq 136, EPsy 116 or #: V MTWThF; CH 214) Alexander
- 224B* RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or #) Donnelly, McAdam, Alexander
- 290 KINESIOLOGY: PHOTOGRAPHIC AND CINEMATOGRAPHIC ANALYSES**
(See PEW 290)

Physical Education for Women (PEW, PEWP, PE)

ACTIVITY COURSES (PEW)

- 5A†† SWIMMING**
For nonswimmers. Course includes aquatic breathing, floating, bobbing, treading, finning, human stroke, elementary backstroke, sidestroke, front crawl. (1 cr; limited to 24 students; V MTWTh; NGW 58) Ost
- 28A†† FENCING**
Instruction in the basic techniques of fencing; offense and defense with experience in fencing bouts. (1 cr; limited to 22 students; II MTWTh; NGW 60; co-ed, see PEM 28A) Shick
- 29A†† GOLF**
Class and individual instruction in the fundamentals of golf; rules, etiquette, and terminology. (1 cr, §PEWP 22B; each section limited to 24 students) Young
 Sec 1, III MTWTh, NGW 60
 Sec 2, IV MTWTh, NGW 60
- 36A†† TENNIS**
Course includes fundamental strokes such as service, forehand and backhand drives, and volley; court positions and strategy for singles and doubles; rules, terminology, and etiquette. (1 cr, §PEWP 22C; each section limited to 24 students)
 Sec 1, II MTWTh, NGW 151, Ost
 Sec 2, III MTWTh, NGW 151, Ost
 Sec 3, IV MTWTh, NGW 151, Shick
- 37A†† TRACK AND FIELD**
(Co-ed, see PEM 37A)

†† Health Service approval must be secured for participation in this course.

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PEWP)**70 TEACHING HEALTH, PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL**

Methods of instruction in health and physical education for the elementary education major. (3 cr, §Hlth 70; each section limited to 45 students)

Sec 1, II MTWThF, NGW 201, Hauptfuehrer

Sec 2, III MTWThF, NGW 201, Hauptfuehrer

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)**101 FOUNDATIONS OF PHYSICAL EDUCATION**

(See PEM 101)

102 CURRICULUM

For students without previous experience in curriculum; objectives, content, organization, evaluation, and trends. (3 cr; prereq sr; I MTWThF; NGW 3) Young

118E PROBLEMS

Focus on teaching of physical education. (Cr and hrs ar; prereq MEd candidate, §) Jaeger, Wilson

128E INTEGRATING PAPER

(3 cr, §Hlth 128E) Jaeger, Wilson

130 CONTRIBUTION OF BASIC SCIENCE TO PHYSICAL EDUCATION

Recent research; applications in selected areas. (3 cr; prereq §; II MTWThF; NGW 4) Wilson

136 INTRODUCTION TO RESEARCH

(See PEM 136)

137 READINGS: PHYSICAL EDUCATION

Independent study under tutorial guidance. (1-3 cr; prereq sr honor, grad, §; hrs ar) Jaeger, Wilson

155 INSTRUCTIONAL AIDS IN HEALTH, PHYSICAL EDUCATION, AND RECREATION

(See PEM 155)

160 PRACTICUM: PREVENTION AND CARE OF ATHLETIC INJURIES

(See PEM 160)

224A* RESEARCH PROBLEMS

(See PEM 224A)

224B* RESEARCH PROBLEMS

Individual problems. (Cr and hrs ar; prereq 224A or §) Jaeger, Wilson

290 KINESIOLOGY: PHOTOGRAPHIC AND CINEMATOGRAPHIC ANALYSES

Application of analyses techniques; verification or development of mechanically efficient movement patterns. (3 cr; prereq 115, §; VI MTWThF; CH 420) Wilson

Recreation and Park Administration (Rec)

Courses for the summer terms include offerings in recreation program planning, school recreation, supervised field experience, problems and readings courses for advanced students, and practicums for graduate students.

90 FIELD EXPERIENCE

(1-9 cr [9 cr req for majors, 3 cr req for minors], §84-85; prereq sr, recreation major or minor; hrs ar) Giles, Scott

112 RECREATION PROGRAM PLANNING

Principles of program planning for an organized offering of recreation opportunities. (3 cr; prereq 20 or §; I MTWThF; CH 214) Cheatham

118E PROBLEMS

Focus on conduct of recreation programs. (Cr and hrs ar; prereq MEd candidate, §) Giles, Scott

- 137 READINGS: RECREATION**
Independent study under tutorial guidance. (1-3 cr; prereq §; hrs ar) Giles, Scott
- 224B* RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or §) Donnelly
- 250 PRACTICUM: COLLEGE UNIONS**
Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Giles
- 251 PRACTICUM: THERAPEUTIC RECREATION**
Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Scott
- 252 PRACTICUM: PUBLIC RECREATION AND PARKS**
Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Giles

School Health Education (Hlth)

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 which apply to the minor in school health education are Hlth 25 and 117B.
 2. Courses offered this summer which apply to advanced and graduate degrees in school health education are Hlth 117B, 118E, 124, 137, 224A, 224B.
- 25 AMERICAN RED CROSS STANDARD ADVANCED FIRST AID**
Lectures, demonstrations, and practice in emergencies and first aid treatment. American Red Cross Standard and Advanced Certificate in First Aid received upon successful completion of the course. (2 cr; limited to 35 students; I MTWThF; NGW 201) Guthmann
- 70 TEACHING HEALTH AND PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL**
Methods of instruction in health and physical education for the elementary education major. (3 cr, §PEWP 70; limited to 45 students; prereq elementary education majors) Hauptfuehrer
Sec 1, II MTWThF, NGW 201
Sec 2, III MTWThF, NGW 201
- 119 SAFETY EDUCATION**
The scope and nature of the accident problem in our society; study of curricular areas leading to accident prevention. (4 cr; limited to 50 students; prereq sr; 10:15-11:45 MTWThF; NGW 3) Guthmann
- 224A* RESEARCH PROBLEMS**
Designing, reporting on individual problems. Required of all M.A. and Ph.D. candidates. (3 cr; prereq PE 136, EPsy 116 or §; V MTWThF; CH 214) Alexander

General College (GC)

2C PSYCHOLOGY OF HUMAN DEVELOPMENT

Provides an objective view of the complex individual as he functions in and interacts with a complex environment at various stages during the process of physical and psychological development from conception through maturity. (3 cr; I MTWThF; NH 213) Latts

5B FUNCTIONS AND PROBLEMS OF LOGIC

The student studies and attempts to apply the rules and procedures of sound argument and valid inference. He is shown the relationship of formal patterns of reasoning to such uses of ordinary language as argument, propaganda, and persuasion. (3 cr; IV MTWThF; NH 216) Kroiss

7D GEOLOGY

The origin and interpretation of the surface features of the land. A consideration of Minnesota's 10,000 lakes leads to the study of the work of glaciers, water, and wind in sculpturing the earth's surface. Mountain-making, the common rock types and their origins, the age of the earth, and significance of fossils are briefly treated. (5 cr; III-IV MTWThF, SciCB 125; field trips or lab VI-VII Th) J M Harris

8A APPLIED MATHEMATICS

Measurement, calculations with measured data, use of the slide rule, formulas, and equations. The most commonly useful mathematical skills are built up in a steady progression against a background of practical applications. Problems provide a broad acquaintance with the language and nature of many fields. (5 cr; III-IV MTWThF; NH 207) Policoff

10A PRINCIPLES OF BIOLOGY

The variety and relationships of living organisms illustrate the general principles of biology as to man, animals, and plants. These principles are drawn from fields such as the study of cells, relationships of organisms in nature, heredity, chemical and physical properties of living organisms, evolution, and reproduction. Films and demonstration laboratories supplement the lectures. (5 cr; I-II MTWThF, SciCB 125; lab hrs ar) Dearden

14D INTRODUCTION TO DATA PROCESSING

Defines data processing, summarizes its applications to date, and assesses its social and economic affects. Students study terminology, basic cycles, and kinds of machines. Career opportunities are explained, and suggestions for further study are outlined. (3 cr; III MTWThF; NH 216) Folz

15 INTRODUCTION TO MODERN BUSINESS

Provides an overview of the major functions of a business organization, including production, marketing, finance, and personnel. It is a useful introductory course for students planning to do more work in business, but it is also recommended for those who want a brief survey of the business field. Lectures supplemented by cases, business games, and films. (3 cr; I MTWThF; NH 207) Pung

16A BOOKKEEPING-RECORD KEEPING

Introduces basic accounting terminology and procedures. Trains students in the fundamental skills necessary to keep records and to prepare summaries of these records for a business service organization. Emphasis is given to accounting for cash, payrolls, credit and collections, subsidiary ledgers, and taxes. (3 cr; II MTWThF; NH 207) Ruth Larson

21 GENERAL ARTS

An opportunity is given the student to examine the basic similarities which underlie all art forms, and to investigate these art forms in terms of human needs. The arts concentrated on are painting, sculpture, music, architecture, and literature. (3 cr; II MTWThF; NH 111) Byrne

22A ART TODAY

The student examines the role and importance of contemporary art and design in several related fields such as architecture, painting, sculpture,

photography, and industrial art. He is challenged to develop powers of observation, sensitivity, and judgment, and to communicate these in a thoughtful and intelligent manner. Course activity consists of discussion, illustrated lectures, explorative exercises, and gallery trips. (3 cr; III MTWThF; NH 111) Gates

29E READING SHORT STORIES

To enhance his appreciation of a popular form of leisure reading, the short story, the student reads representative stories by outstanding American, British, and Continental writers. He sees how individual writers have used the short story to express in a concise artistic form their ideas about human experience. (3 cr; II MTWThF; NH 213) Stockdale

31A WRITING LABORATORY: PERSONAL WRITING

To increase awareness of himself, his surroundings, and his relationships with friends and family, the student reads and writes descriptions, incidents, character and autobiographical sketches. He works on his own writing difficulties, dictionary usage, and brief study of the history and development of language. (3 cr)

Sec 1, I-II MTWTh, NH 209, Sheldon

Sec 2, I-II MTWTh, NH 209A, Hagen

Sec 3, III-IV MTWTh, NH 209, Reisman

31C WRITING LABORATORY: COMMUNICATING IN SOCIETY

The student investigates the role played by language in his own life, in the mass media of communication, and elsewhere in the society in which he lives. Through reading and listening he becomes aware of the various devices of propaganda and the methods of persuasion. In addition, he writes analyses of arguments of others and composes persuasive arguments of his own. (3 cr; prereq 31A, 31B; III-IV MTWTh; NH 209A) Rathburn

41A MAN IN SOCIETY: HIS PERSONAL ROLE

The nature of social problems is probed by application of methods from several social science disciplines. A study of the American value system stresses the conflicts in values which contribute to the development of specific social problems. There is intensive study of a particular social problem: race relations within American society. The role of the individual is emphasized. (5 cr; I-II MTWThF; NH 216) Wold

43A BACKGROUND OF THE MODERN WORLD

Dealing primarily with the history of modern Europe, three major themes are studied: the nation state, industrialism, and modern science. The student learns how each of these originated in Europe, in what direction they have developed, and how they have spread to other parts of the world. (3 cr; III MTWThF; NH 213) David Jones

46A PROBLEMS OF AMERICAN GOVERNMENT

The general principles, procedures, and problems of government are studied. Among the problems considered are federal-state relations; conduct of foreign relations; the relations of government to agriculture, labor, and business; taxation; and the relationship of the individual citizen with his government. (3 cr; IV MTWThF; NH 213) Hathaway

College of Liberal Arts

American Studies (AmSt)

See section on Special Programs.

Hum 22 AMERICAN LIFE II

Religious and philosophic attitudes in relation to American life and thought. (3 cr; I MTWThF; ForH 285) Davies

102/202 INTRODUCTION TO AMERICAN STUDIES

(3 cr; limited to 12 students; open to MA candidates in American Studies and other qualified students; prereq Δ ; V-VI MTh; ForH 285)

250 INDEPENDENT READINGS IN AMERICAN CIVILIZATION

(Cr and hrs ar; prereq consent of program chairman) Staff

Anthropology (Anth)

2A INTRODUCTION TO ANTHROPOLOGY: CULTURAL ANTHROPOLOGY

Varieties and range of human behavior as revealed through study of primitive societies in all parts of the world. Scientific analysis of the ways in which primitive men organize their lives, directed toward a deeper and broader understanding of human capacities and purposes. (3 cr; III MTWThF; ForH 155) Spencer

68 RELIGION AND CULTURE

Introduction to comparative study of religion in its cultural context. (3 cr; prereq 2A or 100; especially suitable for nonmajors; II MTWThF; ForH 349)

101 PRINCIPLES OF BIOCULTURAL EVOLUTION

Intensive survey: human biological and cultural origins and evolution. Emphasis on interpretation of paleontological and archaeological record. (3 cr, §1A; may be taken in lieu of 1A; I MTWThF; ForH 155) Peterson

112 MODERN INDIA: TOWNS AND CITIES

Development of Indian towns and cities from anthropological perspective; emphasis on social and cultural processes of urban life, city growth, and urban migration. (3 cr; prereq 2A or 100 or Δ ; II MTWThF; ForH 155) Rowe

140 FIELD RESEARCH IN ARCHAEOLOGY

(6 cr [may be taken for cr only once]; limited to 20 students; prereq 90 and Δ)

164 SOCIAL ANTHROPOLOGY

Structure of nonliterate and folk societies; systems of kinship and marriage and their relationship to economic, religious, and political institutions; functional and structural approaches in cultural anthropology. (3 cr; prereq 2A or 100; IV MTWThF; ForH 155)

165 CULTURE AND PERSONALITY

Role of culture in formation of personality. Problems of individual adjustments to demands of culture. Psychological approach to culture. (3 cr; prereq sr, 2A or 100 or Δ ; waived for majors in public health, nursing, psychology, sociology, and social work; IV MTWThF; ForH 55) Spencer

173 HUMAN BIOLOGY

Evolutionary processes in the differential development of races. Physical characteristics, distribution, and relationships of living races of mankind.

Human genetics, particularly of blood types in racial analysis. Influence of various environments on man. (3 cr; prereq 1A, 101 or Δ; III MTWThF; ForH 155) Peterson

204 ANTHROPOLOGICAL PERSPECTIVES IN THE ANALYSIS OF EXPRESSIVE CULTURES

Anthropological perspectives in the analysis of expressive culture (art, literature, music) in India. (3 cr; IV MTWThF; ForH 261) Rowe

Art History (ArH)

1 PRINCIPLES OF ART

Lecture course on basic problems of art. Examples from the painting, sculpture, and architecture of various periods will be used to illustrate general cultural factors that influence the production of art as well as basic problems of design and of technique. (3 cr, §50; II MTWThF; Arch 25) Torbert

5 SURVEY: HISTORY OF ART

Modern architecture, sculpture, and painting, 19th and 20th centuries. (3 cr, §60; IV MTWThF; Arch 25) Waldfoegel

50 INTRODUCTION TO THE VISUAL ARTS

Similar to ArH 1 in organization and basic content. Expanded program of reading and more extensive contact with works of art. (3 cr, §1; II MTWThF; Arch 25) Torbert

59 SUMMER TRAVEL COURSE IN EUROPEAN ART

Conducted by Department of Art History under auspices of Summer Session. Main phases of ancient, medieval, Renaissance, baroque and modern art. Guided visits and discussions at important cultural centers, museums, and cathedrals. Cities and sites usually visited: Athens, the Greek Islands, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Copenhagen, London, Stonehenge, Winchester, Paris, Versailles, Chartres. (6 cr; prereq §; about June 28 to August 12, approximately 6 wks in Europe; may be taken as 159su) Safer

60 SURVEY: HISTORY OF ART

Similar to ArH 5 in organization and content. Expanded program of reading and contact with works of art. (3 cr, §5; IV MTWThF; Arch 25) Waldfoegel

106 ITALIAN ART OF 14TH CENTURY

Survey of painting from primitives through International Style, including painting after Black Death. Special emphasis on Giotto, Duccio, the Lorenzetti, and Simone Martini. (3 cr; prereq sr, grad or §; III MTWThF; J 207B) Canedy

114 SIXTEENTH-CENTURY SCULPTURE AND ARCHITECTURE

High Renaissance, mannerism, and other trends in Italy and northern Europe. (3 cr; prereq sr, grad or §; V MTWThF; J 207B) Canedy

147 MODERN AMERICAN AND EUROPEAN ARCHITECTURE

Revivalist and progressive currents in later 19th century; sources and founders of modern architecture. Chicago School and its chief exponents. Richardson, Jenney, Sullivan, the early Wright; their European counterparts. Modern materials and techniques; rise of skyscraper. (3 cr; prereq sr, grad or §; IV MTWThF; J 207A) Torbert

155 ENGLISH PAINTING FROM 1750 TO 1850

Landscape painting from topographers to Turner. Other artists and movements. Blake and Fuseli, Haydon, Ety, pre-Raphaelites and Victorian narrative painters. (3 cr; prereq sr, grad or §; II MTWThF; J 207B) Waldfoegel

189 ART OF THE FILM — INDIA

History of Indian films; a mass art form and its relation to cultural factors. (3 cr; prereq sr, grad or §; III MTWThF; J 207A) Kale

Studio Art (Arts)

10 PHOTOGRAPHY

Introduction to the photographic medium, its background and meaning today. Lectures in contemporary and historical use of photography. Problems in the use of the camera, printing, and enlarging. (3 cr; limited to 20 students) Liebling

Sec 1, III-IV MTWThF, ArtB 131

Sec 2, I-II MTWThF, ArtB 120

11 PHOTOGRAPHY

For students who have had previous instruction in photography or have worked in photography and know the principles of developing and printing. Develops a personal photographic perception in the student through lectures on photographic history and contemporary trends in photography. Intensive field work. (3 cr; limited to 15 students; prereq 10; I-II MTWThF; ArtB 131) Downs

20 BASIC DRAWING

An introduction to studio work; exploration of contemporary and traditional methods. Work from nature, various drawing media. (3 cr; limited to 25 students)

Sec 1, I-II MTWThF, ArtB 150, Gray

Sec 2, III-IV MTWThF, ArtB 140, Routon

23 DRAWING AND PAINTING

Work from life and nature; introduction to color and pictorial structure. (3 cr; limited to 25 students; prereq 20)

Sec 1, III-IV MTWThF, ArtB 160, Gray

Sec 2, I-II MTWThF, ArtB 140, Routon

32-33 ELEMENTS OF PRINTMAKING

(Sequence limited to 15 students) Priede

32 Foundation course. Familiarizes the student with the mediums of printmaking in general. Problems in engraving, etching, and other techniques employed in working on metal plate, as well as lithography, woodcuts, and combined processes. (3 cr; I-II MTWThF; ArtB 170)

33 A beginning course designed to introduce the various techniques of etching, engraving employed in working on metal plate. Woodcuts and lithography are included, and lectures and demonstrations are given. (3 cr; I-II MTWThF; ArtB 170)

34-35-36 LITHOGRAPHY

Introduction to methods of lithography-planography. (3 cr; limited to 15 students; prereq 20 or ‡; III-IV MTWThF; ArtB 170) Priede

40-41 SCULPTURE

(Sequence limited to 20 students) Daly

40 Beginning course. Intensive study of structure in nature with emphasis on accurate observation. Construction in metal and plaster. (3 cr; I-II MTWThF; HoIB 154)

41 Integrates basic principles examined in Art 40. Natural form is studied for sculptural possibilities. A more imaginative approach to the study of nature is encouraged. (3 cr; prereq 40; I-II MTWThF; HoIB 154)

53-54-55 DRAWING

From the model, still life, and nature. Principles of anatomy. (3 cr; limited to 25 students; I-II MTWThF; ArtB 160) Hender

60B-61B-62B WATER COLOR

Introduction to transparent water color, gouache, casein, and tempera. General course introducing student to various drawing and painting mediums. Figure, still life, landscape, and abstract design. (3 cr; limited to 25 students; prereq 20, or equiv, with ‡; III-IV MTWThF; ArtB 141) Myers

66-67-68 INTRODUCTION TO ART OF FILM-MAKING

Lectures and practical aspects of making films. (3 cr; limited to 20 students; prereq 10; III-IV MTWThF; ArtB 120) Downs

70-71-72 OIL PAINTING

Introduction to medium of oil; individual projects and instruction. (3 cr; limited to 25 students; prereq 55 or §; III-IV MTWThF; ArtB 161) Hendler

80A, C-82A, C SCULPTURE

(Sequence limited to 15 students; III-IV MTWThF; HolB 154) Daly

80A Work with direct metal sculpture and constructions. Attention given to 20th-century tools and equipment. (3 cr; prereq 42)

81A Direct metal problems of sculptural expression and organization in relation to architecture. (3 cr; prereq 80A, 80B, 80C)

82A Experimental work in direct metal. Class problems are assigned. (3 cr; prereq 81A)

80C Metal casting of sculpture. Lost-wax and sand casting techniques are employed. (3 cr; prereq 42)

81C Problems concerned with cast metal sculpture for landscape architecture. (3 cr; prereq 80A, 80B, 80C)

82C Experimental work in cast metals. Class problems are assigned. (3 cr; prereq 81C)

83-84-85 PHOTOGRAPHY II

Gives advanced students an opportunity to carry out creative problems in color development and printing. Experiments in photographic controls to illustrate limitations and capacities. Use of photography to interpret the visual environment, and the photographer's responsibilities in this use. (3 cr; limited to 5 students; prereq 11 or Jour 6 or Δ; I-II MTWThF; ArtB 131) Downs

90-91-92 PRINTMAKING, INTAGLIO PROCESSES

(3 cr; limited to 5 students; prereq 32 or §; I-II MTWThF; ArtB 170) Priede

120-121-122 ADVANCED DRAWING

Primarily for painting majors. (3 cr; prereq 55 or equiv; I-II MTWThF; ArtB 141) Busa

150-151-152 PROBLEMS IN PAINTING

(3 cr; limited to 10 students; prereq 72 and §; III-IV MTWThF; ArtB 151) Busa

180A, C-181A, C-182A, C SCULPTURE IV

(Sequence limited to 5 students; prereq 9 cr in courses numbered 81 or above; III-IV MTWThF; HolB 154) Daly

180A-181A-182A Advanced work in welding. (3 cr)

180C-181C-182C Advanced work in foundry practices. (3 cr)

190-191-192 ADVANCED PRINTMAKING, INTAGLIO PROCESSES

(3 cr; limited to 5 students; prereq 90 or §; III-IV MTWThF; ArtB 170) Priede

200-201-202-203-204-205 ADVANCED PROBLEMS: PAINTING

(3 cr; prereq §; hrs and rm ar) Busa

210A-C, 211A-C, 212A-C ADVANCED PROBLEMS: SCULPTURE

(3 cr; prereq §; hrs and rm ar) Daly

220-221-222 ADVANCED PROBLEMS: PRINTMAKING

(3 cr; prereq §; hrs and rm ar) Myers

231-232-233 ADVANCED PROBLEMS: DRAWING

(3 cr; prereq §; hrs and rm ar) Busa

Classics

Classics (Clas)††

45 GREEK AND ROMAN MYTHOLOGY

Classical myths which acquaint the student with the stories of the gods, demigods, and heroes which are a basic component of the European cul-

†† No knowledge of Latin or Greek is required.

tural heritage, with attention to their artistic, religious, psychological, and anthropological interpretations. (3 cr, §42, §42A, §145; II MTWThF; FoIH 308) Coulson

- 71 HELLENISTIC RELIGIONS: INTRODUCTION TO HISTORY OF ANCIENT RELIGIONS**
 Criticisms of traditional Greek religion. Eclipse of city-state and "failure of nerve." Mystery religions and impact of Eastern cults. Ancient myths and need for allegory. Ruler-worship. Gnosticism. Judaism in Greek world; Dead Sea scrolls. (3 cr, §171; prereq jr; IV MTWThF; FoIH 308) Kraabel
- 124 FIELD RESEARCH IN ARCHAEOLOGY**
 Field excavation, survey, and research in archaeological sites in Greece, Turkey, Italy, or the Mediterranean area. Intensive training in techniques of excavation and exploration as well as analysis and interpretation of archaeological materials. (3-6 cr; prereq 121-122-123 or equiv and Δ) McDonald
- 145 GREEK AND ROMAN MYTHOLOGY**
 Same class work as Clas 45 but with special independent reading and research assignments in consultation with the instructor. (3 cr, §42, §42A, §45; II MTWThF; FoIH 308) Coulson
- 171 HELLENISTIC RELIGIONS**
 Meets with Clas 71, but requires additional work for advanced credit. (3 cr, §71; prereq #: IV MTWThF; FoIH 308) Kraabel

Greek (Grk)

50 BEGINNING CLASSICAL GREEK

See section on 10-week courses, pages 142-148.

174D GREEK LITERATURE

Authors vary from term to term and from year to year. One or more appropriate authors studied in a given course. (3 cr; for exp tchr fellows, others by #: III MTWThF; FoIH 303) Erickson

Latin (Lat)

63 GOLDEN AND SILVER LATIN

Selections from history, satire, nonlyric verse, the novel, and other genres. (3 cr; prereq 62 or 4X or Δ; V MTWThF; FoIH 303) Coulson

123 LATIN TEXT COURSE

Meets with Lat 63 but students will do supplementary work at discretion of instructor. (3 cr; prereq grad in field other than classics; V MTWThF; FoIH 303) Coulson

178C LATIN LITERATURE: RELIGIOUS TEXTS

Authors vary from term to term and from year to year. One or more appropriate authors studied in a given course. (3 cr; V MTWThF; FoIH 307) Kraabel

Economics (Econ)

1 PRINCIPLES OF ECONOMICS

Principles underlying economic activity and the economic institutions within which economic units function. National income, money and banking, business cycles, and international trade. Econ 1-2 or equivalent are prerequisite for most advanced courses in business administration and economics. (3 cr, †1-2, §1T, §C, §50A; prereq 3rd qtr fr)

- Sec 1, I MTWThF, BlegH 155, Staff
- Sec 2, II MTWThF, BlegH 225, Staff
- Sec 3, III MTWThF, BlegH 350, Staff
- Sec 4, IV MTWThF, BlegH 225, Staff
- Sec 5, V MTWThF, BlegH 230, Staff

2 PRINCIPLES OF ECONOMICS

(Continuation of Econ 1) Demand and supply, competition and monopoly, and the distribution of income. (3 cr, †1-2, §2T, §C, §50B; prereq 1 or equiv)

- Sec 1, I MTWThF, BlegH 215, Staff
- Sec 2, III MTWThF, BlegH 120, Staff

- 65 INTERMEDIATE ECONOMIC ANALYSIS I**
 Behavior of firms and industries under competitive and monopolistic conditions; factors influencing production, price, and advertising decisions. (3 cr, §65T, §165; prereq 1-2 or §)
 Sec 1, I MTWThF, BlegH 120, Staff
 Sec 2, II MTWThF, BlegH 435, Staff
 Sec 3, IV MTWThF, BlegH 235, Staff
- 66 INTERMEDIATE ECONOMIC ANALYSIS II**
 Determinants of national income, employment, and price level; attention given to aggregate consumption and investment. (3 cr, §66T, §166; prereq 1-2 or §; III MTWThF; BlegH 155) Staff
- 67 MONEY AND BANKING**
 Historical development, present pattern, and economic role of financial institutions, with special emphasis on commercial banks, the money supply, and the Federal Reserve System. (3 cr; prereq 66 or equiv; III MTWThF; BlegH 110) Staff
- 68 ELEMENTS OF PUBLIC FINANCE**
 Survey of government expenditures, budgeting, fiscal policy, debts, and taxes in terms of fiscal institutions, impact on business and the economy, and policy issues. (3 cr; prereq 66 or equiv; IV MTWThF; BlegH 415) Staff
- 69 GOVERNMENT REGULATION OF BUSINESS**
 Economic aspects of public policy affecting the market process. Relations between market structure and economic efficiency and welfare; economic origins of monopoly and other business limitations on free competition; purposes and effect of antitrust laws and laws relating to "unfair business practices." (3 cr; prereq 65 or equiv for business or economics majors, suitable background in law or political science for others, or §; I MTWThF; BlegH 225) Staff
- 75 INTERMEDIATE ECONOMIC ANALYSIS III**
 Introduction to household and welfare theory. Applications of evaluative techniques to various market phenomena and government policies. (3 cr; prereq 65 or 65H or equiv; II MTWThF; BlegH 404) Staff
- 103 ECONOMIC DEVELOPMENT**
 Conditions necessary for increasing income; capital formation, measurement of economic growth, and problems of underdeveloped areas. (3 cr, §103A; not open to economics majors; prereq 2 or equiv; III MTWThF; BlegH 220) Staff
- 103A ECONOMIC DEVELOPMENT**
 Conditions necessary for increasing income; capital formation, measurement of economic growth, and problems of underdeveloped areas. (3 cr, §103; prereq 65, 66 or equiv or §; III MTWThF; BlegH 220) Staff
- 165 ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD**
 Individual decision making by households and by firms under conditions of monopoly, competition; some welfare economics. (3 cr, §65; prereq grad or §; IV MTWThF; BlegH 235) Staff
- 166 ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT**
 Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding. (3 cr, §66; prereq grad or §; III MTWThF; BlegH 155) Staff
- 176A ECONOMIC ANALYSIS II: INCOME THEORY**
 General equilibrium models from which may be determined the real output, employment, price level, and rate of interest. Effects of government fiscal and monetary policies on these equilibrium values. (3 cr; prereq 166 or equiv or §; III MTWThF; BA 632) Staff
- 185A ECONOMIC ANALYSIS I: PRICE THEORY**
 Theories of choice as applied to consumers, firms, and resource owners, economic behavior in competitive and monopoly market situations. (3 cr; prereq 165 or equiv; IV MTWThF; BA 632) Staff
- 190 READINGS IN ECONOMICS**
 Areas useful to individual programs and objectives not available in regular course offerings. (Cr ar; prereq consent of adviser and §) Staff

290 INDIVIDUAL GRADUATE RESEARCH
(Cr ar) Staff

English (Engl)§§

1 FRESHMAN ENGLISH

(3 cr, §Engl A or §Engl 1A or §Engl 1B or §Engl 10H or §Comm 1; each section limited to 28 students; prereq assignment to category 1, or 1A, or 2)

- Sec 1, I MTWThF, MH 214
- Sec 2, II MTWThF, ME 102
- Sec 3, III MTWThF, ME 208
- Sec 4, IV MTWThF, ME 208

3 FRESHMAN ENGLISH

(3 cr, §Engl C or §Engl 3A or §Engl 3B or §Engl 12H or §Comm 3; each section limited to 28 students; prereq 2)

- Sec 1, I MTWThF, ME 214
- Sec 2, II MTWThF, MH 214
- Sec 3, III MTWThF, ME 214
- Sec 4, IV MTWThF, Arch 20

21 INTRODUCTION TO LITERATURE

Medieval and Renaissance literature. (6 cr; limited to 65 students; prereq ††; III-IV MTWThF; Aero 209) Stricker

22 INTRODUCTION TO LITERATURE

Milton, the Restoration, and 18th century. (6 cr; limited to 65 students; prereq ††; I-II MTWThF; Ex 193) Leyasmeyer

55 SHAKESPEARE

The reading of plays from Shakespeare's early and middle periods: *Richard II*, *A Midsummer Night's Dream*, *The Merchant of Venice*, *Hamlet*, and two or three other plays from the early and middle periods. (3 cr; limited to 35 students; prereq ††; may not be taken concurrently with 56)

- Sec 1, II MTWThF, ME 202, Rosendahl
- Sec 2, III MTWThF, C 111, Rosendahl

56 SHAKESPEARE

The reading of plays from middle and late periods: *Twelfth Night*, *King Lear*, *Macbeth*, *The Tempest*, and two other plays from the middle and late periods. (3 cr; limited to 35 students; prereq 55; may not be taken concurrently with 55; II MTWThF; FolH 102) Scoggins

60 INTRODUCTION TO THE ENGLISH LANGUAGE

How English exemplifies basic concepts of language with respect to inner structure, outer form, time, situation, and user. (3 cr; limited to 100 students; prereq ††; may not be counted toward a major in English in Arts College except by students taking 34 or more Upper Division cr in English; IV MTWThF; ME 18) Underwood

72 AMERICAN LITERATURE

The beginnings through Melville. (3 cr; limited to 65 students; prereq ††; III MTWThF; ME 110) Bales

90H MAGNA HONORS THESIS

(3 cr; prereq candidate for magna cum laude and Δ)

91H SUMMA HONORS THESIS

(3 cr; prereq candidate for summa cum laude and Δ)

92H SUMMA HONORS THESIS

(3 cr; prereq 91H)

†† Five credits in literature, English or American, exclusive of Freshman English.

‡‡ Completion of or exemption from Freshman English requirement.

§§ Credit in English will be allowed for certain classics courses numbered between 40 and 82. Consult English Department for approval.

- 93H HONORS THESIS**
(3 cr; prereq honors candidacy in English and consent of English honors adviser)
- 106 WHITMAN AND MARK TWAIN**
(3 cr; prereq ††; II MTWThF; ME 221) Kwiat
- 109 ROMANTIC POETRY AND PROSE**
Scott, Byron, Lamb, DeQuincey, and others. (3 cr; prereq ††; IV MTWThF; Ph 210) Scoggins
- 126 RESTORATION AND 18TH-CENTURY ENGLISH DRAMA**
Heroic play, tragedy, comedy of manners, sentimental comedy. (3 cr; prereq 56; IV MTWThF; Lib 12) Haley
- 137 VICTORIAN LITERATURE**
The early Victorians. (3 cr; prereq ††; II MTWThF; ME 110) Zorn
- 158 AMERICAN POETRY**
Major poets of the late 19th and early 20th centuries. (3 cr; prereq ††; IV MTWThF; ME 110) Geffen
- 162 MILTON**
The minor poems. *Areopagitica*, *Paradise Lost*, and *Samson Agonistes*. (3 cr; prereq 22 or 56; II MTWThF; ME 302) O'Brien
- 166 HISTORY OF ENGLISH LANGUAGE**
Historical influences upon, and changes within, the language as both a popular and a literary medium of communication. (3 cr; prereq ††; III MTWThF; Lib 14) Kirchner
- 194 ELIZABETHAN PROSE AND VERSE**
From beginning of Tudor period to about 1580. (3 cr; prereq ††; IV MTWThF; C 111) O'Brien
- 198 SEVENTEENTH-CENTURY LITERATURE**
Prose and nondramatic poetry of the mid-century. (3 cr; prereq ††; III MTWThF; ForH 285) Haley
- 298 INDEPENDENT READING**
(3 cr; prereq M.A. degree or equiv)

Family Studies (FamS)

- 1 DYNAMICS OF DATING, COURTSHIP, AND MARRIAGE**
Application of principles from the behavioral sciences to dating, courtship, mate selection, engagement, mixed marriages, roles of men and women, interaction of marital spouses, and marital stability. (3 cr; limited to 40 students; III MTWThF; J 2) Kokosh
- 1A DYNAMICS OF DATING, COURTSHIP, AND MARRIAGE**
(See FamS 1) Designed for Upper Division or engaged or married students. (3 cr, §1; limited to 40 students; II MTWThF; J 2) Bruce
- 15 THE HOME AND ITS FURNISHING**
Present-day housing problems; choice of location; house plans as they affect family living; exterior and interior design; choice of appropriate furnishings and accessories; building furnishing costs. (3 cr, but cr does not count toward B.A. degree; limited to 40 students; II MTWThF; JohH 122) Ludwig
- 25 PARENTHOOD**
Examination of differing concepts of family roles—the father, mother, son, daughter, sister, brother. Their implications for parent-child and sibling in-

†† Five credits in literature, English or American, exclusive of Freshman English.

teraction. Effects of parenthood on husband-wife relations. (3 cr; limited to 40 students; II MTWThF; J 4) Huyck

100 HUMAN SEXUAL BEHAVIOR

The nature of sexual functioning, sexual development, ethics and attitudes, research problems. (3 cr; limited to 100 students; prereq 15 cr in psychology or sociology; III MTWThF; BlegH 10) Ar

Foreign Study (FS)

161 SEMINAR FOR FOREIGN STUDY I

See section on 10-week courses, pages 142-148.

French and Italian

French (Fren)

1 BEGINNING FRENCH

(5 cr; III-IV MTWThF; P 110)

3 BEGINNING FRENCH

(5 cr; prereq 2, or 2 yrs of high school French; I-II MTWThF; ME 106) Schmid

25 INTERMEDIATE FRENCH

(5 cr; prereq 3, or 3 yrs of high school French; III-IV MTWThF; MinMet 120) Johnstone

30 INTRODUCTION TO FRENCH LITERARY TEXTS

A variety of literary works representing the principal genres is examined through stylistic analyses and literary explications. Students learn critical terminology and discuss literary problems and techniques. (3 cr; prereq 25 or 4 yrs of high school French or §; I MTWThF; FolH 102) Akehurst

54 FRENCH COMPOSITION

(3 cr; prereq 25 or equiv; IV MTWThF; Aero 321) Todd

55 FRENCH CONVERSATION AND PRONUNCIATION

In addition to regular conversation course, 2 hours per week (individually arranged) are devoted to practical phonetics, pronunciation, drill, and laboratory exercises. (3 cr; prereq 25 or equiv; II MTWThF; Arch 20) Mantini

58 ADVANCED FRENCH CONVERSATION

(3 cr; prereq 55; IV MTWThF; FolH 109) Rickert

67 SURVEY OF FRENCH LITERATURE: ROMANTICISM TO SURREALISM

(3 cr; prereq 30; IV MTWThF; FolH 108) Lock

107 STRUCTURE OF MODERN FRENCH: PHONOLOGY

(3 cr; prereq 57 or ¶57 or §; II MTWThF; Aero 321) Mantini

113 MEDIEVAL FRENCH ROMANCE

A study of the Arthurian tradition and courtly love in French medieval romances. Special attention will be given to the works of Chrétien de Troyes and to the Tristan stories. (3 cr; II MTWThF; FolH 107) Akehurst

130 POETRY OF VICTOR HUGO

(3 cr; IV MTWThF; FolH 102) Schmid

136 FRENCH ROMANTICISM

(3 cr; III MTWThF; FolH 103) Lock

189 INDEPENDENT READINGS FOR UPPER DIVISION STUDENTS

(1-3 cr; prereq § and consent of dept chm; hrs ar) Staff

259 DIRECTED READINGS FOR GRADUATE STUDENTS

(1-3 cr; prereq §; hrs ar) Lock, Mantini, Renaud

OFFERED ONLY IN LA MAISON FRANÇAISE‡‡

All students who enroll in La Maison Française should register for Fren 100. After the ability of students enrolled in La Maison Française has been determined, students will be assigned to one of the following courses:

22 PRACTICAL FRENCH CONVERSATION**

Primary purpose is to build a practical vocabulary and to give students an opportunity to use it appropriately in small drill sections under guidance of instructors. (5 cr; prereq 2 or equiv; VI-VII MTWThF) Staff

56A ADVANCED PRACTICAL FRENCH CONVERSATION**

Fluency acquired by presenting short oral reports and oral explications de texte, and participating in debates. (5 cr; prereq 25 or equiv; VI-VII MTWThF) Staff

106 ORAL DICTION**

Enables advanced students to acquire a finer feeling for the language, a sense of shades of expression, and a complete mastery of certain grammatical and idiomatic difficulties. (4 cr; prereq ‡; VI-VII MTWThF) Kalb

Note — The General Extension Division will offer French for Graduate Students (Fren 17A). Please address all inquiries to the General Extension Division.

Italian (Ital)

1 BEGINNING ITALIAN

(5 cr; III-IV MTWThF; FolH 107) Pipa

25 INTERMEDIATE ITALIAN

(5 cr; prereq 3; I-II MTWThF; FolH 202) Valenti

189 INDEPENDENT READINGS FOR UPPER DIVISION STUDENTS

(1-3 cr; prereq ‡ and consent of dept chm; hrs ar) Pipa

259 DIRECTED READINGS FOR GRADUATES

(1-3 cr; prereq ‡; hrs ar) Pipa

Geography (Geog)

4 HUMAN GEOGRAPHY

Geography of population and principal ways of life; capacity of earth for future population. (5 cr; I-II MTWThF; AndH 250) Hart

71 MAPS AND MAP INTERPRETATION

Uses and abuses of maps. Interpretation of topographic and statistical maps. Survey of map sources, and air photo as a map. Emphasis on map analysis with minimum of drafting. (3 cr, §60; limited to 25 students; prereq soph, 5 cr in geography or ‡; II MTWThF; BlegH 445) Brown

78 GEOGRAPHY OF INDUSTRIALIZATION

Historical and comparative geography of changing landscape, socioeconomic structure, and trade relations of selected areas in world undergoing industrialization in 18th, 19th, and 20th centuries. (3 cr; prereq 41 or ‡; IV MTWThF; BlegH 435) Adams

81 INTRODUCTION TO CARTOGRAPHY

Principles of map design, compilation, specification, and drafting. Map symbols. History of cartography. Projections — analysis of construction, properties, and uses. (3 cr, §70; limited to 22 students; prereq 5 cr in geography or ‡; II MTWThF; BlegH 455) Hsu

‡‡ See Modern Language Residence Houses in the section on Special Programs.

- 106 REGIONS OF U.S.S.R.**
Regionalization, production, specialization, and interchange within U.S.S.R.; effects of policies of centralization and regional autonomy; present trends, prognosis, and comparisons with United States. (3 cr; prereq 63 or §; II MTWThF; AndH 230) Adams
- 157 LANDFORM GEOGRAPHY**
Detailed consideration of landform resources in regional setting; emphasis on North America. (3 cr; limited to 30 students; prereq 1 or §; I MTWThF; BlegH 445) Brown
- 182 ADVANCED CARTOGRAPHY**
Advanced statistical mapping techniques; selected topics in cartography: visual perception, automation, spatial statistics, and history of cartography. (3 cr, §140; limited to 22 students; prereq 181 or §; III MTWThF; BlegH 455) Hsu
- 200 DIRECTED READINGS**
(1-5 cr)
- 301 RESEARCH PROBLEMS IN GEOGRAPHY**
(Cr ar) Hart

German

- 1A BEGINNING GERMAN**
(5 cr; I-II MTWThF; A 116) Staff
- 3A BEGINNING GERMAN**
(5 cr; prereq 2A or 2 yrs of high school German; I-II MTWThF; FolH 209) Staff
- 4 INTERMEDIATE GERMAN**
Selected readings from literature. (3 cr; prereq 3A or 3B or 3 yrs of high school German...§5 recommended; I-II MWF; FolH 208) Staff
- 5 INTERMEDIATE GERMAN**
Elementary composition and conversation. (2 cr; prereq 3A or 3B or 3 yrs of high school German...§4 recommended; I-II TTh; FolH 208) Staff
- 56A READING AND ANALYSIS OF LITERARY TEXTS**
(3 cr; not open to students who have had courses 70 or above; prereq 4 or 4 yrs of high school German; IV MTWThF; FolH 208) Voss
- 60A COMPOSITION**
Review of German grammar; emphasis on colloquial usage and original composition. Ger 60A and 60B are the equivalent of Ger 57-58-59. (3 cr; prereq 4 and 5; II-III MF; FolH 209½) Staff
- 74 NINETEENTH-CENTURY DRAMA**
(3 cr; prereq 56 or 4 and §; I MTWThF; FolH 103) Menze
- 77 GERMAN PROSE OF 19TH AND 20TH CENTURIES: MODERN WRITERS**
(3 cr; prereq 56A or §; IV MTWThF; FolH 209½) Staff
- 112 MIDDLE HIGH GERMAN LANGUAGE**
(3 cr; prereq 111; II-III MW; FolH 205) C Wood
- 122 HISTORY OF THE GERMAN LANGUAGE**
(6 cr for both terms, 122-123†; prereq §; VI-VII MW; FolH 205) C Wood
- 149 DIRECTED READINGS**
Readings will be confined to areas that represent the professor's major interests. A term paper is a requirement of the course. (3 cr; prereq §; first meeting IV W, June 18, FolH 217; individual consultations for remainder of course) Ramras
- 156 GERMAN LITERATURE FROM 1700 TO 1800: STORM AND STRESS**
(3 cr; prereq 14 cr in courses 70 and above or equiv; III-IV TTh; FolH 205) Ramras

173 NINETEENTH-CENTURY NOVEL

(3 cr; prereq 14 cr in courses 70 and above or equiv; VI-VII TTh; FoH 103)
Voss

Note — The General Extension Division will offer German for Graduate Students (Ger 17A), First Term, MTh 5:30-8:00 p.m.; and Ger 17B, Second Term, MTh 5:30-8:50 p.m. Please address all inquiries to the General Extension Division.

OFFERED ONLY IN DEUTSCHES HAUS††

All students who enroll in Deutsches Haus should register for Ger 100. After the ability of students enrolled in Deutsches Haus has been determined, they will then be assigned to one of the following courses:

22 INTERMEDIATE CONVERSATION AND ORAL PRACTICE**

For students who understand German fairly well but need assurance in self-expression and basic active vocabulary. A thorough study will be made of the material to be used in the conversation sections for the day. Then students will subdivide into smaller groups and their entire time will be devoted to actual conversation under supervision of native teachers. (5 cr; prereq 2 or equiv) Staff

67 ADVANCED ORAL PRACTICE AND SELF-EXPRESSION**

Intended primarily to develop self-confidence in expressing ideas in German. It will consist of daily training in current German through discussions on assigned topics with definite vocabulary preparation, short debates, oral reports, and oral criticism of books and articles. (5 cr; prereq 4 or equiv) Staff

106 GERMAN STYLISTICS**

To enable advanced students and especially teachers of German to acquire a finer feeling for German style, a sense for shades of expression, and a complete mastery of certain grammatical and idiomatic difficulties. Model selections of prose will form the basis for imitative composition. Aims to strengthen the background and broaden the range of the American teacher of German. (4 cr; prereq #) Friedrichsmeyer

History (Hist)

1 INTRODUCTION TO MODERN EUROPEAN HISTORY, PART I

Development of western European civilization, rise of national states, to 1715. (3 cr; IV MTWThF; BlegH 5) Noonan

2 INTRODUCTION TO MODERN EUROPEAN HISTORY, PART II

Revolution, liberalism, and nationalism, to 1870. (3 cr; III MTWThF; BlegH 5) Thayer

3 INTRODUCTION TO MODERN EUROPEAN HISTORY, PART III

1870 to recent times. (3 cr; II MTWThF; BlegH 5) Kieft

14 ANCIENT CIVILIZATION, PART I

Near East to 500 B.C. (3 cr; II MTWThF; BlegH 140) Staff

24 AMERICAN HISTORY, PART II

Modern America. (4 cr; 9:00-10:05 MTWThF; AndH 270) Berman

50 ANCIENT CIVILIZATION, PART I

Near East to 500 B.C. (3 cr; II MTWThF; BlegH 215) Staff

91 MIGRATION AND MOBILITY IN AMERICAN HISTORY, PART II

Frontier as image and reality of migration and mobility in American life. (3 cr; V MTWThF; AndH 230) Berkhofer

†† See Modern Language Residence Houses under Special Programs. Permission of the German Department is required for registration.

- 93 HISTORY OF AMERICAN FOREIGN POLICY, PART I**
 Revolution, territorial expansion, to post-Civil War settlements, 1775 to 1871. (3 cr; II MTWThF; BlegH 125) Brauer
- 95 HISTORY OF AMERICAN FOREIGN POLICY, PART III**
 American foreign policy since Versailles. (3 cr; IV MTWThF; BlegH 220) Brauer
- 100B DIRECTED STUDY, PART I**
 Qualified senior and graduate students may register for 1 or more quarters with consent of instructor for work and training on a tutorial basis. (3 cr; prereq #) Staff
- 106A EUROPE IN THE EARLY MIDDLE AGES, PART I**
 Reforms of Diocletian to first sack of Rome (410). (3 cr; III MTWThF; BlegH 105) Bachrach
- 115B FRENCH REVOLUTION AND NAPOLEON, PART I**
 Background and emergence of the Revolution. (3 cr; I MTWThF; BlegH 415) Bamford
- 118C HISTORY OF GERMANY, PART I**
 From 911 to 1648. (3 cr; I MTWThF; BlegH 230) Pflanze
- 118E HISTORY OF EARLY RUSSIA, PART I**
 Origins of Russia, Kievan period. (3 cr; II MTWThF; BlegH 255) Noonan
- 118G MODERN NEAR EAST: OTTOMAN EMPIRE AND SUCCESSOR STATES, PART I**
 The 19th century; from Treaty of Jassy (1792) to Congress of Berlin. (3 cr; III MTWThF; BlegH 440) Stavrou
- 120F MODERN RUSSIA, PART III**
 Fall of Russian monarchy; revolutions and Soviet regime. (3 cr; II MTWThF; BlegH 350) Stavrou
- 123C INTELLECTUAL AND CULTURAL HISTORY OF MODERN EUROPE, PART III**
 Late 19th and early 20th centuries, breakdown of intellectual unity of Europe. (3 cr; V MTWThF; BlegH 415) Thayer
- 123D DIPLOMATIC HISTORY OF MODERN EUROPE, PART III**
 1914 to present. (3 cr; III MTWThF; BlegH 105) Kieft
- 139A CURRENT INTERPRETATION AND PROBLEM OF SYNTHESIS IN AMERICAN HISTORY**
 Designed to acquaint students with current scholarship in field and its implications for general interpretation of American history. (3 cr; limited to 25 students; prereq #; 1:25-3:50 TF; BlegH 440) Berkhofer
- 144C HISTORY OF AMERICAN LABOR, PART III**
 From 1917 to present. (3 cr; III MTWThF; BlegH 435) Berman
- 148A HISTORY OF INDIA, PART I**
 Ancient India and early Muslim India, to 1526. (3 cr; III MTWThF; BlegH 225) Kopf
- 172C PROSEMINAR: FRENCH REVOLUTION AND NAPOLEON, PART I**
 (3 cr; III MTWThF; SocSci 628) Bamford
- 193B PROSEMINAR: HISTORY OF INDIA, PART I**
 (3 cr; II MTWThF; SocSci 633) Kopf
- 200 HISTORICAL BIBLIOGRAPHY AND CRITICISM**
 (3 cr; IV-V TTh; SocSci 628) Bachrach

Humanities (Hum)

1A HUMANITIES IN THE MODERN WORLD

The Old Regime, the Revolution, neoclassicism, and romanticism. Period from about 1740 to about 1820. Authors: Pope, Voltaire, Goethe. One historical novel, Tolstoy's *War and Peace*. (3 cr, \$1 or \$51)

Sec 1, I MTWThF, Arch 130, White
 Sec 2, III MTWThF, Arch 25, Milgrom

- 4 HUMANITIES IN THE MODERN WORLD IV**
The humanities between two wars. Authors: Freud, Lenin, Koestler, T. S. Eliot, Kafka, and others. Background topics include civilization between two wars, impact of psychoanalysis, communism, and fascism. (3 cr, §54; IV MTWThF; JacH 178) Penn
- 22 AMERICAN LIFE II**
Religious and philosophic attitudes in relation to American life and thought. (3 cr; I MTWThF; ForH 285) Davies
- 51 HUMANITIES IN THE MODERN WORLD**
(See Hum 1A) (3 cr, §1 or §1A; IV MTWThF; FraH 81) Kwiat
- 53 HUMANITIES IN THE MODERN WORLD**
(See Hum 3A) (3 cr, §3 or §3A; I MTWThF; Arch 10) Smaby
- 54 HUMANITIES IN THE MODERN WORLD**
(See Hum 4) (3 cr, §4; II MTWThF; ForH 55) Kliger
- 55 HUMANITIES IN THE MODERN WORLD V**
The intellectual climate of the western world since World War II. The worlds of existentialism and "the absurd"; alienation, irrationalism; the anti-hero in literature; the new theology; the influence of Zen. Readings in Buber, Camus, Ionesco, Tillich, Hesse, etc. (3 cr)

Sec 1, III MTWThF, ForH 55, Smaby
Sec 2, IV MTWThF, Arch 5, Kliger
- 61B THE GREAT PERIOD OF GREECE**
From the Persian Wars to Macedonian conquest. Tragedy, comedy, philosophy of Plato and Aristotle. (3 cr, §1 or §61; II MTWThF; JacH 178) Erasmi
- 62A THE CIVILIZATION OF THE ROMANS**
A survey of their literature and religion. An analysis of the social and political condition of the Empire. The philosophy of Stoics and Epicureans. (3 cr, §12 or §62; IV MTWThF; Arch 40) Erasmi
- 70 INDEPENDENT READINGS**
(1-5 cr) Staff
- 99 SCIENCE AND THE HUMANITIES**
Examines the warfare between the "two cultures," the scientific and the humanistic, through a consideration of decisive documents from Ficino and Vives to the recent work of Polanyi, Koestler, Bronowski, A. Huxley. Selected topics include: humanistic scholarship and the methodological character of the sciences, creativity in the arts and sciences, and the problem of the scientist's moral responsibility. (3 cr; II MTWThF; MurH 308) Penn
- 132 HUMANITIES PROSEMINAR**
Discussion of the relationships between history, literature, and the arts; exact area of concentration to be determined by the class after a discussion of alternatives offered by the instructor. Student reports, papers. Audio-visual aids available. (3 cr; limited to 15 students; prereq sr; II-III TTh; ForH 261) Ames

Journalism and Mass Communication (Jour)

- 5 VISUAL COMMUNICATION**
Introduction to functions of visual communication in news and advertising in print and electronic media. Evaluation and criticism of visuals in creative typography, photography, and other visual techniques. Lectures, projects, and critiques. (3 cr; limited to 25 students; prereq 3rd qtr fr; II MWF, ForH 150; rec II TTh, MurH 311; CCTV) Schuneman
- 18 PRINCIPLES OF ADVERTISING**
Theory, principles, and functions of advertising; its role in social, economic, and marketing structure. Newspapers, magazines, radio, and television as

advertising media. (3 cr; limited to 35 students; prereq soph, 1, C avg, Comp 27, 1 or ¶1 for Upper Division students; IV MTWThF; MurH 311) Peterman

57 DESIGN AND TYPOGRAPHY: ADVERTISING

Principles of design and layout. Preparation of layouts for print and film. Photo-type techniques. Appropriate use of type faces and color. (3 cr; limited to 35 students; prereq journalism-advertising major, or journalism minor in College of Education, School of Business Administration, or College of Agriculture, Forestry, and Home Economics, or §; lect I MW; MurH 308) Wilson

Lab 1, II-III MW, MurH 315

Lab 2, I-II TTh, MurH 315

79 ADVERTISING COPY WRITING

Advertising appeals and strategy; techniques of writing and editing advertising copy for newspapers, magazines, radio-TV, direct mail, outdoor, brochures; planning advertising campaigns; laboratory work. (5 cr; limited to 25 students; prereq 18, 57; lect III MTW, MurH 212; lab III-IV ThF, MurH 212) Harris, Robbins

109 HISTORY OF JOURNALISM

Development of American newspapers and periodicals, from early beginnings in Europe to present day; rise of radio and television; relation of communications developments to political, economic, and social trends. (3 cr; IV MTWThF; MurH 308) Emery

110 TOPICS IN HISTORY OF JOURNALISM

Intensive study of significant individuals, newspapers, and periodicals in history of American journalism. Individual projects and readings. (3 cr; prereq 109; II MTWThF; MurH 302) Emery

112 COMMUNICATION AND PUBLIC OPINION

Theories of communication process and of persuasion and attitude change. Functions of interpersonal and mediated communication in diffusions of information and in opinion information. (3 cr; prereq 15 cr in social sciences; III MTWThF; MurH 308) Carter

131 PUBLIC OPINION AND PERSUASION

Advanced study of theories of opinion formation, persuasion, and attitude change. Studies of communication process in relation to interpersonal influence and to community power structure. Polls, politics, and pressure groups. (3 cr; prereq 112; I MTWThF; MurH 311) Carter

140 INTERPRETATION OF CONTEMPORARY AFFAIRS

Analysis of major political, economic, and social developments and their interpretation in editorial and interpretative article. (3 cr; limited to 20 students; prereq sr, 51 and 15 cr in social science; I MTWThF; MurH 302) Gerald

156 PSYCHOLOGY OF ADVERTISING

Psychological analysis of basic principles underlying advertising and selling. Consumer research is stressed. Research techniques for investigating advertising problems and analysis of consumer wants are considered in detail. (3 cr, §Psy 156; prereq Psy 2 and Principles of Economics; III MTWThF; SciCB 325) Peterman

182 PUBLICATIONS WORKSHOP

Intensive study of the role of the high school and college newspaper and yearbook; analysis of content; study of design and make-up, typography, photography, processes. Separate study sections for college newspaper or yearbook editors, and for school publication advisers. (3 cr; not open to jour maj; prereq jr, sr and grad or §; June 16-27; 1:00-4:30 MTWThF; MurH 311) Wilson

208 SEMINAR: HISTORY OF MASS COMMUNICATION

Analysis of major historical literature in mass communication; development of a research project. (Cr and hrs ar; prereq grad) Emery

Library School (Lib)††

- 102** REFERENCE I**
Intensive study of some 150 outstanding and useful reference books and tools most frequently used by students and librarians. Landmark reference books, indexes, and periodical guides. Theory and practice of reference work. (3 cr; limited to 50 students; I MTWThF; Lib 12) King
- 103** CATALOGING AND CLASSIFICATION**
Basic principles of descriptive cataloging, rules of entry, subject headings, and classification in libraries, for all types of libraries. (3 cr; limited to 35 students; II MTWThF; Lib 12) Ar
- 104** SELECTION OF LIBRARY MATERIALS**
Theory, principles, and techniques of selection; an introduction to the basic tools for selection of books, magazines, pamphlets, phonograph records, films, etc., for all types of libraries. (3 cr; limited to 50 students; III MTWThF; Lib 12) Mugnier
- 113 MEDIA CENTER ADMINISTRATION**
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 service; administration and organizational plans, procedures and relationships. (3 cr; I MTWThF; Lib 14) Thornley
- 114 READING, LISTENING, AND VIEWING GUIDANCE FOR YOUTH IN LIBRARIES**
Philosophy and objectives of library service in schools and children's departments; guidance techniques; planning library programs. Review of relevant research related to reading, listening, and viewing, and a survey of professional literature from various fields pertinent to understanding children and adolescents. (3 cr; prereq 104; III MTWThF; Ph 210) Thornley
- 195 PRINT MATERIALS IN THE LIBRARY**
Selection, evaluation, and the use of books, periodicals, and other printed sources of information and recreation for youth in school and public libraries; reading patterns of children and adolescents, and implications for the selection of printed materials to meet the requirements, purposes, and abilities of different age groups. (3 cr; II MTWThF; Ph 145) Ar
- 197 MATERIALS RELATED TO THE CURRICULUM**
Survey of elementary and secondary school curricula with emphasis on a multi-media approach to teaching and optimum use of school libraries by teachers; consideration of teacher and librarian relations; exploration in depth of materials in at least one curriculum area. (3 cr; for College of Education students only; prereq 104, 194, and 195; IV MTWThF; Lib 14) Loving
- 241 LIBRARY MECHANIZATION AND SYSTEMS ANALYSIS**
Application of systems analysis to library operations; principles, problems, and examples of library mechanization. (3 cr; limited to 30 students; prereq 101 and 103 or §; V MTWThF; Lib 4B) Mason
- 242 INTRODUCTION TO INFORMATION RETRIEVAL**
Theory of various methods of subject analysis; methods of data representation, including coding; search strategies. (3 cr; limited to 30 students; prereq 103 or §; IV MTWThF; Lib 4B) Brekhuis

†† The graduate Library School is a professional school. Courses numbered above 200 are open only to graduate students and to librarians who hold a fifth-year degree from an A.L.A.-accredited library school. Courses numbered below 200 are open to anyone who has been admitted to the Graduate School, to anyone who has been admitted to a minimum certification program, and to any undergraduate in the College of Liberal Arts or the College of Education. Students who do not fall in one of the above categories may register for library courses numbered below 200 but, in order to avoid loss of credits, a letter requesting permission to register for library courses should be sent to the Library School before May 1 for the First Term and before June 1 for the Second Term. The Library School discourages registration of unadmitted students who have not sent transcripts before these dates because it is not possible to give appropriate advice to students who appear on the last registration day.

- 259 PROBLEMS IN PUBLIC LIBRARIANSHIP**
Critical evaluation of the ingredients of public library service: personnel, materials, buildings. Case studies, readings, field research when possible. (3 cr; prereq 101 and 254; VI MTWThF; Lib 4B) Mugnier
- 261 LITERATURE OF THE HUMANITIES**
Bibliographical and other reference sources including reviewing media. Developments and trends in the subjects covered. (3 cr; limited to 20 students; prereq 102; V MTWThF; ForH 30) Ar
- 262 LITERATURE OF THE NATURAL SCIENCES**
Bibliographical and other reference sources, with emphasis on indexing, abstracting, and reviewing media. Growth and development of scientific literature and its control and dissemination. Science background is not required for this course. (3 cr; limited to 20 students; prereq 102; III MTWThF; Lib 4B) King
- 268 RESEARCH METHODS IN LIBRARIANSHIP**
Purposes and principles of research with emphasis upon the distinctive characteristics of library science problems; critical examination of research studies; preparation of tentative research proposals. (3 cr; limited to 30 students; II MTWThF; Lib 4B) McDiarmid

Linguistics (Ling)

- 120 TRANSFORMATIONAL GRAMMAR**
(3 cr; prereq 62; IV MTWThF; FoH 103) Hutchinson
- 170 INTRODUCTION TO GENERAL LINGUISTICS**
(3 cr [no cr for linguistics majors]; II MTWThF; Arch 30) Robinett
- 190 APPLIED TRANSFORMATIONAL GRAMMAR FOR TEACHERS**
(3 cr; VII MTWThF; FoH 108) Hutchinson

Middle Eastern Languages

Arabic (Arab)

- A-B BEGINNING INTENSIVE ARABIC**
See section on 10-week courses, pages 142-148.

Persian (Pers)

- 51 INTERMEDIATE PERSIAN**
See section on 10-week courses, pages 142-148.

Music (Mus)

See also *Music Education under College of Education.*

- 4 FUNDAMENTALS OF MUSIC**
(2 cr; limited to 24 students; for nonmusic majors — primarily child development students and elem tchrs)
- Sec 1, I MTWThF, ScH 3, Byrne
 - Sec 2, II MTWThF, ScH 3, Byrne
 - Sec 3, III MTWThF, ScH 3, Lauritzen
 - Sec 4, IV MTWThF, ScH 3, Byrne
 - Sec 5, V MTWThF, ScH 3, Lauritzen
 - Sec 6, VI MTWThF, ScH 3, Lauritzen

7A EAR TRAINING

Résumé of aural work included in Mus 1T-3T, with concentration on their application. (3 cr; prereq #: I MTWThF, ScH 103; IV MWF, ScH 103) Bachelor

8A HARMONY

Résumé of part writing and harmonization of chorales which are included in Mus 1T-3T, with concentration on their application. (3 cr; prereq #: II MTWThF, ScH 103; IV TTh, ScH 103) Bachelor

Note — Applied music courses 11 through 30 are offered as electives for nonmusic majors and as part of degree programs for Lower Division and Upper Division music majors. When taken for no credit, place the letter V after the appropriate number.

11 PIANO**

(2 cr; prereq entr exam; hrs ar; ScH 107) Weiser, McNab, Ivory

12 VOICE**

(2 cr; prereq entr exam; hrs ar; ScH 107) Thut, Wilson, Wittich

13 VIOLIN**

(2 cr; prereq entr exam; hrs ar; ScH 107) Saslav, Roche, Sambuco

14 VIOLA**

(2 cr; prereq entr exam; hrs ar; ScH 107) Skerlong

15 CELLO**

(2 cr; prereq entr exam; hrs ar; ScH 107) Jamieson

16 BASS**

(2 cr; prereq entr exam; hrs ar; ScH 107) Clute

17 FLUTE**

(2 cr; prereq entr exam; hrs ar; ScH 107) Niosi, Opava

18 OBOE**

(2 cr; prereq entr exam; hrs ar; ScH 107) Angelucci

19 CLARINET, SAXOPHONE**

(2 cr; prereq entr exam; hrs ar; ScH 107) Fitch, Haugen, Williams

20 BASSOON**

(2 cr; prereq entr exam; hrs ar; ScH 107) Beckerman

21 TRUMPET**

(2 cr; prereq entr exam; hrs ar; ScH 107) Chenette

22 FRENCH HORN**

(2 cr; prereq entr exam; hrs ar; ScH 107) Ar

23 TROMBONE**

(2 cr; prereq entr exam; hrs ar; ScH 107) Weinman, Zellmer

24 TUBA**

(2 cr; prereq entr exam; hrs ar; ScH 107) Walton

25 PERCUSSION**

(2 cr; prereq entr exam; hrs ar; ScH 107) Brunelle, Dahlgren, Fine

26 HARP**

(2 cr; prereq entr exam; hrs ar; ScH 107) Miller

27 ORGAN**

(2 cr; prereq entr exam; hrs ar; ScH 107) Fleischer

28 HARPSICHORD**

(2 cr; prereq entr exam; hrs ar; ScH 107) Ar

29 CLASSICAL GUITAR**

(2 cr; prereq entr exam; hrs ar; ScH 107) Pederson

30 CLASSICAL ACCORDION**

(2 cr; prereq entr exam; hrs ar; ScH 107) Hane, Malmberg

46 CONCERT BAND

(1 cr; prereq #: V MTWThF; NMA 4) Zdechlik

60 INTRODUCTION TO ORCHESTRAL REPERTOIRE

Concerts, lectures, demonstrations with the Minnesota Orchestra. Emphasis upon structure, elements of orchestral tone color, and roles of composer, performer and conductor. (2 cr; primarily for nonmusic majors; schedule to be announced; NMA) Caswell

Note — Applied music courses 61 through 80 are offered as electives for nonmusic majors and as part of degree programs for Lower Division and Upper Division music majors. When taken for no credit, place the letter V after the appropriate number.

- 61** PIANO**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Weiser, McNab, Ivory
- 62** VOICE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Thut, Wilson, Wittich
- 63** VIOLIN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Saslav, Roche, Sambuco
- 64** VIOLA**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Skerlong
- 65** CELLO**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Jamieson
- 66** BASS**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Clute
- 67** FLUTE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Niosi, Opava
- 68** OBOE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Angelucci
- 69** CLARINET, SAXOPHONE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Fitch, Haugen, Williams
- 70** BASSOON**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Beckerman
- 71** TRUMPET**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Chenette
- 72** FRENCH HORN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 73** TROMBONE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Weinman, Zellmer
- 74** TUBA**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Walton
- 75** PERCUSSION**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Brunelle, Dahlgren, Fine
- 76** HARP**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Miller
- 77** ORGAN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Fleischer
- 78** HARPSICHORD**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 79** CLASSICAL GUITAR**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Pederson
- 80** CLASSICAL ACCORDION**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Hane, Malmberg

- 84 FORM AND ANALYSIS**
Key, harmonic, and form analyses of important contrapuntal and homophonic music. (3 cr; prereq 6T; III MTWThF; ScH 103) Argento
- 98 COUNTERPOINT**
Strict, 16th-century and Bach-style counterpoint in two and three parts; writing of canons, motets, inventions, fugues. (2 cr; prereq 97; V MTWThF; ScH 103) Argento
- 100** ADVANCED APPLIED MUSIC**
Advanced literature in piano, voice, organ, and orchestral instruments. (2 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 103A ASIAN MUSIC IN PERFORMANCE, PART I: INDIA**
Development of vocal and/or instrumental skills through applied training and lecture-demonstrations. (2-4 cr; hrs ar; ScH 107) Higgins and Rangana-
than
- 109 LASSO AND PALESTRINA**
Council of Trent, its influence on writing and performance of sacred music of 16th century. Madrigal, mass, and motet writing as exemplified in their works; Lasso's cosmopolitan and Palestrina's a cappella styles of writing; Palestrina style of 17th and 18th centuries; Caecilianism of 19th and 20th centuries. (3 cr; for majors in music, arts, history; prereq 6 cr in music history or Renaissance and baroque art, or political history to 1700, or general history of Western philosophy, or ‡; V MTWThF; ScH 104) Riedel
- 127-128-129* COMPOSITION**
Original work in various forms. (2 cr each; prereq 99 and 123; VI MTWThF; ScH 205) Argento
- 153 INTRODUCTION TO MUSICOLOGY**
Scope, aims, methods, and resources of research in musicology, including fields of acoustics, psychology, sociology, theory, ethnomusicology, and anthropology. Mus 153 is devoted to ethnomusicology. (3 cr; prereq 110 or ‡; IV MTWThF; ScH 2) Kagan
- 161-162 BAND ARRANGING**
Scoring for band instruments, creative arrangements for marching or concert bands. (3 cr each; prereq 6T, 143, or MuEd 65, or ‡; VII MTWThF; NMA 4) Zdechlik
- 178 CHARLES IVES: LIFE AND WORKS**
Detailed study of Ives' compositions. Ives and American transcendentalism. Ives and the Progressive Party. Ives as a 19th- and 20th-century composer. (3 cr; VI MTWThF; ScH 104) Riedel
- 188A RAGA AND TALA: FOUNDATIONS OF INDIAN ART MUSIC**
The history and analysis of music theory in north and south India. Notational systems, tonal and rhythmic materials and classifications, musical forms and performance practice. (3 cr; III MTWThF; ScH 2) Higgins
- 204** GRADUATE APPLIED MUSIC**
Individual lessons. (4 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 212* SPECIAL PROBLEMS**
(3-9 cr; prereq 110; hrs ar; ScH 107) Staff
- 227-228-229* SEMINAR: COMPOSITION AND ORCHESTRATION**
(3 cr each; prereq ‡; VI MTWThF; ScH 205) Argento

Natural Science (NSci)

1† ORIENTATION IN THE NATURAL SCIENCES

Integrated survey course designed primarily for students who have no significant science background and who wish to acquire some comprehension

† To receive credit, a student must complete both NSci 1 and 2, but not necessarily in the Summer Session.

of the field for general education purposes. Student is introduced to basic principles and scope of the physical sciences as well as modes of approach or method developed in each field. Course cuts across conventional outlines of any particular science. The first quarter considers some astronomy, physics, and chemistry. (5 cr, sequiv courses in science depts; prereq 1 yr of high school algebra or §; III-IV MTWThF, Ph 133; 2 hrs lab, Ph 246) Dahl

- Lab 1, I MTh
- Lab 2, I TF
- Lab 3, II MTh
- Lab 4, II TF
- Lab 5, V MTh
- Lab 6, V TF
- Lab 7, VI MTh
- Lab 8, VI TF
- Lab 9, VIII MTh
- Lab 10, VII TF
- Lab 11, VIII MTh
- Lab 12, VIII TF

Philosophy (Phil)

1A PROBLEMS OF PHILOSOPHY

Introduction; main fields of investigation; permanent problems; principal methods and schools of philosophy; historical and contemporary views. (3 cr; I MTWThF; ForH 55) Matthews

2A LOGIC

Difference between logical and fallacious reasoning; functions and uses of language; rules of good definition and sound argument. (3 cr)

- Sec 1, III MTWThF, ForH 120, Hochberg
- Sec 2, IV MTWThF, ForH 285, Brodbeck

3A ETHICS

Examination of problems that arise when human beings attempt to think systematically about conduct and values (are there absolute standards?), problem of free will, and survey of historical views about the right and the good. (3 cr; II MTWThF; FraH 20) Lewis

106 AMERICAN PHILOSOPHY FROM WILLIAM JAMES

Among philosophers discussed: Peirce, James, Dewey, Lewis. (3 cr; prereq 1 or 1 qtr of history of philosophy or §; II MTWThF; ForH 170) Brodbeck

140 SURVEY OF CONTEMPORARY PHILOSOPHY

Current systematic and critical philosophies, as represented by their principal exponents. (3 cr; prereq 52 or §; IV MTWThF; ForH 349) Lewis

164 PHILOSOPHY OF SOCIAL SCIENCES I

Analysis of concepts, theories, and explanation of individual and group behavior; objectivity; purpose; function; freedom. (3 cr; prereq 15 cr in philosophy, social science, psychology, education, or history, or §; IV MTWThF; ForH 170) Hochberg

171 PROBLEMS OF INDIAN PHILOSOPHY

Introduction to problems of systematic inquiry in India; special attention to analyses of causation, freedom, and knowledge. (3 cr; prereq 5 cr in philosophy and 3 cr in India courses or §; II MTWThF; ForH 349) Potter

182 PHILOSOPHY OF RELIGION

Discussion of ground and sanctions of religion, according to various philosophies. (3 cr; prereq 6 cr in philosophy; III MTWThF; ForH 349) Matthews

Political Science (Pol)

A THE STATE IN THE MODERN WORLD

The development, principles, and operation of the modern nation state. (3 cr; II MTWThF; AndH 230) Riggs

1 AMERICAN GOVERNMENT AND POLITICS

Fundamentals of American government, nature and growth of the Constitution, citizenship, individual rights and liberties, political parties, public opinion, nominations, and elections. (3 cr; IV MTWThF; AndH 250) Scott

25 WORLD POLITICS

Introduction to contemporary international relations, policies of the great powers, nationalism, internationalism. (3 cr; II MTWThF; AndH 350) Penikis

30 AMERICAN PUBLIC POLICY

Analysis of policy to meet major foreign and domestic issues facing the American political system; emphasis on forces molding government policy on civil rights, labor and business, military and diplomatic strategy, foreign aid. (3 cr; III MTWThF; AndH 350) Eyestone

40 CONTEMPORARY POLITICAL IDEOLOGIES

Liberalism, communism, fascism, Nazism, taking account of democratic and dictatorial regimes in theory and practice. Emphasis on ideas, role of policy, power nationally and internationally. (3 cr; IV MTWThF; AndH 330) Walcott

107 THE AMERICAN CHIEF EXECUTIVE

Constitutional powers and political roles of the President and governors; the chief executive and administration; executive relations with legislatures; party and popular leadership; presidential roles in crisis. (3 cr; prereq 2 or #; IV MTWThF; BlegH 250) Eyestone

115 STATE GOVERNMENT

The states in the American federal system; intergovernmental relations with national and local governments; governmental institutions and processes; special reference to Minnesota. (3 cr; prereq 2 or #; I MTWThF; BlegH 220) Crew

116 INTRODUCTION TO COMMUNITY POLITICS

Community political systems in their legal, political, social, and economic environments. Community political behavior and decision making. (3 cr; prereq 2 or #; II MTWThF; BlegH 360) Scott

130 ADMINISTRATIVE PROCESS I

Organization theory and administrative behavior. Problems of centralization, rationality, bureaucratic processes. (3 cr; prereq 2 or #; III MTWThF; BlegH 215) Walcott

138 AMERICAN POLITICAL CAMPAIGNS AND ELECTIONS

Examination of national, state, and local campaigns and elections. (3 cr; prereq 2 or #; III MTWThF; BlegH 415) Crew

141 EUROPEAN GOVERNMENT AND POLITICS

Britain, France, Germany, and Italy. Political institutions in their social setting; problems of power and responsibility; governmental stability; political decision making, government and the economic order. (3 cr; prereq B or 12 cr in social science or #; I MTWThF; BlegH 145) Schwarz

161 PROBLEMS OF DEMOCRACY

Analysis of postulates and implications; moral foundations; democratic theory and the economic order; liberty and authority; equality; representation; spiritual order; democracy and practical politics; critics of democracy. (3 cr; prereq B or 9 cr in social science or #; III MTWThF; BlegH 250) Schwarz

177 U. S. FOREIGN POLICY

Analysis of factors conditioning U.S. foreign policy; geographic and economic position, defense needs and dispositions, social structure, ideologies, public opinion; political parties, interest groups, bureaucracy; leadership. (3 cr; IV MTWThF; BlegH 155) Penikis

187 INTERNATIONAL ORGANIZATION I

The organization of interaction among nation-states; decision making in international organizations; comparison of national and international political institutions; world organization for collective security and peaceful settlement of disputes. (3 cr; IV MTWThF; BlegH 135) Riggs

Psychology

Psychology (Psy)

1-2† GENERAL PSYCHOLOGY

General introduction to study of human behavior. Prerequisite for all advanced courses in psychology. (3 cr for each; prereq soph or 3rd qtr fr with B avg; I-II MTWThF; NH 45) T Hyde

4-5† INTRODUCTORY LABORATORY PSYCHOLOGY

Experiments illustrating contemporary subject matter such as: human and animal learning, motivation, verbal behavior, problem solving, visual perception, psychological measurement, personality, and social psychology. (2 cr for each; prereq soph)

Sec 1, I-III MTWThF, WeH 101

Sec 2, IV-VI MTWThF, WeH 101

90 INTRODUCTION TO STATISTICAL METHODS

Central tendency and variation, correlation methods, bivariate regression, introduction to problems of sampling and hypothesis testing. (3 cr; prereq 1-2 or equiv; II MTWThF; Arch 40) Thorndike

110 PSYCHOLOGY OF LANGUAGE

An introduction to the theories and experimental evidence involved in past and present conceptions of psychology of language. (3 cr; prereq 75 except for students in Sequence A and grads; IV MTWThF; C 225) Jenkins

113 THE PERCEPTION OF SPEECH

The problem of understanding the perception of speech is approached experimentally and analytically. The development of speech synthesizers is reviewed as offering powerful tools to the task. Research is critically reviewed and discussed in the context of theories of speech perception. (3 cr; prereq ‡; VI MTWThF; ForH 155) Hawles

125-126† DIFFERENTIAL PSYCHOLOGY

Introduction to methodology. Quantitative studies of nature of psychological traits and influence of age, sex, heredity, and environment. Causation of individual differences in ability and temperament. (3 cr for each; prereq 90, or 5 and 5 cr in statistics; I-II MTWThF; C 225) Arvey

128-129 PSYCHOLOGY OF LEARNING

Survey: experimental literature on classical conditioning and all types of instrumental learning. Critical evaluation of theories relevant to these types of learning. (3 cr each; prereq 75 except for students in Sequence A and grads; III-IV MTWThF; Arch 35) Trapold

132 PSYCHOLOGY OF MOTIVATION

Classical and contemporary theories of motivation. Elaboration of basic drives into motives, acquisition of new drives and goals; dynamics of elaborated drive structure. Motivation in complex situations involving set, level of aspiration, Zeigarnik effect, frustration, etc. (3 cr, 132-133†; prereq 9 cr; I MTWThF; FraH B1) Russell

144-145† ABNORMAL PSYCHOLOGY

Normal and abnormal behavior contrasted. Dynamics and determinants of personality maladjustments. (3 cr for each; prereq 9 cr or 6 cr plus Biol 2 or 12 cr in a social science; I-II MTWThF; Ph 150) Phillips

156 PSYCHOLOGY OF ADVERTISING

Examination of psychological principles, research techniques, and applications in advertising and selling. Analysis of relevant consumer attitudes and behavior. Psychological mechanisms upon which effectiveness of advertisements and commercials depend. (3 cr; prereq 2; III MTWThF; SciB 325) Peterman

190 PROJECT IN PSYCHOLOGY

Individual library study or experimental investigation. (Cr and hrs ar; prereq sr, ‡) Darley

215 SEMINAR: SPECIAL AREAS OF PSYCHOLOGY — PSYCHOLINGUISTICS

Consideration of the role of experimentation in the pursuit of psycholinguistics. The relation of linguistic competence to performance and the interplay of theory and experimentation in the search for adequate models will be stressed. (3 cr; prereq #) Jenkins

Personal Orientation (PO)

1 HOW TO STUDY

Practical assistance to the student in developing efficient study habits, organizing materials, preparing for examinations, and improving the speed and comprehension of reading. (2 cr, but cr added to CLA grad requirement; limited to 30 students; I MTWThF; JohH 105)

Public Administration (PA)

114A WORKSHOP ON MINNESOTA GOVERNMENT

Lectures, panel discussions, and seminar sessions on selected public policy issues which currently confront Minnesota's governmental units. This workshop course will focus on The General Welfare and will include such topics as the environment of hostility, organization of communities, range of current programs, areas of neglect, and problems of planning and coordination. Some 25 legislators, governmental officials, civic leaders, and university professors will serve as faculty for the course. (3 cr; prereq Δ: 1:30-4:30 W, AndH 270; 1:15-3:15 Th, BlegH 435) Warp, Hathaway, and others

182A ADMINISTRATIVE INTERNSHIP

Field work in an approved administrative agency under the joint supervision of an employee of the agency and a member of the faculty. Rotation through various administrative assignments, solution of special problems, seminar discussion of experiences, and preparation of an internship report. (3 cr; prereq Δ: 1:15-3:15 T; BlegH 435) Likins

210 FOUNDATIONS OF PUBLIC ADMINISTRATION

An examination of the political and governmental factors which condition the structure and functioning of public administration in the United States. (3 cr; prereq grad; 8:00-10:00 TTh; BlegH 430) Jernberg

214A CURRENT ISSUES OF PUBLIC ADMINISTRATION AND POLICY DEVELOPMENT IN MINNESOTA

(See PA 114A) (3 cr; 1:30-4:30 W, AndH 270; 1:15-3:15 Th, BlegH 425) Warp and others

249 SOCIAL PLANNING

A study of the identification of social goals and of the attempts of public agencies to achieve them; analytical techniques and procedures of social planning; outstanding issues and problems. (3 cr; prereq grad; 3:30-5:30 TTh; BlegH 435) Steen

270B PUBLIC ADMINISTRATION SEMINAR: FINANCE

Role of fiscal planning and management in the administrative process; organization for financial administration; budgetary theory; the budget process — planning, authorization, expenditure control; accounting and auditing; treasury management and debt administration; procurement; intergovernmental fiscal relations. (3 cr; prereq Δ; 10:15-12:15 TTh; BlegH 440) Jernberg

282A ADMINISTRATIVE INTERNSHIP

See section on 10-week courses, pages 142-148.

283A RESEARCH SEMINAR: PUBLIC ADMINISTRATION

See section on 10-week courses, pages 142-148.

Scandinavian Languages

Finnish (Finn)

- 1-2-3 **INTENSIVE BEGINNING FINNISH**
See section on 10-week courses, pages 142-148.

Swedish (Swed)

- 1-2-3 **INTENSIVE BEGINNING SWEDISH**
See section on 10-week courses, pages 142-148.

Scandinavian (Scan)

- 162 **CONTEMPORARY TRENDS IN SCANDINAVIAN NOVEL**
Characteristic trends in Scandinavian life and thought in 20th century as expressed in prose fiction of Knut Hamsun, Sigrid Undset, Hjalmer Bergman, Pär Lagerkvist, and others. (3 cr; prereq 8 cr in literature or #...reading knowledge of a Scandinavian language required for majors only; II MTWThF; FolH 108) Simpson
- 172 **STRINDBERG AND DRAMA IN REVOLT AND TRANSITION**
Strindberg as master of naturalistic drama and as "father of modernity" in European and American theater since his day. (3 cr; prereq 8 cr in literature or #...reading knowledge of a Scandinavian language required for majors only; IV MTWThF; FolH 204) Simpson

Slavic Languages

Russian (Russ)

- 1-2-3 **BEGINNING INTENSIVE RUSSIAN**
See section on 10-week courses, pages 142-148.
- 4-5-6 **INTENSIVE RUSSIAN (INTERMEDIATE)**
See section on 10-week courses, pages 142-148.

Social Science (SSci)

- 51 **THE MEANING OF HUMANITY**
The problem of the essence of man and the factors determining his way-of-life explored through a variety of theories, such as those of Marx, Freud, Aristotle. (4 cr; II MTWThF; BlegH 240) Roshwald
- 52 **MAN, SOCIETY, AND TECHNOLOGY**
The impact of technology on human condition and the attitude of man to technology are examined, both philosophically and sociologically. (4 cr; IV MTWThF; BlegH 215) Roshwald
- 62 **STRUCTURE AND DYNAMICS OF POVERTY**
Structural characteristics of poverty as described by social, legal, and economic criteria. Specific problems of poverty, unemployment, immobility, illiteracy, crime, and others. Private and public programs designed to alleviate poverty. Field work in depressed areas. (3 cr; prereq 9 cr in related social sciences; III MTWThF; BlegH 240) Riggi
- 93 **URBAN CRISIS**
An examination of the effects of white racism and projections of the image of white supremacy on the socio-economic and political life chances of black people in America followed by an examination of the nature of and basis for social unrest in Minneapolis. Will combine classroom work and field experience. Resource persons from the black community will be utilized, visits to

agencies providing services to the black community, and to selected black families will be made in an effort to gain first-hand experience. (5 cr; prereq Δ) Glover

Social Work (SW)

90 AMERICAN SOCIAL WELFARE

Analysis of American social welfare as a basic social institution. (5 cr; prereq Soc 3; VI-VII MTWTh; BlegH 215) Wiebler

91 INTRODUCTION TO SOCIAL WORK PROCESS

Analysis of the nature of social work helping processes through a study of development of social work theory and its implementation in the field of practice. (4 cr; prereq 90; IV MTWThF, VI-VII F; BlegH 430) Wiebler

95 FIELD EXPERIENCE

Direct experience under supervision in a social welfare agency. (1-3 cr; prereq sr, 91; hrs ar) Broeker

100 SPECIAL TOPICS IN SOCIAL WORK

An analysis of poverty programs in the U.S.A. (Cr ar; prereq #; VII MTWThF; BlegH 450) Bloom

101 SPECIAL TOPIC: THE DEPRIVED CHILD

A consideration of the problems of children suffering from various forms of deprivation. Review of pertinent literature; suggested societal problem solutions. Designed for teachers and others working with children. (3 cr; limited to 25 in each section; II MTWThF) Bergherr and Liebenow

Sec 1, II MTWThF, Arch 15

Sec 2, II MTWThF, ForH 359

103 SPECIAL TOPIC: MANAGEMENT OF CHILDREN WITH SOCIAL-EMOTIONAL PROBLEMS

Understanding children whose problems interfere with their adjustment and educational progress. Open to teachers, social workers, counselors, and others. (3 cr; IV MTWThF; ForH 359) Merl

106 SPECIAL TOPIC: TREATMENT OF THE DELINQUENT CHILD

Providing knowledge of problems involved in dealing with delinquent behavior and orientation to programs and resources currently available. Open to teachers, institutional personnel, social welfare workers, and others. (3 cr; I MTWThF; ForH 120) Brusseau

171 COMMUNITY ORGANIZATION

Analysis of the processes of social policy and planning for community health and welfare services including principles of community development. (3 cr; I MTWThF; SocSci 860) France!l

206 READINGS IN SOCIAL WORK

Independent study under tutorial guidance. (Cr and hrs ar; for grad students only; SocSci 909) Merl and France!l

287 SPECIAL STUDIES IN SOCIAL WORK

Selected projects previously approved by instructor. (Cr and hrs ar; open only to social work students in 2nd grad yr; VII MTWThF; SocSci 860) Boettcher

Sociology (Soc)

1 MAN IN MODERN SOCIETY

Characteristics of human group life. Analysis of factors associated with development of human group life and man's social environment; structure of social environment and its influence upon individual's behavior. (3 cr; II MTWThF; AndH 310; CCTV) McNall and others

2 AMERICAN COMMUNITY

Sociological analysis of modern American society. Topics include distribution of population, urban-rural differences, social factors in business systems,

occupational groups, determination of social status, and minority group adjustment. Attempts to familiarize student with current research methods. (3 cr; prereq 1 or 1H or 3; I MTWThF; BlegH 10) Cooperman

3 SOCIAL PROBLEMS

Survey of contemporary social problems; special emphasis on personal demoralization and social disorganization. (3 cr; IV MTWThF; AndH 350) Fulton

53 ELEMENTS OF CRIMINOLOGY

General survey of field of criminology. (3 cr; prereq 1 or 1H or 3; IV MTWThF; AndH 230) Clark

118 DELINQUENT BEHAVIOR

Critical analysis of nature of delinquent behavior and its "causes"; consideration of help that understanding of causes can give to its modification and its prevention. (3 cr; prereq 53; II MTWThF; BlegH 10) Clark

120 SOCIAL PSYCHOLOGY

Research and theory regarding relation of the individual to social groups. Emphasis on socialization processes; effects of social interaction and isolation; individual behavior under conditions of social organization and disorganization; cultural influence and its limits. (3 cr; prereq 1 or 3; I MTWThF; AndH 310) Finestone

123 MINORITY GROUP RELATIONS

Interaction of social and cultural groups in America; particular reference to the Negro. Processes leading to group contact; characteristics and contributions of ethnic groups in United States; mechanisms and problems of group adjustment. Democratic theory and practice; sources of prejudice; contemporary status of principal minority groups; international implications; trends and proposed solutions. (3 cr; prereq 1 or 3; III MTWThF; AndH 310) Finestone

144 SOCIAL STRATIFICATION AND MOBILITY

The analysis of the form and content of hierarchical arrangements. The relationship of hierarchical arrangements to problems of social order and individual behavior. (3 cr; prereq 1 or 3; II MTWThF; BlegH 250) Fulton

155 SOCIAL STRUCTURE AND POLITICAL BEHAVIOR

Analysis of structural and ideological conditions influencing legitimation of political institutions and relationships of this process to political participation, political apathy, and rise of mass movements. (3 cr; prereq 1; III MTWThF; BlegH 235) Cooperman

South Asian Languages

For complete course listings, see section on 10-week courses, pages 142-148.

Indic (Indc)

1 SURVEY OF INDIAN CIVILIZATION

Introduction to contemporary civilization, considered in light of its development. (3 cr; IV MTWThF; FolH 104) Kale

171 SURVEY OF TAMIL LITERATURE (in English)

No knowledge of Urdu is necessary. (3 cr; IV MTWThF; FolH 110) Asher

Spanish and Portuguese

Portuguese (Port)

1-2-3 BEGINNING PORTUGUESE

See section on 10-week courses, pages 142-148.

Spanish (Span)

- 1 BEGINNING SPANISH**
(5 cr; III-IV MTWThF; FoIH 202)
- 3 BEGINNING SPANISH**
(5 cr; prereq 2 or 2 yrs of high school Spanish; III-IV MTWThF; FoIH 209) Bieder
- 25 INTERMEDIATE SPANISH**
(5 cr; prereq 3 or 3A or 3 yrs of high school Spanish; I-II MTWThF; Ph 210)
- 30 INTRODUCTION TO SPANISH LITERARY TEXTS**
Variety of literary works representing the principal genres are examined through stylistic analyses and literary explications. Students learn critical terminology and discuss literary problems and techniques. (3 cr; prereq 25 or 4 yrs of high school Spanish or #; II MTWThF; FoIH 201) Hochster
- 54 SPANISH COMPOSITION**
(3 cr; prereq 25 or equiv; II MTWThF; FoIH 304) Burt
- 55 SPANISH CONVERSATION**
(3 cr; prereq 25 or equiv; III MTWThF; FoIH 203) Gonzales
- 57 ADVANCED SPANISH COMPOSITION**
(3 cr; prereq 54; II MTWThF; FoIH 207) Arrieta
- 61 SPANISH CIVILIZATION AND CULTURE**
(3 cr; prereq 55; III MTWThF; FoIH 207) Surfs
- 67 SURVEY OF SPANISH LITERATURE: NEOCLASSICISM TO EARLY 20TH CENTURY**
(3 cr; prereq 30; IV MTWThF; FoIH 304) Jones
- 75 SURVEY OF THE LITERATURE OF SPANISH AMERICA**
(3 cr; prereq 30...¶85B, ¶86B, ¶87B for majors; II MTWThF; FoIH 302) Floripe
- 107 STRUCTURE OF MODERN SPANISH: PHONOLOGY**
(3 cr; prereq 57 or # or ¶57; III MTWThF; FoIH 201) Narváez
- 109 STRUCTURE OF MODERN SPANISH: SYNTAX**
(3 cr; prereq 107 or # or ¶107; IV MTWThF; FoIH 201) Narváez
- 113 WORLD OUTLOOK IN SPANISH NOVEL (KRAUSISMO TO EXISTENCIALISMO)**
(3 cr; prereq 65, 66, 67; III MTWThF; FoIH 208) Rundorff
- 121 CELESTINA**
(3 cr; prereq 65, 66, 67; II MTWThF; FoIH 203) Jones
- 149 CONTEMPORARY LATIN-AMERICAN NOVEL**
(3 cr; prereq 65, 66, 67 or 74, 75, 76; IV MTWThF; FoIH 207) Floripe
- 189 INDEPENDENT READINGS FOR UPPER DIVISION STUDENTS**
(1-3 cr; prereq # and consent of dept chm; hrs ar) Floripe, Jones, Rundorff
- 250 SPANISH SEMINAR: GALDÓS**
(2 cr; prereq #: I-II TTh; Arch 30) Pattison
- 259 DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq #: hrs ar) Rundorff

Speech, Communication, and Theatre Arts

(For special department activities see: Acting Workshop; High School Forensics Workshop; High School Theatre Workshop; Speech Science, Pathology, and Audiology programs; and University Theatre)

Speech (Spch)

- 2 COMMUNICATION IN THE MODERN WORLD: INTERPERSONAL COMMUNICATION**
Description of structure of acts of communication and of factors influencing occurrence, form, and effects of such act. Analysis of relationship of communication forms in social structure. (3 cr; II MTWThF; Aero 209) Condon
- 5 FUNDAMENTALS OF SPEECH**
Development of basic skills in meeting variety of speech situations; extemporaneous speaking, oral reading, discussion. Development of basic under-

standing of speech processes and forms. (5 cr; limited to 22 students; I-II MTWThF; FolH 305)

6 FUNDAMENTALS OF SPEECH

Emphasis on investigation and persuasion ranging from informal committee session to formal meeting requiring parliamentary rules. (3 cr, §5; limited to 22 students; prereq 2 or ¶2; I MTWThF; FolH 307)

50 PUBLIC SPEAKING

Principles of preparing and presenting public speeches; directed practice in public speaking. Consideration of functions of public speaking in contemporary life. (3 cr, §5; limited to 22 students; prereq Upper Division standing; V MTWThF; FolH 305)

51 ADVANCED PUBLIC SPEAKING

Preparation and delivery of speeches on current public issues. (3 cr; limited to 20 students; prereq 5 or 6; III MTWThF; FolH 307) Scott

52 DISCUSSION AND CONFERENCE METHODS

Cooperative thinking in task-oriented groups. Planning, preparing for, participating in, and leading private and public meetings. (3 cr; limited to 25 students; prereq 5 or 6 or ¶; II MTWThF; FolH 306) Miller

61 PROCESS OF INTERPERSONAL COMMUNICATION

Basic orientation on place of speech and language in human behavior; discussion and nature and function of communication process. (3 cr, §161; prereq 5 or 6 or ¶, Psy 2; I MTWThF; FolH 308) D Smith

65 INTRODUCTION TO BROADCASTING PRODUCTION

Fundamentals of practice and theory in radio and television. Emphasis on projects and exercises in performance and scripting; introduction to studio equipment and procedures. Historical and sociological aspects of broadcasting. (3 cr; limited to 16 students; prereq 5 or 6; II MTWThF; MurH 302 and Aero 309) Browne

81 INTERPRETATIVE READING

Aesthetic theory of literature and of oral reading. Practice in reading for interpretation and mastery of technique. (3 cr; prereq 5, jr or sr or 6, limited to 24 students)

Sec 1, I MTWThF, FolH 306, Steiner

Sec 2, III MTWThF, FolH 306, Fredricks

82 INTERPRETATIVE READING

Aesthetic theory of literature and of oral reading. Practice in reading for interpretation and mastery of technique. (3 cr; limited to 15 students [grad students may register for 182]; prereq 81; IV MTWThF; FolH 305) Fredricks

106 SMALL GROUP COMMUNICATION

Study of communication and dynamics within small, task-oriented group. Group cohesiveness, leadership, role structure, information processing, and decision making. (3 cr; limited to 25 students; prereq 52 or ¶; II MTWThF; FolH 307) D H Smith

109 CLASSICAL RHETORIC

Greek and Roman theories of speechmaking; historical and philosophic context and influence on education. (3 cr; prereq 5 or 6; IV MTWThF; FolH 306) Scott

161 ADVANCED PROCESS OF INTERPERSONAL COMMUNICATION

(See Spch 61) (3 cr, §61, but grad students must satisfy addtl requirements by writing papers on advanced topics; I MTWThF; FolH 308) D Smith

170 RADIO AND TELEVISION PROGRAMMING

Theory and practice. Principles of program effectiveness; program policies of the industry. FCC and programming. Emphasis on talk and discussion. (3 cr; prereq 65; IV MTWThF; FolH 305A) Browne

172A ADVANCED TV PRODUCTION: PRACTICUM

(3 cr; prereq 171 or ¶; meets first day V hr, 303A FolH; hrs and rm thereafter to be ar) Bart

174 EDUCATIONAL TELEVISION PROGRAMMING AND ADMINISTRATION

Television applied to educational needs; current practices; significant research findings; relative effectiveness of differing types of television utiliza-

tion; impact of various modes of transmission on programming and administrative concepts. (3 cr; prereq 170, 173 or §; III MTWThF; Arch 20) Goldstein

EdCI 177 DIRECTING SECONDARY SCHOOL SPEECH ACTIVITIES

Acquaint students with the philosophy, organization, and administration of extemporaneous speaking, oratory, interpretation, and debate. (3 cr; prereq 5 or 2 and 6 or §; VI MTWThF; FoIH 305) Caruson

181, 182, 183 READINGS IN SPEECH

Directed reading and preparation of reports on selected subjects. (Cr and hrs ar; prereq 9 cr in Upper Division speech courses and §) Staff

210 SEMINAR: FACE-TO-FACE INTERCULTURAL COMMUNICATION

Defines and investigates factors influencing face-to-face communication in varied cultures, concentrating upon task-oriented communication between North Americans and nationals in the host country. It is concerned with both verbal (linguistic) and nonverbal (nonlinguistic) dimensions of communication. (3 cr; prereq Anth 100 or similar course in cultural anthropology or §...111 recommended; hrs ar) Condon

276 SEMINAR: RHETORIC

History and critical study of rhetorical theory. Examination of research in rhetoric. (3 cr; prereq 109 or §; V-VI MTh; 1st meeting T; FoIH 306) Scott

291, 292, 293 RESEARCH

(Cr and hrs ar; open to grad students engaged in research on special problems) Staff

Speech Science, Pathology, and Audiology (SSPA)††

99 INTRODUCTION TO SPEECH PATHOLOGY AND AUDIOLOGY

Survey of concepts basic to the understanding of normal and abnormal speech and hearing function. Introduction to the causes, characteristics, and modification of communication problems. (3 cr; II MTWThF; FoIH 105) McDermott

101, 102, 103 READINGS

Directed readings and preparation of reports on selected subjects. (Cr and hrs ar; prereq §) Chaiklin, Henrikson, Lassman, Martin, McDermott, Siegel, Speaks

119 FUNDAMENTALS OF SOUND

The elements of acoustics necessary to an understanding of the quantitative aspects of speech pathology or audiology. Vibrators, transmission systems, and their mathematical counterpart. (3 cr; I MTWThF; FoIH 406) Speaks

122 VOICE SCIENCE

Inspection of research data relevant to basic processes involved in speech production and perception. Topics: respiratory system as a generator, vocal folds and articulators as sound sources and vocal tract as an acoustic modifier of sound source. Laboratory experience and exercises. (3 cr; prereq 121; IV MTWThF; FoIH 104) Speaks

147 REHABILITATION OF THE LARYNGECTOMIZED

Historical and contemporary types of surgical intervention. Relation between types of surgery and the development of speech. Methods of initiating and developing communication. Use of the artificial larynx. Cooperation with other rehabilitation agencies and personnel. (3 cr; prereq 99, 120 or §; I MTWThF; FoIH 104) Henrikson

150 SPEECH DEVELOPMENT AND RETARDATION

An analysis of conditioning and linguistic approaches to normal and delayed speech development. Applications to therapy are made, but the primary emphasis is on research. Students are required to complete small research projects during the quarter. (3 cr; prereq 99; VI MTWThF; Arch 30) Shriner

†† The facilities of the University Speech and Hearing Clinic are available both terms to students desiring a personal speech or hearing analysis or wanting help with their speech or hearing problems. Interested students are invited to confer with the director of the Speech and Hearing Clinic, 110 Shevlin Hall.

- 175 GALVANIC SKIN RESPONSE AUDIOMETRY**
Galvanic skin response audiometry in the differential diagnosis of auditory disorders; nature of the GSR mechanism; historical aspects and conditioning literature relevant to audiometry. Includes laboratory experience. (3 cr; prereq 173; III MTWThF; Arch 30) Chaiklin
- 190, 191, 192 CLINICAL METHODS AND PRACTICE IN AUDIOLOGY**
Methods and supervised practice in analysis, diagnosis, and habilitation of communication disorders of persons with auditory impairments. (3 cr; prereq 173 or 174 or §; hrs ar) Chaiklin, Lassman, McClellan, Hoel
- 248 SEMINAR: ANALYSIS OF LITERATURE IN SPEECH PATHOLOGY**
Basic problems relating to evaluation of various types of literature in speech pathology. Individual projects designed to determine and evaluate the student's analytical procedures. (3 cr; prereq grad major in speech pathology or §; III MTWThF; FolH 103) Henrikson
- 249 SEMINAR: CURRENT ISSUES IN SPEECH PATHOLOGY**
Significant problem areas in speech pathology; relation to other rehabilitation programs and personnel. Class projects involving in-depth exploration of a specific problem. (3 cr; prereq grad major in speech pathology or §; II MTWThF; FolH 406) Shriner
- 250 SEMINAR: LANGUAGE RETARDATION**
Analysis of causation, diagnosis, and current research techniques. (3 cr; prereq 150 or §; hrs ar) Siegel
- 266 CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY: SPECIALIZED PRACTICA**
Specialized practica may be taken in one or more of the following areas: cleft palate, voice, articulation, stuttering, neuromuscular disorders, aphasia, laryngectomy, and hearing impaired. (1-3 cr [can be repeated]; prereq §; hrs ar) Henrikson, Martin, McDermott
- 270 DIAGNOSIS OF DISORDERS IN THE AUDITORY SYSTEM**
The use of audiological data in identification of the site and nature of lesions in the auditory system. Emphasis on differential diagnosis of temporal lobe, eighth nerve, cochlear, middle ear, and functional hearing disorders. (3 cr; prereq 173, 174 and §; 3:00-5:00 MW, 3:00-4:00 F; MH 214) Lassman
- 290, 291, 292 ADVANCED CLINICAL AUDIOLOGY**
Supervised internship experiences for advanced graduate students working with communication disorders of persons with auditory impairments. (3 cr; prereq 190, 191, 192 and §; hrs ar) Chaiklin, Lassman

Note — For clinical methods and practice in speech pathology in the College of Education, see EdCI 174-175-176.

The following courses are offered by the College of Education:

- EdCI 174-175-176 CLINICAL METHODS AND PRACTICES IN SPEECH PATHOLOGY**
Case history and analysis; testing and diagnosis of speech defects; techniques and work programs for treatment; practical clinical work. (3 cr each; limited to students attending full time spring qtr 1969; hrs ar) Starr, Speidel

Theatre (Th)

- 11 INTRODUCTION TO THEATRE ARTS**
History and theory of plays and production as well as various arts and crafts of theatre. (3 cr; limited to 200 students; I MTWThF; ScH 108) Ballet
- 12 LABORATORY SECTION: INTRODUCTION TO THEATRE**
Practice of arts and crafts of theatre; scenery and particularly construction and painting, stage operation, publicity and promotion, theatre lighting, costuming, or make-up. (1 cr; prereq 11 or §11; meets first day VII hr in 108 ScH; hrs and rm thereafter to be ar)
- 21 BEGINNING ACTING: CREATIVE APPROACH**
Creation and presentation of original scenes and skits. Stresses ability to respond to imagined situation with individuality and effectiveness. (3 cr;

- prereq fr with Δ or soph, 12 or ¶12; limited to 18 students; I-II MTWThF; WeH 302) Herstand
- 22 BEGINNING ACTING: CREATING A ROLE**
Application of creative techniques to analysis, understanding, and theatrically effective communication of roles from dramatic literature. (3 cr; limited to 18 students; prereq 21; III-IV MTWThF; WeH 302) Klein
- 24 STAGE MAKE-UP**
Theory and practice in art of stage make-up. (1 cr; limited to 15 students; prereq 12 or ¶12; VI-VII TTh; Sch 23)
- 34 STAGECRAFT: CONSTRUCTION AND PAINTING**
Theory and practice in construction, painting, and shifting of stage scenery. (3 cr; limited to 20 students; prereq soph, 12; III MTWThF; WeH 306)
- 74 PLAY PRODUCTION IN SECONDARY SCHOOL**
Technical fundamentals: stagecraft, design, lighting, and costuming. (3 cr; limited to 15 students; prereq 12; II MTWThF; WeH 306) Adey
- 90 COSTUMING**
Theory of design, and construction of costumes for theatrical production. (3 cr; limited to 10 students; prereq 34; V-VI MWF; NH 315) Pieper
- 91 SCENE DESIGN**
Theory and practice of designing scenery for theatrical production. (3 cr; prereq 34; III MTWThF; WeH 306) Josal
- 100 INTRODUCTION TO RESEARCH**
Graduate research in theatre arts; selection of topics and methods of investigation. (3 cr; prereq sr, Spch 5 or 6, Psy 2; IV MTWThF; FolH 203) Herstand
- 101, 102, 103 THEATRE PRACTICUM**
Directed individual creative projects meeting approval of a faculty committee in one or more of these areas: playwriting, directing, acting, and design. (2-6 cr; prereq Δ , $\#$; hrs and rm ar) Josal and staff
- 101A SHOWBOAT LABORATORY**
(2-6 cr; prereq Δ , $\#$; hrs ar) Whiting
- 112 STAGE DIRECTION**
Rehearsal problems and direction of two one-act plays. (3 cr; prereq sr, 21, 6 cr from 90, 91, 92 and $\#$; IV MTWThF; ShH 115) Adey
- 115 PLAYWRITING**
After evidence of thorough groundwork in established techniques of a well-made play, the student is encouraged to use other, more experimental forms. One-act play. (3 cr; limited to 6 students; prereq 21 or $\#$; III MTWThF; NH 304) Nolte
- 131 CREATIVE DRAMATICS**
Principles and methods of developing original dramatizations with children. Observation of children's classes in creative dramatics. Readings, projects, term papers. (3 cr; limited to 60 students; prereq 12 or ¶12, or elementary education major, or $\#$...21 recommended; IV MTWThF; FolH 105) Graham
- 173 HISTORY OF THEATRE**
Plays, arts, and crafts of theatre from their beginnings to present. Reports and projects. (3 cr; prereq sr, 12 and 100 or $\#$; II MTWThF; NH 304) Nolte
- 181, 182, 183 READINGS IN THEATRE ARTS**
Directed reading and preparation of reports on selected subjects. (Cr ar; prereq 9 cr in theatre and $\#$) Staff
- 190 ADVANCED PROBLEMS IN COSTUMING**
Theory and design of costumes; special projects. (3 cr; limited to 6 students; prereq 112 or $\#$; III MTWThF; NH 315) Pieper
- 191 ADVANCED PROBLEMS IN SCENE DESIGN**
Theory and design of stage scenery, special reports, and projects. (3 cr; limited to 6 students; prereq 112 or $\#$; IV MTWThF; WeH 306) Josal
- 192 ADVANCED PROBLEMS IN STAGE LIGHTING**
Theory and design of stage lighting; special reports and projects. (3 cr; limited to 6 students; prereq 112 or $\#$; V MTWThF; WeH 306) Josal

211 SEMINAR: STAGE DIRECTION

Great plays and their potentials for meaningful and effective production in the modern theatre. (3 cr; limited to 6 students; prereq 111, 112, 113; II MTWThF; FoH 303A) Ross Smith

215 SEMINAR: PLAYWRITING

Advanced work in creative writing for the stage. (Cr ar; limited to 6 students; prereq 115-116-117 or #; III MTWThF; NH 304) Nolte

281, 282, 283 RESEARCH

(Cr ar; prereq #) Staff

Statistics (Stat)**101 INTRODUCTION TO DECISION THEORY**

Elements of probability, basic concepts in statistical decision theory, relationship to game theory, prediction, and inference. (3 cr; prereq Econ 101A or Math 40 or Math 42 or Math 13 or #; III MTWThF; ForH 175) Ar

121 THEORY OF STATISTICS

Probability distributions, law of large numbers, sampling, likelihood function. (3 cr; for nonmajors; prereq Math 42 or equiv; II MTWThF; ForH 175) Ar

182 TUTORIAL COURSE

Students whose needs are not met by current offerings may obtain content of regular courses or special areas by directed study. (3 cr; prereq #) Ar

281A ADVANCED TOPICS: EXPERIMENTAL DESIGN

(3 cr; prereq #; hrs and rm ar) Martin

College of Medical Sciences

For general information on the College of Medical Sciences, see section on Schools, Colleges, and Special Programs.

MEDICAL SCHOOL

Anatomy (Anat)

ELECTIVE COURSES

156 ADVANCED ANATOMY

Individual problems in gross anatomy, embryology, histology, or neuroanatomy. (Cr and hrs ar; prereq #) Staff

204 RESEARCH IN ANATOMY

Gross anatomy, cytochemistry, histology, endocrinology, embryology, hematology, or neuroanatomy. (Cr and hrs ar; prereq #) Staff

Anesthesiology (Anes)

All anesthesiology courses are listed in the section on 10-week courses, pages 142-148.

Biochemistry (MdBc)

REQUIRED COURSES

100 BIOCHEMISTRY

(7 cr; prereq organic and physical chemistry and physics; lect IV, VI MTWTh, II-III F, Owre 15; lab I-III MTWTh, MH 201) Carr, Koerner, Bodley

ELECTIVE COURSES

153 PROBLEMS IN BIOCHEMISTRY

Special work arranged with qualified students. May be taken one or both terms. (Cr and hrs ar; prereq 100, 101) Carr, Koerner, Bodley

205 RESEARCH IN BIOCHEMISTRY

(Cr and hrs ar) Armstrong, Carr, Larner, Wetlaufer, Wold, Koerner, Van Pilsum, Bodley

Laboratory Medicine

Laboratory Medicine (LMed)

180 FLUID, ELECTROLYTE AND ACID-BASE METABOLISM

(Cr and hrs ar; prereq #) Mulhausen and staff

181 PROBLEMS IN CLINICAL LABORATORY MEDICINE

(Cr and hrs ar; prereq #) Benson, Quie, Strandjord, Sundberg, E Yunis, J Yunis

- 235 ADVANCED CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Quie, Strandjord, Sundberg, E Yunis, J Yunis
- 236 RESEARCH: CLINICAL LABORATORY PROBLEMS**
(Cr and hrs ar; prereq #) Benson and staff
- 251 RESEARCH: HUMAN GENETICS**
(Cr and hrs ar; prereq #) J Yunis

Medical Technology (MedT)

- 110 ADVANCED CLINICAL LABORATORY TECHNIQUES**
Assignment on individual basis for observation, study, and practice in special problems; techniques and methodology in one or two of the units of the clinical laboratories (chemistry, hematology, histology, immunology, or microbiology). (5 cr; prereq grad; hrs ar) Hovde and staff

Medicine (Med)

Division of Internal Medicine

REQUIRED COURSES

- 104 INTRODUCTION TO INTERNAL MEDICINE**
Combined with pediatrics and laboratory medicine. (2 cr per qtr for 4 qtrs; prereq 101, LMed 102; 1:15-2:00 W; Hosp Todd Amph) Ebert and staff
- 112 CLERKSHIP: INTERNAL MEDICINE**
(16 cr; prereq regis med; 8:00-5:00 MTWThFS) Murray and staff

ELECTIVE COURSES††

- 180 EXTERNSHIP IN MEDICINE**
Care of medical patients on an inpatient service at an advanced level of responsibility. (6 cr per period [offered 3 elective periods]; hrs ar) University, Murray; Veterans Administration, Hall; Hennepin County General, Schultz; St. Paul-Ramsey, Frost; Mount Sinai, Lewis; and Northwestern, Watson.
- 181 RESEARCH IN MEDICINE**
Research opportunities in the following areas are available at University and affiliated hospitals (as in Med 180): gastroenterology, hypertension and sodium metabolism, lipid metabolism as related to atherosclerosis, liver disease, adrenal disease, carbohydrate metabolism and clinical diabetes, immunology and infectious diseases, cardiovascular and pulmonary disease, experimental hemodynamics, internal medicine. A detailed listing of these opportunities is available in the departmental office. (6 cr per period [offered 3 elective periods]; hrs ar) Staff
- 184 SPECIAL CLINICAL PROBLEMS**
Opportunities for study in the following areas of clinical interests are available at University or affiliated hospitals (as in Med 180): clinical electrocardiography and vectorcardiography, clinical and basic problems in bile pigment and porphyrin metabolism, infectious diseases, endocrinology and metabolic disease including diabetes and thyroid disturbances, immunology and allergy, cardiovascular and pulmonary disease, clinical hemodynamics. A detailed listing of these opportunities is available in the departmental office. (6 cr per period [offered 3 elective periods]; hrs ar) Staff
- 201 CLINICAL MEDICINE**
(Cr and hrs ar) Ebert and staff
- 202 DISEASES OF THE CARDIOVASCULAR APPARATUS**
(Cr and hrs ar) Frantz and staff

†† Prior arrangements with departmental office.

- 203 RESEARCH IN MEDICINE**
(Cr and hrs ar) Ebert and staff
- 205 DISEASES OF CHEST**
(Cr and hrs ar) Ebert, Hall, Lillehei
- 206 CLINICAL CONFERENCE**
Presentation of problem cases. Discussion of diagnosis and treatment and consideration of pertinent literature. (1 cr; 10:00-11:00 Th; Eustis Amph) Ebert and staff
- 207 CLINICAL PATHOLOGICAL CONFERENCE**
Presentation of clinical features, necropsy findings, and discussion. Medical and surgical cases. (1 cr; 10:30-11:00 T; Todd Amph) Dawson and staff
- 208 CLINICAL RADIOLOGICAL CONFERENCE**
Presentation and discussion of X-ray films from the Medical Service, with clinical correlation. (1 cr; 10:00-10:30 T; Todd Amph) Peterson, Ebert, and staff
- 210 SEMINAR: INFECTIOUS DISEASE**
(1 cr; hrs ar) Spink
- 211 ELECTROCARDIOGRAPHIC CONFERENCE**
(1 cr; 4:00-4:50 T; VCHH 299) Tuna and staff
- 214 CARDIAC CONFERENCE**
Weekly conference on clinical cardiovascular problems, held jointly by the Departments of Medicine, Surgery, and Radiology. (1 cr; 4:00-4:50 M; VCHH 299) Wang and staff

Division of Dermatology

REQUIRED COURSES

- 123 DERMATOLOGY, SYPHILOLOGY**
(2 cr; prereq 101; 3:15-4:00 alt W; Eustis Amph) Lynch and staff
- 124 SENIOR CLERKSHIP: DERMATOLOGY**
(2 cr; prereq regis med; 8:00-9:00 MTThF, 1:00-5:00 MTTh, 9:00-11:00 Th, 1:00-4:00 W, 1:30-2:30 F; Eustis Amph) Lynch and staff

ELECTIVE COURSES

- 182 EXTERNSHIP IN DERMATOLOGY**
(Cr and hrs ar) Lynch
- 183 PROBLEMS IN DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 225 CLINICAL DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 226 SEMINAR: DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 227 HISTOPATHOLOGY OF THE SKIN**
(1 cr; hrs ar) Orkin and staff
- 228 RESEARCH: DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 230 FUNCTIONAL BIOLOGY OF THE SKIN**
(Cr and hrs ar) Fusaro, Rukavina, and Smith

Microbiology (MicB)

- 152 SPECIAL PROBLEMS**
(Cr and hrs ar; prereq *) Staff

- 201 **RESEARCH**
(Cr and hrs ar) Staff
- 222 **PHYSIOLOGY OF BACTERIA LABORATORY**
Techniques employed in study of bacterial physiology and metabolism. (3 cr; designed for grad students in microbiology, open to others with §; prereq 121; lab I-IV MTWThF; Mayo A-205) Rogers

Obstetrics and Gynecology (Obst)

REQUIRED COURSES

- 120 **OBSTETRICS AND GYNECOLOGY**
Physiology of pregnancy, labor, and the puerperium. (4 cr; prereq 124; 2:15-3:00 W) Sciarra and staff
- 135 **CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY**
Includes clinics in obstetrics and gynecology. (12 cr; prereq regis med) Sciarra and staff

ELECTIVE COURSES

- 184 **EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY**
Elective for junior and senior medical students and recent graduates. Course will consist of clinical work in obstetrics and gynecology. Under exceptional circumstances investigative work can be done. Registration may be for one or both terms. (Cr and hrs ar; limited to 10 students) Sciarra and staff

COURSES FOR GRADUATE STUDENTS

- 201 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART I**
(Cr ar) Sciarra and staff
- 202 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART II**
(Cr ar) Sciarra and staff
- 203 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART III**
(Cr ar) Sciarra and staff
- 204 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART IV**
(Cr ar) Sciarra and staff
- 205 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART V**
(Cr ar) Sciarra and staff
- 206 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VI**
(Cr ar) Sciarra and staff
- 207 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VII**
(Cr ar) Sciarra and staff
- 208 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VIII**
(Cr ar) Sciarra and staff
- 209 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART IX**
(Cr ar) Sciarra and staff
- 210 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART X**
(Cr ar) Sciarra and staff
- 211 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XI**
(Cr ar) Sciarra and staff
- 212 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XII**
(Cr ar) Sciarra and staff
- 216 **RESEARCH**
(Cr ar) Staff
- 301 **EXTERNSHIP**
(6 cr) Staff

Ophthalmology (Oph)

- 200 **CLINICAL OPHTHALMOLOGY**
(6 cr; 8:00-6:00 MTWThF; O-P Clin) Harris and staff
- 201 **PRACTICAL OCULAR SURGERY**
(3 cr; 7:30-12:00 MTWThF; Oper Rm) Harris and staff
- 203 **BASIC AND APPLIED OPHTHALMOLOGY**
(2 cr; 8:00-12:00; O-P Clin) Harris and staff

Otolaryngology (Otol)

COURSES FOR GRADUATE STUDENTS

- 230 **CLINICAL OTOTOLOGY**
(3 cr; 1:00-4:00 MTWThF; O-P Clin) Paparella and staff
- 231 **CLINICAL RHINOLOGY AND LARYNGOLOGY**
(3 cr; 1:00-4:00 MTWThF; O-P Clin) Paparella and staff
- 232 **SURGERY OF EAR, NOSE, AND THROAT**
(3 cr; 9:00-12:00 MTWThF; Oper Rm) Paparella and staff
- 241 **SEMINAR ON CURRENT LITERATURE**
(1 cr; 9:00-11:00 S; Mayo A-675) Staff
- 248 **RESEARCH**
(Cr and hrs ar) Staff

Pathology (Path)

- 104 **AUTOPSIES**
(Cr and hrs ar; prereq 102) Dawson
- 106 **DISEASES OF THE HEART**
See section on 10-week courses, pages 142-148.
- 111 **CONFERENCE ON AUTOPSIES**
See section on 10-week courses, pages 142-148.
- 112 **DIAGNOSIS OF TUMORS**
See section on 10-week courses, pages 142-148.
- 113 **SURGICAL PATHOLOGY**
(Cr and hrs ar; prereq 102) Hebbel
- 120 **DISEASES OF THE LUNGS**
(1 cr; prereq 102; hrs ar) Dawson
- 150 **PROBLEMS IN PATHOLOGY**
See section on 10-week courses, pages 142-148.
- 201 **RESEARCH**
Students with the necessary preliminary training may elect research either as a major or minor in pathology. (Cr and hrs ar; prereq §) Dawson

Pediatrics (Ped)

REQUIRED COURSES

- 120 **CLINICAL LECTURES IN PEDIATRICS**
(2 cr; prereq regis med; 1:00-2:00 W; Eustis Amph) J Anderson and staff
- 135 **CLINICAL CLERKSHIP**
(12 cr; prereq regis med) J Anderson and staff

ELECTIVE COURSES**181 EXTERNSHIP**

Care of pediatric patients on an inpatient service at an advanced level of responsibility. Offered at University and affiliated hospitals. (Cr ar)

182 SPECIAL CLINICAL PROBLEMS

Opportunities for study in the following areas of clinical interest are available at University and affiliated hospitals: pediatric cardiology, pediatric neurology, pediatric endocrinology and metabolism; and renal diseases. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

183 RESEARCH IN PEDIATRICS

Research opportunities in the following areas are available at University or affiliated hospitals: hematology, infectious disease, immunology and inflammatory diseases, renal diseases, metabolic and endocrinologic research. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

COURSES FOR GRADUATE STUDENTS

All pediatric medical fellows, medical fellow specialists, teaching assistants, and research assistants are required to register for one or more of the following courses. Credit obtained may be applied to the M.S. or the Ph.D. degree. The clinical experience in these courses is obtained in the outpatient and inpatient services of the University of Minnesota Hospitals. Research opportunities will be provided by arrangement in either the basic science departments of the Medical School or in the laboratories of the Department of Pediatrics.

200 GRADUATE SEMINAR: PEDIATRICS

(1½ cr; VIII T; Mayo 1450) J Anderson and staff

202 PEDIATRIC CLINIC

(5 cr; II-IV MTWThF; O-P depts of HC Gen Hosp or U Hosp) J Anderson and staff

204 RESIDENCY IN PEDIATRICS

Three-month residency in pediatrics at University Hospitals, Hennepin County General Hospital, St. Paul Children's Hospital, St. Paul-Ramsey Hospital. (7 cr; I-X MTWThF) J Anderson and staff

206 PEDIATRIC SPECIAL INTEREST

Pediatric graduate students who have completed at least 1½ years of their general graduate pediatric training may obtain advanced clinical and basic training in one or more of the following special fields: allergy, neurology, cardiology, psychiatry, pathology, endocrinology and metabolism, hematology. Clinical training in these areas is obtained in the inpatient and outpatient services of the University Hospitals and its affiliated hospitals. Training in the basic sciences related to these fields of special interest may be obtained in the preclinical divisions of the Medical School. (Cr and hrs ar; prereq §) J Anderson and staff

208 PEDIATRIC RESEARCH

Special problems. Students may collaborate with members of the staff or with other students. (Cr and hrs ar; ped labs) J Anderson and staff

Pharmacology (Phcl)**109 PHARMACOLOGICAL PROBLEMS**

(Cr and hrs ar) Shideman and staff

203 RESEARCH IN PHARMACOLOGY

(Cr and hrs ar) Shideman and staff

Physical Medicine and Rehabilitation (PMed)

- 103 **PHYSICAL THERAPY CLINIC**
(Cr and hrs ar) Gullickson
- 161 **CLINICAL MEDICINE IN REHABILITATION**
(5 cr) Staff
- 180 **PROBLEMS IN PHYSICAL THERAPY**
(Cr ar; prereq physical therapist) Staff
- 181 **EXTERNSHIP IN PHYSICAL MEDICINE AND REHABILITATION**
(Cr ar; prereq regis med) Gullickson
- 190 **PROBLEMS IN PHYSICAL MEDICINE AND REHABILITATION**
(Cr ar; prereq regis med) Staff
- 191 **SEMINAR: REHABILITATION LITERATURE**
(Cr ar; prereq regis med) Staff
- 200 **PHYSICAL MEDICINE SERVICE**
(Cr and hrs ar) Staff
- 205 **READINGS**
(1 cr; I M) Kottke
- 206 **CONFERENCE**
(Cr and hrs ar) Staff
- 210 **RESEARCH IN PHYSICAL MEDICINE**
(Cr and hrs ar) Staff
- 212 **ELECTROMYOGRAPHY**
(Cr and hrs ar) Awad

Occupational Therapy

- 94-95-96 **CLINICAL TRAINING IN OCCUPATIONAL THERAPY**
A total of 9 months of supervised training in affiliated hospitals. (18 cr per qtr for sr OT students)

Physical Therapy

- 83A **THEORY AND TECHNIQUE OF MUSCLE FUNCTION**
(4 cr; prereq registered physical therapist; lect II ar, ChRC 208; lab III-IV ar, II-IV ar, ChRC 220) Pohtilla, Allison
- 86 **EVALUATION PROCEDURES**
(3 cr; prereq registered physical therapist) Pohtilla
- 88 **CLINICAL TRAINING**
Five weeks of supervised practice at affiliating hospitals. (3 cr; limited to physical therapy students in the professional program; hrs ar at affiliating hospitals) Clayson

Physiology (Phsl)

- 51 **HUMAN PHYSIOLOGY**
An introduction to human physiology. (5 cr; primarily for baccalaureate nursing students and physical therapy students; prereq zoology and 1 yr of college chemistry; lect VI MWF, VII TThF, VIII TTh, Owre 111; conf IV TTh, Owre 111; lab VII-IX MW, MH 307) Lee
- 113 **PROBLEMS IN PHYSIOLOGY**
Topics assigned for laboratory study, conferences, and reading. (Cr and hrs ar) Staff
- 202 **READINGS IN PHYSIOLOGY**
Topics selected for each student, written reviews prepared and discussed. (Cr and hrs ar) Staff

- 203 RESEARCH IN PHYSIOLOGY
(Cr and hrs ar) Staff

Psychiatry and Neurology (NPsy)

- 101 CLINICAL NEUROLOGY
(4 cr; prereq regis med or grad clin psychol; 8:00 a.m. S) Baker
- 103 CLINICAL CLERKSHIP
(12 cr) Staff
- 145 READINGS IN PSYCHIATRY
(Cr ar) Staff
- 145X READINGS IN NEUROLOGY
(Cr ar) Staff
- 151 SURVEY OF NEUROPATHOLOGY
(Cr ar) Staff
- 181 EXTERNSHIP IN NEUROLOGY
(Cr ar) Staff
- 182 PROBLEMS IN BASIC AND CLINICAL NEUROLOGY
(Cr ar) Staff
- 191 EXTERNSHIP IN ADULT PSYCHIATRY
(Cr ar) Staff
- 192 EXTERNSHIP IN CHILD PSYCHIATRY
(Cr ar) Jensen
- 193 PROBLEMS IN PSYCHIATRY
(Cr ar) Staff
- 202 SPECIAL RESEARCH TOPICS
(Cr ar; prereq #) Staff
- 203 PSYCHOMETRIC CLERKSHIP
(Cr ar) Staff
- 204 INTERNSHIP IN CLINICAL PSYCHOLOGY
(2 or 4 cr; prereq Ph.D. candidate in clinical psychology with #) Staff
- 206 MEDICAL PSYCHOLOGY I
(3 cr; prereq grad) Briggs, Hafner
- 208 CLINICAL NEUROLOGY
(Cr ar) Baker and staff
- 209 RESEARCH IN NEUROLOGY
(Cr ar) Baker and staff
- 212 SURVEY OF NEUROPATHOLOGY
(1 cr) Sung
- 226 NEUROLOGICAL-NEUROSURGICAL CONFERENCE
(1 cr) Baker and staff
- 231 APPLIED ELECTROENCEPHALOGRAPHY, MYOGRAPHY
(Cr ar) Torres, Kennedy
- 233 APPLIED NEUROPATHOLOGY
(Cr ar) Sung
- 245 CLINICAL CORRELATIVE NEUROANATOMY
(1 cr) Riley
- 251 CLINICAL INPATIENT PSYCHIATRY
(Cr ar) Staff
- 252 CLINICAL OUTPATIENT PSYCHIATRY
(Cr ar) Anderson and staff
- 253 CLINICAL CHILD PSYCHIATRY
(Cr ar) Jensen and staff

- 254 **ADVANCED CLINICAL INPATIENT PSYCHIATRY**
(Cr ar) Staff
- 255 **ADVANCED CLINICAL OUTPATIENT PSYCHIATRY**
(Cr ar) Anderson and staff
- 256 **ADVANCED CLINICAL CHILD PSYCHIATRY**
(Cr ar) Jensen and staff
- 257 **SPECIAL ASSIGNMENTS**
(1 cr) Staff
- 258 **RESEARCH IN PSYCHIATRY**
(Cr ar) Staff
- 260 **ORIENTATION TO CLINICAL PSYCHIATRY**
(1 cr) Staff
- 291 **SEMINAR: CURRENT LITERATURE**
(1 cr) Simon
- 292 **SPECIALIZED SUPERVISED PSYCHOTHERAPY**
(1 cr) Hastings and staff

Radiology (Rad)

ELECTIVE COURSES FOR THIRD- AND FOURTH-YEAR STUDENTS

- 180 **EXTERNSHIP IN RADIOLOGY**
(Cr and hrs ar)
- 181 **EXTERNSHIP IN DIAGNOSTIC RADIOLOGY**
(Cr and hrs ar)
- 182 **EXTERNSHIP IN RADIATION THERAPY**
(Cr and hrs ar)
- 183 **PROBLEMS IN RADIATION BIOLOGY AND RADIOACTIVE ISOTOPE METHODS**
(Cr and hrs ar)
- 184 **PROBLEMS IN DIAGNOSTIC RADIOLOGY**
(Cr and hrs ar)
- 186 **ROENTGEN TECHNIQUE**
(Cr and hrs ar)

REQUIRED COURSES FOR GRADUATE STUDENTS

- 110 **RADIATION BIOLOGY INSTITUTE**
Effects of irradiation on living systems. Radioisotopic procedures. Physics and chemistry fundamental to radiation biology and effects on all types of chemical and biological systems. (Cr and hrs ar) Maruyama, Hahn
- 111 **MEDICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the medical staff at which all the important medical cases which have X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; III T; Todd Amph) Peterson and staff
- 124 **PEDIATRIC ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the pediatric staff at which all the important pediatric cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; II T; Eustis Amph) Wolfson
- 135 **SURGICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the surgical staff at which all the important surgical cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological standpoints. (1 cr; II S; Todd Amph) Ampatz, Gedgaudas
- 163 **NEUROSURGICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the neurosurgical staff at which all the important neurosurgical cases which have had X-ray diagnostic procedures are reviewed

- from both the clinical and roentgenological points of view. (1 cr; VI F; Todd Amph) Peterson
- 200 **RESEARCH IN ROENTGENOLOGY**
Problems in roentgen diagnosis. (Cr ar) Peterson and others
- 202 **CARDIOVASCULAR ROENTGENOLOGIC CONFERENCE**
(1 cr; VIII M; Todd Amph) Amplatz, Gedgudas
- 204 **TUMOR CLINIC CONFERENCE**
(Cr ar; IV Th; Todd Amph) Charyulu
- 205 **RESEARCH: RADIATION THERAPY, NUCLEAR MEDICINE, RADIOBIOLOGY**
(Cr ar) Loken, Hahn
- 206 **ROENTGENOSCOPY**
Theory and practical application of roentgenoscopy, particularly to diseases of the gastrointestinal tract, lungs, and heart. (3 cr) Peterson and others
- 209 **ROENTGEN DIAGNOSIS**
Theory and practical application of roentgen diagnostic methods to medical cases in general. (3 cr) Peterson and others
- 210 **ROENTGEN TECHNIQUE**
Theory and practical application of the principles of roentgen technique including the study of X-ray machines and X-ray tubes, exposure, technique, and darkroom. (2 cr) Peterson and others
- 211 **DOSIMETRY OF INTERNAL, EXTERNAL RADIATION EMITTERS**
(1 cr; 7:00-8:00 a.m. W; Mayo B-142) Moore
- 212 **SEMINAR: RADIATION BIOPHYSICS AND NUCLEAR MEDICINE**
Research approaches to problems in radiation biophysics; use of radioactive isotopes discussed. Recent advances reviewed. (1 cr; V M) Loken, Moore
- 236 **NUCLEAR MEDICINE CONFERENCE**
Current topics in nuclear medicine. (1 cr; 4:00-5:00 T; Rigler Library) Loken
- 238 **ROENTGEN-SURGICAL PATHOLOGY CONFERENCE**
Weekly meetings with the surgical pathology staff at which surgical specimens and roentgenograms are reviewed from the pathologic and roentgenologic points of view. (1 cr; 4:00-5:00 Th; Todd Amph) Lober, Peterson, and others
- 240 **RADIATION THERAPY CONFERENCE**
Recent advances in clinical radiotherapy. (1 cr; 4:00-5:00 M; Rigler Library) Charyulu, Maruyama

Surgery (Surg)

Division of General Surgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 135 **CLINICAL CLERKSHIP**
(16 cr; prereq regis med) Najarian and staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 181 **CARDIOVASCULAR SURGERY**
Clinical problems and participation in surgery. (Cr and hrs ar; for srs only) Varco, Castaneda
- 182 **PROBLEMS IN CLINICAL INVESTIGATIONS AND PROBLEMS IN EXPERIMENTAL SURGERY**
(Cr and hrs ar; University and affiliated hosps) Najarian and staff
- 183 **CLINICAL TISSUE TRANSPLANTATION**
Participation in transplantation operations, ward rounds, and seminars. Additional time may be spent in the laboratories participating in experimental organ transplantation studies. (Cr and hrs ar) Najarian

184 EXTERNSHIP IN AFFILIATED HOSPITALS

(Cr and hrs ar) Najarian, Eisenberg, Hitchcock, Humphrey, and Perry

REQUIRED COURSES FOR GRADUATE STUDENTS

200 OUTPATIENT CLINIC IN SURGERY

Student is required to assist in the outpatient surgical clinic and to participate in diagnosis and treatment. (1 cr) Najarian and staff

203 PROCTOSCOPY AND SIGMOIDOSCOPY

Diagnosis and treatment of lesions of the lower bowel. (1 cr; hrs ar) W Bernstein and staff

204 TUMOR CLINIC

Combined clinical-pathological consideration of tumors as seen by the general surgeon. Tumor conference follows. (1 cr; hrs ar) Staff

205 SURGICAL DIAGNOSIS

Surgical fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in Outpatient Department. (1 cr; hrs ar) Najarian and staff

208 STUDY OF SURGICAL PROBLEMS

Surgical fellow acts as house surgeon in University and affiliated hospitals. (1 cr; hrs ar) Najarian and staff

211 OPERATIVE SURGERY

Surgical fellow acts as the first assistant at operations in University and affiliated hospitals and later may be permitted to operate. (1 cr; hrs ar) Najarian and staff

214 SURGICAL WARD CONFERENCE

Presentation of interesting cases by the fellows. (1 cr; hrs ar) Najarian and staff

215 SURGICAL-ROENTGENOLOGICAL-PATHOLOGY CONFERENCE

Weekly reviews of selected surgical patients. (1 cr; hrs ar) Radiology, Pathology, and Surgery staffs

216 SURGICAL RESEARCH

Problems in experimental surgery. (1 cr; hrs ar) Najarian and staff

217 SURGICAL SEMINAR

Conferences for review of surgical literature, for presentation of cases, and as research. (1 cr; hrs ar) Najarian and staff

218 SURGICAL CLINICS-PATHOLOGIC CONFERENCE

Review of interesting cases by the medical, surgical, pediatrics, and pathology staffs. (1 cr; hrs ar) Najarian and staff

219 SURGERY-LITERATURE CONFERENCE

Leading surgical journals are assigned to the fellows who review and report selected articles at weekly conference. (1 cr; hrs ar) Najarian and staff

220 PERIPHERAL VASCULAR CONFERENCE

Vascular clinic with conference following. (1 cr; hrs ar) Najarian and staff

221 SURGERY-PHYSIOLOGY CONFERENCE

Seminar discussing the physiological aspects of surgery. (1 cr; VIII T) Najarian, Sosin

COMPLICATIONS CONFERENCE

Discuss complications encountered postoperatively. (Cr and hrs ar) Najarian, Delaney

Division of Neurosurgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

127 CLINICAL LECTURES IN NEUROSURGERY

(1 cr per yr; prereq regis med; W) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 188 NEUROSURGERY EXTERNSHIP, UNIVERSITY HOSPITALS**
(Cr ar; prereq regis med; MTWThF) Staff
- 189 NEUROSURGERY EXTERNSHIP, VETERANS ADMINISTRATION HOSPITAL**
(Cr ar; prereq regis med; MTWThF) Staff
- 190 NEUROSURGERY INVESTIGATION**
(Cr ar; prereq regis med; MTWThF) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 305 NEUROSURGICAL DIAGNOSIS**
The neurosurgical fellow assists in instruction of clinical clerks and interns, and studies problems in diagnosis in the Outpatient Department and in University Hospitals. (3 cr; MTWThF) French, Chou, Long
- 308 STUDY OF NEUROSURGICAL PROBLEMS**
The neurosurgical fellow acts as house surgeon at University Hospitals. (4 cr; MTWThF) French, Chou, Long
- 311 OPERATIVE NEUROSURGERY**
The neurosurgical fellow acts as first assistant at operations in University Hospitals and later may be permitted to operate. (4 cr; MTWThF) French, Chou, Long
- 316 NEUROSURGICAL RESEARCH**
Problems in experimental or clinical surgery. (3 cr; MTWThF) French, Chou, Long
- 318 NEUROSURGICAL CONFERENCE**
A review of X-rays and case histories on neurosurgical service. (1 cr; F) French, Chou, Long

*Division of Orthopedic Surgery***ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS**

- 185 EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES**
(Cr ar; prereq regis med) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 401 ORTHOPEDIC CONFERENCE**
Review of X-rays and case histories of patients on the orthopedic inpatient or outpatient service. (3 cr) Moe, Kane, Patterson, House, Bunch, and staff
- 403 FRACTURES**
The orthopedic fellow acts as house surgeon on the fracture service at Henepin County General Hospital. (5 cr) Gustilo and staff
The orthopedic fellow acts as house surgeon on the fracture service at St. Paul-Ramsey Hospital. (5 cr) Comfort and staff
- 405 ORTHOPEDIC DIAGNOSIS**
The orthopedic fellow assists in instruction of clinical clerks and interns and studies problems in diagnosis in the Outpatient Department and in the University Hospitals. (3 cr) Moe, Kane, Patterson, House, Bunch, and staff
- 407 PEDIATRIC ORTHOPEDICS**
The orthopedic fellow acts as house surgeon at Gillette State Hospital for Crippled Children. (5 cr) Moe and staff
- 408 STUDY OF ORTHOPEDIC SURGERY PROBLEMS**
The orthopedic fellow acts as house surgeon at the University Hospitals. (5 cr) Moe, Kane, Patterson, House, Bunch, and staff
- 410 ORTHOPEDIC PATHOLOGY**
Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities. (2 cr) Moe, Kane, Patterson, House, Bunch, and staff

- 411 ORTHOPEDIC OPERATIVE SURGERY**
The orthopedic fellow acts as first assistant at operations at the University Hospitals and later may be permitted to operate. (5 cr) Moe, Kane, Patterson, House, Bunch, and staff
- 412 ORTHOPEDIC ANATOMY**
The orthopedic fellow dissects upper and lower extremities and aids in instruction of medical students in anatomy of the extremities. (2 cr) Moe, Kane, Patterson, House, Bunch, and staff
- 416 ORTHOPEDIC RESEARCH**
Problems in experimental or clinical surgery. University Hospitals. (5 cr) Moe, Kane, Bunch, and staff

Division of Urology

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 180 EXTERNSHIP IN UROLOGY**
(Cr and hrs ar) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 250 UROLOGICAL SURGERY**
Urological fellow first assists at operations in the University Hospitals and later is permitted to operate under supervision of the staff. (4 cr; hrs ar) Staff
- 251 CYSTOSCOPY AND UROLOGICAL DIAGNOSIS**
Urological fellow performs cystoscopies and other diagnostic procedures. (4 cr; hrs ar) Staff
- 252 UROLOGICAL CONFERENCE**
Problems in diagnosis and treatment are discussed. (4 cr; hrs ar) Staff
- 253 RESEARCH IN UROLOGY**
Problems in experimental and clinical surgery. (4 cr; hrs ar) Staff

SCHOOL OF NURSING (Nurs)

- 82A NURSING TREATMENT AND DELEGATED MEDICAL ACTIVITY**
Modification of nursing treatment and the planning and providing of delegated medical care. (4 cr; prereq 72, Psy 145, Phcl 9) Staff
- Sec 1, Lect III-IV TTh, Owre 112
Sec 2, Lect III-IV TTh, Owre 113
Sec 3, Lect III-IV TTh, Owre 117
Sec 4, Lect III-IV TTh, MH 118
Sec 5, Lect III-IV TTh, PoH 2317
Lab III-IV, VI-VII MWF
- 199 SPECIAL TOPICS IN NURSING**
(6 cr; prereq regis in grad program or Δ; hrs ar) Ar

SCHOOL OF PUBLIC HEALTH (PubH)

- 50 PERSONAL AND COMMUNITY HEALTH**
Fundamental principles of health conservation and disease prevention. (3 cr, §2, §3, §4, §5, §51, or §100A; III MTWThF; NH 45) Smith
- 65 FIELD PRACTICE IN PUBLIC HEALTH NURSING**
See section on 10-week courses, pages 142-148.
- 123 TOPICS IN PUBLIC HEALTH**
Selected readings in public health with discussion based on these readings. (Cr ar; prereq §) Staff

- 164B RESEARCH METHODOLOGY IN HOSPITAL ADMINISTRATION**
Research design; research in administration. (2 cr; prereq 108, 164A) Litman, Weckwerth
- 179A LONG-TERM PATIENT CARE AND REHABILITATION**
Problems associated with rehabilitation; selected experience correlated with seminars. (Cr ar; prereq §) E Anderson
- 179B LONG-TERM PATIENT CARE AND REHABILITATION**
Independent study. Exploration of a comprehensive multidiscipline approach in the continuity of care for long-term patients. (Cr ar; prereq 179A) E Anderson
- 179C FIELD WORK: PHYSICAL THERAPY IN COMMUNITY AGENCIES**
Supervised experience in local public health agencies. Includes advisory service and planning in-service programs for nursing staff; selected experiences in county and state health departments. (Cr ar; §) E Anderson
- 181E PRINCIPLES AND METHODS IN PUBLIC HEALTH EDUCATION — ORGANIZATION AND ADMINISTRATION IN HEALTH EDUCATION**
Methods and procedures in organizing and administering health education programs and services; consultation process in health education. (3 cr; prereq 181D) Craig, Ellis
- 186 PROBLEMS OF AIR POLLUTION CONTROL**
Special supervised studies involving laboratory and field investigation procedures; pertinent literature review. (Cr ar; prereq 155, §) Paulus
- 187E COMMUNITY HEALTH EDUCATION LABORATORY**
Practical experience in community agencies and organizations; background studies in specific neighborhood areas; supervised health education practice; action planning for health education. (Cr ar; prereq 181A, B, C, D or E) Craig, Ellis
- 189 FIELD COURSE IN PUBLIC HEALTH NUTRITION**
Placement in an approved agency with opportunity for experience in nutritional aspects of public health programs. (Cr ar; prereq §) Stief and associates
- 190** COMMUNITY HEALTH EDUCATION PRACTICE**
See section on 10-week courses, pages 142-148.
- 196* SEMINAR: PUBLIC HEALTH NUTRITION**
(Cr ar; prereq §) Stief
- 200 RESEARCH**
Opportunities will be offered by the School of Public Health and by various cooperating organizations for qualified students to pursue research work. (Cr ar) Staff
- 231** GROUNDWATER DEVELOPMENT**
See section on 10-week courses, pages 142-148.
- 233 WATER QUALITY INVESTIGATION AND RESEARCH TECHNIQUES**
Field techniques and special research methods for establishing pollution base-lines; recognition and appraisal of advancing eutrophication. (6 cr; prereq §) Olson, Odlaug
- 234 WATER QUALITY RESEARCH**
Design and implementation of independent short-term research activity. Literature review, statistical design, and data processing. (6 cr; prereq §) Olson, Odlaug

Biometry (PubH)

- 110A BIOMETRY I**
Basic concepts in probability; binomial, Poisson, and normal probability models; testing statistical hypotheses and estimation of parameters of probability models. (3 cr; prereq Math 10 or §, Math 43 or §, ¶PubH 111A) Bartsch
- 111A BIOMETRY LABORATORY I**
Application of concepts of probability to the development of probability models for random phenomena in the biological and medical sciences. (2 cr; prereq ¶110A) Bartsch

120D* BIOMEDICAL COMPUTING

See section on 10-week courses, pages 142-148.

201 TOPICS IN BIOMETRY

Studies in special topics for advanced students. (Cr ar; prereq 110A and \$)
Staff

211 SEMINAR: BIOMETRY

(Cr ar) Boen

MORTUARY SCIENCE (Mort)

90A PRACTICUM IN FUNERAL SERVICE

See section on 10-week courses, pages 142-148.

91 PRACTICUM CONFERENCE

Discussion of practicum, practicum reports, and assigned readings of funeral service literature. (3 cr; prereq ¶90 or ¶90A)

99 INDEPENDENT STUDY

A report based on study and research in an area of student's interest in funeral service. (Cr ar; prereq sr)

Institute of Technology

For general information about the Institute of Technology, see section on Schools, Colleges, and Special Programs.

COLLEGE OF ENGINEERING

Aeronautics and Engineering Mechanics

Mechanics and Materials (MM)

35 STATICS

Vector algebra. Application of the equations of equilibrium to the analysis of simple engineering structures and machines. Nature and influence of friction. Elementary theory of statically determinate framed structures. Deformation of structures with axially loaded elements. (4 cr; prereq Math 31 or ¶Math 31 and Phys 21; I-II MWF, II TTh; AE 21)

36 DYNAMICS

Introduction to vector calculus. Kinematics. Application of principles of particle motion. Conservation principles. Dynamics of particle systems and plane rigid bodies. Technical applications. (4 cr, §Phys 100 or §Phys 100A; prereq Math 32 or ¶Math 32 and Phys 21; III-IV MWF, III TTh; AE 21)

Electrical Engineering (EE)

30 CIRCUIT ANALYSIS

Steady-state and transient response of linear passive circuits under DC, step, and sinusoidal excitation. (3 cr; prereq Phys 23 or ¶Phys 23, Math 31 or ¶Math 31) Ar

Lect 1, I-II MWF, Arch 50

Rec 1, III-IV M, ME 302

Rec 2, I-II T, ME 208

Rec 3, I-II Th, ME 208

30A ELECTRICAL ENGINEERING LABORATORY

Laboratory to accompany EE 30. (1 cr; prereq ¶30) Ar

Lab 1, III-IV MW, EE 121

Lab 2, VI-VII MW, EE 121

Lab 3, I-II TTh, EE 121

Lab 4, III-IV TTh, EE 118

Lab 5, III-IV TTh, EE 121

Lab 6, VI-VII TTh, EE 118

Lab 7, VI-VII TTh, EE 121

Lab 8, III-IV WF, EE 121

65 ELECTRONICS II

Piecewise linear and incremental models, biasing, operating characteristics of active devices in single-stage circuits; applications of diodes for rectification, clipping, and clamping. (4 cr, §105; prereq 64; I-II MTWThF; Arch 55) Ar

76 ELECTROMAGNETIC FIELDS

Applications of electrostatic, magnetostatic, and electromagnetic field theory. (3 cr; prereq 75; III-IV MWF; Arch 55) Ar

85 JUNIOR ELECTRICAL ENGINEERING LABORATORY

Experimental study of electronic circuits. (2 cr; prereq 84, ¶65) Ar

Lab 1, V-VIII MW, EE 216

Lab 2, V-VIII MW, EE 205

Lab 3, V-VIII TTh, EE 205

Mechanical Engineering

Engineering Graphics (EG)

1 THE SLIDE RULE

Computation practice and theory. Design of special scales. (1 cr [no cr for IT students]; prereq higher algebra and trigonometry or §; VI TTh; Arch 10) Springer

25 ENGINEERING GRAPHICS

Engineering representation and analysis of systems of projection; the coordinate system, graphical solution of space problems, intersections, and developments. Precision in graphics and techniques of sketching; pictorial projection systems, size description, standard and simplified practices applied to graphic communication. (4 cr; prereq Math 21A or §; lect V MTWThF, VI W, Arch 10; rec VI MF, Arch 10; lab hrs ar, ME 308) Springer

Industrial Engineering (IE)

130 INTRODUCTION TO OPERATIONS RESEARCH

Industrial applications of operations research techniques using linear programming, decision models, game theory, and general optimization techniques; industrial problems in allocation, inventory control, competitive strategies, scheduling. (4 cr; prereq ME 99 or equiv; I MTWThF, II MWF; ME 321) Arora

177 INDUSTRIAL SAMPLING TECHNIQUES

Selection and operation of attributes sampling plans; operating characteristic curves; sampling techniques for continuous production; variables sampling plans; administrative and economic comparisons. (3 cr; prereq 171; 3 lect hrs per wk; III MTWThF and 1 hr ar; ME 321) White

198 DESIGN AND ANALYSIS OF EXPERIMENTS I

One-factor experiments, design constructed to reduce the experimental error, general linear regression model, the analysis of variance, estimation and comparison of effect, orthogonal contrasts, components of variance, fixed random, and mixed models, incomplete block designs, introduction to general factorial experiments. (3 cr; prereq ME 99 or equiv or §; 3 lect hrs per wk; IV MTWThF and 1 hr ar; ME 321) White

Mechanical Engineering (ME)

24 OPTIMUM DESIGN OF MECHANICAL ELEMENTS

Application of fundamental principles to the design of typical mechanical components. Engineering approach to the analysis and synthesis of machines. Optimum design criteria. (3 cr; prereq 23 or ¶23, MM 37; lect VI MTWTh, ME 214; lab VII-IX MW, ME 308) Kleinhenz

30A THERMODYNAMICS

Properties, equations of state, and processes of thermodynamic systems and devices. Application of first and second laws correlating energy with heat, work, and mass transfer. Equilibrium and irreversibility. (4 cr; prereq Phys 23, Math 32; III MTWThF, IV MWF; ME 221) Ibele

33 MEASUREMENTS LABORATORY I

Fundamental principles of measurement. Standards, accuracy, calibration. Treatment of experimental data. (2 cr; prereq Math 32; lect V MW, ME 321; lab VII-IX MW, ME 352) Tomisak

35 MEASUREMENTS LABORATORY III

Static and dynamic characteristics of measurement systems. Fundamental principles of measurement and calibration. Measurement of temperature, pressure, vacuum, humidity, density, viscosity, heating values, speed, power, force, stress-strain, and radioactivity. (2 cr; prereq 34; lect IV TTh, ME 214; lab VII-IX TTh, ME 370) McFarland

90, 91, 92, 93 INDUSTRIAL ASSIGNMENT, PART I

See section on 10-week courses, pages 142-148.

192 MECHANICAL ENGINEERING DESIGN

Design of mechanical engineering elements and systems. Interdivisional problems involving thermodynamics, mass and heat transfer, solid and fluid mechanics, economics and production, operations analysis, and automatic controls. (2 cr; prereq 4th yr engr or Φ) Frohrib

Sec 1, VI-VII MWF, ME 325

Sec 2, VI-VII MWF, ME 321

SCHOOL OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE

21 ARCHITECTURAL THEORY AND HISTORY

An introduction to architecture, the philosophy and principles of architecture as an art, a survey of the development of architecture from the ancient periods until the present time. (3 cr; prereq for all architectural history; II MTWThF; Arch 130) Winterowd

51 ANCIENT ARCHITECTURE

The history of architecture in ancient Mesopotamia, Egypt, Crete, Greece, and Rome through the Augustan Age. (3 cr; prereq 21; IV MTWThF; Arch 130) Winterowd

81-83, 91-93, 111-113, 121-122 ARCHITECTURAL DESIGN

See section on 10-week courses, pages 142-148.

SCHOOL OF CHEMISTRY

Analytical Chemistry (AnCh)

40 INTRODUCTION TO ANALYTICAL CHEMISTRY

Equilibria involved in analytical processes. Properties and formation of precipitates. Methods of separation. Introduction to electrochemical methods. (4 cr; for physics majors; prereq GeCh 14, 15; lect, rec, quiz V-VI MWF, C 325; lab I-III any 2 days of wk, C 310) Meehan

57A QUANTITATIVE ANALYSIS

(Lecture) A survey of modern quantitative methods of analysis. (3 cr [no cr until 57B completed]; for nonchemistry majors; prereq GeCh 5; V-VI MWF; C 325) Meehan

57B QUANTITATIVE ANALYSIS

(Laboratory) A survey of modern quantitative methods of analysis including elementary physicochemical procedures. (2 cr; for nonchemistry majors; prereq 57A or Φ 57A; I-III MTWThF; C 310) Meehan

201 SPECIAL TOPICS

Analytical topics not covered in regular courses are selected after discussion with instructor. (Cr and hrs ar; prereq Φ) Meehan

301 RESEARCH IN QUANTITATIVE ANALYSIS

(Cr and hrs ar) Staff

General Chemistry (GeCh)

4 GENERAL PRINCIPLES OF CHEMISTRY

General laws of chemistry, principles of structure, and chemical behavior of matter. (5 cr, 4-5†; for premedicals, predentals, etc.; prereq predicted Math GPA 1.90 on ACT...Math Y or Z or college course in algebra...4 yrs of high school math and high school chemistry recommended; lect I MTWThF, SciCB 325; rec V MWF, lab VI-VIII MWF, C ar) Staff

6 PRINCIPLES OF SOLUTION CHEMISTRY

The chemistry of the metals including the behavior of their ions in solution, equilibrium principles, oxidation and reduction, electrochemistry, nature of solutions, complex ion systems; laboratory considers the detection of metal ions, a selected few anions, preparation and spectrochemical studies of some transition metal complexes in solution, and analyses of simple solids and alloys. (4 cr; prereq 5, 15 or 25; lect II MTWThF, SciCB 375; lab V-VIII MWF, C ar) Staff

14 GENERAL PRINCIPLES OF CHEMISTRY

Basic principles and concepts of chemistry with a similar but more rigorous treatment than that of GeCh 4. (4 cr, 14-15†; limited to College of Engineering students; prereq Phys 21, 22 or ‡; lect I MTWThF, SciCB 375; rec V MWF, lab VI-VIII MWF, C ar) Staff

24 GENERAL PRINCIPLES OF CHEMISTRY

Basic principles and concepts of chemistry with a similar but more rigorous treatment than that of GeCh 4. (5 cr, 24-25†; for chemistry and chemical engineering majors; lect I MTWThF, SciCB 375; rec V MWF, lab VI-VIII MWF, C ar) Staff

Organic Chemistry (OrCh)

61 ELEMENTARY ORGANIC CHEMISTRY

Important classes of organic compounds, both aliphatic and aromatic, together with some heterocyclic compounds. Laboratory work includes the preparation of typical substances. (5 cr; for all colleges; prereq GeCh 5 or 25 or equiv; lect I MTWThF, C 325; rec II TTh, C 325; lab II-IV MWF, C 390; lab conf III TTh, C 325) Bach

65 ELEMENTARY ORGANIC CHEMISTRY LABORATORY

Reactions of typical functional groups and introduction to methods of organic qualitative analysis. (4 cr; prereq 63; lab VI-IX MTWTh, C 390; lab conf II MTW, C 315) Koelsch

96 SENIOR THESIS

A written final senior thesis report is required. (Cr ar; prereq ‡, 4th yr) Staff

139 ADVANCED ORGANIC CHEMISTRY LABORATORY

Selected laboratory synthetic problems, which may include original work. Includes considerable individual instruction. (2-5 cr; prereq 64 or 65; 12-30 hrs lab work ar) Koelsch

165 ORGANIC QUALITATIVE ANALYSIS

Reactions of typical functional groups and introduction to methods of organic qualitative analysis. (4 cr, §65; prereq 63; lab VI-IX MTWTh, C 390; lab conf II MTW, C 315) Koelsch

301 RESEARCH IN ORGANIC CHEMISTRY

(Cr ar; prereq 238 and Δ) Staff

GRADUATE THESIS IN ORGANIC CHEMISTRY

(No cr; prereq Δ) Staff

Physical Chemistry (PCh)

101 PHYSICAL CHEMISTRY

(4 cr; prereq 1 yr college chemistry, Phys 9 or ¶9, or 6 with ‡, Math 31 or 44; II-III MTThF; C 315) Sullivan

105 ANALYSIS OF DATA

(1 cr; prereq 101 or 102 or 108; II-III W; C 315) Sullivan

106A-B LABORATORY

(1-2 cr; prereq 105; VI-VIII MW; C 190) Van-Catledge

107 ELEMENTARY PHYSICAL CHEMISTRY

(3 cr; prereq 1 yr of college chemistry, Phys 9 or ¶Phys 9 or Phys 6 with §; II MTWThF; C 111) Wertz

SCHOOL OF EARTH SCIENCES**Geology and Geophysics (Geo)****1 PHYSICAL GEOLOGY**

A first course in geology for science majors and an introduction to scientific methods and the nature of the earth for others. Survey of the main features of the physical world and of the processes that have evoked them. (5 cr; limited to 72 students; prereq high school physics and chemistry recommended; lect II MTWThF; P 110) Rapp, Matsch

Lab 1, III-IV MWF, ForH 180

Lab 2, VI-VII MWF, ForH 180

100 FIELD GEOLOGY

Measurement of stratigraphic sections; study of fossils and igneous, sedimentary, and metamorphic rocks. Geological surveying on aerial photographs and topographic maps. Preparation of geologic maps and cross-sections. Study of structural and geomorphic features and geologic setting of mineral deposits. (9 cr; limited to students majoring in geology, geophysics, and geological engineering; prereq 63, 65, or §) Bright

103 GEOLOGIC PROBLEMS

(Cr and hrs ar; prereq §)

109C PHYSICAL GEOLOGY FOR TEACHERS

An introduction to the scientific methods and the nature of the earth. Survey of the main features of the physical world and of the processes that have evoked them. (4 cr, §old Geol 1, §old Geol A, §Geo 1, §Geo 11; limited to 18 students; only for students holding degrees in education; prereq 1 term college chemistry or physics; lect II MTWThF, seminar V TTh, P 110; lab III-IV MWF, ForH 185) Matsch

SCHOOL OF MATHEMATICS (Math)**T (Arts) TRIGONOMETRY**

Analytic trigonometry emphasizing identities, equations, and properties of the functions; right and oblique triangles without logarithmic computation. (3 cr [open for cr if taken before 43, even to students with high school trigonometry]; prereq plane geometry and high school algebra, ¶10 allowed; II MTWThF; Arch 50) Ar

Z (Arts) PREPARATORY MATHEMATICS

Designed to supplement the background in algebra for those students whose background is insufficient. Covers most of the material of the high school elementary and higher algebra courses, with emphasis on the latter. (No cr; III-IV MTWThF; Arch 50) Ar

5A (Arts) FOUNDATIONS OF ARITHMETIC

Includes a 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, with some attention to the history of the subject and its role in our culture and civilization. (3 cr [not available for Arts College cr]; prereq 1 yr of elementary algebra and 1 yr of high school geometry or equiv, and enrollment as elem educ student, or Δ ; III MTWThF; Arch 5) Ar

10 (Arts) COLLEGE ALGEBRA AND ANALYTIC GEOMETRY

(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 Math 15 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. (5 cr, §15, §10A, §21A; prereq Z or high school higher algebra and satisfactory math placement score; III-IV MTWThF; E 104) Ar

10A (Arts) ALGEBRA, ANALYTIC GEOMETRY, AND ELEMENTARY FUNCTIONS

(A first course of a 2-quarter sequence, specifically designed for students in the pre-business administration curriculum and for other students requiring an introduction to algebra, analytic geometry, elementary functions, and calculus of one and several variables. Students who plan to take several quarters of mathematics should register for the Math 15, 42-43-44 sequence.) Inequalities and elementary set theory, functions and graphs, quadratic equations in two variables, conic sections, complex numbers, theory of equations, mathematical induction, general systems of linear equations, combinations, permutations and probability, and vectors and lines and planes in space. (5 cr, §10, §15, §21A; prereq high school higher algebra, T or high school trigonometry, and satisfactory math placement score; III-IV MTWThF; ME 202) Ar

15 (Arts) COLLEGE ALGEBRA

(A standard college algebra course for students planning to take the sequence in analytic geometry and calculus.) Functions and graphs, quadratic equations in one and two variables, progressions, complex numbers, inequalities, theory of equations, permutations and combinations, binomial theorem, probability, mathematical induction, determinants. (5 cr, §10, §10A, §21A; prereq high school higher algebra, T or high school trigonometry, and satisfactory math placement score; III-IV MTWThF; ME 102) Ar

21A (IT) ANALYSIS I: ALGEBRA, TRIGONOMETRY, AND ANALYTIC GEOMETRY

Review of algebra and elementary analytic geometry, fractions and factoring, exponents and radicals, binomial theorem, functions and graphs, linear equations and determinants, complex numbers, logarithmic and exponential functions, trigonometric functions, identities, and equations, polynomial equations, and conic sections, translation of axes, polar coordinates, introduction to differentiation. (5 cr, §10, §10A, §15; primarily for IT students; prereq 4 yrs of high school mathematics including trigonometry; I-II MTWThF; E 215) Ar

22A (IT) ANALYSIS II: ANALYTIC GEOMETRY AND CALCULUS

Functions and derivatives, limits, continuity, slopes, tangents, differentiation of algebraic functions, applications, differentials, the indefinite integral, physical, and geometrical applications. (5 cr, §42; prereq 21A; I-II MTWThF; E 225) Ar

23A (IT) ANALYSIS III: ANALYTIC GEOMETRY AND CALCULUS

The definite integral, the fundamental theorem, differentiation of transcendental functions, methods of integration, parametric equations and polar coordinates, application of integration to physical and geometrical problems in two and three dimensions. (5 cr; prereq 22A; III-IV MTWThF; E 215) Ar

31 (IT) CALCULUS IV: CALCULUS AND ANALYTIC GEOMETRY

Study of solid analytic geometry and vectors in space involving dot and cross products, planes, quadric surfaces, derivatives of vector functions. Definition of double and triple integrals. Iterated integrals in rectangular, polar, cylindrical, and spherical coordinates. Applications to moments and centroids. Partial differentiation including the chain rule, implicit functions, directional derivative, maxima and minima. (5 cr; prereq 23A; III-IV MTWThF; E 203) Ar

32 (IT) CALCULUS V: CALCULUS, LINEAR ALGEBRA, DIFFERENTIAL EQUATIONS

Standard topics of infinite series including tests for convergence and divergence. Power series, and Taylor expansions. Introduction to linear algebra. Matrices, determinants, and theorems on systems of algebraic equations. Differential equations involving the standard first order types plus higher order linear equations with constant coefficients. (5 cr; prereq 31; III-IV MTWThF; E 226) Loye

- 40A (Arts) INTRODUCTION TO CALCULUS OF ONE AND SEVERAL VARIABLES**
 (A second course of a 2-quarter sequence, specifically designed for students in the pre-business administration curriculum and for other students requiring an introduction to algebra, analytic geometry, elementary functions, and calculus of one and several variables. Students who plan to take several quarters of mathematics should register for the Math 15, 42-43-44 sequence.) Limits and derivative, differentiation of the elementary functions of one and several variables with applications to rates of change, maxima and minima, approximations by differentials, integration with standard forms and applications to area and volume, simple differential equations. (5 cr, \$40, \$42, \$22A; prereq 10A, 10, or 15, and T or high school trigonometry; I-II MTWThF; E 229) Ar
- 42 (Arts) ANALYTIC GEOMETRY AND CALCULUS I**
 (Course description covers sequence 42-43-44) A full-year course in the elements of analytic geometry and calculus. Plane analytic geometry including straight line, conic sections, parametric representations, polar coordinates, translation and rotation of axes. Introduction to solid analytic geometry, functions and limits, differentiation of algebraic, trigonometric, exponential, and logarithmic functions with applications to velocity and acceleration, rates, maxima and minima, curve tracing, indeterminate forms, approximations by differentials. Introduction to partial differentiation. Integration by standard forms with applications to area, volume, work, moments. Improper integrals. Infinite series. Taylor's theorem. Multiple integrals in two and three dimensions. (Math 43-44 are available for Upper Division credit to all except mathematics and physics majors.) (5 cr, \$40, \$40A, \$22A; prereq 10, 10A or 15 and T or high school trigonometry...may enter 43 from 40 or 40A if grade in 40 or 40A is A or B; I-II MTWThF; E 203) Ar
- 43 (Arts) ANALYTIC GEOMETRY AND CALCULUS II**
 (See Math 42 for course description) (5 cr; prereq 42 or 40 or 40A with grade of B; III-IV MTWThF; Arch 60) Ar
- 44 (Arts) ANALYTIC GEOMETRY AND CALCULUS III**
 (See Math 42 for course description) (5 cr; prereq 43; III-IV MTWThF; E 229) Ar
- 60 (Arts) SYNTHETIC METRIC GEOMETRY**
 Euclidean geometry including ruler and compass constructions and theorems on the triangle and circle not studied in a high school course in plane geometry. (3 cr; prereq 42; V MTWThF; E 229) Ar
- 63 (Arts) LINEAR ALGEBRA**
 Vectors, system of linear equations, matrices, determinants. Groups of transformations, conics, normal forms of matrices. (3 cr, \$149; prereq 1 qtr of calculus; II MTWThF; E 104) Ar
- 65 (IT) INTRODUCTION TO COMPUTER PROGRAMMING**
 Basic Fortran computer language with extensions. Programming applications and techniques. The binary number system and elements of computer organization and machine language. Integral laboratory. Three lectures and nonscheduled laboratory. (4 cr, \$164; prereq 23A or 43; IV MTWThF; Arch 5) Ar
- 106 (Arts) DIFFERENTIAL EQUATIONS**
 Problems course, methods for solving ordinary differential equations of various types with necessary theory for developing these methods. (3 cr, \$32; prereq 55; IV MTWThF; Arch 135) Ar
- 107A (Arts) ADVANCED CALCULUS**
 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. (3 cr; prereq 32 or 55; III MTWThF; E 225) Ar
- 112 (Arts) ELEMENTARY SET THEORY**
 Basic properties of operations on sets, cardinal numbers, simply ordered sets, well-ordered sets, ordinal numbers, axiom of choice, axiomatics. (3 cr; prereq 31 or 44; IV MTWThF; E 225) Ar
- 125A CRITICAL REASONING IN MATHEMATICAL ANALYSIS**
 Notions of limit, sequence, series, function, derivative, and integral. Gives more mature understanding of these concepts. Technique of developing ac-

curate proofs; intuition and logic in connection with these techniques. (3 cr; prereq 25A or 26B or 44 or 31; III MTWThF; Arch 135) Ar

126C (IT) FUNDAMENTALS OF ANALYTIC GEOMETRY AND CALCULUS

See section on 10-week courses, pages 142-148.

142 VECTOR AND MATRIX THEORY WITH APPLICATIONS

Systems of linear equations, determinants, finite dimensional vector spaces, matrices, characteristic values and their numerical estimation, reduction to canonical forms, quadratic and bilinear forms. Application to engineering problems. (3 cr, §149, §131A-B-C; prereq 31 or 44; V MTWThF; E 215) Ar

147 (IT) VECTOR ANALYSIS

Scalar and vector products, derivatives, geometry of space curves, del operator, line and surface integrals, divergence and Stokes's theorem, transformation of coordinates, dyadics, applications. (3 cr, §33; prereq 32 or 55; I MTWThF; E 217) Ar

148 (IT) DIFFERENTIAL EQUATIONS

Linear differential and difference equations with constant coefficients, isoclines, phase plane, reduction in order, Picard's method, uniform convergence, series solutions, Bessel functions, Legendre polynomials, introduction to boundary value problems. (3 cr, §150; prereq 32 or 106; II MTWThF; E 217) Ar

164 THEORY OF PROGRAMMING MODERN DIGITAL COMPUTERS

Number systems. Complement arithmetic. Logical organization of computer. Basic and advanced absolute machine language programming. Arithmetic operations. Scaling. Introduction to symbolic programming. (3 cr [cr available after completion of Math 65]; prereq 32 or 55 or §; III MTWThF; E 217) Ar

168A ELEMENTARY THEORY OF COMPLEX VARIABLES

Conformal mapping, Schwarz-Christoffel transformations, Laplace transforms, and applications. (3 cr; prereq 151, 153, or 147, 148, 149 or 108, or 107B, or §; IV MTWThF; ME 106) Ar

181A INTRODUCTION TO TOPOLOGY

Metric spaces: completeness, compactness, uniform continuity. Abstract topologies: comparison of topologies, separation axioms, homeomorphisms. Product and function spaces. Connectedness. Local connectedness, Hahn-Mazurkiewicz Theorem, characterization of arc, Jordan curve theorem. Introduction to algebraic topology. (3 cr; prereq 32 or 55; III MTWThF; ME 106) Ar

184 (IT) ELEMENTARY NUMERICAL ANALYSIS IN ENGINEERING

Finite differences, interpolation, summation of series, numerical integration, Euler-MacLaurin formula and asymptotic expansions. Numerical solutions of systems of algebraic and transcendental equations. Newton's and Graeffe's method. (3 cr; prereq 32 or 106; III MTWThF; Ex 193) Ar

196 (IT) SPECIAL FUNCTIONS IN MATHEMATICAL ANALYSIS

Asymptotic expansions. Gamma and Beta functions. Hypergeometric functions as solution of differential equations. Bessel functions using Sommerfeld's contour integrals. Legendre functions. (3 cr; prereq 168A or 175 or §; IV MTWThF; E 217) Ar

SCHOOL OF MINERAL AND METALLURGICAL ENGINEERING

Metallurgical Engineering (MetE)

56 PHYSICAL METALLURGY

(ME, MinE) Introduction to principles. Theory of metals and alloys, constitution diagrams, heat treatment, relation of structure to properties. (3 cr; prereq 3rd yr; I MTWThF, V Th; MinMet 116) Sivertsen

60 PHYSICAL METALLURGY

(ChE) Theory of metals and alloys, constitution diagrams, heat treatment, relation of structure to properties. (3 cr; prereq 3rd yr; I MTWThF, V Th; MinMet 116) Sivertsen

141-142-143*‡ SPECIAL PROBLEMS IN METALLURGICAL ENGINEERING

Laboratory investigation of problems involved in metallurgical unit processes. (Cr ar; prereq sr) Staff

201-202-203*‡ RESEARCH IN METALLURGICAL ENGINEERING

(Cr ar) Staff

SCHOOL OF PHYSICS AND ASTRONOMY**Astronomy (Ast)****12 SOLAR SYSTEM**

Survey of what is known about the properties and motions of planets and their satellites, comets, and meteors, followed by a brief description of the universe. (Nonmathematical course) (3 cr, §11; II MTWThF and 1 clear evening per wk for observations with telescope; Ph 166) Kaufmanis

13 STARS AND GALAXIES

Discussion of constellations, properties, and motions of stars, and the structure of the sidereal universe. (Nonmathematical course; may be taken simultaneously with Ast 12) (3 cr, §11; III MTWTh and 2 clear evenings per wk for observation; Ph 166) Kaufmanis

Physics (Phys)**1 INTRODUCTORY PHYSICS**

Demonstration lectures on the principles of physics and physical phenomena underlying these principles. (3 cr; prereq high school algebra and plane geometry; I MTWThF; Ph 133) Ar

1A INTRODUCTORY PHYSICS LABORATORY

Laboratory course given in conjunction with Phys 1. (1 cr; prereq 1 or §1; combination of 1 and 1A may be applied toward group requirements in CLA) Ar

23 GENERAL PHYSICS, PART I

See section on 10-week courses, pages 142-148.

23A PHYSICS LABORATORY, PART I

See section on 10-week courses, pages 142-148.

50 INTERMEDIATE GENERAL PHYSICS, PART I

See section on 10-week courses, pages 142-148.

50A PHYSICS LABORATORY, PART I

See section on 10-week courses, pages 142-148.

114C INTERMEDIATE GENERAL PHYSICS

See section on 10-week courses, pages 142-148.

130C GEOMETRICAL AND PHYSICAL OPTICS

See section on 10-week courses, pages 142-148.

190 INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS

See section on 10-week courses, pages 142-148.

208 SYMMETRY AND ITS APPLICATIONS TO PHYSICAL PROBLEMS

See section on 10-week courses, pages 142-148.

College of Veterinary Medicine††

All classes scheduled by arrangement

Veterinary Anatomy (VAna)

191* TOPICS IN ORGANOLGY

Lecture and laboratory presentations regarding selected organ systems of domestic and laboratory animals. (1-5 cr [regis for more than 1 term permitted]; prereq 151 or equiv, §) Weber, Fletcher, Czarnecki, Vanden Berge

Veterinary Microbiology and Public Health (VMic)

128* PROBLEMS IN VETERINARY BACTERIOLOGY AND PUBLIC HEALTH

(Cr ar; prereq 103 or equiv, §) Pomeroy, Anderson, Lindorfer, Loken, Diesch

201* ADVANCED POULTRY DISEASES

Investigations of specific infectious disease problems of poultry. (Cr ar; prereq 131, §) Pomeroy, Higbee, Nelson, Bergeland

205* ADVANCED VETERINARY BACTERIOLOGY

Special topics, techniques, collateral reading, and conferences. (Cr ar; prereq §) Pomeroy, Anderson, Loken, Lindorfer, Diesch

Veterinary Medicine (VM)

122A-B CLINICS

Medical, obstetrical, radiological, surgical, and laboratory examination of diseases of animals. (3 cr; for 4th yr VMed; prereq 121) Low and others

202* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES

Detailed examination, discussion, treatment, and prevention of animal disease problems. (Cr ar; prereq 104, 132, §) Sorensen, Low, Mather, L Johnson, Finco, Larson

Veterinary Obstetrics (VObs)

204* SPECIAL PROBLEMS IN ANIMAL REPRODUCTION

(Cr ar; prereq §) Zemjanis

Veterinary Pathology and Parasitology (VPaP)

157 VETERINARY NECROPSIES

Necropsy techniques, examination of tissue sections, and preparation of records. (1-5 cr; prereq 153 or equiv, Δ) Staff

†† Tuition fees per term in College of Veterinary Medicine are \$76.50 for resident and \$190 for nonresident students; incidental fee per term is \$16.25. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

- 158* SURGICAL PATHOLOGY**
Preparation and interpretation of surgical and necropsy specimens. (3 cr; prereq 157, §, Δ) Bergeland and staff
- 160* DIAGNOSTIC PATHOLOGY**
Interpretation of history, necropsy findings, laboratory findings and histopathology in the diagnosis of animal diseases. (5 cr; prereq 157, §, Δ) Bergeland and staff
- 241* PROBLEMS IN VETERINARY PARASITOLOGY**
(Cr ar; prereq 102 or equiv, §) Griffiths

Veterinary Physiology and Pharmacology (VPP)

- 171* PROBLEMS IN VETERINARY PHARMACOLOGY**
(Cr ar; prereq 152 or equiv, §) Hammond, Stowe
- 231* RESEARCH IN ANIMAL PHYSIOLOGY**
(Same as AnSc 231) 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. (Cr and hrs ar; prereq §) Staff

Veterinary Surgery and Radiology (VSR)

- 210* ADVANCED VETERINARY RADIOLOGY**
Lecture and laboratory. Radiological diagnostic procedures and interpretation as applied to veterinary medicine. (2 cr; prereq 121 or equiv, §) Hanlon
- 220* ANESTHESIA**
Selection of proper anesthetic agent; administration of local, regional, and general anesthesia in large or small animals. (Cr ar; prereq 103 or equiv, §) Arnold, Usenik, Piermattei
- 225* ADVANCED SMALL ANIMAL SURGERY**
Surgery of the various systems in small animals with preoperative and post-operative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Piermattei
- 230* ADVANCED LARGE ANIMAL SURGERY**
Surgery of the various systems in large animals with preoperative and post-operative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Arnold, Usenik, Myers



Course Descriptions

10 - Week Courses

Ten-Week Courses

A. Students should register for both terms at the same time and must enter in the First Term. The entire sequence must be completed before credit is granted (†); or students must satisfactorily complete the Second Term before credit is granted for First Term (††).

Accounting (Acct)

- 305A†† SEMINAR IN ACCOUNTING THEORY: VALUATION AND PRINCIPLES
(3 cr; 8:00-9:30 TTh; BlegH 115)

Anesthesiology (Anes)

ELECTIVE COURSES

- 169†† RESEARCH IN ANESTHESIOLOGY
Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) Van Bergen and staff
- 181†† EXTERNSHIP IN ANESTHESIOLOGY
(Cr and hrs ar) Van Bergen and staff
- 182†† EXTERNSHIP IN ANESTHESIOLOGY AND RESPIRATORY PROBLEMS
(Cr and hrs ar) Van Bergen and staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 265†† GENERAL ANESTHESIA
Instruction and experience in general anesthesia. (12 cr) Van Bergen and staff
- 266†† REGIONAL ANESTHESIA
Observation, instruction, and administration of all types of local, regional, and spinal anesthesia. (4 cr) Van Bergen and staff
- 267†† PRE- AND POSTANESTHETIC EVALUATION
Selection of proper anesthetic agent and technique, premedication, and observation of recovery from anesthesia. (2 cr) Van Bergen and staff
- 268†† SEMINAR: ANESTHESIOLOGY
Review of literature, report of case problems, and discussion of research work in progress within the department. (2 cr) Van Bergen and staff

ELECTIVE COURSE FOR GRADUATE STUDENTS

- 269†† RESEARCH IN ANESTHESIA
Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) Van Bergen and staff

Architecture (Arch)

- 81† ARCHITECTURAL DESIGN**
Basic exercises in composition of line, form, proportion, color, and texture. Elements of architectural design. Architectural drawing. Model making. (6 cr for both terms; prereq 2nd yr for IT students, jr for CLA and Δ; VI-X MTWThF; Arch 210) Myers
- 82† ARCHITECTURAL DESIGN**
(See Arch 81) (6 cr for both terms; prereq 81; VI-X MTWThF; Arch 210) Myers
- 83† ARCHITECTURAL DESIGN**
(See Arch 81) (6 cr for both terms; prereq 82; VI-X MTWThF; Arch 210) Myers
- 91† ARCHITECTURAL DESIGN**
Architectural problems with emphasis on development of structure as an integral part of design; site planning. (6 cr for both terms; prereq 83; VI-X MTWThF; Arch 210) Myers
- 92† ARCHITECTURAL DESIGN**
(See Arch 91) (6 cr for both terms; prereq 91; VI-X MTWThF; Arch 210) Myers
- 93† ARCHITECTURAL DESIGN**
(See Arch 91) (6 cr for both terms; prereq 92; VI-X MTWThF; Arch 210) Myers
- 111† ARCHITECTURAL DESIGN**
Advanced architectural problems of complex requirements, involving thorough study and detailed solution; electrical and mechanical equipment as well as structure as an integral part of design; research techniques. Individual effort and group collaboration. (7 cr for both terms; prereq 93; VI-X MTWThF; Arch 210) Myers
- 112† ARCHITECTURAL DESIGN**
(See Arch 111) (7 cr for both terms; prereq 111; VI-X MTWThF; Arch 210) Myers
- 113† ARCHITECTURAL DESIGN**
(See Arch 111) (7 cr for both terms; prereq 112; VI-X MTWThF; Arch 210) Myers
- 121† ARCHITECTURAL DESIGN**
Building design and development in the urban context. Individual and collaborative effort; survey and analysis of urban problems; reporting and preparation of large scale proposals. (9 cr for both terms; prereq 113, CE 41; VI-X MTWThF; Arch 210) Myers
- 122† ARCHITECTURAL DESIGN**
(See Arch 21) (9 cr for both terms; prereq 121; VI-X MTWThF; Arch 210) Myers

Educational Psychology (EPsy)

- 218†† STATISTICAL METHODS (Parts I and II)**
Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems. (3 cr total for combined course [Parts I-II]; prereq 217; IV MWF; Arch 30) MacEachern
- 218A†† STATISTICAL METHODS LABORATORY (Parts I and II)**
For students who wish more experience in solution of problems and use of machines than is obtained in EPsy 218. (2 cr total for combined course [Parts I-II]; limited to 22 students; prereq †218; II-III MF; WuH 330) Proshek
- 237†† PRACTICUM IN GROUP COUNSELING (Parts I and II)**
Supervised practice in counseling several groups, preferably in the setting in which a student intends to work. Emphasis on systematic evaluation of progress through direct observations and tapes, and on developing skill in interpersonal perception, communication, and research. (3 cr total for combined course [Parts I-II]; limited to 16 students; prereq 236; I-IV MWF; West High School) A Anderson, Shaffer

Foreign Study (FS)

161, 162†† SEMINAR FOR FOREIGN STUDY I AND II

Directed field study (SPAN program) in Bolivia, Portugal, or Taiwan, investigating current economic, political, educational, cultural, and religious patterns of life. Each student will study the country carefully before embarking and write a comprehensive report of his findings upon returning. (12 cr for both terms; prereq approval before December 1968 by a faculty selection committee [grad students must also have approval of adviser]) Stavrou, administrative official, Hauberg, Lewis, Schneider

Mathematics (Math)

126C (JT)†† FUNDAMENTALS OF ANALYTIC GEOMETRY AND CALCULUS

The fundamental ideas involved in analytic geometry and calculus. Topics include functions, limits and continuity, differentiation, integration, infinite series. (No grad cr; prereq admission to Summer Institute or consent of institute director; IV MTWThF plus 2 rec hrs ar; Ph 131) Ar

Mechanical Engineering (ME)

90†† INDUSTRIAL ASSIGNMENT, PARTS I AND II

Cooperative work-study curriculum, industry laboratory quarters (work periods). Grades are based on a formal written report by the student, covering his work during the industrial assignment. (2 cr for both terms; prereq regis in engineering intern program; hrs ar) Lund

91†† INDUSTRIAL ASSIGNMENT, PARTS I AND II

(See ME 90) (2 cr for both terms; prereq regis in engineering intern program; hrs ar) Lund

92†† INDUSTRIAL ASSIGNMENT, PARTS I AND II

(See ME 90) (2 cr for both terms; prereq regis in engineering intern program; hrs ar) Lund

93†† INDUSTRIAL ASSIGNMENT, PARTS I AND II

(See ME 90) (2 cr for both terms; prereq regis in engineering intern program; hrs ar) Lund

Mortuary Science (Mort)

90A-B†† PRACTICUM IN FUNERAL SERVICE

Practical experience in a funeral home as assigned by the department (off campus). (6 cr per term, 90A-90B†; prereq sr)

Pathology (Path)

106†† DISEASES OF THE HEART

(1 cr; prereq 102; hrs ar) Edwards

111†† CONFERENCE ON AUTOPSIES

(1 cr; prereq 102; hrs ar) Dawson

112†† DIAGNOSIS OF TUMORS

(5 cr; prereq 102; I MTThF; JacH 178) Hebbel

150†† PROBLEMS IN PATHOLOGY

(Cr and hrs ar; prereq 102) Dawson

Physics (Phys)

- 23†† GENERAL PHYSICS, PARTS I AND II**
Electricity and magnetism. (4 cr for both terms; prereq 22, ¶23A; II MTWThF; Ph 170) Ar
- 23A†† PHYSICS LABORATORY, PARTS I AND II**
Laboratory exercises in electricity and magnetism. (1 cr for both terms; prereq ¶23; 2 lab hrs per wk; rm ar) Ar
- 50†† INTERMEDIATE GENERAL PHYSICS, PARTS I AND II**
Special relativity. Atomic view of matter, electricity, and radiation. Bohr model of atom. X rays. Introduction to wave nature of matter and radioactivity. (4 cr for both terms; prereq 6 or 9 or 23...Math 31 or ¶Math 31 or Math 44 or ¶Math 44; III MTWThF; Ph 170) Ar
- 50A†† PHYSICS LABORATORY, PARTS I AND II**
Laboratory course given in conjunction with Phys 50. (1 cr for both terms; prereq ¶50; 2 lab hrs per wk; rm ar) Ar
- 114C†† INTERMEDIATE GENERAL PHYSICS**
NSF Institute for High School Teachers of Physics (also see section on Special Programs). An intermediate course in classical physics, emphasizing basic principles for selected topics in mechanics and electromagnetism. Emphasis on conservation principles and the field concept. (No grad cr; prereq admission to Summer Institute or consent of institute director; I MTWThF; Ph 131) Ar
- 130C†† GEOMETRICAL AND PHYSICAL OPTICS**
NSF Institute for High School Teachers of Physics (also see section on Special Programs). A study of ray optics, wave motion and the wave theory of refraction, interference, diffraction, and polarization. Selected topics in modern optics: photons, optical pumping, lasers, and holography. (4 cr for both terms; prereq admission to Summer Institute or consent of institute director; II TThF plus lab hrs ar; Ph 131) Ar
- 190*†† INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS**
Discussion and analysis of experiments used to study properties of elementary particles and the theoretical ideas currently being used to interpret the experimental results. (3 cr; prereq 181B, §; III MWF; Ph 145) Ar
- 208*†† SYMMETRY AND ITS APPLICATIONS TO PHYSICAL PROBLEMS**
Use of symmetry methods (group theory) to study systems too complicated for exact solution. Applications to atomic, molecular, nuclear, solid-state, and elementary particle physics. (3 cr; prereq ¶181C or §; IV MWF; Ph 145) Ar

Public Administration (PA)

- 282A†† ADMINISTRATIVE INTERNSHIP**
Supervised field work in an approved local, state, or federal administrative agency; preparation of an acceptable formal report. (3 cr for both terms; prereq §; hrs ar) Steen
- 283A†† RESEARCH SEMINAR: PUBLIC ADMINISTRATION**
(3 cr for both terms; prereq §; hrs ar) Helberg

Public Health (PubH)

- 65†† FIELD PRACTICE IN PUBLIC HEALTH NURSING**
Instruction and supervised experience in public health nursing in selected public health agencies. (Cr ar; prereq nurses) E Anderson, Downey, Leonard
- 190**†† FIELD PRACTICE IN PUBLIC HEALTH EDUCATION**
Approximately 10 weeks of supervised community health education experience. (5 cr per term; prereq 181 and 187 sequences and §) Craig, Ellis
- 231**-232**†† GROUND WATER DEVELOPMENT (232) FIELD WORK**
Ground water exploration through well design and construction, special reference to public health problems and field tests. (Cr ar; prereq grad engineer, §) Bond, Singer, staff and lecturers

120D*, E*†† BIOMEDICAL COMPUTING

Introduction to digital computer and FORTRAN programming with applications in biology and medicine. (2 cr per term; prereq mathematics, ¶120A) Johnson and staff

Quantitative Analysis (QA)

62†† BASIC COMPUTER SYSTEMS

Concepts of computer logic and computer systems. Application of introductory software systems to the development of models for organizational decision making. The student will program decision models and basic file-oriented information systems using FORTRAN and COBOL. (3 cr, \$MIS 209A; prereq 53; II MT; BlegH 410) Kozar

Lab 1, II W, BlegH 410
Lab 2, II Th, BlegH 410

B. To receive credit for the following courses, a student must complete both Biol 1 and 2, but not necessarily in the Summer Session.

Biology (Biol)

1 and 2 GENERAL BIOLOGY

Study of plants, animals, and microbes. Includes an introduction to ecology, physiology, classification, cytology, energetics, genetics, development, and evolution. (5 cr each; limited to 168 students; lect V MTWTh, V-VI F, Aero 313, 317, 319, 321; lab VI-VII MTWTh, Z 101 ABCD) Ar

C. The following courses which carry a dagger (†) are concentrated programs of study extending over the entire 10 weeks of the Summer Session. They permit 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. Students enrolled in one of these sequences may not enroll in other courses in the Summer Session. Those language courses which do NOT carry a dagger are taught at a normal or semi-intensive rate.

Arabic (Arab)

A-B BEGINNING INTENSIVE ARABIC

Introduction to Arabic grammar, drill in basic vocabulary, and readings in easy texts. Equivalent to the first 1½ quarters of the regular first-year sequence, Arab 1-2-3. (15 qtr cr for both terms [10 semester cr]; I-III MTWThF; TSF 155) Chejne, Koury

Finnish (Finn)

1-2-3† INTENSIVE BEGINNING FINNISH

(15 qtr cr for both terms [10 semester cr]; I-III MTWThF; FoiH 204) Lehtinen, Hornby

Greek (Grk)

50-51 BEGINNING CLASSICAL GREEK

Intensive reading course. No prerequisites, but previous experience in foreign language is highly desirable. (3 cr per term, §1-2; III MTWThF; FoIH 302) Sonkowsky

Persian (Pers)

51-52 INTERMEDIATE PERSIAN

(6 cr for both terms; prereq 1 yr of Persian or equiv)

Portuguese (Port)

1-2-3 BEGINNING PORTUGUESE

(15 cr for both terms; II-III MTWThF; Aero 327) Hamilton

Russian (Russ)

1-2-3 BEGINNING INTENSIVE RUSSIAN

(See section on Special Programs) Covers the same material as the regular first-year sequence, Russ 1-2-3. (15 cr for both terms; I-III MTWThF; FoIH 109) Donchenko

4-5-6 INTENSIVE RUSSIAN (INTERMEDIATE)

(See section on Special Programs) Covers the same material as the regular second-year sequence, Russ 4-5-6. (12 cr for both terms; I-II MTWThF; FoIH 207) Prokopov

South Asian Languages

The following courses in South Asian Languages are being offered in conjunction with the C.I.C. Inter-University Summer Program in South Asian Studies. (See also pages 183-184 of this bulletin.)

Bengali

1-2-3 BEGINNING BENGALI

(15 cr for both terms; II MTWThF; First Term — A 201, Second Term — Arch 30) Sorwar

51-52-53 INTERMEDIATE BENGALI

(15 cr for both terms; prereq 3 or equiv; III-IV MTWThF; First Term — FoIH 303A, Second Term — FoIH 305A) Van Meter

101-102 ADVANCED BENGALI

(6 cr for both terms; prereq 53 or equiv; II MTWThF; First Term — A 202; Second Term — Arch 140) Van Meter

Hindi

1-2-3 BEGINNING HINDI

(15 cr for both terms) Masica

Sec 1, I, VII-VIII MTWThF, FoIH 107

Sec 2, VII-VIII MTWThF, First Term — FoIH 302, Second Term — FoIH 205

Sec 3, I, VII-VIII MTWThF, First Term — TSF 153, Second Term —
FolH 307

51-52-53 INTERMEDIATE HINDI

(15 cr for both terms; prereq 3 or equiv; VII MTWThF; FolH 304) Staneslow

Rec 1, I, VIII MTWThF, First Term — FolH 108, Second Term — FolH
102

Rec 2, I, VIII MTWThF, First Term — FolH 304, Second Term — FolH
202

101-102 ADVANCED HINDI

(6 cr for both terms; prereq 53; designed for qualified students; I MTWThF;
First Term — FolH 203, Second Term — FolH 303) Upadhyaya

Sanskrit

1-2-3/51-52-53 BEGINNING SANSKRIT

(9 cr for both terms; I MTWThF, FolH 105; VII MTWThF, VIII TTh, FolH 305A)
Upadhyaya

101-102-103 INTERMEDIATE SANSKRIT

(12 cr for both terms; prereq 3, 53, or equiv; VII-VIII MTWThF; First Term —
FolH 208, Second Term — FolH 103) Arya

175, 176 ADVANCED READING IN SANSKRIT

(6 cr for both terms; prereq 3; hrs ar) Arya

Tamil

1-2-3 BEGINNING TAMIL

An intensive course introducing the structure of the language through speak-
ing and writing. It is recommended that students taking this course consider
taking or auditing Mus 103A, Asian Music in Performance. (15 cr for both
terms; I-II MTWThF, FolH 103; VII-VIII MTWThF, FolH 203) Asher

51-52 INTERMEDIATE TAMIL

A semi-intensive course which should prepare students for third-year work.
(10 cr for both terms; prereq 3 or equiv; I-II MTWThF; FolH 305A) Annamalai

101-102 ADVANCED TAMIL

(6 cr for both terms; prereq 53 or equiv; hrs ar) Annamalai

Telugu

1-2-3 BEGINNING TELUGU

An intensive course introducing the structure of the language through speak-
ing, reading, and writing. (15 cr for both terms; I-II MTWThF, First Term —
J 5, Second Term — FolH 302; VII-VIII MTWThF, FolH 109) Vasireddi

51-52 INTERMEDIATE TELUGU

A semi-intensive course. (10 cr for both terms; prereq 3 or equiv; I-II
MTWThF; First Term — A 205, Second Term — FolH 305A) Rao

101-102 ADVANCED TELUGU

(6 cr for both terms; prereq 3; hrs ar) Rao

Urdu

51-52 INTERMEDIATE URDU

A course introducing the Urdu script and literary language. (10 cr for both
terms; prereq 3; VII-VIII MTWThF; FolH 303A) Narang

Swedish (Swed)

1-2-3† INTENSIVE BEGINNING SWEDISH

(15 qtr cr for both terms [10 semester cr]; I-III MTWThF; FolH 110) Saether



**SCHOOLS,
COLLEGES, and
SPECIAL PROGRAMS**

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

There are many courses, primarily for graduate students, in the College of Agriculture, Forestry, and Home Economics. Most departments correlate thesis and problem work with work in the Agricultural Experiment Station.

High school teachers of agriculture may take advanced courses in those agricultural fields which are applicable to the requirements of the Department of Agricultural Education (see College of Education, page 59).

The summer courses of the School of Home Economics, including the Department of Home Economics Education, are planned to meet the varying needs of undergraduate and graduate students, experienced teachers, and other home economists. Transfer students and students wishing to qualify for vocational certification may meet some of their requirements through Summer Session attendance. In addition to regularly scheduled courses, a variety of offerings has been arranged to permit those who wish to attend the national meeting of the American Home Economics Association to schedule courses afterward.

Included in the summer program are readings, seminars, special problems, and concentrated courses as well as regularly scheduled classes. It is possible for students in some areas to earn advanced degrees through work completed during the Summer Session only.

Information concerning admission to the Graduate School should be obtained from the dean of the Graduate School, 316 Johnston Hall. Students wishing information regarding courses at the graduate level should confer with the graduate staff of the department or school in which they will be working.

Home Economics

Attention is directed to special workshops in home economics which have been planned for graduates and special students, primarily, who find intensive study for short periods desirable. These are in areas of food and nutrition, related art, and textiles and clothing (see index: Home Economics and Home Economics Education).

For further information write: Associate Director, School of Home Economics, University of Minnesota, St. Paul, Minnesota 55101.

Efficient Reading

Adult reading needs are a matter of real concern. The course Efficient Reading (Rhet 47), designed for the average and above-average adult reader, provides a unique combination of activities for improving reading speed, comprehension, and vocabulary.

COLLEGE OF BIOLOGICAL SCIENCES

The College of Biological Sciences was officially established on September 1, 1965, for the purpose of providing a visible structure for the coordination and unification of basic biological research and training activities throughout the University.

At the present time, the college is composed of the Departments of Biochemistry, Botany, Ecology and Behavioral Biology, Genetics and Cell Biology, and Zoology, as well as the Dight Institute of Human Genetics and the James Ford Bell Museum of Natural History. 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 the opportunity to study at a field station should refer to the following description of the Biology Session and to the special bulletin available upon request from: Dean of the Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

BIOLOGY SESSION

Held at Lake Itasca Forestry and Biological Station

During two 5-week terms of the Summer Session (June 11-July 18 and July 20-August 25) an excellent opportunity for field work in terrestrial and freshwater biology in its most fundamental aspects is presented at Itasca State Park, 220 miles northwest of the Twin Cities.

These classes will be conducted cooperatively by various departments in the College of Agriculture, Forestry, and Home Economics and the College of Biological Sciences. Interested persons may 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. Opportunities for graduate students who may wish to pursue biological investigation in the lakes, prairies, or forests of the area.
3. Facilities for guest investigators for independent research in terrestrial and freshwater biology.

To receive the *Lake Itasca Biology Session Bulletin*, describing in detail the opportunities and facilities at the station, write to the Dean of Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Biological Research Stipends

Stipends for research workers in biology will be available at the station under the terms of a grant by the National Science Foundation.

Admission and Registration††

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

Course work taken at the Itasca Biology Session may be considered for resident requirement 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 form for this purpose is included in the *Lake Itasca Biology Session Bulletin*. This Request for Reservation form should be mailed to: Director of Field Biology, 112 Snyder Hall, University of Minnesota, St. Paul, Minnesota 55101. Assignments to classes and housing will be verified by April 1. The necessary class reservation cards will be held with the reservation request for use by the student when he registers at the station on June 11 or July 20.

Fees and Expenses

The following fees are payable by each registrant on or before June 11 or July 20 and must be paid before registration is completed:

Tuition fee	\$72.00
Incidental fee	16.25
Laboratory fee	<u>8.50</u>
Total fees for each term	\$96.75

Graduate students may register for thesis-only upon payment of \$31 tuition per term and required incidental and laboratory fees.

Individuals holding the Ph.D. degree or its equivalent, pursuing research as independent investigators, will pay a research table fee of \$5 per week.

In addition, on the basis of the experience of other groups of students, it is estimated that board which is on a cost basis will be approximately \$90 for the 5 weeks. A charge of \$4 per week is made for room and is to be paid to the director during the first week of each term.

Laboratory fee includes the use of microscopes, nets, boats, various class supplies, and accessories.

†† See sections on Admission and Registration beginning on page 13.

The estimated cost of \$210 per 5-week term does not include traveling expenses, clothing, laundry, and minor incidental personal expenses.

Tuition and fees are payable on or before June 11 or July 20. After June 11 or July 20 the late fee will be charged according to the following schedule:

June 12-14 or July 21-23	\$ 3.00
June 15-18 or July 24-26	5.00
Thereafter	10.00

No registration will be accepted after June 11 or July 20 without the approval of the director. Fee statements dated Wednesday, June 11, may be paid on Thursday, June 12, without penalty. However, fee statements dated Thursday, June 12, will carry the late fee described above.

SCHOOL OF BUSINESS ADMINISTRATION

Admission

For admission to the School of Business Administration a student must have satisfied the requirements of the 2-year prebusiness curriculum. These requirements may be completed at another institution. A student must have a minimum of approximately 90 credits, with an overall grade average of at least "C." See the *School of Business Administration Bulletin*.

Programs

See the *School of Business Administration Bulletin*.

SCHOOL OF DENTISTRY

The School of Dentistry will not offer courses regularly scheduled in the dental curriculum but will provide instruction for students who are deficient in certain clinical or laboratory requirements for promotion to the succeeding class. Instruction will also be available for students who wish to gain additional experience in certain clinical disciplines.

Dentistry fees during each summer term are: full-time tuition, resident \$84, nonresident \$190; less than a full program may be paid at the summer rate or academic year rate, whichever is higher. There will be an incidental fee of \$18.50 per term.

COLLEGE OF EDUCATION

Summer Session students who do not expect to become candidates for an undergraduate or graduate degree do not need to present credentials (see main section on Admission and Registration). Those wishing to enter a graduate program should apply immediately for admission to the Graduate School (see Admission under the Graduate School section). Students expecting to become candidates for a Bachelor's degree should apply for admission as regular students 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. They should also seek as early as possible the advice of the major adviser in the department concerned in order to learn the requirements of the curriculum they will need to complete. Students who have not been admitted to a regular degree program are classified as "summer-only."

For all general matters relating to admission, advanced standing, credits, grade points, curricula, and requirements for graduation, students should consult the *College of Education Bulletin*.

Courses listed in elementary and secondary education may be used for renewal of teaching certificates. Former teachers reentering the profession should consult the advisers in elementary and secondary education or the Student Personnel Office, 206 Burton Hall, concerning a program for renewal of certificates. Summer programs for those planning to reenter secondary school teaching should include courses in their teaching subjects.

Counseling Services

The staff of the Student Personnel Office of the College of Education will be available during both terms for consultation concerning admission, requirements of the teaching profession, and for counseling. Appointments should be made in 206 Burton Hall.

Committee on Student Scholastic Standing

Undergraduate students with questions concerning program adjustments and substitutions for required work should consult their advisers or the chairman of the Committee on Student Scholastic Standing.

Demonstration Facilities

Summer students are welcome to observe programs at Tuttle Demonstration Elementary School, the Institute of Child Development, the Psycho-Educational Clinic, and Marshall-University High School. For information on these facilities, please see the following paragraphs.

Summer Demonstration Elementary School

Tuttle Elementary School, kindergarten and grades 1 through 6, will be in operation during First Term. Tuttle School is used as a demonstration facility in elementary education under a cooperative agreement between the Minneapolis Board of Education and the College of Education. Classes may be observed by students in elementary methods and by those registered in the laboratory course in elementary school practices. (See EdCI 186) (I, II, III, IV MTWThF; Tuttle School, Talmadge and 18th Avenues Southeast, Minneapolis, Minnesota).

Summer Demonstration High School

Inquiries about registration of secondary school students in Marshall-University High School should be addressed to the principal, Marshall-University High School, 14th Avenue and 5th Street Southeast, Minneapolis, Minnesota 55414. The work of this school, First Term, may be observed by summer students in secondary education.

Introduction to Teaching: Elementary and Secondary

The basic professional course for persons preparing to teach in the elementary schools is Ed 75A (First Term). The basic sequence for secondary teachers is Ed 55A (First Term) and Ed 55B (Second Term).

These courses are available ONLY to students who have been approved in ADVANCE of the Summer Session registration period for admission as regular degree students in the College of Education. Application for admission should be made to the director of admissions of the University by May 13, as each applicant must present an official record of previous college work and must complete speech, health, and psychological tests. These courses are NOT open to students planning to complete a teacher education program at another institution.

Physical Education

Physical Education — It is recommended that every man and woman student avail himself of the opportunity offered by the University Health Service for a physical examination. Health Service approval must be secured for participation in activity courses designated by ††.

Prevention and Care of Athletic Injuries Practicum — A special 3-week course will be offered for men and women on the prevention and care of athletic injuries in sports programs for boys and girls. The latest training and rehabilitation techniques will be demonstrated and class members will have an opportunity to practice these techniques. The practicum (PE 160) will be held from 2:30 to 5 p.m. daily, June 17 through July 3.

Higher Education

Regular graduate courses in higher education will be available in both summer terms: First Term, Effective College Teaching (EdCI 252); Second Term, The Junior College (EdAd 274), Higher Education in the United States (EdCI 250), and Curriculum Trends in American Colleges (EdCI 251). Directed Experience in College Instruction (EdCI 254) is scheduled both terms.

Two special offerings are listed: a workshop for junior college administrators (EdAd 128), June 16 to July 2; and the teacher education workshop (EdCI 228), July 21 to August 15 planned with a committee from the North Central Association, as in previous summers.

Workshops in Educational Administration

In response to the expressed needs of educational administrators, the summer offering includes a number of 3-credit workshops scheduled to meet 3 hours each day for 2½ weeks. EdAd 139, offered June 16 to July 2 in the First Term and repeated twice in the Second Term, employs the technique of simulation and emphasizes the decision-making role of the administrator. In the first 2½ weeks of each term, EdAd 139 will focus on the role of the secondary school principal, and the August 6 to 22 section is planned for the elementary school level.

A workshop of special interest to junior college administrators (EdAd 128, section 1) is scheduled for June 16 to July 2 in the First Term. Also in the First Term, July 2 to 18, a second section of EdAd 128 is listed to analyze the process of collective bargaining in public schools. During the Second Term, an innovative workshop is planned (EdAd 128, July 21 to August 6), which addresses the problems confronting educational administrators in city and suburban schools, with attention centered on inter-agency cooperation.

Educational Administration Two-Year Programs

Advanced graduate programs leading to the Specialist Certificate in School Administration have been developed for elementary and secondary school principals, superintendents, school business administrators, and superintendents of intermediate units. New courses, workshops, and seminars have been introduced, several of which are available this summer. An announcement describing these programs will be sent upon request to: Department of Educational Administration, 203 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Doctor of Education Programs

The Department of Educational Administration now offers programs leading to the doctor of education (EdD) degree for administrators in elementary and secondary schools. These programs emphasize broad preparation in education and substantively related fields, and they include heavy concentration in history and philosophy of education, social psychology, and curriculum and instruction. Through independent study, internships, and clinical experiences, students are encouraged to make the application of theoretical knowledge to the practical situations of a school setting. A brochure describing these programs is available by writing to: Department of Educational Administration, 203 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

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 Session.

Nursery School — The Nursery School will be in session from 8:30 to 12 noon, beginning June 16 and closing July 19. Applications for the enrollment of children will be received at the office of the Nursery School. Tuition is \$45 for the term. Parents are responsible for the transportation of their children to and from the school.

Psycho-Educational Clinic

The Psycho-Educational Clinic will be in operation during both summer terms for training, research, and service activities. The program of the facility will include diagnostic and remedial service for learning-disabled children. These activities will provide demonstration and practicum opportunity for students enrolled in the special summer learning disability program (see description under Special Institute: Learning Disability). Clinic summer activities will also include remedial reading service for children. The remedial reading program provides practicum opportunity for students enrolled in EPsy 150. Practicum experience in the clinic will be made available for advanced graduate students registered under EPsy 257 or EPsy 288. Information may be obtained from: Professor Evelyn Deno, Director, Psycho-Educational Clinic, 209 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Industrial Education Pre-Service Clinic for Vocational Education Teachers

The clinic program will involve the participant in a high intensity, interrelated series of activities aimed at establishing foundation concepts and skills in course organization, lesson planning, presentation techniques, and evaluation. Twelve students will be accepted for each of two sections of Ind 106 meeting I through VII hours daily: section 1, July 21 to August 5; section 2, August 6 to August 22.

The program has been designed to provide entry-level instruction for vocationally certifiable persons planning to teach in post-secondary vocational schools. Registration is open only to prospective vocational education teachers on recommendation of a vocational school employing agent. Participants will receive four graduate-level credits (equivalent to 48 clock hours for vocational certification purposes). For information write to: Professor Robert R. Randleman, 125 Peik Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Workshop — Educable Mentally Retarded Pupils in the Secondary School

During the Second Term, a workshop for experienced teachers of educable mentally retarded children (EdCI 100C) will include lectures, demonstrations, discussions, and independent study centered around the problems of curriculum and curriculum planning. Requests for information should be sent to Professor Robert H. Bruininks, 12 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Special Education Instructional Materials Centers

A course (EdCI 183), given First Term, offers the opportunity to learn practices and procedures related to development of special education instructional materials centers in schools and colleges, focusing principally on the use of materials and media to upgrade teacher education curriculum. Programmed practice with equipment will be provided, using software relevant to special education. The use of computer-related networks for information storage and retrieval, and cataloging and circulation of materials will be discussed as they relate to materials centers. Interested students should write to Professor Helen Juliar, 6 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Workshop — Educable Mentally Retarded Children

A workshop for experienced teachers of educable mentally retarded children, centering on curriculum and program planning (EdCI 100B),

will permit students to study independently a curricular area in depth and will be available in the First Term. The instructor will act as a resource teacher, devoting time to individual participants. Inquiries concerning application, requirements, and procedures may be addressed to Professor John Rynders, 13 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Workshop — The Special Education Resource Model

Practicum, materials, and individualized instruction will be emphasized in a First Term workshop for experienced teachers of educable mentally retarded children who are interested in actual participation in a resource model program (EdCI 100D). Further information is available on request to Miss Rita Grismer, 13 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Institute: Learning Disabled Children

The University of Minnesota will offer the courses which constitute the methods and practicum core of the Special Learning Disability Resource (SLDR) or clinical teacher sequence EPsy 160, 160A, 161, and 161A) as a special 8-week, full-time institute for which 12 credits will be granted. The institute is scheduled from June 16 to August 8, 1969. Enrollment will be limited to 30 students who have been formally admitted as candidates in the learning disability sequence and have completed all prerequisites for the courses listed. Applications for permission to register are available from the Department of Special Education, 101A Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455 and must be submitted by May 1, 1969.

Teaching the Mentally Retarded

In the First Term, several courses required for certification to teach either educable or trainable mentally retarded children will be offered as well as related courses of value for such teachers. Questions should be directed to the Department of Special Education, 101A Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Trainable Mentally Retarded Children

A First Term workshop for teachers and prospective teachers of trainable mentally retarded children will include observation and practicum as well as lectures, discussion, and committee work (EdCI 100A). For information about application, requirements, and procedures, write to Professor Dewey Force, Jr., 101A Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Education of Blind and Partially Seeing Children

Courses offered in the First Term will provide background information for an experienced regular class teacher to serve visually handicapped children (EdCI 115, 118, 178). This work may be taken for graduate credit by students registered in the Graduate School, or for credit as a summer-only student with the permission of the instructor.

Special Education — Programs and Scholarships

Summer offerings in Special Education include speech correction, and courses for teachers of the educable and trainable retarded, the deaf and hard-of-hearing, the blind, the crippled, the gifted, the emotionally disturbed, the culturally disadvantaged, and children with learning disabilities. Many state departments of education offer summer traineeships and students should contact their State Department of Education for information.

Teaching Emotionally Disturbed Children

Education of Emotionally Disturbed and Socially Maladjusted Children is offered First and Second Terms (EPsy 186). An advanced course, Education of Emotionally Disturbed and Socially Maladjusted Children (EPsy 286) also is available in both terms.

Teaching Culturally Disadvantaged Children

Two courses in this area, Education of the Culturally Disadvantaged Child (EPsy 188) and Seminar on the Culturally Disadvantaged (EPsy 268) are offered First Term. EPsy 188 is repeated in the Second Term.

Teaching the Deaf and Hard-of-Hearing

Courses for teachers of the deaf and hard-of-hearing are listed in schedules of both the Division of Speech Science, Pathology, and Audiology and the College of Education.

Graduate Credit for Workshops

The amount of graduate credit in workshops which may be used on a Master's degree program is limited. Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

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) elementary education seniors working toward junior high school endorsement; and (d) some students in special education. Application must be made by May 15 in the Student Teaching Office, 227 Burton Hall. Because of limited facilities, it is not possible to offer student teaching to students completing programs in other institutions.

Detailed Description of Courses

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

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. Due to space limitations it is not always possible to admit all applicants.

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. He may use this program to explore educational and personal interests, to test his ability to succeed in college-level academic work, or (if his grades are acceptable) to prepare himself for advanced study at the University or in another college. He may combine general and liberal arts courses with instruction in such occupational education sequences as electronics technology, dental assisting, marketing, law enforcement, medical or legal secretarial training, landscape horticulture, and recreation for special groups. Credits earned in these occupational sequences, and in some cases through work experience, can be applied toward the requirements for the associate in arts (AA) degree.

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. They can be used to give an overview of a field, but stu-

dents deciding upon a major should register for the basic courses offered by the department in which he hopes to do 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 one 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 terms, when only a limited number of General College courses is available.

General College students may transfer to other colleges of the University, without undue loss of time or academic credits, if they earn grades demonstrating ability to meet the level of academic competition characteristic of 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, or to the Office of the Dean, 106 Nicholson Hall.

UNIVERSITY COLLEGE

This college draws upon the entire University for its courses. It has no fixed curriculum. 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 suited to his interests or particular objectives. Such a student, with the approval of the University College Committee, may arrange a study program including suitable amounts of work in two or more schools or colleges to fit his individual needs. Upon completing this approved program, he 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.

Information about University College is available from: University College Office, 106 Nicholson Hall, University of Minnesota, Minneapolis, Minnesota 55455.

GRADUATE SCHOOL

The Graduate School presents excellent opportunities for advanced study and research in many fields. It brings together in a single organization all the programs and offerings of the University at the level of advanced instruction that may lead to the degrees of master of arts, master of science, doctor of philosophy, doctor of education, and the specialist's certificate in education and in library science teaching.

The privileges of the Graduate School are open, upon application, to those with satisfactory character and professional qualifications who

have received Bachelor's degrees from recognized colleges and universities and whose records demonstrate that they are prepared for successful work in their chosen major fields of study. Applications are considered by the Graduate School and by graduate advisers in the departments in which the applicants propose to carry major work with due consideration of the available facilities for accepting additional graduate students. In many instances applicants are required to present evidence supplementary to that contained in their official transcripts. This evidence may take the form of tests such as the Graduate Record Examination or the Miller Analogies Test.

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

Admission

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, and the credentials examination fee and test results if required — *at least 4 weeks* prior to the opening of the quarter or summer term in which the student expects to register (Monday, May 19, 1969, for First Term; and Monday, June 23, 1969, for Second Term). Applications should be sent to: Graduate School, 322 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

HOLDERS of the 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 adult special students or may register as special Summer Session-only students. These students, if they subsequently decide to make application for admission to the Graduate School, may transfer *only their first term's work as an adult special student or Summer Session-only student* to their graduate program. Only courses of graduate character taught by members of the graduate faculty may be transferred.

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. Under no circumstances will a student be admitted to candidacy until he has been in residence for at least 1 quarter (or 1 term of the Sum-

mer Session) and until he has removed any deficiencies which may have conditioned his admission to the Graduate School.

Following completion of from 9 to 15 graduate credits, at least 3 of which must be in the major, the student who expects to obtain a Master's degree shall present his program and his thesis title (for Plan A) or his program (for Plan B) for his adviser's recommendation and transmission to the appropriate group committee for action. Approval by the Graduate School indicates the student's admission to candidacy for the degree.

Requirements for Advanced Degrees

For information concerning requirements for graduate degrees, please refer to the *Graduate School Bulletin*, 1968-70, pages 12-27.

Deadline Dates for Summer Session Graduation

Theses of all graduate degree candidates must be complete and registered in the Graduate School office at least 9 weeks before the end of the term in which they take the degree; final oral examinations must be passed at least 5 weeks before the end of the term in which candidates take the degree.

First Term:

Thesis Registration — May 16, 1969
Final Oral Examination — June 13, 1969
Commencement — July 18, 1969

Second Term:

Thesis Registration — June 20, 1969
Final Oral Examination — July 18, 1969
Commencement — August 22, 1969

COLLEGE OF LIBERAL ARTS

Liberal arts and general education courses are offered by the College of Liberal Arts to meet the special needs of four groups of students: students, usually with a Bachelor's degree as their immediate goal, seeking preparation for professions and other careers and a foundation for a broad understanding of the world in which they are to live and work; those in other professional or specialized divisions of the University who wish to broaden the base of their educational experience; students expecting to continue in graduate work in any of the areas represented in this college; teachers wishing either to pursue graduate work or to expand their knowledge and background in their specialties and in other fields.

Courses in the College of Liberal Arts in the 1969 Summer Session are for the most part selected from the regular Arts College curriculum. The complete curriculum is described in the *College of Liberal Arts Bulletin*, which may be obtained from the Office of Admissions and Records.

Courses announced as open to "juniors and seniors" (numbered 50-99) or to "juniors, seniors, and graduates" (numbered 100-199) are called Upper Division courses. Those numbered 50-99 are usually open to sophomores who have a C average in the prerequisite courses. Those numbered 100-199 are sometimes available to advanced sophomores with strong records.

Many courses listed in this summer bulletin, under the School of Business Administration, the Medical School, the Institute of Technology, the College of Agriculture, Forestry, and Home Economics, and the College of Biological Sciences, are open to any students who have the prerequisites even though the students identify themselves basically as liberal arts students.

Admission to Summer Session is described in the section on Admission and Registration of this bulletin. Cost, housing, and other information is provided both in the summer bulletin and the *General Information Bulletin*.

Students are urged to bring questions or problems to the college offices, at 214 Johnston Hall (Lower Division) and 223 Johnston Hall (Upper Division), or on Monday, June 16, to the Arts College desk in the Coffman Union Main Ballroom.

College of Liberal Arts departments offer a wide-ranging and representative group of courses during the Summer Session at both the undergraduate and graduate levels. In addition, several special programs are available which are described in the following paragraphs.

Minnesota SPAN Association

The Student Project for Amity among Nations (SPAN) is a program for undergraduate study abroad, sponsored by the University of Minnesota and 10 other Minnesota colleges. During the summer of 1969, SPAN will have students studying in Bolivia, Portugal, and Taiwan. The SPAN program can be divided into three distinct phases: preparation, study abroad, and the writing of a research paper.

The academic year previous to their summer abroad, the SPAN students meet with a faculty adviser for their "country groups" to study the language, history, current problems, and culture of the country to be visited. During this year the students also pursue preliminary research on their independent research projects. The second phase of the program is a minimum stay of 8 weeks in the host country where SPAN students work on their projects. This includes interviews, visits to appropriate institutions, documentary investigation, and often living with local families — all done in the SPAN spirit of encouraging international

understanding and friendship. The third major phase of the program is the return to the United States and the completion of the SPAN paper, a major academic work written on the basis of material gathered during the year of preparation and the summer abroad.

The SPAN student receives 12 quarter-credits from the University of Minnesota for his preparation year work and the SPAN paper. During their summer abroad, the students are registered in Foreign Studies Seminar (FS 161-162) and the faculty directors of the group are considered members of the University's Summer Session faculty. Interested students should apply one year ahead of time for participation in the SPAN Program. For further information, contact: Professor Theofanis Stavrou, History Department, 614 Social Sciences Building, University of Minnesota, Minneapolis, Minnesota 55455.

Geographical Field Session

An intensive field research seminar, Geog 276 and Geog 277, will be given from July 30 to August 23. Field headquarters will be at River Falls, Wisconsin. Research will be focused upon related problems in cultural and rural geography of the Upper Coulee Country. Reservations must be made no later than May 20. For costs, detailed information, and reservations contact: Professor Cotton Mather, Department of Geography, 414 Social Sciences Building, University of Minnesota, Minneapolis, Minnesota 55455.

Travel Course in European Art

The summer travel course in European art will be conducted by the Department of Art History under the auspices of the Summer Session. It will cover the main phases of ancient, medieval, Renaissance, and modern art in a series of guided visits and discussions held at important cultural centers, museums, and cathedrals. Among the places to be visited are Athens, the Greek Isles, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Paris, Copenhagen, and London. Six credits will be given in ArtH 59 to students successfully completing the course. The total cost is approximately \$1,550 including University fees.

Members of the group will depart from New York by air about June 28 and spend approximately 6 weeks in Europe, and return to New York about August 12. Return passage (Europe to U.S.A.) may be arranged for at a later date than that of group return.

Information may be obtained by contacting Professor Donald Torbert, Department of Art History, 106B Jones Hall, University of Minnesota, Minneapolis, Minnesota 55455.

American Studies

During the summer of 1969, visiting professors will offer courses in various aspects of American culture, as will members of the University of Minnesota staff in anthropology, history, English, sociology, economics, education, geography, art history, journalism, music, philosophy, and political science.

The American Studies summer program is designed for candidates for the B.A., the M.A., and the Ph.D. degrees. Candidates for these degrees enroll in courses conducted by the participating departments listed above and in American Studies seminars designed to integrate these courses. Knowledge of a foreign civilization is also required of all Ph.D. candidates.

Classics

TEACHER FELLOWSHIP PROGRAMS

During the First Term the Department of Classics, in cooperation with the College of Education, will conduct a continuation of the 1968-69 program for Experienced Teacher Fellows. The summer program will concentrate on techniques for introducing Greek into high school classes and will feature a demonstration class arranged by the University of Minnesota Continuation Center. See page 85.

Observers are welcome. Prospective and experienced teachers of Latin and Greek interested in applying for the 1969-70 program may write to the Department of Classics, 311 Folwell Hall, University of Minnesota, Minneapolis, Minnesota 55455.

PROGRAM FOR TRAINING SMALL COLLEGE AND JUNIOR COLLEGE TEACHERS

In the Second Term, the Department of Classics will inaugurate a program for the guidance and training of teachers of the classics and classical humanities in junior colleges and small 4-year liberal arts colleges.

Eligibility: A 4-year degree with a major concentration in Latin, Greek, or classical humanities is required. An M.A. or some work toward an advanced degree is desirable, but not always necessary. Write to Department of Classics, 311 Folwell Hall, University of Minnesota, Minneapolis, Minnesota 55455.

EXCAVATION IN SOUTHWEST GREECE

Beginning in 1969, the University of Minnesota Messenia Expedition will spend several summer campaigns (June through August) in the excavation of a Bronze Age habitation site. Credit may be arranged by enrolling for Clas 124 (see pp. 85 and 228). A limited number of

traineeships is available for graduate students with primary interest in archaeology. For application forms write to Department of Classics, 311 Folwell, University of Minnesota, Minneapolis, Minnesota 55455.

Journalism and Mass Communication

The School of Journalism and Mass Communication program contains courses for both undergraduate and graduate students interested in professional training. Several of the courses are open to students who have majors in other fields and have not had previous journalism courses. A special workshop course (Jour 182), divided into two sections, is included. Section 1 is intended for journalism teachers and publications advisers in the secondary schools or junior colleges. Section 2 is designed for college student publications editors who lack formal journalism training. Students may fit regular Summer Session courses around the 2-week workshop period.

The school offers courses at the Upper Division-Graduate level in the area of mass communication. These include Communication and Public Opinion; Interpretation of Contemporary Affairs; Mass Communication Theory; International Communication; Mass Communications and the News; History of Journalism; Mass Media in a Dynamic Society; and Seminar in Mass Communication Problems of Developing Countries. Several Lower Division courses are also offered.

Murphy Hall, the School of Journalism and Mass Communication building, is the headquarters of both the National Scholastic Press Association and the Associate Collegiate Press. Students are welcome to visit these organizations and to obtain counsel on publication problems from the staffs of NSPA and ACP.

Speech Science, Pathology, and Audiology

During the First Term, the Division of Speech Science, Pathology, and Audiology will offer basic science and professional courses for undergraduate students, graduate students, and nondegree students seeking to continue their professional education.

SSPA offerings and those of other departments will provide advanced students with an opportunity for concentrated study of language and language disorders. Professional courses and practica will be offered to those concerned with the laryngectomized. Clinical practica in audiology and galvanic skin response audiometry will be available. Basic and advanced voice science courses will be taught.

Students interested in exploring speech pathology and audiology as a career may enroll in introductory courses.

During the Second Term, advanced students may participate in clinical practica in audiology and in speech pathology, or they may pursue independent study and research.

Students seeking additional information should contact Professor Clark D. Starr, Speech and Hearing Clinic, University of Minnesota, Minneapolis, Minnesota 55455 (phone 373-4116).

High School Forensics Workshop

The Department of Speech, Communication, and Theatre Arts, in cooperation with the College of Education, will sponsor a special workshop for high school students interested in competitive speech activities. College speech students may observe the work of these high school students. Those wishing to do so should contact Professor Bernard Brock (404 Folwell Hall). Professor Brock will also teach EdCI 177, available to students desiring instruction in teaching speech at the high school level (see the Education section and the Speech, Communication, and Theatre Arts section of First Term course descriptions in this bulletin). The workshop will be held in 305 Folwell Hall, 1 hour; II-V hour in 406 Folwell Hall.

High School Theatre Workshop

The Department of Speech, Communication, and Theatre Arts, in cooperation with the College of Education, will sponsor a special enrichment program in theatre for high school students. Lectures in theatre history, classes in acting, stagecraft, and fencing, and participation in a series of plays are included in the curriculum. For further information contact: Mr. Dale Huffington, 320 Wesbrook Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Acting Workshop

As in the past, the Department of Speech, Communication, and Theatre Arts plans to have an outstanding artist from the professional theatre conduct a 1-week workshop open to students registered in Summer Session. Past guests have been: Lee Strasberg (1960); Peggy Wood (1961); Harold Clurman (1962); Sir Tyrone Guthrie (1963); Robert Lewis (1964); Sir Tyrone Guthrie (1965); Morris Carnovsky (1966); Dame Sybil Thorndike and Sir Lewis Casson (1967) and Morris Carnovsky (1968). Our 1969 guest, professional commitments permitting, will be Alan Schneider.

Expanded Offerings in German

The German Department has increased its offerings this summer in order to make it possible for in-service teachers to make more rapid progress toward the objective of earning an M.A. degree in about three summers. The policy of an expanded German program will be continued.

Modern Language Residence Houses

During the First Term the French and Italian Department and the German Department will sponsor residence houses, located near the campus, for graduate and undergraduate students of French and German. All activities will be carried on in the language elected by the student. Each house will constitute a milieu for training in the language and culture of the country and will provide a unique opportunity for improvement in the spoken language.

The directors of the residence houses will be Professor Erhard Friedrichsmeyer for the Deutsches Haus, and Professor Peter Robinson for the Maison Française. In each house there will be native assistants. (See course listings under Departments of German and French and Italian.)

Programs — The programs consist of practical conversation sections in the afternoon, and lectures, round-table discussions, plays, films, music, and dances in the evening conducted at the residence houses. This work carries 5 quarter-credits for the elementary group and 4 quarter-credits for the advanced and graduate students. To round out their programs it is recommended that the students select no more than 5 additional credits of work from the departmental courses of the language of their choice. It is possible, however, for students to combine work in the language houses with work in another field.

The houses have proved valuable to students and others who desire training in speaking a foreign language . . . those planning to apply for Fulbright or SPAN scholarships, or to join other foreign study groups . . . teachers or potential teachers of French or German, whether or not they are working for graduate degrees . . . men and women training for positions with the government, international organizations, or private business.

Registration — Students who register for the Modern Language Residence Houses should enroll for Fren 100 or Ger 100.

Fees — An additional fee of \$40 is charged for the program offered in a language residence house. Room and board are additional.

Intensive Scandinavian Language Offerings

The impressive success of the Intensive Swedish summer course offered by the Department of Scandinavian in 1967 led to the expansion of the Scandinavian summer language program in 1968 to also include Finnish. As was the case in the Intensive Swedish summer course, the Intensive Finnish is the first such course in the United States. It is intended for undergraduate and graduate students without previous formal knowledge of Finnish. For detailed information on Intensive Finnish consult Professor Meri Lehtinen and for Intensive Swedish, Lillemor Saether, Department of Scandinavian, 210 Folwell Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Middle Eastern Languages

The Department of Middle Eastern Languages will offer an intensive beginning course in written Arabic (Arab A and B) and Intermediate Persian (Pers 51 and 52). The courses cover the same ground as a full-year beginning course. Students completing the intensive 15-credit summer course will be eligible to enroll for the second-year level in the fall quarter.

The courses will cover grammar, vocabulary, and reading of easy texts, with constant drill and laboratory aids. It is open to all students, and may be taken toward the fulfillment of their language requirements.

Courses in Russian

The department is offering two intensive courses in Russian, a beginning course in spoken and written Russian (Russ 1-2-3) and an intermediate course (Russ 4-5-6). Students completing the intensive summer courses will be prepared to continue at the next higher level in the following quarter.

COLLEGE OF MEDICAL SCIENCES

MEDICAL SCHOOL

The Medical School offers a wide variety of courses and externships during the Summer Session. The externships for recently graduated physicians and for qualified medical students from other institutions who are recommended by their respective deans will offer an integrated program of bedside teaching and clinical responsibilities, ward rounds, conferences, and seminars on the wards of the University Hospitals, the Hennepin County General Hospital, the Veterans Administration Hospital, and St. Paul-Ramsey Hospital in St. Paul. Registration may be for one or more terms of the Summer Session. Research opportunities may be afforded registrants who remain for both terms. At the discretion of individual clinical departments, selected registrants may remain during the month of September for additional clinical training.

A student applying to register in preclinical subjects for the purpose of making up deficiencies incurred at other medical schools should present, at the time of application for such registration, a letter from the dean of his medical school approving the purpose of the registration. Medical students from other schools, whether their purpose is to make up work or to accelerate or broaden their medical education, are registered as adult special students and receive subject credit only. If such students desire legal time credit toward a medical degree, they should make arrangements with the institution from which they intend

to receive the degree. No obligation to accept such students for registration in the regular medical course is attached to adult special registration. They should consult the deans or department heads in their own schools as to the equivalence of the courses in which they might be interested at the University of Minnesota. (See departmental listings)

Opportunity for Practitioners

In addition to the externships which have been described above, attention is called to continuation courses offered from time to time throughout the year under the General Extension Division and the Department of Conferences and Institutes. These courses are primarily for practitioners and are largely practical in nature. Circulars may be obtained from the Department of Conferences and Institutes.

Clinics and conferences in the University Hospitals, the Hennepin County General Hospital, the Veterans Administration Hospital, and the St. Paul-Ramsey Hospital will go on as usual during the Summer Session and will be open to visiting physicians.

Graduate Courses

Opportunities are offered in the various departments of the Medical School for work during the Summer Session for advanced degrees, either in laboratory or clinical branches of medicine. Such work involves admission to, and registration in, the Graduate School. For detailed information see the statement under Graduate School in this bulletin or in the special bulletin on graduate work in medicine.

Fees

Medical Students Desiring Time Credit — The Medical School tuition fee for the full summer quarter is \$168 for residents of Minnesota, and \$380 for nonresidents. Less than a full program may be paid for at the summer rate or academic year rate, whichever is higher. In addition each student will pay the incidental fee of \$32.50. Students in certain courses are required to furnish microscopes.

Medical Students or Physicians Registering for Externships — A tuition fee of \$72 per term is charged for the externships listed under the various clinical departments. This is the same for residents and non-residents of Minnesota. No additional tuition will be charged for such electives in the basic sciences or clinical work as the registrant may have time for, not to exceed one-fourth time. Tuition for clinical externships is not charged unless formal transfer of credit is required. Each registrant for an externship will pay the incidental fee of \$16.25 per term. In elective courses where a microscope is required this may be rented from the University.

Nonmedical Summer Session Students — Students who do not desire to register for time credit toward a medical degree, and who are ineligible to register for an externship or for a program of clinical subjects, may pay the regular Summer Session fees per term.

SCHOOL OF NURSING

Courses and Fees — Courses in the 1969 School of Nursing Summer Session are provided for those students who are currently enrolled in the school's regular programs. A limited number of qualified nurses may be admitted to the Special Topics Course. Students planning to matriculate in a regular program of the School of Nursing should consult an adviser in the School of Nursing before registration for Summer Session. For further information, see the *School of Nursing Bulletin*. All students pay Summer Session fees.

Program Leading to a Master's Degree — Elective courses and undergraduate courses required prior to enrollment in the program leading to the degree of master of science in psychiatric nursing or medical-surgical nursing are available during the Summer Session. Students in this program register in the Graduate School.

Programs Leading to the Degree of Bachelor of Science — Students already enrolled in the baccalaureate program in the School of Nursing may register in the School of Nursing for either general education or nursing courses. For further information see the *School of Nursing Bulletin*.

High school graduates, graduates of associate degree or diploma programs in nursing, and transfer students from colleges or universities may register for elective courses in the College of Liberal Arts. Students planning to matriculate in a regular program of the School of Nursing should consult an adviser in the School of Nursing before registration for Summer Session. For further information see the *School of Nursing Bulletin*.

SCHOOL OF PUBLIC HEALTH

Summer courses at the graduate level are designed for completion of Master's degree programs and for students beginning such programs in the fields of environmental health, veterinary public health, dental health, health education, public health administration, and public health nutrition. It is expected that all students in these categories will begin their programs of study not later than the Second Term of Summer Session, and continue in residence in the interval between the end of Second Term and the beginning of the fall quarter.

Ground Water Development

For the tenth time since 1959, the School of Public Health will offer a special intensive program on Development of Ground Water Supplies. This program, sponsored by the Agency for International Development of the Department of State, will place special emphasis on the public health aspects of such supplies. While designed primarily for engineers employed in economically underdeveloped areas of the world, the content will be applicable to those engaged in water supply programs in federal, state, and local agencies in the United States. The course will be limited in registration and will run from June 16 to August 22. For further information, write: School of Public Health, University of Minnesota, Minneapolis, Minnesota 55455.

Water Quality Investigations

Two special courses in research techniques in water quality investigation will be offered First and Second Terms to specialists who have an interest in water quality control. They will be given at Duluth, Minnesota, and will be headquartered at the Limnological Research Station of the University of Minnesota, Duluth. Activities will include formal lectures, laboratory work, and extensive field operations. The latter will be centered around Knife River Harbor where two fully equipped research vessels are available for the scheduled field studies. The courses will be limited in registration, and will run from June 16 to July 19 and from July 21 to August 22. For detailed information write: School of Public Health, University of Minnesota, Minneapolis, Minnesota 55455.

MORTUARY SCIENCE

The admission requirements for the Department of Mortuary Science are described in the departmental bulletin. The Summer Session courses are planned to make scheduling during the regular academic year more feasible and flexible. Many students find that these courses can be more easily scheduled during the summer terms when work and housing obligations are also more flexible. All of the summer courses are required for the bachelor of science degree and must be completed prior to the last quarter in attendance. These courses are not available in other colleges of the University or at other institutions of higher learning. All students who plan to take Mort 90A and B must make special application on forms available from the departmental office, and return them no later than May 15, 1969.

COLLEGE OF PHARMACY

The undergraduate courses that are offered by the divisions of the College of Pharmacy during the academic year are offered during the Summer Session only when justified by a sufficient demand.

Graduate student research work is offered during the Summer Session to students who are enrolled in the Graduate School and who are pursuing a curriculum in one of the College of Pharmacy divisions as a major or minor.

INSTITUTE OF TECHNOLOGY

Summer courses are offered in architecture; astronomy; mechanics and materials; electrical, industrial, mechanical, and metallurgical engineering; engineering graphics; geology; mathematics; and physics.

In the Department of Chemistry, analytical, general, organic, and physical chemistry will be given. Students are able to acquire a Master's degree in chemistry by attendance at Summer Session only.

Institute for Teachers of High School Physics

An Institute for High School Teachers of Physics, supported by the National Science Foundation, will be held in Minneapolis from June 16 to August 22 (that is, both terms of the Summer Session). A limited number of stipends will be available. Teachers not receiving stipends may register by special permission of the director of the institute. Credit for the courses will be given only for the full 10-week session.

Geology for High School Teachers

The Department of Geology and Geophysics offers a course in physical geology, a course in historical geology, and a course in systematic mineralogy for high school teachers who wish to obtain an introduction to earth sciences. These courses, Geo 109C, 122C, and 162, cover the description of geologic materials and processes, the history of the development of the earth, and the study of minerals and rocks composing the crust of the earth. The lectures are augmented with intensive laboratory exercises and with guided discussions on the classroom demonstrations of geological principles. These courses are introduced to help teachers in their efforts to satisfy the increasing demand for earth sciences in high school curricula.

The sequence of Geo 109C, 122C, and 162 can be accepted for the fulfillment of the minor requirements of the M.A. program of graduate students in education.

GENERAL EXTENSION DIVISION

Department of Conferences and Institutes Program

Held in the Nolte Center for Continuing Education

The following conferences and institutes will be offered during the Summer Session:

June 5-6 — Accounting for Nonaccountants

June 2-13 — Rock Mechanic Seminars — Basic and Advanced

June 16-July 3 — Summer Graduate Course in Epidemiology

July 7-18 — Voice Production Workshop

July 21-25 — Creative Writing for Children and by Children

July 22-26 — Techniques in Infrared Spectroscopy

July 28-August 1 — Chemical Interpretation of Infrared Spectra

August 18-22 — Assessment and Appraisal Course for Tax Assessors, A

August 25-29 — Assessment and Appraisal Course for Tax Assessors, B

Continuing Education for Women

A few special noncredit courses and workshops will be offered during the summer as part of the Continuing Education Program for Women. Plans include a course in modern literature, a humanities course, a study skills workshop and Guidelines for Women (a workshop for those planning to return to school to help them assess their interests and abilities). Classes will meet once a week with 2- to 2½-hour sessions.

Further information may be obtained by calling 373-5166, or by writing Mrs. Louise Roff, Director, Continuing Education for Women, 310 Nolte Center, University of Minnesota, Minneapolis, Minnesota 55455.

Voice Production Workshop

July 7-18 • 9:00 a.m. to 4:00 p.m. • Nolte Center for Continuing Education

The Department of Conferences and Institutes, in cooperation with the Department of Speech, Communication, and Theatre Arts, will conduct a 2-week workshop on the increasingly popular "Warren Methods of Voice Production."

The workshop will provide an opportunity to master the fundamentals of this method of vocal training which emphasizes physical relaxation and uses special exercises to control bodily tensions. Exercises are designed to free, strengthen, and help the student recognize voice potential.

Mrs. Mary Corrigan, who studied the Iris Warren Method from Kristan Linklater under the auspices of a Rockefeller Foundation grant, will be the instructor.

The 2-credit course is offered for both undergraduates (Th 18) and for graduate students (Th 118).

Registration fee for the workshop is \$69. A brochure and registration information may be obtained by writing directly to:

Director
Department of Conferences and Institutes
Nolte Center for Continuing Education
University of Minnesota
Minneapolis, Minnesota 55455

Diplomats in Residence Program

Five ranking Foreign Service Officers from the U.S. Department of State will be "in residence" during the First Term. This unique program is sponsored by the Summer Session and the General Extension Division's World Affairs Center in cooperation with the State Department.

One diplomat will be on campus each week during the term. The officers will appear in a number of classes as lecturers, discussion leaders, or as the subject of interviews. They will also participate in a number of school and community activities. The Department of State is particularly interested in increasing its contact with secondary school teachers.

Inquiries may be addressed to the Summer Session Office or to the Program Director, William C. Rogers, World Affairs Center, 122 Social Sciences Building, University of Minnesota, Minneapolis, Minnesota 55455. Telephone 373-3799.

Unique Programs at CIC Institutions

The Committee on Institutional Cooperation (CIC) was established in 1958 to provide for voluntary cooperative arrangements among the Big Ten Universities and the University of Chicago. A primary objective of CIC is to enable the student to obtain the best education available throughout the 11-university complex.

The CIC annually sponsors a number of outstanding and unique institutes. During the summer of 1969 the following institutes will be offered:

Far Eastern Languages — Indiana University

Slavic Language and Area Studies — University of Illinois

South Asian Language and Area Studies — University of Minnesota

Geology — University of Minnesota

In addition to the rotating institutes, the following courses were considered by the CIC Summer Session Committee to be unique offerings of the cooperating institutions. This list is only descriptive and is provided to assist the student in selecting a program in an area which otherwise may be limited in the summer. Courses designated "Graduate" are open only to graduate students. Those not so restricted are open to both undergraduate and graduate students.

UNIVERSITY OF ILLINOIS • Urbana

Library Science 309 — Storytelling. Fundamental principles of the art of storytelling including techniques of adaptation and presentation for children of various ages. Content and sources of materials; story cycles; methods of learning; practice in storytelling; planning the story hour for the school and public libraries, for recreational centers, for the radio, and for television. Advanced undergraduates and graduates. Prerequisite: consent of instructor, Spencer G. Shaw. July 14-August 9.

Library Science E439 — Medical Literature and Reference Work. Considers representative reference and bibliographical aids in medical sciences. Problems provide experience with typical medical reference sources. (Taught at University of Illinois Medical Center, Chicago, but application must be placed through Richard F. Casper, University of Illinois at Chicago Circle). Prerequisite: consent of instructor, Clara L. Meckel. June 17-July 19.

Library Science 450 — Advanced Studies in Librarianship. Section F: Rare Books Librarianship. Organization and care of rare book collections in large public and scholarly libraries. Graduates. Prerequisite: consent of instructor.

Linguistic Institute. Basic courses in descriptive, historical, applied, and mathematical linguistics. Advanced offerings on theory of syntactic, phonological, and semantic analysis. Seminars for advanced graduate students. June 16-August 9.

CIC Cooperative Summer Slavic Institute. Program is intended primarily for students of Slavic languages and literatures and other disciplines dealing with the Slavic and East European area. Language offerings will include Russian, Czech, Polish, Ukrainian, and one non-Slavic language, Rumanian. June 16-August 9.

INDIANA UNIVERSITY • Bloomington

Folklore Institute, F484. Folklore and Culture of the American Negro. Use of oral traditions in terms of history (antebellum to present) and social change (rural to urban). 3 credits. Intensive course from June 3-18.

CIC Far Eastern Language Institute. Basic courses: 10-week session, June 9-August 16. Advanced courses: 8-week session, June 16-August 16.

Geology, G429. Field Geology in the Rocky Mountains (Cardwell, Montana). Advance registration required. 8 credits. June 7-July 26.

Geology, G575. Geology of Shallow Marine Environments (Florida Keys and Southeastern states). Advance registration required. 5 credits. June 6-July 10.

Geometric Optics I, V321. Optics of lenses, prisms, and mirrors; emphasis on application in visual science. 4 credits. June 17-August 8.

Graduate Library, L529. Librarianship and Bibliography of Africa South of the Sahara. Selection, acquisition, and organization of literature for African studies. 4 credits. June 17-August 8.

Police Administration, P101, P493. Two separate courses dealing with (1) principles underlying social organizational control; and (2) problems involved in police science. June 17-August 8.

UNIVERSITY OF IOWA • Iowa City

Translation Workshop 8:488. For those interested in the translation of foreign texts into English of high literary merit. Professor: Frederic Will.

Great Books of China and India 39:163. Advanced course for serious students of religion and philosophy. Book reports and term paper. No prerequisite. Professor: Y. P. Mei.

The Genius of American Religious Institutions 32:176. Delineation of outstanding characteristics of the contemporary religious scene in the United States. Professor: Sidney E. Mead.

Iowa Lakeside Laboratory. Course offering in Field Biology, Helminthology, Morphology of Algae, Aquatic Ecology, Field Entomology. Professor: Richard V. Bovbjerg. June 9-July 11; July 14-August 15.

Field Seminar in Geography. Jointly sponsored by the Departments of Geography at Iowa, Minnesota, and Wisconsin. Guided experience in

the formulation and study of individual field problems in one or two branches of geography. Graduate. Professor: Neil Salisbury. Three weeks during August and September.

Geology Field Techniques 12:113. Six-week geology field course, Park City, Utah. Training in the description and mapping of rock units and geologic structures in the Wasatch and Uinta Mountains. Professional level course. Professor: Richard Hoppin. Six weeks during June and July.

MICHIGAN STATE UNIVERSITY • East Lansing

Summer Institute of Glaciological Sciences. Held on and near the Juneau Icefield of coastal Alaska, the Institute offers 7 weeks of intensive field study in glaciological and arctic sciences. Graduate and undergraduate.

University Summer Art School at Leland, Michigan. Five weeks of concentrated painting experience in a commercial fishing center where the docks, boats, and fishermen provide excellent material for the painter. Graduate and undergraduate.

The Kellogg Biological Station at Gull Lake, Michigan. Ten-week session of instruction in botany, entomology, zoology, parasitology, microbiology, and geography. Emphasis on field study. Graduate and undergraduate.

NORTHWESTERN UNIVERSITY • Evanston

Political Science 449-C32. Institute on International Relations. Six-week period divided into two 3-week sessions, each session to have a different focus. Institute will be concerned with the major problems of the world community and the state of man's knowledge related to these problems. Three hours daily, 5 days a week. Each session carries 4 quarter-hours credit. Graduate and undergraduate. June 24-August 2.

Sociology 471-C01, C15. Institute on Urbanization and Industrialization. Six weeks duration divided into two 3-week sessions. First 3-week session devoted to study of nature of urban social structure, culture, and systems of urban differentiation. Second 3-week session deals with structure and culture of modern industry, consequences for status and class organization in the work plant and wider community. Three hours daily, 5 days a week. Each session carries 4 quarter-hours credit. Graduate and undergraduate.

In each institute students may register for either the entire 6 weeks or for one of the 3-week sessions. First 3-week session, June 24-July 11. Second 3-week session, July 14-August 2.

OHIO STATE UNIVERSITY • Columbus

- Agronomy 594. Soil Science Special Section for Science Teachers.** The physical, chemical, and biological properties of soils are studied. Emphasis is placed on the use of soil samples to illustrate biological, physical, and chemical principles in various science courses. Open for both undergraduate and graduate credit to science teachers in elementary, junior high, and senior high schools. The method of instruction is audio-tutorial. 5 hours credit. Offered in conjunction with the Summer Institute for Teachers of Science. Professor: Dr. Frank L. Himes. June 17-August 8.
- Anthropology 664.** Joint expedition of the Ohio State University and the Ohio Historical Society Museum to excavate prehistoric sites in Ohio. Special field work training. Required full time of student. 8-16 credit hours. Chairman, Department of Anthropology. June 17-July 22; July 23-August 30.
- Sociology.** The Department of Sociology will host the Institute for Comparative Sociology. Courses and faculty for this institute are yet to be determined, but are international in scope. Director: Dr. Hans Zetterberg. June 9-August 1.
- Theatre.** Third International Theatre Research Tour Seminar: Advanced students in theatre history, invited to the Centennial of the Shakespeare Theatre. Advanced research in history of Shakespearean Staging. Approximately 5 weeks in London and 5 weeks in Stratford with stops at Birmingham and Edinburgh. Professor: John C. Morrow. Approximately June 17-August 30.
- Biology Lake Erie.** The Franz Theodore Stone Laboratory, Put-in-Bay, Lake Erie, Ohio — Course offerings in aquatic biology dealing with the ecology of (a) physical and chemical factors, and (b) biota of freshwater Lake Erie. Dean, College of Biological Sciences. June 18-July 24; July 25-August 30.
- CIC Biometeorology Graduate Program.** Field course in biometeorology conducted at Biological Field Station, South Bass Island, Lake Erie, Ohio. Dean, College of Biological Sciences. June 18-July 24; July 25-August 30.
- Geology 580. Field Work in Earth Science.** A required course in earth science field methods especially designed for the future earth science teacher. Taught near Ft. Collins, Colorado. Primary emphasis in the course is the solution of geological field problems and to provide experiences in meteorology and astronomy data gathering and interpretation. 5 credit hours. Professor: Victor J. Mayer, Department of Geology. Approximately June 17-July 22.

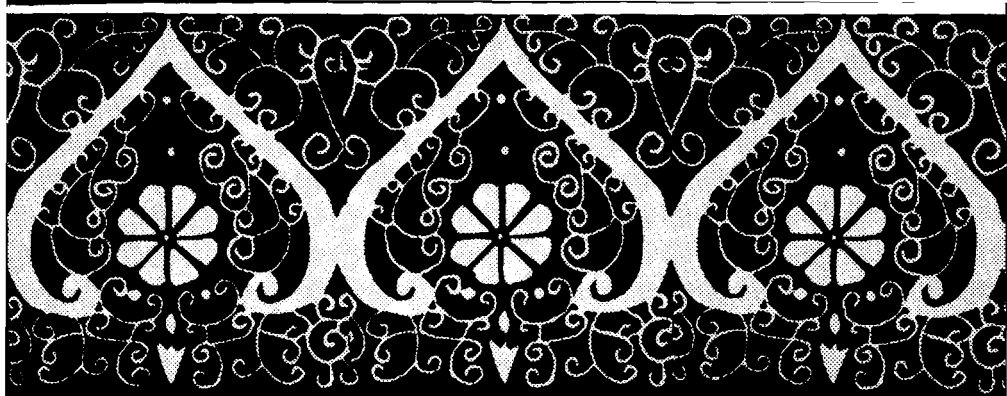
UNIVERSITY OF WISCONSIN • Madison

Intensive Program in African Languages and Literature. The Madison Summer Sessions will host a program in African Languages and Literature to be comprised of the following courses:

- 104-303-3 Intensive Intermediate Amharic
- 104-311-6 Intensive Berber
- 104-341-3 Intensive Fula
- 104-371-2 Intensive Yoruba
- 104-381-9 Intensive Wolof
- 104-391-0 Intensive Sango

Courses are open to graduates and undergraduates. Each course will meet 5 hours daily, 5 days a week. For details contact: Professor Lyndon Harris, Summer Chairman, African Languages and Literature, 1456 Van Hise Hall, University of Wisconsin, Madison, Wisconsin 53706.

Note — The following courses offered by the University of Minnesota were selected by the CIC Summer Session Committee to be included in this listing of unique courses: Public Health 231-232 (Ground Water Development); Public Health 138 (Hospital Engineering Problems); Lake Itasca Biology Session; Music 60 (The Development of Early and Symphonic Music); Social Science 93 (Urban Crisis: Civil Disorders in the Twin Cities); Inter-University Rotating Summer Program in South Asian Studies; Field Geology 100 (Geology Field Camp). A description of these programs will appear in the summer bulletins of all CIC member institutions. The University of Minnesota programs are described in this bulletin in the appropriate college or departmental section.

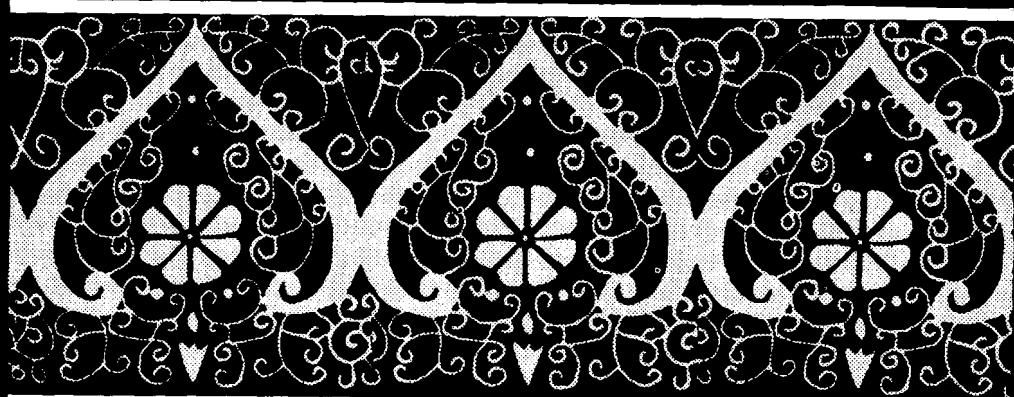


South Asian Studies

The University of Minnesota is host to the 1969 Inter-University Rotating Summer Program in South Asian Studies, which is sponsored annually by the Committee on Institutional Cooperation (CIC), consisting of the Big Ten universities and the University of Chicago.

Course Offerings

- **South Asian Languages and Literature** — Beginning, intermediate, and advanced courses in Hindi, Bengali, Sanskrit, Tamil, Telugu, and Urdu.
- **Music** — A unique feature of this year's South Asian Program.
- **Anthropology**
- **Art History** — Indian Art and Film.
- **Geography**
- **History**
- **Middle Eastern Languages** — Persian and Arabic.
- **Philosophy**
- **Political Science** — Government and Politics of South Asia.
- **Speech, Communication, and Theatre Arts** — Drama and theatre.



Qualifications

The program is part of the regular 1969 Summer Session. Courses may be taken by regular University students, summer-only students, or by those who come specifically for the Rotating Summer Program on South Asia.

The elementary language courses will be taught on an intensive basis and will be equivalent to a full academic year's study of the language. Most intermediate language courses will be taught on a "semi-intensive" basis. Advanced language classes will be taught at a normal rate.

Housing

A section of Sanford Hall, a coeducational residence hall, has been set aside for participants in the South Asian Summer Program. The dormitory contract, which includes meals, will cost \$335 per term for a single room and \$313.50 per term for a double room.

Additional Information

For detailed course descriptions, information on admission, registration, and tuition, refer to the index in the back of this bulletin.

For further information on the CIC South Asian Program write:

Paul W. Staneslow
192 Klæber Court
University of Minnesota
Minneapolis, Minnesota 55455

University of Minnesota – Summer Arts Study Center

A series of concentrated undergraduate workshops and courses offering intensive training for both beginners and advanced students. Teachers are all professionals, well-known artists, among the leaders in their fields. Schooling and living at the attractive Sugar Hills resort in Grand Rapids, Minnesota. Sponsored by the Grand Rapids Performing Arts Council.

Course Offerings

Early Music • June 16 to June 20

Tuition: \$45

The Philador Trio — members of the distinguished New York Pro Musica. Shelly Gruskin (Flute and Recorder): beginning, intermediate, advanced recorder classes, Renaissance Band; Elizabeth Humes (Vocal Music): Renaissance and Baroque solo song repertoire, Madrigal Literature and performance, private lessons and small group practice, combined vocal and instrumental repertoire; Edward Smith (harpsichord): Harpsichord master class, Harpsichord, recorder, and renaissance reeds — chamber music coaching, keyboard and solo voice literature coaching. All classes meet daily. The Philador Trio will present a concert on the Sunday evening prior to the workshop.

No credit

Drama • June 29 to July 3

Tuition: \$45

Alan Schneider, professional director (professional commitments permitting). Sessions in acting, voice, movement conducted in mornings by Mary Corrigan; directing/coaching in group scenes by Mr. Schneider. Evening coaching in rehearsal for two- and three-person scenes. Performance at end of week.

1½ credits

Drawing and Painting • July 7 to July 18

Tuition: \$45

Mario Volpe, professor of art, well-known midwestern artist. Class meets Monday through Friday for 2 weeks from 4:00-10:00 p.m. with a break for an informal supper discussion. The class will explore contemporary and traditional methods. Work from nature, various media and techniques.

3 credits

(A limited number of partial scholarships will be available to Grand Rapids area residents through the Grand Rapids Performing Arts Council.)

Contemporary Art • July 14 to July 18

Tuition: \$40

Jack Tworckov, chairman, Yale University Art Department, internationally known artist. Morning sessions: lecture/discussions (with slides) on aesthetic principles underlying the development of techniques in modern artists. Picasso to DeKuning, Pollock, Rothko, et al. Afternoon sessions: critique of paintings brought by students.

2 credits (grad or undergrad)

Choral Music - July 21 to July 26

Tuition: \$45

Douglas McEwen, popular midwestern choral director; professor, University of New Mexico Music Department; soloist and assistant conductor, Roger Wagner Organization. Repertory sessions daily involving technical and stylistic suggestions for effective interpretation of recent choral publications. Lecture-discussions combined with demonstration of techniques of choral conducting. Topics to be considered: Drama and the Conductor, Voice and the Vowel, Consonants and Character, Conducting, Countenance and Style. Rehearsal of major choral work, applying techniques and concepts discussed in other classes; performance with Minnesota Orchestra. Special session daily on the field of Junior High repertory. 2 credits

Dance - July 28 to August 2

Tuition: \$40

Daniel Nagrin, nationally known dancer/choreographer, creator of the highly acclaimed "Peloponnesian War" commissioned by the National Endowment and the New York State Arts Council. **Morning:** 2½-hour sessions for technique — beginning and advanced. **Afternoon:** daily 1½-hour class in composition.

Students will have 2 hours daily to work on individual composition problems. There will be evening lecture demonstrations on theory and approaches to aesthetics of dance and techniques of presentation for recital. Following the workshop there will be studio presentations of compositional work by individual students and a recital by Mr. Nagrin. 1½ credits

A special feature of the Arts Study Center is the informal contact with the artist during meal and recreational times. The setting, in the fresh northern Minnesota ski country, is beautiful and quiet, and both the air and the water are clear and cool.

Recreational facilities include golf, boating, waterskiing, tennis, and horseback riding; free indoor-outdoor swimming pool, sauna and chair-lift. There will be organized recreational activities throughout the festival, including evening open-air barbecues, short guided wilderness walks, and movies.

Room (double occupancy; private bath), breakfast, and dinner are available at Sugar Hills for the evening before and the nights of the workshop at \$55, or \$110 for the 2-week art course. Please write directly to Sugar Hills, Box 280, Grand Rapids, Minn. 55744 specifying the dates of arrival and departure and the number in your party. (Two persons, each \$55; third and above, each \$45). Make checks for tuition payable to: University of Minnesota. Please send application form and checks by **May 1, 1969** to:

Dale Huffington, Director
Summer Arts Study Center
c/o Drama Advisory Service
320 Wesbrook Hall
University of Minnesota
Minneapolis, Minnesota 55455

Mail to: Dale Huffington, Summer Arts Study Center, c/o Drama Advisory Service, 320 Westbrook Hall, University of Minnesota, Minneapolis, Minnesota 55455.

University of Minnesota • Summer Arts Study Center

REGISTRATION FORM

Name _____

Address _____

Street

City

State

Zip Code

Telephone

I wish to enroll in the following:

___ 1. Early Music (no credit) — June 16-June 20 — \$45 \$ _____

___ 2. Drama (1½ credits) — June 29-July 3 — \$45 _____

___ 3. Drawing and Painting (3 credits) — July 7-July 18 — \$45 _____

___ 4. Contemporary Art (2 credits) — July 14-July 18 — \$40 _____

___ 5. Choral Music (2 credits) — July 21-July 26 — \$45 _____

___ 6. Dance (1½ credits) — July 28-August 2 — \$40 _____

I enclose check or money order payable to the
University of Minnesota for this total amount:

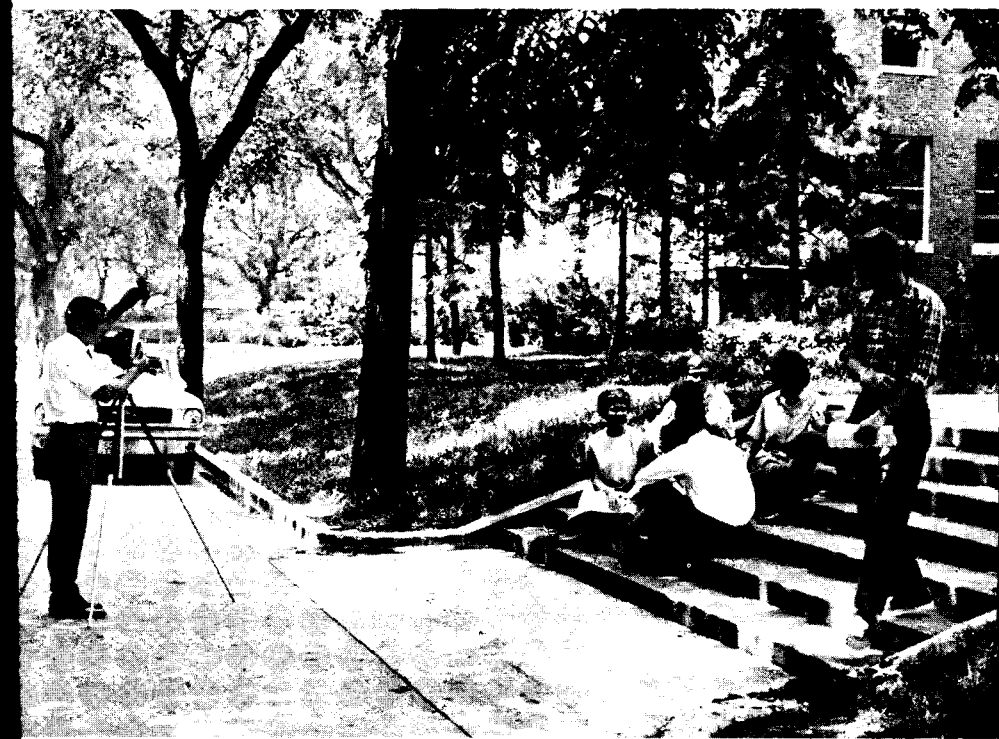
Total \$ _____







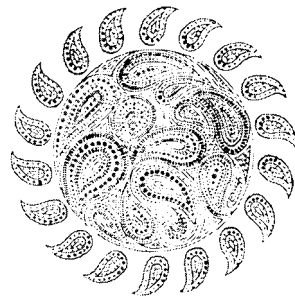












Course Descriptions

Second Term

College of Agriculture, Forestry, and Home Economics

For general information on the College of Agriculture, Forestry, and Home Economics, see section on Schools, Colleges, and Special Programs.

Agricultural Economics (AgEc)

201 GENERAL SEMINAR: AGRICULTURAL ECONOMICS

Special problems for individual work by qualified students. (3 cr; prereq # in advance of regis; hrs and rm ar) Staff

Agricultural Engineering (AgEn)

Mechanized Agriculture (MeAg)

131 PROBLEMS AND FIELD STUDIES IN ADVANCED FARM MECHANICS

Principles and practices pertaining to the implementation of an instructional program in farm mechanics. (3 cr per term [9 cr max]; prereq 130; hrs and rm ar) Bear

Agronomy and Plant Genetics (Agro)

Agronomy

201* RESEARCH IN FARM CROPS

Problems in physiology, production, and classification of crop plants. (Cr and hrs ar) Staff

Plant Breeding

241* RESEARCH IN PLANT GENETICS

May be taken as major or minor work. (Cr and hrs ar) Staff

244 LABORATORY METHODS IN PLANT BREEDING

Field study of plant breeding programs and techniques. (1 cr total for both terms; prereq 132 or #) Lambert

Animal Science (AnSc)

209* RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY

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. (Cr and hrs ar; prereq #) Staff

210* RESEARCH IN ANIMAL SCIENCE

Research including experimental studies in the disciplines associated with animal production and research with special emphasis on interdisciplinary

studies embracing environmental and managerial considerations. (Cr and hrs ar; prereq #) Staff

211* RESEARCH IN ANIMAL GENETICS

Research in quantitative genetics, cytogenetics, and other areas related to animal breeding. (Cr and hrs ar; prereq #) Staff

212* RESEARCH IN ANIMAL NUTRITION

Research in selected areas of animal nutrition. Research topics and animal species determined by consultation. (Cr and hrs ar; prereq #) Staff

231* RESEARCH IN ANIMAL PHYSIOLOGY

Individual research under faculty direction. Topics to be determined by consultation and may be a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser. (Cr and hrs ar; prereq #) Staff

Entomology, Fisheries, and Wildlife (Ent)††

Ample opportunity for research work in various phases of entomology, fishery biology, and wildlife biology will be afforded properly qualified students. This work will be on an individual basis.

55 ENTOMOLOGICAL TECHNIQUES

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. (1-3 cr; prereq 74 or equiv) Cook

243* RESEARCH IN ENTOMOLOGY

(Cr ar) Hodson, Chiang, Cook, Cutkomp, Harein, Peterson, Richards, Brooks, Furgala, Kulman, Price, Radcliffe

267* RESEARCH IN FISHERY BIOLOGY

(Cr ar) Smith, Waters, Underhill

280* RESEARCH IN WILDLIFE BIOLOGY

(Cr ar) Marshall, Beer, Tester, Erickson, Mackie

Food Science and Industries (FSci)

170* SPECIAL PROBLEMS IN FOOD MANUFACTURING

Individual laboratory or library research on chemical, physical, and engineering problems involved in processing and utilization of food products. (1-3 cr; prereq sr or #; hrs ar) Staff

180* SPECIAL PROBLEMS IN DAIRY AND FOOD MICROBIOLOGY

Laboratory or library research on problems related to the microbiology of dairy and other food products. (1-5 cr; prereq sr or #; hrs ar) Staff

Forestry (For)

Offered on the St. Paul Campus

200* RESEARCH PROBLEMS IN SILVICULTURE

(Cr ar) B Brown, Hansen, Bakuzis, Scholten, Tappeiner

203* RESEARCH PROBLEMS IN FOREST MANAGEMENT

(Cr ar) B Brown, Irving, Meyer, Winsness, Hughes, Hallgren

†† For additional courses, see index for Biology Session.

- 205* **RESEARCH PROBLEMS IN FOREST ECONOMICS**
(Cr ar) Skok, Hughes
- 207* **RESEARCH PROBLEMS IN FOREST PRODUCTS ENGINEERING**
(Cr ar) Haygreen, Hossfeld, Kaufert, Erickson, Gertjeansen
- 213* **RESEARCH PROBLEMS IN FOREST UTILIZATION**
(Cr ar) Haygreen, Hossfeld, Kaufert, Erickson, Gertjeansen, Thompson
- 215* **RESEARCH PROBLEMS IN FOREST TREE PHYSIOLOGY**
(Cr ar) Sucoff
- 217* **RESEARCH PROBLEMS IN REMOTE SENSING AND PHOTOGRAMMETRY**
(Cr ar) John, Meyer, Gerrard
- 218* **RESEARCH PROBLEMS IN FOREST MEASUREMENTS**
(Cr ar) John, Meyer, Gerrard
- 219* **RESEARCH PROBLEMS IN FOREST RECREATION**
(Cr ar) Hansen, Merriam, Skok, Hughes
- 220* **RESEARCH PROBLEMS IN FOREST TREE GENETICS**
(Cr ar) Pauley
- 221* **RESEARCH PROBLEMS IN FOREST INFLUENCES**
(Cr ar) Mace
- 222* **RESEARCH PROBLEMS IN FOREST POLICY**
(Cr ar) Irving, Merriam, Skok, Winsness, Hughes

Offered at Lake Itasca Forestry and Biological Station

Special Term for Forestry Students — August 27 to September 19

Required of all Forest Resources Development and Forest Science majors. Must be completed between sophomore and junior years. Trigonometry, a college course in botany or biology, and a college physics course are required for registration. The schedule is arranged to occupy the student's full time for 5½ days per week. Largely field or laboratory work. In addition to the regular field work in For 54 and 56, a special field trip to a federal, state, or private forestry operation is required of all students. All students must register for the following courses.

- 50 **IMPORTANT FOREST PLANTS**
Identification of forest plants as related to forest types. (2 cr) Scholten
- 54 **FOREST ECOLOGY**
Ecological principles. Silvical characteristics of tree and shrub species. Forest communities and environmental factors. The ecology of recreational areas. (3 cr) Sucoff
- 56 **FIELD FOREST MEASUREMENTS**
Introduction to and use of instruments in forest mensuration. (1 cr; prereq Math T) Hallgren

Home Economics (HE)

- 24B **HOME PLANNING AND FURNISHINGS EXPERIENCE I**
Problems in designing for living space needs. Experiences in evaluation of design quality of furnishing elements. Selection and coordination of fabrics, furniture, accessories in interior space laboratory. (3 cr; prereq 20, 21, 24A; II-III MTWThF; McNH 360)
- 58B **FIELD EXPERIENCES**
Supervised work-study program in display design and/or crafts. (3 cr; prereq completion of at least one-half of professional sequence and #; hrs and rm ar) Ar

86 HOME MANAGEMENT LABORATORY

(Students should not register for a first-period class) Residence for 5 weeks with direct experience in management and sharing of various activities and responsibilities involved in group living of the students in residence. (4 cr; limited to 12 students; prereq 85 or §§85...40, 41 recommended; deposit of \$10 required)

179 READINGS IN NUTRITION

Survey of literature in the field; oral and written reports. (2 cr; prereq 170, §; hrs and rm ar) Sirny

201 READINGS IN TEXTILES AND CLOTHING

Independent study—survey of literature in selected areas. Written reports. (1-3 cr; prereq 102, 115 or 116, §; III MF and ar; McNH 323) Davison

220 READINGS IN RELATED ART

Independent study and review of books and periodicals in selected areas of related art. Written reports. (1-3 cr; prereq §; hrs and rm ar) Esteros

295-296 HOME ECONOMICS PROBLEMS

Food, nutrition, textiles and clothing, family economics, related art. Independent study and written reports. (1-5 cr per qtr; prereq §; hrs and rm ar) Graduate faculty

Horticultural Science (Hort)

190-191-192 SPECIAL PROBLEMS

Written report based on library, laboratory, or field research. (1-4 cr per qtr; prereq §) Staff

251* ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING

Written report based on library, laboratory, or field research. (3-9 cr; prereq §) Staff

252* ADVANCED PROBLEMS IN PHYSIOLOGY OF HORTICULTURAL CROPS

Written report based on library, laboratory, or field research. (3-9 cr; prereq §) Staff

Plant Pathology (PIPa)

201* RESEARCH IN NEMATOLOGY

Taxonomy, or ecology, of plant parasitic and free-living terrestrial or aquatic nematodes. (Cr ar; prereq 101 or §) Kernkamp, MacDonald

203* RESEARCH IN PLANT PATHOLOGY

Special assignment of work in laboratory and field problems in pathological research. (Cr ar) Kernkamp, Christensen, Eide, French, King, Kommedahl, Wilcoxson, Calpouzos, MacDonald, Mirocha, Moore, Anderson, Kennedy, Rowell, Banttari

207* PROBLEMS IN MYCOLOGY

Research along lines such as taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; investigations of fungi involved in industrial or natural processes; morphology or physiology of special forms. (Cr ar; prereq 105, 106, 107) Christensen, Anderson, French

Plant Physiology (PIPh)

141 SURVEY OF PLANT PHYSIOLOGY

(Same as Bot 141) A critical study of the physiological processes which occur in living plants; emphasis on higher plants. Growth and development, energy relations, photosynthesis, and nitrogen metabolism. (3 cr, §Bot 141; prereq Biol 2 or 51, course in organic chemistry, physics; IV MTWThF; HSW 30) Ar

141A PLANT PHYSIOLOGY LABORATORY

(Same as Bot 141A) A laboratory course to accompany 141. (2 cr, §Bot 141A; limited to 16 students; prereq 141 or ¶141; VI-VIII TTh; BoG) Ar

Rhetoric (Rhet)

22 PUBLIC SPEAKING

A practical course in the fundamentals of speechmaking. Particular emphasis upon *organizing* the speech and *projecting* it to the audience. (3 cr; limited to 20 students; prereq satisfaction of freshman communication requirements; IV MTWThF; AgEng 307) Nichols

47 EFFICIENT READING

Designed for students, teachers, business or professional people of average reading ability wishing to improve speed, comprehension, and vocabulary. Techniques valuable in achieving or maintaining superior scholastic or professional status. 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. (3 cr; limited to 30 students) Horberg, Price

Sec 1, I MTWThF, ForH 115

Sec 2, II MTWThF, ForH 115

Sec 3, III MTWThF, ForH 115

Sec 4, IV MTWThF, ForH 115

51 EXPOSITION

Essays and articles, technical writing, application letters, review of English usage. (3 cr; limited to 25 students; prereq jr; II MTWThF; AgEng 307) McBride

Soil Science (Soil)

130* SPECIAL PROBLEMS IN SOILS

Research, readings, instruction. (1-5 cr per qtr [10 cr max]; prereq 18 or 19 or 119) Martin, Burson, Blake, Arneman, Rust, Farnham, Grava, Caldwell, MacGregor, Schmidt, Adams, Baker, Ham

202* RESEARCH PROBLEMS IN SOILS

Individual laboratory or field work on special problems in a phase of soils other than student's major thesis. Arrangements must be made in advance. (2-5 cr; hrs ar) Martin, Burson, Blake, Arneman, Rust, Farnham, Grava, Caldwell, MacGregor, Schmidt, Adams, Baker, Ham

College of Biological Sciences

Biochemistry (BioC)

298 GRADUATE SEMINAR

Reports on recent development in biochemistry and on research projects in the department. (1 cr; prereq Δ ; hrs ar) Staff

299 GRADUATE RESEARCH

Research problems in various fields in biochemistry represented by staff interests. (2-5 cr; prereq $\$$; hrs ar) Dagley, Gander, Henderson, Jenness, Kirkwood, Liener, Schultze, Glass, Warner, Anderson, Chapman, Klein, Lovrien

Biology (Biol)

2 GENERAL BIOLOGY

See section on 10-week courses, pages 142-148.

52 MICROBIOLOGY

(Same as MicB 153) Lectures and laboratory exercises in taxonomy, anatomy, physiology, biochemistry, and ecology of microbes, with emphasis on fundamental properties of bacteria, and a study of the major groups of bacteria and other protists. (4 cr, $\$$ MicB 153; prereq 2 or 49, OrCh 62; lect II MTWThF, Z 313; lab III-IV MTWTh, Mayo 205) Klein

Botany (Bot)††

141 SURVEY OF PLANT PHYSIOLOGY

(Same as PIPh 141) A critical study of the physiological processes which occur in living plants; emphasis on higher plants. Growth and development, energy relations, mineral nutrition, water relations, respiration, photosynthesis, and nitrogen metabolism. (3 cr, $\$$ PIPh 141; prereq Biol 2 or 51, course in organic chemistry, physics; IV MTWThF; HSW 30) Ar

141A PLANT PHYSIOLOGY LABORATORY

(Same as PIPh 141A) A laboratory course to accompany 141. (2 cr, $\$$ PIPh 141A; limited to 16 students; prereq 141 or $\|$ 141; VI-VIII TTh; BoG) Ar

299 RESEARCH PROBLEMS

(Cr ar; prereq $\$$) Staff

Zoology (Zool)††

99 INDIVIDUAL WORK IN SOME SPECIAL DISCIPLINE

(Cr ar; prereq Biol 2 or 50 and $\$$) Staff

101 BASIC ZOOLOGY

(Cr and hrs ar; prereq grad only) Staff

299 RESEARCH

(Cr ar)

†† For additional courses, see index for Biology Session.

Biology Session

Held at Lake Itasca Forestry and Biological Station

For general information on the Biology Session at Lake Itasca, see section on Schools, Colleges, and Special Programs, or write for Biology Session bulletin, Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Botany (Bot)

- 112 **AQUATIC FLOWERING PLANTS**
(5 cr; limited to 20 students; prereq 52 or equiv; MTh) Ownbey
- 117 **AGROSTOLOGY**
(5 cr; limited to 20 students; prereq 52 or equiv or #; offered only at Lake Itasca; WS) Moir
- 159 **LICHENS**
(5 cr; limited to 20 students; prereq 10 cr in botany or zoology; MTh) Hale
- 299* **RESEARCH PROBLEMS**
(Cr ar; prereq #) Staff

Ecology and Behavioral Biology (Ecol)

- 119 **AQUATIC ECOLOGY**
(5 cr; limited to 20 students; prereq 15 cr in biology; WS) Underhill
- 135 **ECOLOGY OF THE ITASCA REGION**
(5 cr; limited to 20 students; prereq Biol 80 or equiv; TF) Bray, Tester
- 162 **VERTEBRATE ECOLOGY**
(5 cr; limited to 20 students; prereq Biol 80 or equiv; WS) Tester, Siniff, Marshall
- 163 **QUANTITATIVE ECOLOGY**
(5 cr; limited to 15 students; prereq 9 cr in ecology; MTh) Bray, Siniff
- 299 **RESEARCH**
(Cr ar; prereq #) Staff

Entomology, Fisheries, and Wildlife (Ent)

- 129 **AQUATIC ENTOMOLOGY**
(5 cr; limited to 15 students; prereq 59 or 74 or equiv; MTh) Fremling
- 196* **SPECIAL PROBLEMS IN ENTOMOLOGY, FISHERIES, AND WILDLIFE**
(Cr ar; prereq #) Staff

Plant Pathology (PIPa)

- 156 **INTRODUCTORY MYCOLOGY**
(5 cr; limited to 15 students; prereq 9 cr in botany; WS) Cavaliere, French

- 160 AQUATIC FUNGI**
(5 cr; limited to 12 students; prereq 3 cr in mycology; TF) Johnson
- 207* PROBLEMS IN MYCOLOGY**
(Cr ar; prereq 107) Staff

Zoology (Zool)

- 72 NATURAL HISTORY OF INVERTEBRATES**
(5 cr; limited to 10 students; prereq Biol 2; TF) Gilbertson
- 115 ADVANCED NATURAL HISTORY OF INVERTEBRATES**
(5 cr; limited to 10 students; prereq 15 cr in zoology; TF) Gilbertson
- 299* GRADUATE RESEARCH**
(Cr ar; prereq #) Staff

School of Business Administration

For general information on the School of Business Administration, see section on Schools, Colleges, and Special Programs.

Accounting (Acct)

24 PRINCIPLES OF ACCOUNTING

Recording, reporting, and interpreting business events. Use of accounting as a tool of business management. (3 cr, §55A; prereq 3rd qtr fr)

Sec 1, I-II MWF, BlegH 220

Sec 2, III-IV, MWF, BlegH 125

25 PRINCIPLES OF ACCOUNTING

Continuation of Acct 24. (3 cr, §55B; prereq 24)

Sec 1, 8:00-9:15, MTWTh, BlegH 130, **CCTV**

Sec 2, 9:30-10:45, MTWTh, BlegH 130, **CCTV**

Sec 3, 11:00-12:15, MTWTh, BlegH 130, **CCTV**

26 PRINCIPLES OF ACCOUNTING

Third quarter of Acct 24-25-26. (See Acct 24) (3 cr, §55B; prereq 24)

Sec 1, I-II, TThF, BlegH 240

Sec 2, III-IV, TThF, BlegH 210

125 AUDITING PRINCIPLES AND PROCEDURES

Analysis of the audit function including both internal and external applications. Emphasis upon use of computer and statistics to assist in performance of the audit. (4 cr; prereq 103 or ¶103; III-IV MTWTh; BlegH 205)

305A SEMINAR IN ACCOUNTING THEORY: VALUATION AND PRINCIPLES

See section on 10-week courses, pages 142-148.

Business Finance (BFin)

56 FINANCE FUNDAMENTALS

Deals with the problems of acquiring, allocating, and managing funds within the firm. The following concepts of internal management are considered in depth: determining financial goals of the firm; analyzing and controlling fund flows through the firm; measuring the expected return on individual investment projects; selecting optimal "portfolios" of projects; determination of capital costs, and the way these costs vary with financing mix; and evaluating the performance of the firm and its components. (3 cr, §156; prereq Acct 26; II MTWThF; BlegH 140) Ar

57 FINANCIAL MANAGEMENT

Financial problems of business concerns presented in case materials. Applications of principles to such situations as budgeting, short- and long-term funds, needs and equity choices, mergers, and reorganization. (3 cr, §276; prereq 56 or Acct 105B; II MTWThF; BlegH 125) Ar

296A READINGS IN BUSINESS FINANCE

Readings useful to student's individual program and objectives but not available in regular course offerings. (3 cr; prereq consent of adviser and § in field covered) Ar

Industrial Relations (IR)

52 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

Introduction to current employment relationships; and economic approach and analysis. The application and conservation of human resources in employment, related social and economic problems. Labor marketing, collective bargaining, unions and employer associations, industrial unrest and conflict, employment and unemployment, wage problems. (3 cr, §152; prereq Econ 2 or equiv)

Sec 1, II MTWThF, BlegH 230, Zaidl

Sec 2, I MTWThF, BlegH 110, Fogel

72 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT

Personnel management and labor relations, the development and application of effective work-teams within firms and agencies. Overview of policy and practice in major manpower management functions of staffing, training, communications, motivation, compensation, and morale maintenance. (3 cr, §172; prereq Econ 2 or §; I MTWThF; BlegH 230) Weitzel

152 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

(See IR 52) (3 cr, §52; prereq Econ 2 or equiv or §; II MTWThF; BlegH 230) Zaidl

172 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT

(See IR 72) (3 cr, §72; prereq Econ 2 or §; I MTWThF; BlegH 230) Weitzel

182A INTERMEDIATE LABOR MARKETING

Advanced discussion and analysis of labor marketing concepts, structures, and processes. Examination of sources of information and different approaches to study, analysis, and resolution of problems in the labor market. (3 cr; prereq 52 or 152 or §; III-IV MWF; BlegH 150) Zaidl

272 GRADUATE TOPICS

Selected topics in industrial relations. (3 cr; prereq 152 or 172 or §; III-IV TTh; BlegH 150) Fogel

Insurance (Ins)

53 RISK MANAGEMENT AND INSURANCE

The nature and economic significance of risk. The recognition, measurement, and treatment of risk with particular emphasis upon insurable risks and insurance. Application of these concepts to the property, liability, and personnel risks faced by a business firm or by a family. The risk management function in business and its relationship to other business management functions. Public policy and risk management with special emphasis on the problem of the uncompensated automobile accident victim, social insurance, and government regulation of insurance. (3 cr, §153; prereq Econ 2 or equiv; I MTWThF; BlegH 155) Whitman

153 RISK MANAGEMENT AND INSURANCE

(See Ins 53) (3 cr, §53; prereq Econ 2 or equiv; I MTWThF; BlegH 155) Whitman

Management (Mgmt)

70 FUNDAMENTALS OF MANAGEMENT

Study of concepts, theory, research, and operational problems. Includes the principal functional areas of management. Examines provisions of necessary factors and relationships to achieve organizational objectives; establishment of goals, policies, procedures; organizational structure and behavior; leadership; control systems. (3 cr)

Sec 1, I MTWThF, BlegH 425, Dickson

Sec 2, II MTWThF, BlegH 425, Ar

80 PSYCHOLOGY IN MANAGEMENT

Centers on behavior principles and methods which underlie managerial competence in preventing and solving problems within and between individuals and groups and aid in effective utilization of human resources. Various laboratory methods are used to highlight concepts, methods, and skills. (3 cr; III MTWThF; BlegH 425) Ar

109 INTRODUCTION TO COMPUTER-ASSISTED MANAGEMENT

Provides an overview of the field of computer-assisted management (CAM) and for management information decision systems. The following topics are introduced: information systems, decision systems, interactive systems, communications systems, and the behavioral aspects of systems. Special emphasis is placed upon relating each of these topics to management practice and in drawing implications as to how this practice is likely to undergo modifications. (3 cr; prereq Econ 2 or equiv; II MTWThF; BlegH 205) Dickson

Marketing (Mktg)

57 PRINCIPLES OF MARKETING

The social, economic, legal, and other environmental aspects of marketing. Special emphasis on the changing environment and the resulting impact on marketing strategy and marketing policies including product development, pricing, marketing channels, and promotion. (3 cr, §157; prereq Econ 2 or equiv; III MTWThF; BlegH 250) Ar

75 SALES MANAGEMENT

Sales policies and planning, sales organization, selection, training, and compensation of salesmen, control of sales performance, sales budgets, and cost control. Case materials. (3 cr; prereq 57; II MTWThF; BlegH 135) Ar

77 ADVERTISING

A survey of economics and functions of advertising, budgets, agencies, media, copy, layout, printing process, and research. (3 cr; prereq 57; IV MTWThF; BlegH 255) Ar

98 SOCIAL PSYCHOLOGY OF BEHAVIOR

Presentation of the basic principles of social influence and research techniques used in the area. Particular emphasis is placed upon the experimental approach. (3 cr; prereq 57; IV MTWThF; BlegH 230) Ross

157 PRINCIPLES OF MARKETING

(See Mktg 57) (3 cr, §57; prereq Econ 2 or equiv; III MTWThF; BlegH 250) Ar

275 SALES MANAGEMENT

(See Mktg 75) (3 cr; prereq 57; II MTWThF; BlegH 135) Ar

277 ADVERTISING

(See Mktg 77) (3 cr; prereq 57; IV MTWThF; BlegH 255) Ar

298 SOCIAL PSYCHOLOGY OF BEHAVIOR

(See Mktg 98) (3 cr; prereq 57; IV MTWThF; BlegH 230) Ross

Quantitative Analysis (QA)

53 QUANTITATIVE METHODS FOR ADMINISTRATION II

Introduction to decision problems; simple static models; static models dominated by constraints; dynamic models; and simulation. (3 cr; prereq 52 and Econ 2 or §; I MTWTh, BlegH 150, CCTV; lab II MTWTh, BlegH 145) Chervany

62 BASIC COMPUTER SYSTEMS

See section on 10-week courses, pages 142-148.

158 QUANTITATIVE APPROACHES TO ADMINISTRATIVE PROBLEMS I

Uses of probability, statistics, mathematics, economic analysis, and operations research in the solution of business problems at administrative levels. (3 cr, §54; prereq 150, 151, 2 qtrs of economics; I MTWTh, BlegH 150, CCTV; lab II MTWTh, BlegH 210) Chervany

Transportation (Tran)

54 FUNDAMENTALS OF TRANSPORTATION

Organization and economic aspects of the transportation system of the United States including rail, highway, air, pipeline, and water transportation. The nature of the transportation function in business. Regulatory problems associated with transportation. Current transportation developments and problems. (3 cr, §154; prereq Econ 2 or equiv) Harper

Sec 1, III MTWThF, BlegH 140

Sec 2, IV MTWThF, BlegH 140

College of Education

For general information on the College of Education, see section on Schools, Colleges, and Special Programs.

Agricultural Education (AgEd)

170 INDEPENDENT STUDY

Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure. (1-3 cr; prereq sr or §; hrs and rm ar) Peterson, Marvin, Persons

221 FIELD PROBLEMS

Making investigations, gathering data, and formulating plans regarding agricultural education. (3 cr; hrs ar) Peterson, Marvin, Swanson, Persons

232* RESEARCH IN AGRICULTURAL EDUCATION

Selecting problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts. (Cr and hrs ar; prereq 15 cr in education) Peterson, Marvin, Swanson, Persons

Art Education (ArEd)

10C SURVEY OF ART ACTIVITIES

Introduction to pictorial expression, design, and the function of art in the social environment. (3 cr; each section limited to 30 students)

Sec 1, I-II MTWThF, WuH 240, Hiniker

Sec 2, III-IV MTWThF, WuH 240, Kain

18C EXPERIENCES WITH PICTORIAL EXPRESSION

Projects in invention, arrangement, and decoration; color, lettering, posters, bulletin board displays. (3 cr; limited to 35 students; III-IV MTWThF; WuH 220) Kumsha

80C CONTEMPORARY CRAFTS

Materials, equipment, design criteria, and techniques for textile, wood, metal, and ceramics. (3 cr; limited to 28 students; III-IV MTWThF; WuH 210) Kain

184 IMPROVING ART PROGRAMS IN THE ELEMENTARY SCHOOL

Evaluating research findings and introduction to new materials, developing cooperation between classroom teachers and art education specialists. (3 cr; limited to 30 students; prereq tchg exper or §; II MTWThF; WuH 110) Salome

295* PROBLEMS: ART EDUCATION

(Cr ar; prereq §) Salome

Institute of Child Development

Child Psychology (CPsy)

80 CHILD PSYCHOLOGY

Introduction to the science of child behavior; emphasis on a critical review of theories and research in child psychology. (3 cr; prereq Psy 2; II MTWThF; Arch 35) Siegel

- 100 PROCESSES OF SOCIALIZATION OF CHILDREN**
Processes of social learning; identification, imitation, reward and punishment, internalization, object choice. (3 cr; prereq 80 or grad; II MTWThF; Arch 10) Yonas
- 132 ADOLESCENT DEVELOPMENT**
Growth; mental, social, emotional, and personality development. (3 cr, §81; prereq sr, 12 cr in psychology, child psychology, or educational psychology; III MTWThF; Arch 10) Ar
- 140 BEHAVIOR PROBLEMS**
Types, origin, development, and treatment of behavior difficulties in normal children. (3 cr; prereq 80 or equiv; IV MTWThF; Arch 40) Ar
- 143 PROBLEMS OF MENTAL DEFICIENCY**
Diagnosis, care, training; social and vocational problems. (3 cr; prereq 80 or equiv; III MTWThF; Arch 130) J Turnure
- 144 PSYCHOLOGY OF THE GIFTED CHILD**
Psychology and development of high intellectual ability and of special talents. (3 cr; prereq 80; VI MWF; CD 218) Rubin
- 179 CLINICAL PROCEDURES WITH CHILDREN**
Survey of methods of clinical psychology; basic concepts and research problems in clinical work with children. (3 cr; primarily for students not majoring in clinical psychology; prereq 12 cr in psychology, educational psychology, sociology, or child psychology; I MTWThF; Bu 120) Gross
- 190 TOPICS: CHILD PSYCHOLOGY**
Independent reading or research. (Cr and hrs ar; prereq §) Templin, Masters, Sroufe

Educational Administration (EdAd)

- 101 PUBLIC SCHOOL ADMINISTRATION**
Organization, administration, and general support of public schools in state and local school districts. (3 cr; not open to EdAd majors; prereq sr, 9 cr in education; III MTWThF; Bu 125) Popper
- 128†† WORKSHOP: EDUCATIONAL ADMINISTRATION**
(Inter-agency Cooperation in the Solution of Educational Problems in Metropolitan Settings) A survey of nonschool agencies in metropolitan areas and an examination of the potential for their cooperation with school organizations in the solution of educational problems. (1-6 cr; prereq 201 and 202 or §; July 21-August 6; V-VII MTWThF; Bu 123) Mueller, Cross
- 139†† LABORATORY IN DECISION MAKING**
Section 1: Emphasizes decision making, recent research and theory related to everyday school problems, participants' self-evaluation as administrators, relation of human behavior to administration. Using the technique of "simulation" this laboratory places participants in the role of the secondary principal. During the workshop each person will make more than 110 decisions relative to operation of the simulated school. (1-4 cr; limited to 30 students; July 21-August 6; V-VII MTWThF; FraH B25) Nickerson
Section 2: Same as Section 1 except that this laboratory in decision making is for elementary principals. (1-4 cr; limited to 25 students; August 6-22; V-VII MTWThF; FraH B25) Cross
- 167 JUNIOR HIGH SCHOOL**
Sources of the movement; purposes, functions, and limitations; fundamental problems, types, and curricular implications of reorganization. (3 cr; prereq 9 or in education; IV MTWThF; Bu 125) Popper

†† Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

- 201 FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
Foundation for all students preparing for administrative positions in schools. Sources, meaning, and application of administrative theory, organizational structure, human relations, and leadership roles as they relate to the conduct of school organizations. (3 cr; I MTWThF; Bu 123) Alkire
- 202 FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
Foundation for all students preparing for administrative positions in school organizations. Aspects of federal, state, and local relationships as they relate to the coordination and operation of public elementary and secondary schools. (3 cr; III MTWThF; CD 105) Alkire
- 228* PROBLEMS: EDUCATIONAL ADMINISTRATION**
(1-3 cr; hrs ar) Hooker, Popper, Mueller, Nickerson, Cross, Sederberg
- 236 FIELD STUDY**
(0-10 cr; prereq #; hrs ar) Hooker, Popper, Lambert, Mueller, Nickerson, Cross, Sederberg
- 264 THE SECONDARY SCHOOL PRINCIPALSHIP**
The principal's role in the secondary school, his qualifications, duties, and problems, including current issues, and factors of staff and student relationships. (3 cr; II MTWThF; CD 218) Nickerson
- 270A* PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION**
(Cr and hrs ar; prereq #) Lambert, Alkire, Cross
- 270B* PROBLEMS: SECONDARY SCHOOL ADMINISTRATION**
(Cr and hrs ar; prereq #) Hooker, Popper, Mueller, Nickerson, Sederberg
- 274 THE JUNIOR COLLEGE**
Present status, development, functions, organization, curriculum, and trends. (3 cr; 12:30-2:40 MW; Bu 120) Wakefield

Educational Psychology (EPsy)

- 110 EDUCATIONAL MEASUREMENT IN THE CLASSROOM**
Principles and methods for construction, evaluation, and improvement of classroom instruction. (3 cr; each section limited to 35 students) Ar
Sec 1, III MTWThF, WuH 130
Sec 2, IV MTWThF, WuH 130
- 116 INTRODUCTORY STATISTICAL METHODS**
Basic statistical techniques; comprehension of literature using elementary statistical concepts and methods. This course is not equivalent to EPsy 216, 216A. (3 cr; each section limited to 45 students) Ar
Sec 1, III MTWThF, Bu 123
Sec 2, IV MTWThF, Bu 123
- 117 BASIC PRINCIPLES OF MEASUREMENT**
Principles underlying construction of achievement examinations; developments in educational and psychological measurement; theory and practice related to statistical methods; types and uses of derived scores; factors influencing reliability and validity. (3 cr; prereq 116 or 216 or Psy 70 or equiv; III MTWThF; WuH 230) Ar
- 133 INTRODUCTION TO GUIDANCE**
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. (3 cr; prereq 9 cr in education; II MTWThF; WuH 230) Tennyson
- 148 CLINICAL DIAGNOSIS OF READING DIFFICULTIES**
Relationship to psychological factors and clinical remedial correction. (3 cr; limited to 25 students; prereq EdCI 145; IV MTWThF; Pt 111) Roberts
- 150 CLINICAL PRACTICE IN REMEDIAL TEACHING**
Remedial tutoring of individual children who have difficulty in school learning. (3 cr; limited to 45 students; prereq EdCI 145 or 151 and #; I-II MTWThF; rm ar) Brown, Weis

159 PERSONALITY DEVELOPMENT AND MENTAL HYGIENE

Examines theory and research in personality development and mental functioning in the light of knowledge concerning the psychology of stress and the concept of mental health as constructive behavior in response to change and stress. (3 cr; each section limited to 40 students) Koff

Sec 1, III-IV MW, III F, FraH B1
Sec 2, III-IV TTh, IV F, FraH B1

161 DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY II

Survey, demonstration, and evaluation of special techniques for amelioration of deficits in perceptive, integrative, and expressive processes. (3 cr; limited to 30 students; prereq 160 and 160A or #; June 16-August 8; V-VI MTWTh; rm ar) Enfield

161A PRACTICUM: DIAGNOSIS AND REMEDIATION OF LEARNING DISABILITY II

Clinical practice in prescriptive teaching using a selective range of techniques presented in EPsy 161. (3 cr; limited to 30 students; prereq #161 or #; June 16-August 8; I-IV MTWThF; rm ar) Deno, Briggs, Enfield

182 EDUCATION OF EXCEPTIONAL CHILDREN

Introduction to field of special education for classroom teachers and other school personnel. (3 cr; III MTWThF; AH 150) Force

186 EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN

Discussion and evaluation of curricula, materials, and methods for instruction of disturbed and delinquent children in hospital, training school, and public school settings. (3 cr; prereq grad or #; II MTWThF; WuH 130) Wilderson

188 EDUCATION OF THE CULTURALLY DISADVANTAGED CHILD

Educational needs of children handicapped by behavior related to deficiencies of physical and/or cultural environment; adaptations of educational programs. (3 cr; prereq 12 cr in psychology, educational psychology, or sociology; II MTWThF; AH 150) Ar

190 EDUCATIONAL PROBLEMS OF THE NEUROLOGICALLY IMPAIRED

Problems in development, learning, and adjustment produced by neurological impairment; study and development of materials to meet educational needs; observations of teaching and personal conferences. (3 cr; prereq 182 or #; I MTWThF; CD 105) Force

193 PSYCHOLOGICAL ANALYSIS OF INSTRUCTION

Use of psychological concepts and principles in analysis of instructional problems and development of teaching strategies; consideration of behavior modification; behavioral objectives; task analysis. (3 cr; each section limited to 40 students) P Johnson

Sec 1, II MTWThF, Pt 111
Sec 2, IV MTWThF, WuH 230

208* METHODS IN EDUCATIONAL RESEARCH

Methods and techniques employed in investigation and report of educational problems. (3 cr; limited to 20 students; II MTWThF; CD 105) Hoyt

217 STATISTICAL METHODS

Foundations of statistical theory; practice in applying theories to solution of educational and psychological problems. (3 cr; prereq 216; I MTWThF; WuH 230) MacEachern

217A STATISTICAL METHODS LABORATORY

For students who wish more experience in solution of problems and use of machines than is obtained in EPsy 217. (2 cr; limited to 22 students; prereq #217; II-III TWTh; WuH 330) Proshek

218 STATISTICAL METHODS (Part II)

See section on 10-week courses, pages 142-148.

218A STATISTICAL METHODS LABORATORY (Part II)

See section on 10-week courses, pages 142-148.

226* COUNSELING THEORY AND PROCEDURE II

Dimensions of counseling relationship; dynamics of interviewing; distinction between psychotherapy and counseling; treatment of factors; counselor at-

SECOND TERM COURSES

- titude and personality; applications in different settings. (3 cr; prereq 225, 140 or ¶140; II MTWThF; Bu 125) Blocher
- 233° PROBLEMS: GUIDANCE AND PERSONNEL WORK**
Independent study. (1-9 cr; hrs ar) Blocher, Parker, Tennyson, A Anderson, Shaffer
- 236 GROUP COUNSELING: PRINCIPLES AND PROCEDURES**
Introduction to basic principles of group dynamics related to the group counseling process. For counselors and student personnel workers; emphasis on developing concepts, attitudes, and skills necessary for group counseling, including theory and laboratory experiences. (3 cr; prereq 133 or 250, and 125 or 225; VI-VII MWF; Bu 125) A Anderson
- 237 PRACTICUM IN GROUP COUNSELING (Part II)**
See section on 10-week courses, pages 142-148.
- 253° RESEARCH PROBLEMS**
(Cr and hrs ar; prereq ¶) Deno, Duker, Hoyt, Force, P Johnson, MacEachern, Neale, Wilderson, Bruininks
- 257 CLINICAL PRACTICE IN EDUCATIONAL DIAGNOSIS**
Supervised work with children referred to the Psycho-Educational Clinic for diagnosis of learning disabilities and school-related problems. Parent and child interviewing, testing, and preparation of case reports. (3 cr, §151; limited to 2 students; prereq 210 or equiv, EdCI 145, ¶; hrs ar; Pt 210) Briggs
- 283 COUNSELING PRACTICUM: INTERMEDIATE**
Individual assignments in counseling under supervision. (1-3 cr [total 6], §282B; limited to 12 students; prereq 282 and ¶; VI-VIII MTWThF; West High School) Parker, Shaffer
- 286 ADVANCED COURSE: EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN**
Techniques of behavior modification, analysis of teacher-pupil interaction in study of classroom groups, and classroom management strategies with disturbed and delinquent children. Current literature review; individual assignments. (3 cr; prereq ¶; I MTWThF; Bu 125) Wilderson
- 288 PRACTICUM: SPECIAL EDUCATION**
Supervised experience in supervision, administration or coordination, teaching and related work in schools, agencies, institutions, and other facilities for exceptional children. (3-9 cr; prereq ¶; hrs ar) Deno, Wilderson, Grismer
- 299 INTERNSHIP: SCHOOL PSYCHOLOGICAL SERVICES**
Advanced field experience; for doctoral candidates in School Psychology. (5-15 cr; prereq 287, ¶; hrs and rm ar) Duker

General Education

Business Education (BsEd)

- 131 ADVANCED TEACHING OF TECHNICAL BUSINESS SUBJECTS**
Recent research and trends. (3 cr, §EdCI 131; III MTWThF; PeikH 255) Hopkins
- 133 CONSUMER EDUCATION IN THE SCHOOLS**
Objectives, content, and curriculum organization at elementary and secondary levels. (3 cr, §EdCI 133; I MTWThF; PeikH 255) Hopkins
- 158 MATERIALS AND METHODS IN OFFICE AND STENOGRAPHIC PROCEDURES**
Recent research and developments in teaching office practice, clerical practice, and office machines. (3 cr, §EdCI 158; limited to 20 students; II MTWThF; PeikH 265) Price
- 237 SEMINAR: RESEARCH IN BUSINESS, DISTRIBUTIVE, AND ECONOMIC EDUCATION**
(No cr, §EdCI 237; prereq ¶; hrs ar) Price
- 239 PROBLEMS: BUSINESS EDUCATION**
(Cr ar, §EdCI 239; prereq ¶) Price

Curriculum and Instruction

EdCI (GENERAL)

- 100C†† WORKSHOP: EDUCABLE MENTALLY RETARDED PUPILS IN THE SECONDARY SCHOOLS**
Curriculum, research, and program trends; lectures, discussion, and independent study. (6 cr; limited to 25 students; prereq §; I-VIII MTWThF; rm ar) Bruininks
- 105 AUDIO-VISUAL MATERIALS IN EDUCATION**
(3 cr; prereq sr; I MTWTh and 2 hrs lab ar; NH 211) Pearson
- 106 COORDINATING AN AUDIO-VISUAL EDUCATION PROGRAM**
(3 cr; prereq 105 or §; III MTWThF; WeH 202) Pearson
- 108 NONPROJECTED AUDIO-VISUAL MATERIALS AND EQUIPMENT LABORATORY**
(3 cr; each section limited to 15 students; prereq 105 or §105; lect IV MTWThF; WeH 206) Alton Jensen
Sec 1, VI MW, WeH 206
Sec 2, VI TTh, WeH 206
- 145 READING DIFFICULTIES**
(3 cr; limited to 50 students; prereq 143A or 144; III MTWThF; Pt 214) Schreiner
- 170 PROGRAMS AND PROCEDURES OF CURRICULUM DEVELOPMENT**
Leadership in procedures; operational processes; major considerations in planning and organizing; interpersonal relationships; and evaluation of improvement programs. (3 cr, §170A-B; prereq 113 or 119; III MTWThF; PeikH 325) Kimpston
- 173 PREPARATION OF CURRICULUM MATERIALS**
Selecting and organizing units, courses of study, curriculum guides, and writing materials individually and in groups. (3 cr, §173A-B; prereq 113 or 119; II MTWThF; PeikH 325) Kimpston
- 201* PROBLEMS: TEACHING SOCIAL STUDIES**
Individual research. (Cr and hrs ar; prereq 102 or 155 or 168, 204 or §) Gardner, Ellis, Ryan
- 205* PROBLEMS: AUDIO-VISUAL EDUCATION**
(Cr and hrs ar; prereq §) Pearson
- 207* PROBLEMS: RADIO-TELEVISION EDUCATION**
(1-3 cr; prereq 107; hrs ar) Pearson
- 271* PROBLEMS: CURRICULUM CONSTRUCTION**
(Cr and hrs ar; prereq §) Gardner, Gennaro, Hill
- 273* PROBLEMS: READING**
(Cr and hrs ar; prereq 143A or 144 or §) Odland, Dykstra, Schreiner
- 296* PROBLEMS: TEACHING ENGLISH**
(Cr and hrs ar) Dykstra, Piché

EdCI (ELEMENTARY EDUCATION)

- 57 NURSERY SCHOOL-KINDERGARTEN CURRICULUM II**
This course is the second part of the kindergarten endorsement program which satisfies the kindergarten certification requirements. (3 cr; limited to 40 students; prereq 56; II MTWThF; Pt 102) H Hansen
- 60 TEACHING READING IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A; II MTWThF; Pt 110) Ar
- 61 TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A; I MTWThF; Pt 214) Ellis

†† Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate program.

- 62 TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, Math 5A-B; I MTWThF; Pt 111) Jackson
- 63 CHILDREN'S LITERATURE**
(3 cr; limited to 40 students; III MTWThF; Bu 120) Biesbrock
- 64 TEACHING ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, Engl 60; IV MTWThF; Pt 110) Dykstra
- 65 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 40 students; prereq Ed 75A, 10 cr in natural sciences; III MTWThF; Pt 102) R Johnson
- 102 TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
The class is planned for graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should register for EdCl 61. (3 cr; limited to 40 students; prereq Ed 75B or elem tchg exper; II MTWThF; Pt 214) Ellis
- 103 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
The class is planned for graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should register for EdCl 65. (3 cr; limited to 48 students; prereq Ed 75B or elem tchg exper; I MTWThF; Pt 102) R Johnson
- 119 ELEMENTARY SCHOOL CURRICULUM**
(3 cr; limited to 50 students; prereq Ed 75B or equiv; II MTWThF; Bu 123) Goossen
- 121 LITERATURE FOR THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; II MTWThF; Bu 120) Biesbrock
- 143A TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOL**
The class is planned for graduate students and for summer students who already hold a Bachelor's degree in elementary education. Undergraduate students should register for EdCl 60. (3 cr; limited to 50 students; prereq 9 cr in education; I MTWThF; Bu 123) Schreiner
- 153 TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq 64 or elem school tchg exper; III MTWThF; Pt 110) Dykstra
- 155A MATERIALS LABORATORY FOR ELEMENTARY SOCIAL STUDIES TEACHERS**
Printed, audio-visual, and other materials; investigation and evaluation of teaching materials and devices. (3 cr, \$155; limited to 25 students; prereq 61 or 102 or §; IV MTWThF; Pt 214) Ryan
- 166 CURRENT TRENDS, KINDERGARTEN EDUCATION**
Continuing needs of children in our changing culture; current practices and recent research; NOT intended for kindergarten certification requirements. (3 cr; limited to 35 students; prereq tchg exper kindergarten or nursery school or §; I MTWThF; Pt 110) H Hansen
- 213* RESEARCH FOUNDATIONS OF ELEMENTARY SCHOOL SCIENCE TEACHING**
Implications for improvement of instruction in science in elementary schools. (3 cr; limited to 30 students; prereq 103 or §; IV MTWThF; Pt 102) Goossen
- 261* PROBLEMS: IMPROVEMENT OF INSTRUCTION**
(Cr and hrs ar; prereq §) Goossen, Odland, Dykstra, Jackson, Lambert, Biesbrock, Ellis, H Hansen, R Johnson, Ryan, Schreiner

EdCl (SECONDARY EDUCATION)

- 51 DISTRIBUTIVE OCCUPATIONAL EXPERIENCE**
Observation and practice in distributive businesses combined with weekly seminars on application to the teaching and guidance of high school and post-high school students. (3-9 cr; prereq jr, sr, dist ed majors only, §) Klaurens

- 101A†† DRIVER EDUCATION I**
Materials and methods of driver education; building a plan for driver education for a specific school; behind-the-wheel training. Valid Minnesota driver license required. (4 cr, §101; limited to 32 students; prereq Δ; 1:00-2:20 MTWThF; Bu 123) Ar
- 101B†† DRIVER EDUCATION II**
(4 cr; limited to 32 students; prereq 101 or 101A and Δ; 2:30-3:50 MTWThF; Bu 123) Ar
- 112 FAMILY LIFE EDUCATION**
Sources and types of materials available; techniques; preparation and evaluation of instructional materials. (3 cr; limited to 30 students; III MTWThF; BlegH 115) Hey
- 113 PRINCIPLES OF SECONDARY SCHOOL CURRICULUM**
Fundamental principles; curricular concepts, special services, student activity programs, instructional instruments, administrative systems and future trends. (3 cr; prereq Ed 55B or equiv; III MTWThF; PeikH 155) Hill
- 122A TEACHING LITERATURE IN SECONDARY SCHOOLS**
(3 cr; limited to 45 students; prereq Ed 55B or jr-sr high school tchg exper; I MTWThF; PeikH 155) Kemp
- 122B TEACHING RHETORIC AND COMPOSITION IN SECONDARY SCHOOLS**
(3 cr; limited to 30 students; III MTWThF; CD 218) Kemp
- 129 TRENDS AND ISSUES IN SECONDARY CURRICULUM**
(3 cr; prereq 113 or equiv; IV MTWThF; PeikH 325) Hill
- 168 CURRENT DEVELOPMENTS IN THE SOCIAL STUDIES**
Contemporary literature, curricular trends, developments in methods. (3 cr; prereq grad or §; II MTWThF; PeikH 215) F Johnson
- 190 CURRENT DEVELOPMENTS IN SECONDARY SCHOOL SCIENCE TEACHING**
(3 cr; prereq EdT 68B-C or 68M, equiv undergrad courses or science tchg exper; II MTWThF; PeikH 385) Gennaro
- 193B METHODS AND MATERIALS FOR TEACHING BIOLOGICAL SCIENCES**
Individualized instruction in laboratory techniques and equipment with application to classroom use. (3 cr; limited to 20 students; prereq EdT 68C or 68M or equiv; III TTh and lab ar MWF; PeikH 385) Gennaro
- 195B SOURCES FOR CURRICULUM DEVELOPMENT IN ENGLISH AND SPEECH**
Implications from anthropology, sociology, psychology, rhetoric, dialectology and dialect geography, mathematical linguistics, logic and semantics. (3 cr; prereq 195A or §; IV MTWThF; PeikH 215) Kegler, Piché, Kemp
- 225* PROBLEMS: SECONDARY SCHOOL SUPERVISION**
An individual problems course on improvement of instruction. (Cr ar; prereq §) Hill
- 295 READINGS IN ENGLISH AND MODERN LANGUAGE EDUCATION**
(1-3 cr; hrs and rm ar) Piché
- EdCI (HIGHER EDUCATION)**
- 228*‡‡ WORKSHOP: PROBLEMS OF TEACHER EDUCATION**
(6 cr; July 21 to August 15; hrs and rm ar MTWThF) Mork, McCune, Woestehoff, and consultants
- 250 HIGHER EDUCATION IN THE UNITED STATES**
Development, present status, and outlook for American colleges; purposes; current and projected programs; trends in curriculum instruction and administration; evaluation of outcomes. (3 cr; limited to 30 students; prereq yr of grad study in any field or 18 cr in education; 1:15-3:30 TTh; Pt 102) Eckert

†† Advance application required; for information write to Dean's Office, College of Education, 204 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

‡‡ Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

251 CURRICULUM TRENDS IN AMERICAN COLLEGES

Principles in development of college programs; examination of current curricula in liberal arts and professional fields; general education courses and sequences. (3 cr; prereq yr of grad study in any field or 18 cr in education; I MTWThF; WuH 130) Moen

254 DIRECTED EXPERIENCE IN COLLEGE INSTRUCTION

Individualized program under guidance of an instructor or department; understandings, procedures, and skills related to application of instructional theory, curriculum development, and evaluation practices. (Cr and hrs ar; prereq #; may also count toward grad major in sociology) Neale

Distributive Education (DE)

139 COORDINATION TECHNIQUES

Problems of coordinators in the cooperative part-time program; guidance and selection; placing students in work stations, assisting job adjustments, developing the training program. (3 cr, §EdCl 139; limited to 30 students; II MTWThF; PeikH 275) Klaurens

141 COOPERATIVE OCCUPATIONAL EDUCATION PROGRAMS

Planning, organizing, curriculum building, plant and equipment, promoting and evaluating cooperative part-time distributive, office, miscellaneous trades, and diversified occupations programs. (3 cr, §EdCl 141; limited to 30 students; III MTWThF; PeikH 275) Klaurens

159 MATERIALS LABORATORY, SECONDARY SCHOOL DISTRIBUTIVE EDUCATION

Development of specific related vocational materials for distributive occupations, cooperative part-time classes. (3 cr, §EdCl 159; limited to 20 students; prereq 137A or DE 90C or #; July 21-August 6; 1:00 to 4:00 p.m.; PeikH 275) Goodenough

238 PROBLEMS: DISTRIBUTIVE EDUCATION

Individual research. (Cr ar, §EdCl 238; prereq #) Klaurens

Education (Ed)

55B INTRODUCTION TO SECONDARY SCHOOL TEACHING

Open only to students accepted for a regular degree program in the College of Education. (5 cr; each section limited to 30 students; prereq Psy 2) Ar

Sec 1, I-II MTWThF, Aero 211

Sec 2, I-II MTWThF, Aero 215

Sec 3, I-II MTWThF, Aero 313

Sec 4, III-IV MTWThF, Aero 313

Sec 5, III-IV MTWThF, Aero 317

History and Philosophy of Education (HEd)

90 THE SCHOOL AND SOCIETY

(3 cr; each section limited to 75 students; prereq sr)

Sec 1, I MTWThF, Arch 10, Harkins

Sec 2, II MTWThF, A 116, Landsverk

141 CRITICAL ISSUES IN CONTEMPORARY EDUCATION

Introduces graduate students to ideas involved in current theory and practice. (3 cr; II MTWThF; PeikH 155) Barton

182 COMPARATIVE PHILOSOPHIES OF EDUCATION

Examination of competing philosophies of education. (3 cr; IV MTWThF; PeikH 155) Barton

241* PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION

For graduate students interested in research and work in these areas. (Cr and hrs ar; prereq #) Barton, Harkins

Mathematics Education (MhE)

145 MATHEMATICS FOR GIFTED CHILDREN

Curriculum and methods of instruction for academically talented children; development of enrichment units; source material for teachers. (3 cr, §EdCI 165A; limited to 48 students; prereq 111 or EdCI 62 or §; III MTWThF; Pt 111) David C Johnson

166 COMPUTER-ASSISTED MATHEMATICS INSTRUCTION

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. (3 cr, §EdCI 230; limited to 20 students; prereq 112 or EdT 67 or §; IV-V MWTh, PeikH 315) David C Johnson

202* RESEARCH IN SECONDARY SCHOOL MATHEMATICS EDUCATION

(3 cr; hrs ar) David C Johnson

280* PROBLEMS: MATHEMATICS EDUCATION

(Cr and hrs ar) Jackson, David C Johnson

Home Economics Education (HEEd)

60 CURRICULUM IN HOME ECONOMICS EDUCATION

Selection and organization of content of curriculum at secondary level. (3 cr; prereq 49, Soc 1 or 1A, Ed 55B or ¶Ed 55B; VI MTWThF; McNH 102) Wantoch

190 READINGS IN HOME ECONOMICS EDUCATION

Independent study under tutorial guidance. (1-3 cr; prereq §; hrs and rm ar) Brown, Ford, Whiteford, Newkirk

201* PROBLEMS: HOME ECONOMICS EDUCATION

Independent study of current educational problems. (1-9 cr, §293; prereq 200A and §; hrs ar) Brown, Ford, Whiteford, Newkirk

Industrial Education (Ind)

100 INDUSTRIAL INSTRUCTION

Concepts and techniques of instruction in industrial arts, trade and industrial schools and classes, and training-within-industry programs. (3 cr; prereq 40, Ed 55B or §; I MTWThF; PeikH 65) Miletich

106 INDUSTRIAL EDUCATION WORKSHOP: PRE-SERVICE CLINIC FOR VOCATIONAL EDUCATION TEACHERS

The clinic program will involve the participant in a high intensity, interrelated series of activities aimed at establishing foundation concepts and skills in course organization, lesson planning, presentation techniques, and evaluation. (3 or 6 cr; each section limited to 12 students; prereq tchg exper or §) Randleman

Sec 1, July 21-August 5, I-VII MTWThF, PeikH 60

Sec 2, August 6-22, I-VII MTWThF, PeikH 60

110 VOCATIONAL GUIDANCE

History of educational and vocational guidance movement; typical public school means and methods; types and uses of occupational information; duties of the counselor, organization and relationships. (3 cr; prereq Ed 55B; II MTWThF; PeikH 65) Nelson

135 INDUSTRIAL COURSE CONSTRUCTION

Principles and techniques; experience in planning, organizing, and building a teaching guide. (3 cr, §40; III MTWThF; PeikH 65) Miletich

200* RESEARCH PROBLEMS

Independent work for the degrees, master of arts, Plan B; and master of education, Plan Y. Individual conferences. (3, 6, or 9 cr; prereq approval of candidacy for Master's degree; hrs ar MTWThF; PeikH 125) Nelson

Methods and Student Teaching (EdT)

- 50 JUNIOR PRACTICUM IN SPECIAL EDUCATION**
Supervised observation and participation in classroom and related school activities for exceptional children. A pre-student teaching exploratory experience. (3 cr; prereq #: hrs ar) Reynolds, Grismer
- 53A TEACHING HANDICAPPED CHILDREN**
Observing work with special classes; teaching under direction. (3 cr; prereq #: hrs ar) Reynolds, Grismer

Music Education (MuEd)

- 56 TEACHING MUSIC IN THE ELEMENTARY SCHOOL**
For nonmusic majors. Methods and materials in teaching singing, rhythm, music reading, creativity, classroom instruments, fundamentals, appreciation in K-6. (3 cr; each section limited to 25 students; prereq Mus 4 or exemption)
- Sec 1, II MTWThF, ScH 4, Larsen
Sec 2, III MTWThF, ScH 4, Larsen
Sec 3, IV MTWThF, ScH 4, Steen
- 101 PHILOSOPHIES OF MUSIC EDUCATION**
Analysis and interpretation of philosophies in music and education; objectives, trends, curriculum, evaluation. (3 cr; II MTWThF; ScH 104) Borg
- 113 BIBLIOGRAPHY**
Sources, materials, and techniques. (3 cr; I MTWThF; ScH 104) Turrentine
- 114 READING AND STYLISTIC INTERPRETATION OF CHORAL MUSIC**
Defining means of teaching choristers to read and interpret music of representative periods and styles of compositions. (3 cr; prereq 104 or #: III MTWThF; ScH 104) Caswell
- 125 SELECTION, INSTRUMENTAL MUSIC MATERIALS**
Analytical survey of wind instrument literature from the 18th century to the present and a comparative analysis of transcriptions for modern band. (3 cr; prereq sr; III MTWThF; ScH 3) Turrentine
- 224* RESEARCH PROBLEMS**
(3-9 cr; prereq knowledge of elementary statistics; hrs ar; ScH 214) Caswell, Borg, Turrentine

Physical Education

For Special Fees, see page 26.

Physical Education for Men (PEM, PEMP, PE)

ACTIVITY COURSES (PEM)

- 27A†† PHYSICAL EDUCATION FOR FAMILY LIVING**
(Co-ed, see PEW 27A) (1 cr; limited to 24 students; III MTWTh; CH 214) Torpey
- 29B†† GOLF**
(1 cr; each section limited to 24 students) Bolstad
- Sec 1, 12:30-1:45 MW, Golf Course
Sec 2, 12:30-1:45 TTh, Golf Course

†† Health Service approval must be secured for participation in this course.

- 36A†† **TENNIS**
(Co-ed, see PEW 36A) (1 cr; limited to 24 students; 12:30-1:45 TTh; CH 214)
Joseph Marshall

PROFESSIONAL COURSES OPEN TO MEN ONLY (PEMP)

- 82 **FOOTBALL COACHING**
Techniques and orientation, strategy, generalship, styles of offense and defense, methods of organizing practices and handling players. (2 cr, §67; pre-req 11 or §; V MTWThF; CH 215) Crawford
- 99 **INDEPENDENT STUDY**
Self-directed study preceded by classroom study and possession of basic competence. (1-9 cr; prereq Δ; hrs ar) Bird

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)

- 51 **MECHANICS OF MOVEMENT**
(See PE 51)
- 100 **TEACHING ELEMENTARY SCHOOL PHYSICAL EDUCATION**
Principles, techniques, and procedures in developing basic motor skills, physical fitness, and sports skills. (3 cr; prereq tchg certif or §; I MTWThF; CH 215) Torpey
- 118E **PROBLEMS**
Focus on teaching of physical education. (Cr and hrs ar; prereq MEd candidate, §) Richardson, Torpey
- 124 **SUPERVISION OF SCHOOL HEALTH AND PHYSICAL EDUCATION**
(See PE 124)
- 135 **TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION**
(See PE 135)
- 137 **READINGS: PHYSICAL EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq grad, §; hrs ar) Richardson, Torpey
- 140 **ANALYSIS OF MOVEMENT IN GYMNASTICS**
Scientific principles of body mechanics and training relating to teaching, analysis, and development of advanced performance techniques. (3 cr; pre-req 51, PEMP 84 or PEWP 57 or §; III MTWThF; CH 215) Bird
- 224B* **RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or §) Richardson

Physical Education for Women (PEW, PEWP, PE)

ACTIVITY COURSES (PEW)

- 13A†† **POSTURE AND INDIVIDUAL EXERCISE**
(1 cr; limited to 24 students; II MTWTh; NGW 153-153A) Lampe
- 27A†† **PHYSICAL EDUCATION FOR FAMILY LIVING**
(Co-ed, see PEM 27A)
- 36A†† **TENNIS**
(Co-ed, see PEM 36A)

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PEWP)

- 45†† **PHYSICAL EDUCATION ACTIVITIES FOR THE ELEMENTARY SCHOOL**
Laboratory course for PEW 70. Experience with graded activities; problems of organization and teaching progression considered. (2 cr; limited to 30 students; prereq soph; III MTWThF; NGW 153-153A) Lampe

†† Health Service approval must be secured for participation in this course.

- 70 TEACHING HEALTH, PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL**
Methods of instruction in health and physical education for the elementary education major. (3 cr, §H1th 70; limited to 45 students; II MTWThF; NGW 201) Plack

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)

- 51 MECHANICS OF MOVEMENT**
Structures of the body, principles, and mechanics of bodily movements. (3 cr; prereq Anat 27; III MTWThF; NGW 3) Stoner
- 100 TEACHING ELEMENTARY SCHOOL PHYSICAL EDUCATION**
(See PE 100)
- 118E PROBLEMS**
Focus on teaching of physical education. (Cr and hrs ar; prereq MEd candidate, §) Slocum, Stoner
- 124 SUPERVISION OF SCHOOL HEALTH AND PHYSICAL EDUCATION**
Functions, adaptations of accepted procedures for observation, guidance, and training of teachers. (3 cr, §H1th 124; prereq §; II MTWThF; NGW 4) Slocum
- 128E INTEGRATING PAPER**
(3 cr, §H1th 128E) Slocum
- 135 TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION**
Place and limitations of measurement; construction and interpretation of evaluative procedures. (3 cr; prereq grad or MEd, §; V MTWThF; NGW 3) Stoner
- 137 READINGS: PHYSICAL EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq sr honor, grad, §; hrs ar) Slocum
- 140 ANALYSIS OF MOVEMENT IN GYMNASTICS**
(See PE 140)
- 224B* RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or §) Slocum

Recreation and Park Administration (Rec)

- 90 FIELD EXPERIENCE**
(3-9 cr [9 cr req for majors, 3 cr req for minors], §84-85; prereq sr, recreation major or minor; hrs ar) Ostrander, Scott
- 118E PROBLEMS**
Focus on conduct of recreation programs. (Cr and hrs ar; prereq MEd candidate, §) Ostrander, Scott
- 137 READINGS: RECREATION**
Independent study under tutorial guidance. (1-3 cr; prereq §; hrs ar) Ostrander, Scott
- 151 SCHOOL RECREATION**
Principles of organizing and conducting school-sponsored recreation programs. (3 cr; III MTWThF; CH 206) Cheatham
- 224A* RESEARCH PROBLEMS**
Designing, reporting on individual problems; required of all M.A. and Ph.D. candidates. (3 cr; prereq 136, EPsy 116 or §; hrs ar) Anderson
- 224B* RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or §) Anderson
- 250 PRACTICUM: COLLEGE UNIONS**
Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Ostrander
- 251 PRACTICUM: THERAPEUTIC RECREATION**
Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Scott

252 PRACTICUM: PUBLIC RECREATION AND PARKS

Supervised experiences in program operation; administrative and supervisory duties. (3-9 cr; prereq 12 grad cr in recreation; hrs ar) Ostrander

School Health Education (Hlth)

70 TEACHING HEALTH, PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL

Methods of instruction in health and physical education for the elementary education major. (3 cr, §PEWP 70; limited to 45 students; II MTWThF; NGW 201) Plack

117B ADVANCED INSTRUCTION IN SCHOOL HEALTH FOR SECONDARY SCHOOLS

Instructional and individual problems. (3 cr; prereq 83 or §; IV MTWThF; NGW 3) Slocum

118E PROBLEMS

Focus on teaching of school health education. (Cr and hrs ar; prereq MEd candidate, §) Slocum

124 SUPERVISION OF SCHOOL HEALTH AND PHYSICAL EDUCATION

Functions; adaptations of accepted procedures for observation, guidance, and training of teachers. (3 cr, §PE 124; prereq §; II MTWThF; NGW 4) Slocum

128E INTEGRATING PAPER

(3 cr, §PE 128E) Slocum

137 READINGS: HEALTH EDUCATION

Independent study under tutorial guidance. (1-3 cr; prereq sr honor, grad, §; hrs ar) Slocum

224B* RESEARCH PROBLEMS

Individual problems. (Cr and hrs ar; prereq 224A or §) Slocum

General College

3A HOME LIFE: MARRIAGE AND FAMILY LIVING

The particular values of family life for the individual and for society are traced by study of biological, psychological, and sociological foundation of the family. Study is made of adjustment and human relationships in the student's present and future home life, preparation for marriage, factors associated with success or failure in marriage, problems of parenthood, and problems of old age. (3 cr; III MTWThF; NH 213) W Anderson

5D MAN'S RELIGIOUS BELIEFS

The student investigates the religious beliefs most influential in the world today, compares selections from the writings representing different religious beliefs, and develops an understanding of world religions. (3 cr; IV MTWThF; NH 213) Zanoni

9A STATISTICS

This introduction to modern statistics emphasizes problem solving through statistical decision making. Topics include organization and presentation of data, summary statistics, sampling, probability, distributions, simple estimation, and tests of hypotheses. The data presented acquaint the student with the wide applicability of statistics. The course requires only a working knowledge of arithmetic skills. (5 cr; I-II MTWThF; NH 207) McCutcheon

10B THE HUMAN BODY: STRUCTURE, FUNCTION, HEALTH

Problems of physical, mental, and social health are related to the structure, function, and needs of the human body. The anatomy and physiology of the systems which constitute the human organism are studied, e.g., the heart—what it is, how it works, importance of body function, what can go wrong with it, what is known about keeping it on the job. (5 cr; III-IV MTWThF; SciCB 175) Jefferson

19A PROBLEMS OF BUSINESS TRANSACTIONS

Using no mathematical skills beyond arithmetic, the class studies the methods used to solve problems connected with taxes, pricing and profits, simple interest and discount, compound interest, and the most common annuities. Through the study of practical business problems, the student develops both the mathematical skills used in financial calculations and the understanding necessary to make sound decisions on financial matters. (3 cr; III MTWThF; NH 207) Roger Larson

20A PRACTICAL LAW

Covers a study of courts and court procedure; contracts; law of sales of goods under the Uniform Sales Act; nature and classification of real estate; deeds and conveyances; Torrens titles; tenancy; wills; insurance. (3 cr; IV MTWThF; NH 207) Hower

23B INTRODUCTION TO COMMERCIAL ART

Emphasis is placed on the processes of design, lettering, graphic expression, and commercial processes which are fundamental to commercial art. Student should have some previous art experience before entering the course or may get special permission from the instructor for admission. (3 cr; III-IV MTWThF; NH 102) Gates

29A WORLD LITERATURE I

Seeks to integrate life and literature and to relate the student's experience to certain universal themes concerning personal relationships and spiritual values of mankind. Readings are in both ancient and modern Oriental and Western literature. (3 cr; II MTWThF; NH 216) Kivits

30A READING AND VOCABULARY DEVELOPMENT

Reading films, slides, programmed learning texts, and reading and vocabulary exercises help the student enlarge his vocabulary, increase his reading speed, and expand his comprehension. Reading material varies from the level of the popular magazine to the college textbook. (3 cr; I MTWThF; NH 216) Sartain

31B WRITING LABORATORY: ORGANIZING IDEAS

The student learns how to organize ideas in expository writing and how to read at the level of comprehension required in university courses. From textbook materials the student learns to detect central ideas and supporting details and to utilize such patterns of organization in his own factual writing. He writes summaries, outlines, and various pieces of explanatory writing. (3 cr)

Sec 1, I-II MTWTh, NH 209, Draxten
Sec 2, III-IV MTWTh, NH 209, Kurak

32A ORAL COMMUNICATION: BASIC PRINCIPLES

An introduction to the basic principles of speech. By means of such assignments as an introduction, a demonstration, an argument, and a group discussion, the student is given an opportunity to apply these principles. He is helped to develop confidence in himself, to express his ideas clearly and effectively, and to listen critically. (3 cr; III MTWThF; NH 107) Amram

38A GENERAL GEOGRAPHY

Topics covered are selected from the following units: the philosophy and tools of the geographer, the Twin Cities, Minnesota, a comparison of the U.S.S.R. with the U.S., Japan, and a summary of world geography. Each is approached in terms of man's culture, the physical environment, and problems man faces in making a living. (5 cr; I-II MTWThF; NH 213) Steinhauer

44B CURRENT HISTORY

Analysis of current problem areas of the world (such as Latin America, Southeast Asia, Africa, the Soviet Union) or of domestic topics (such as national and state elections, labor-management disputes) forms the material for this course. The sharpening of the student's alertness to news media and of his ability to make critical judgments of current events is another purpose. (3 cr; IV MTWThF; NH 216) Matsumoto

46D PROBLEMS OF INTERNATIONAL RELATIONS

Some of the basic problems of international relations — war, conflict of ideologies, developing nations, international trade, and international law and organizations — are considered. Authorities on international relations differ in their systems of analysis. Therefore, the student learns and applies several of the more important analytical systems to the problems and thus develops a more mature approach of his own. (3 cr; III MTWThF; NH 216) Fred Johnson

College of Liberal Arts

American Studies (AmSt)

(See section on Special Programs)

HUM 21 AMERICAN LIFE I

Individualism in American life and thought. (3 cr; I MTWThF; ForH 285)

251 INDEPENDENT READINGS IN AMERICAN CIVILIZATION

(Cr ar; prereq consent of program chairman) Staff

Anthropology (Anth)

1A INTRODUCTION TO ANTHROPOLOGY: PREHISTORIC MAN AND CULTURE

The origins of man and the development of modern races. The growth and differentiation of the cultures of man from the Dawn Stone Age to early glacial times through the Old and New Stone Ages to the dawn of civilization in the Bronze and Iron Ages. (3 cr; I MTWThF; ForH 155) Adams

90 ARCHAEOLOGY OF NORTH AMERICA

Survey of prehistoric archaeology of North America north of Mexico. Emphasis of analysis of techniques, methods, and goals of prehistoric archaeology. (3 cr; prereq 1A or 101; III MTWThF; ForH 55) Adams

100 PRINCIPLES OF CULTURAL ANTHROPOLOGY

Intensive introduction to the elements of cultural anthropology. Analysis of primitive societies with respect to range and variability of human behavior. Principles of culture dynamics. (3 cr, §2A; may be taken in lieu of 2A; I MTWThF; ForH 55) Gerlach

120 PEOPLES AND CULTURES OF AFRICA

Survey: races, languages, and cultures of Africa, south of Sahara. Peoples representative of each culture area studied with special attention to social organization, economic and political systems, and adjustment of modern conditions. (3 cr; prereq 2A or 100; III MTWThF; ForH 155) Gerlach

140 FIELD RESEARCH IN ARCHAEOLOGY

Archaeological field excavation, survey, and research in the excavation of various prehistoric sites in the state of Minnesota. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials. (6 cr [may be taken for cr only once]; limited to 20 students; prereq 90 and Δ) Johnson

190, 191, 192 DIRECTED RESEARCH

(Cr and hrs ar; prereq sr, Δ) Staff

295, 296, 297 ADVANCED RESEARCH

(Cr and hrs ar; prereq sr, Δ) Staff

Art History (ArH)

1 PRINCIPLES OF ART

Lecture course on basic problems of art. Examples from the painting, sculpture, and architecture of various periods will be used to illustrate general cultural factors that influence the production of art as well as basic problems of design and of technique. (3 cr, §50; II MTWThF; Arch 25) Haworth

47 INTRODUCTION TO FAR EASTERN ART

Selected major themes within broad context of Indian and Far Eastern art. Introduction to arts of Eastern world but not an inclusive historical survey. (3 cr; V MTWThF; J 207B) Poor

50 INTRODUCTION TO THE VISUAL ARTS

Similar to ArtH 1 in organization and basic content. Expanded program of reading and more extensive contact with works of art. (3 cr, §1; II MTWThF; Arch 25) Haworth

103 MEDIEVAL ART

Early Christian and Byzantine architecture, sculpture, painting, and selected minor arts; including Russia and other Orthodox Christian countries to fall of Constantinople in 1453. (3 cr; prereq jr, sr, grad or §; IV MTWThF; J 207B) Haworth

110 ART OF INDIA

Development of architecture, painting, sculpture, and minor arts. (3 cr; III MTWThF; J 207B) Poor

157 NINETEENTH-CENTURY FRENCH PAINTING, IMPRESSIONISM AND POST IMPRESSIONISM 1860-1900

Realism of Manet and Degas, Impressionist idea and its evolution, multiple styles of postimpressionists, aestheticism, symbolism, and mysticism of 1890's. (3 cr; prereq sr, grad or §; II MTWThF; J 207B) Waldfoegel

177 TWENTIETH-CENTURY PAINTING

Jugendstil, Austrian expressionism. Bridge group. Blue Rider group, new objectivity, de Stijl, and Dada. Kokoschka, Schiele, Kirchner, Schmidt-Rottluff, Nolde, Kandinsky, Marc, Klee, Beckmann, Mondrian, van Doesberg, Grosz. (3 cr; prereq sr, grad or §; V MTWThF; J 207B) Waldfoegel

Studio Arts (Art)

20 BASIC DRAWING

An introduction to studio work; exploration of contemporary and traditional methods. Work from nature, various drawing media. (3 cr; limited to 25 students; III-IV MTWThF; ArtB 150) Volpe

23 DRAWING AND PAINTING

Work from life and nature; introduction to color and pictorial structure. (3 cr; limited to 25 students; prereq 20; III-IV MTWThF; ArtB 160) Egerman

25 DRAWING AND COLOR

Continuing and elaborating upon drawing experiences of Art 23; serves as a bridge between Lower Division drawing courses and Upper Division painting, printmaking, and other courses where color is used. (3 cr; prereq 23; I-II MTWThF; ArtB 150) Volpe

32-33 ELEMENTS OF PRINTMAKING

(Sequence limited to 20 students) Bethke

32 Foundation course. Familiarizes the student with the media of printmaking in general. Problems in engraving, etching, and other techniques employed in working on metal plate, as well as lithography, woodcuts, and combined processes. (3 cr; I-II MTWThF; ArtB 170)

33 A beginning course designed to introduce the various techniques of etching and engraving employed in working on metal plates. Woodcuts and lithography are included, and lectures and demonstrations are given. (3 cr; I-II MTWThF; ArtB 170)

40-41 SCULPTURE

(Sequence limited to 20 students) Kraning

40 Beginning course. Intensive study of structure in nature with emphasis on accurate observation. Construction in metal and plaster. (3 cr; I-II MTWThF; HoIB 154)

41 Integrates basic principles examined in Art 40. Natural form is studied for sculptural possibilities. A more imaginative approach to the study of nature is encouraged. (3 cr; prereq 40; I-II MTWThF; HoIB 154)

60B-61B-62B WATER COLOR

Introduction to transparent water color, gouache, casein, and tempera. General course introducing student to various drawing and painting media. Figure, still life, landscape, and abstract design. (3 cr; limited to 25 students; prereq 20, or equiv, with #; I-II MTWThF; ArtB 141) Egerman

70-71-72 OIL PAINTING

Introduction to medium of oil; individual projects and instruction. (3 cr; limited to 25 students; prereq 55 or #; III-IV MTWThF; ArtB 161) Rowan

80A, C-81A, C-82A, C SCULPTURE

(Sequence limited to 15 students; III-IV MTWThF; HoIB 154) Kraning

80A Work with direct metal sculpture and constructions. Attention given to 20th-century tools and equipment. (3 cr; prereq 41)

81A Direct metal problems of sculptural expression and organization in relation to architecture. (3 cr; prereq 80A, 80B, 80C)

82A Experimental work in direct metal. Class problems are assigned. (3 cr; prereq 81A)

80C Metal casting of sculpture. Lost-wax and sand casting techniques are employed. (3 cr; prereq 42)

81C Problems concerned with cast metal sculpture for landscape and architecture. (3 cr; prereq 80A, 80B, 80C)

82C Experimental work in cast metals. Class problems are assigned. (3 cr; prereq 81C)

90-91-92 PRINTMAKING, INTAGLIO PROCESSES

(3 cr; limited to 10 students; prereq 32 or #; III-IV MTWThF; ArtB 170) Bethke

150-151-152 PROBLEMS IN PAINTING

(3 cr; limited to 10 students; prereq 72 and #; I-II MTWThF; ArtB 150) Rowan

190-191-192 ADVANCED PRINTMAKING, INTAGLIO PROCESSES

(3 cr; limited to 5 students; prereq 90 or #; III-IV MTWThF; ArtB 170) Bethke

200-201-202-203-204-205 ADVANCED PROBLEMS: PAINTING

(3 cr; prereq #; hrs and rm ar) Rowan

210A-C, 211A-C, 212A-C ADVANCED PROBLEMS: SCULPTURE

(3 cr; prereq #; hrs and rm ar) Kraning

Classics

Classics (Clas)††

45 GREEK AND ROMAN MYTHOLOGY

Classical myths which acquaint the student with the stories of the gods, demigods, and heroes which are a basic component of the European cultural heritage, with attention to their artistic, religious, psychological, and anthropological interpretations. (3 cr, \$42, \$42A, \$145; IV MTWThF; FolH 308) Schork

124 FIELD RESEARCH IN ARCHAEOLOGY

Field excavation, survey, and research in archaeological sites in Greece, Turkey, Italy, or the Mediterranean area. Intensive training in techniques of excavation and exploration as well as analysis and interpretation of archaeological materials. (3-6 cr; prereq 121-122-123 or equiv and Δ) McDonald

145 GREEK AND ROMAN MYTHOLOGY

Same class work as Clas 45 but with special independent reading and research assignments in consultation with the instructor. (3 cr, \$42, \$42A, \$45; IV MTWThF; FolH 308) Schork

†† No knowledge of Latin or Greek is required.

Greek (Grk)

51 BEGINNING CLASSICAL GREEK

See section on 10-week courses, pages 142-148.

176B GREEK LITERATURE: PHILOSOPHY

Authors vary from term to term and from year to year. One or more appropriate authors studied in a given course. (3 cr; III MTWThF; FolH 305A) Schork

Economics (Econ)

1 PRINCIPLES OF ECONOMICS

Principles underlying economic activity and the economic institutions within which economic units function. National income, money and banking, business cycles, and international trade. Econ 1-2 or equivalent are prerequisite for most advanced courses in business administration and economics. (3 cr, 1-2†, §1T, §C, §50A; prereq 3rd qtr fr) Staff

Sec 1, I MTWThF, BlegH 120

Sec 2, III MTWThF, BlegH 120

2 PRINCIPLES OF ECONOMICS

(Continuation of Econ 1) Demand and supply, competition and monopoly, and the distribution of income. (3 cr, 1-2†, §2T, §C, §50B; prereq 1 or equiv) Staff

Sec 1, I MTWThF, BlegH 415

Sec 2, V MTWThF, BlegH 415

Sec 3, III MTWThF, BlegH 415

Sec 4, IV MTWThF, BlegH 415

65 INTERMEDIATE ECONOMIC ANALYSIS I

Behavior of firms and industries under competitive and monopolistic conditions; factors influencing production, price, and advertising decisions. (3 cr, §65T, §165; prereq 1-2 or ‡; II MTWThF; BlegH 230) Staff

66 INTERMEDIATE ECONOMIC ANALYSIS II

Determinants of national income, employment, and price level; attention given to aggregate consumption and investment. (3 cr, §66T, §166; prereq 1-2 or ‡) Staff

Sec 1, IV MTWThF, BlegH 220

Sec 2, III MTWThF, BlegH 215

67 MONEY AND BANKING

Historical development, present pattern, and economic role of financial institutions, with special emphasis on commercial banks, the money supply, and the Federal Reserve System. (3 cr; prereq 66 or equiv; III MTWThF; BlegH 145) Staff

68 ELEMENTS OF PUBLIC FINANCE

Survey of government expenditures, budgeting, fiscal policy, debts, and taxes in terms of fiscal institutions, impact on business and the economy, and policy issues. (3 cr; prereq 65, 66 or equiv; II MTWThF; BlegH 415) Staff

69 GOVERNMENT REGULATION OF BUSINESS

Economic aspects of public policy affecting the market process. Relations between market structure and economic efficiency and welfare; economic origins of monopoly and other business limitations on free competition; purposes and effect of antitrust laws and laws relating to "unfair business practices." (3 cr; prereq 65 or equiv for business or economics majors, suitable background in law or political science for others, or ‡; I MTWThF; BlegH 215) Staff

104 INTERNATIONAL ECONOMICS

Significance of foreign trade and investment. International payments and foreign exchange. Gold standard. International Monetary Fund and Bank. Arguments over tariffs and foreign aid policies. (3 cr, §104A; not open to economics majors; prereq 2 or equiv; IV MTWThF; BlegH 155) Staff

104A INTERNATIONAL ECONOMICS

Significance of foreign trade and investment. International payments and foreign exchange. Gold standard. International Monetary Fund and Bank. Arguments over tariffs and foreign aid policies. (3 cr, §104 and §114A; prereq 65, 66, or equiv or §; IV MTWThF; BlegH 155) Staff

165 ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD

Individual decision making by households and by firms under conditions of monopoly, competition; some welfare economics. (3 cr, §65; prereq grad or §; II MTWThF; BlegH 230) Staff

166 ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT

Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding. (3 cr, §66; prereq grad or §; III MTWThF; BlegH 215) Staff

176B DYNAMIC MACROECONOMICS

Theories of the pattern of movements over time of employment, incomes, and prices. Effects of various economic policies upon the magnitude of fluctuations; stability of the economy. (3 cr; prereq 176A or equiv or §; III MTWThF; BlegH 245) Staff

185B ADVANCED MICROECONOMICS

Price and output policies under conditions of imperfect competition. Problems of choice under conditions of uncertainty. (3 cr; prereq 185A or §; IV MTWThF; BlegH 450) Staff

190 READINGS IN ECONOMICS

Areas useful to individual programs and objectives not available in regular course offerings. (Cr ar; prereq consent of adviser and §) Staff

213A ECONOMIC GROWTH AND NATIONAL PLANNING

Models of the process of economic growth; exogenous factors to which growth is attributed. Techniques useful in planning, e.g., input-output, national income accounting, programming. Questions of policy. (3 cr per qtr; prereq 175, 176A, plus a course in the section of Economic Development and Area Studies; II MTWThF; SocSci 628)

English (Engl)§§

1 FRESHMAN ENGLISH

(3 cr, §A or §1A or §1B or §10H or §Comm 1; each section limited to 28 students; prereq assignment to category 1, or 1A, or 2)

Sec 1, II MTWThF, ME 106
Sec 2, IV MTWThF, ME 214

2 FRESHMAN ENGLISH

(3 cr, §B or §2A or §2B or §11H or §Comm 2; each section limited to 28 students; prereq 1)

Sec 1, I MTWThF, E 226
Sec 2, II MTWThF, E 226
Sec 3, III MTWThF, ME 208

55 SHAKESPEARE

The reading of plays from Shakespeare's early and middle periods: *Richard II*, *A Midsummer Night's Dream*, *The Merchant of Venice*, *Hamlet*, and two or three other plays from the early and middle periods. (3 cr; limited to 35 students; prereq ††...may not be taken concurrently with 56; IV MTWThF; ForH 175) Steinmann

†† Five credits in literature, English or American, exclusive of Freshman English.

§§ Credit in English will be allowed for certain Classics courses numbered between 40 and 82. Consult English Department for approval.

56 SHAKESPEARE

The reading of plays from middle and late periods: *Twelfth Night*, *King Lear*, *Macbeth*, *The Tempest*, and two other plays from the middle and late periods. (3 cr; limited to 35 students; prereq 55)

Sec 1, III MTWThF, ForH 175, Clayton
Sec 2, III MTWThF, ForH 285, Durham

73 AMERICAN LITERATURE

Notable authors from Whitman through James. (3 cr; limited to 65 students; prereq ††; II MTWThF; Ph 210) Roth

75 CHAUCER

(Taught concurrently with 175) The reading of selections from *The Canterbury Tales* with an introduction dealing with the grammar and literary forms of 14th-century English. (6 cr; prereq ††; III-IV MTWThF; ME 110) McNally

90H MAGNA HONORS THESIS

(3 cr; prereq candidate for magna cum laude and Δ)

91H SUMMA HONORS THESIS

(3 cr; prereq candidate for summa cum laude and Δ)

92H SUMMA HONORS THESIS

(3 cr; prereq 91H)

93H HONORS THESIS

(3 cr; prereq honors candidacy in English and consent of English honors adviser)

100 OLD ENGLISH

Introduction to sounds and grammar with some prose reading. Relation to modern English stressed. (6 cr; prereq ††; I-II MTWThF; ME 221) Kirchner

105 HAWTHORNE AND MELVILLE

(3 cr; prereq ††; IV MTWThF; Arch 60) Roth

127 DRAMA FROM ca. 1800 TO ca. 1920

Beginnings of modern realism, naturalism, and expressionism in English and continental drama. (3 cr; prereq 56; II MTWThF; ME 202) Hurrell

133 AMERICAN SOCIAL DIALECTS

Social and class variation in American English, with emphasis upon the dialects of the culturally disadvantaged, and their relation to standard English as a second dialect. (3 cr; I MTWThF; ME 214) Allen

135 ADVANCED SHAKESPEARE I

Intensive study of a few plays. (3 cr; prereq 56; IV MTWThF; ME 202) Clayton

159 EARLY AMERICAN LITERATURE

Critical survey: emphasis upon principal writers and major cultural themes, from Puritans to 1800. (3 cr; prereq ††; III MTWThF; Arch 60) Griffin

165 THE STRUCTURE OF MODERN ENGLISH

An introductory study of English phonemics, morphemics, and syntax. (3 cr; prereq ††; II MTWThF; ME 302) Steinmann

174 AMERICAN ENGLISH

Developing distinctiveness of English language in America; its relationships to American cultural patterns; significant regional variations in vocabulary, pronunciation, and grammar; introduction to field methods of American dialect geography; access to unpublished collections of *Linguistic Atlas of Upper Midwest*. (3 cr; III MTWThF; ME 221) Allen

175 CHAUCER

(Taught concurrently with 75) Reading of *The Canterbury Tales* with introduction dealing with grammar and literary forms of 14th-century English. (6 cr, \$75 or equiv; prereq 100; III-IV MTWThF; ME 110) McNally

†† Five credits in literature, English or American, exclusive of Freshman English.

- 185 FORM AND IDEA IN DRAMATIC LITERATURE**
Dramatic types, in chronological sequence; analytical reading of selected representative plays. (3 cr; prereq ††...55-56 recommended; IV MTWThF; ME 208) Hurrell
- 299 INDEPENDENT READING**
(3 cr; prereq M.A. degree or equiv)

Family Studies (FamS)

- 1 DYNAMICS OF DATING, COURTSHIP, AND MARRIAGE**
Application of principles from the behavioral sciences to dating, courtship, mate selection, engagement, mixed marriages, roles of men and women, interaction of marital spouses, and marital stability. (3 cr; limited to 40 students; I MTWThF; FolH 304) Wahlstrom
- 1A DYNAMICS OF DATING, COURTSHIP, AND MARRIAGE**
(See FamS 1) Designed for Upper Division or engaged or married students. (3 cr, §1; limited to 40 students; III MTWThF; FolH 304) Bralton
- 100 HUMAN SEXUAL BEHAVIOR**
The nature of sexual functioning, sexual development, ethics and attitudes; research problems. (3 cr; limited to 40 students; prereq 15 cr in psychology or sociology; III MTWThF; ForH 349) Holland

Foreign Study (FS)

- 162 SEMINAR FOR FOREIGN STUDY II**
See section on 10-week courses, pages 142-148.

French and Italian

French (Fren)

- 2 BEGINNING FRENCH**
(5 cr; prereq 1, or 1 yr of high school French; I-II MTWThF; Aero 319) Arrell
- 25 INTERMEDIATE FRENCH**
(5 cr; prereq 3, or 3 yrs of high school French; I-II MTWThF; FolH 201) Bergh
- 30 INTRODUCTION TO FRENCH LITERARY TEXTS**
A variety of literary works representing the principal genres are examined through stylistic analyses and literary explications. Students learn critical terminology and discuss literary problems and techniques. (3 cr; prereq 25 or 4 yrs of high school French or §; III MTWThF; Arch 140) Rickert
- 54 FRENCH COMPOSITION**
(3 cr; prereq 25 or equiv; I MTWThF; FolH 104) Todd
- 55 FRENCH CONVERSATION AND PRONUNCIATION**
In addition to regular conversation course 2 hours per week (individually arranged) are devoted to practical phonetics, pronunciation, drill, and laboratory exercises. (3 cr; prereq 25 or equiv; II MTWThF; FolH 104) Johnstone
- 57 ADVANCED FRENCH COMPOSITION**
(3 cr; prereq 54; II MTWThF; Ph 236A) Mantini
- 58 ADVANCED FRENCH CONVERSATION**
(3 cr; prereq 55 or §; IV MTWThF; FolH 203) Rickert
- 65 SURVEY OF FRENCH LITERATURE: Rabelais to La Bruyère**
(3 cr; prereq 30; I MTWThF; FolH 203) Johnstone

†† Five credits in literature, English or American, exclusive of Freshman English.

- 105 FRENCH STYLISTICS**
(3 cr; prereq 57 or §; III MTWThF; FolH 203) Todd
- 108 STRUCTURE OF MODERN FRENCH: MORPHOLOGY**
(3 cr; prereq 57 or ¶57 or §; III MTWThF; FolH 108) Mantini
- 189 INDEPENDENT READINGS FOR UPPER DIVISION STUDENTS**
(1-3 cr; prereq § and consent of dept chm; hrs ar) Staff
- 260 DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq §; hrs ar) Staff

Note — The General Extension Division will offer French for graduate students (Fren 17A). Please address all inquiries to the General Extension Division.

Italian (Ital)

- 2 BEGINNING ITALIAN**
(5 cr; prereq 1, or 1 yr of high school Italian; III-IV MTWThF; Aero 327) Taddei

Geography (Geog)

- 1 PHYSICAL GEOGRAPHY**
Major features of distribution patterns of climate, relief, vegetation, and soils; regional differences in problems of physical development. (5 cr; II-III MTWThF; AndH 250) Skaggs
- 103 NORDEN**
Cultural and political development of Scandinavia, Finland, and Iceland. Effects of changing resource appraisal upon patterns of economic activity and human occupancy. (3 cr; prereq 5 cr in geography or §; II MTWThF; AndH 230) Jaatinen
- 115 MEDITERRANEAN REGION**
Physical and human geography of lands adjacent to Mediterranean Sea: Greece, Italy, Spain, Portugal, and southern France. (3 cr, §105; prereq 5 cr in geography or §; I MTWThF; BlegH 235) deSouza
- 120 SOUTH ASIA**
Physical and human geography of India, Pakistan, Ceylon, Afghanistan, and the Himalayan kingdoms; geographic aspects of social structure, population pressures, economic development, and international relations. (3 cr; prereq 5 or §; III MTWThF; AndH 230) Bhardwaj
- 175 RURAL GEOGRAPHY**
Geographic components and assemblages of rural settlement. World patterns and geographic problems of rural settlement on American scene. (3 cr, §150; IV MTWThF; BlegH 435) Jaatinen
- 193 TOPICS IN GEOGRAPHY**
(3 cr; prereq sr or grad and △; IV MTWThF; BlegH 445) deSouza
- 200 DIRECTED READINGS**
(1-5 cr) Skaggs
- 276, 277 SEMINAR: AGRICULTURAL GEOGRAPHY**
An intensive field research seminar will be given from July 30 to August 23. Field headquarters will be at River Falls, Wisconsin. Research will be focused upon related problems in cultural and rural geography of the Upper Coulee Country. (Reservations must be made no later than May 20. For costs, detailed information, and reservations contact Cotton Mather, Department of Geography, University of Minnesota, Minneapolis, Minnesota 55455). (6 cr; prereq §) Mather
- 301 RESEARCH PROBLEMS IN GEOGRAPHY**
(Cr ar) Skaggs

German

- 2A BEGINNING GERMAN**
(5 cr; prereq 1A or 1 yr of high school German; I-II MTWThF; FolH 209) Staff
- 4 INTERMEDIATE GERMAN**
Selected readings from literature. (3 cr; prereq 3A or 3B or 3 yrs of high school German...¶5 recommended; I-II MWF; FolH 209½) Staff
- 5 INTERMEDIATE GERMAN**
Elementary composition and conversation. (2 cr; prereq 3A or 3B or 3 yrs of high school German...¶4 recommended; I-II TTh; FolH 209½) Staff
- 56A READING AND ANALYSIS OF LITERARY TEXTS**
(3 cr; not open to students who have had 70 or above; prereq 4 or 4 yrs of high school German; IV MTWThF; FolH 209) Voss
- 60B COMPOSITION**
Continuation of Ger 60A. (3 cr; prereq 60A or Δ; II-III MF; FolH 205) Staff
- 75 MODERN DRAMA**
(3 cr; prereq 56 or 4 and ¶; I MTWThF; FolH 208) Menze
- 78 GERMAN PROSE OF 19TH AND 20TH CENTURIES: MODERN WRITERS**
(3 cr; prereq 56A or ¶; II MTWThF; FolH 208) Staff
- 123 HISTORY OF THE GERMAN LANGUAGE**
(6 cr for both terms, 122-123†; prereq 122; VI-VII MW; FolH 208) C Wood
- 133 BIBLIOGRAPHY AND RESEARCH METHODS**
Required of all graduate majors. (3 cr; prereq 11 cr above 69; III-IV TTh; FolH 307) Friedrichsmeyer
- 174 NINETEENTH-CENTURY NOVEL**
(3 cr; prereq 14 cr in courses 70 and above or equiv; VI-VII TTh; FolH 208) Voss

History (Hist)

- 2 INTRODUCTION TO MODERN EUROPEAN HISTORY, PART II**
Revolution, liberalism, and nationalism, to 1870. (3 cr; II MTWThF; BlegH 5) Wright
- 3 INTRODUCTION TO MODERN EUROPEAN HISTORY, PART III**
1870 to recent times. (3 cr; III MTWThF; BlegH 5) Rudolph
- 19 HISTORY OF ASIA, PART III**
Modern Asia: impact of Europe, nationalism. (5 cr; IV-V MTWThF; AndH 250) Farmer
- 23 AMERICAN HISTORY, PART I**
Colonial, early national period through sectional crisis. (4 cr; 11:15-12:20 MTWThF; AndH 210) A Jones
- 61 HISTORY OF ASIA, PART III**
Modern Asia: impact of Europe, nationalism. (5 cr; IV-V MTWThF; AndH 230) Marshall
- 81 UNITED STATES IN THE 20TH CENTURY, PART III**
From 1932 to present. (3 cr; III MTWThF; BlegH 10) A Jones
- 101B DIRECTED STUDY, PART II**
Qualified senior and graduate students may register for 1 or more quarters with consent of instructor for work and training on a tutorial basis. (3 cr; prereq ¶) Staff
- 115E WORLD WAR II, PART I**
Origins and background. (3 cr; I MTWThF; AndH 310) Deutsch
- 118L HISTORY OF AUSTRIA, PART I**
From foundation of the March to advent of nationalism (1809). (3 cr; IV MTWThF; BlegH 240) Wright

- 122A ECONOMIC HISTORY OF EUROPE, PART I**
Medieval and early modern economic life. (3 cr; II MTWThF; BlegH 255) Rudolph
- 134E AMERICAN HISTORY, 1850-1900, PART II**
From 1865 to 1880. (3 cr; II MTWThF; BlegH 110) Loehr
- 149E MODERN CHINA, PART II**
China's response to the West, 1700-1911. (3 cr; I MTWThF; BlegH 145) Farmer
- 149F HISTORY OF JAPAN, PART II**
Since 1700. (3 cr; II MTWThF; BlegH 350) Marshall
- 165A PROSEMINAR: MEDIEVAL HISTORY, PART III**
(3 cr; VI MTWThF; SocSci 628) Hoyt
- 170E PROSEMINAR: RECENT EUROPEAN HISTORY, PART II**
(3 cr; prereq lect course in 20th-century Europe or World War II, or §; III-IV MW; SocSci 628) Deutsch
- 182F PROSEMINAR: AMERICAN HISTORY, 1850-1900, PART II**
(3 cr; III MTWThF; SocSci 633) Loehr

Humanities (Hum)

- 1A HUMANITIES IN THE MODERN WORLD**
The Old Regime, the Revolution, neoclassicism, and romanticism. Period from about 1740 to about 1820. Authors: Pope, Voltaire, Goethe. One historical novel, Tolstoy's *War and Peace*. (3 cr, §1 or §51; I MTWThF; ForH 120) Ramsland
- 2A HUMANITIES IN THE MODERN WORLD**
The Industrial Revolution, liberalism, and socialism. Period from about 1776 to 1890. Authors: the classical economists, Marx, Mill, Ibsen, Dostoevski. (3 cr, §2 or §52; III MTWThF; Arch 25) Ramsland
- 3A HUMANITIES IN THE MODERN WORLD**
From about 1840 to about 1914. Authors: Darwin, Nietzsche, Kierkegaard, and Mann. (3 cr, §3 or §53; II MTWThF; Arch 60) Todd
- 4 HUMANITIES IN THE MODERN WORLD IV**
The humanities between two wars. Authors: Freud, Lenin, Koestler, T. S. Eliot, Kafka, and others. Background topics include civilization between two wars, impact of psychoanalysis, communism, and fascism. (3 cr, §54; IV MTWThF; Arch 15) Bryan
- 21 AMERICAN LIFE I**
Individualism in American life and thought. (3 cr; I MTWThF; ForH 285) Malmsheimer
- 54 HUMANITIES IN THE MODERN WORLD**
(See Hum 4) (3 cr, §4)
Sec 1, II MTWThF, ForH 55, Bryan
Sec 2, I MTWThF, Arch 60, Atkin
- 55 HUMANITIES IN THE MODERN WORLD V**
The intellectual climate of the western world since World War II. The worlds of existentialism and "the absurd"; alienation, irrationalism; the anti-hero in literature; the new theology; the influence of Zen. Readings in Buber, Camus, Ionesco, Tillich, Hesse, etc. (3 cr; II MTWThF; FraH B1) Chute
- 63B THE AGE OF REFORMATION**
The Renaissance in Northern Europe and an analysis of the Reformation and Counter Reformation. The baroque era in France and Spain. (3 cr, §13 and §63; IV MTWThF; ForH 155) Chute
- 70 INDEPENDENT READINGS**
(1-5 cr) Staff

Journalism and Mass Communication (Jour)

11 JOURNALISTIC WRITING FOR NONMAJORS

Newspaper fact-gathering and newswriting; specialized reporting; fundamentals of press law. (3 cr; limited to 20 students; prereq soph, C avg, Engl C, 3, 3A, 3B, or Comm 3 or Rhet 3 or exemption from English requirement; I MTWThF; MurH 212) Sim

16 MASS COMMUNICATIONS LAW

Origins and background of principles of press law. Libel and its defenses, penalties. Right of privacy; problems of fair trial. Law and self-regulation in advertising, in broadcast media. Copyright, obscenity statutes. (2 cr; prereq 1, 14; II MTWTh; MurH 302) Gillmor

90 MASS COMMUNICATIONS AND THE NEWS

How news gets to and affects the public, in print, on the air, by film. Evaluation of news-gathering and presentation methods. Contemporary influences on media. (3 cr; not open to journalism majors; III MTWThF; MurH 308) Sim

114 MASS COMMUNICATION THEORY

Study of research concepts and findings that offer promise for development of general theory of mass communication. Analysis of research in communication of ideas and information through mass media. (3 cr; prereq 112; I MTWThF; MurH 302) Kline

121 MASS MEDIA IN DYNAMIC SOCIETY

Economic, political, and social determinants of character and content of mass communications. Patterns of operations, effect on content, and relative social utility. Government and mass communications. (3 cr; prereq 18 or 50 for journalism majors, § for others; IV MTWThF; MurH 308) Gillmor

124 INTERNATIONAL COMMUNICATIONS AND FOREIGN AFFAIRS

Channels of international communication and news-gathering agencies. Factors affecting flow of news throughout world. Role of foreign correspondent. Relation of communications to international affairs. (3 cr; prereq 15 cr in social sciences, with inclusion of an Upper Division course in history or political science, course in international relations recommended; II MTWThF; MurH 308) Nixon

227 MASS COMMUNICATION PROBLEMS OF DEVELOPING COUNTRIES

Systematic analysis of problems and factors affecting the development of viable systems of mass communication in developing countries and regions of the world. (3 cr; IV MTWThF; MurH 207) Nixon

Library School (Lib)††

101 LIBRARY ADMINISTRATION

Principles of library administration, organization, and management. A general course for all librarians. (3 cr; limited to 90 students; I MTWThF; Ph 210) Kittilson

†† The graduate Library School is a professional school. Courses numbered above 200 are open only to graduate students and to librarians who hold a fifth-year degree from an A.L.A. accredited library school. Courses numbered below 200 are open to anyone who has been admitted to the Graduate School, to anyone who has been admitted to the Minimum Certification Program, and to any undergraduate in the College of Liberal Arts or the College of Education. Students who do not fall in one of the preceding categories may register for library courses numbered below 200, but in order to avoid loss of credits, a letter requesting permission to register for library courses should be sent to the Library School before May 1 for the First Term and before June 1 for the Second Term. The Library School discourages registration of unadmitted students who have not sent transcripts before these dates, for it is not possible for us to give appropriate advice to students who appear on the last registration day.

- 102 REFERENCE I**
Intensive study of some 150 outstanding and useful reference books and tools most frequently used by students and librarians. Landmark reference books, indexes, and periodical guides. Theory and practice of reference work. (3 cr; limited to 50 students; II MTWThF; Lib 12) Schlachter
- 103 CATALOGING AND CLASSIFICATION**
Basic principles of descriptive cataloging, rules of entry, subject headings, and classification in libraries, for all types of libraries. (3 cr; limited to 35 students; IV MTWThF; Lib 4B) Schlachter
- 104 SELECTION OF LIBRARY MATERIALS**
Theory, principles, and techniques of selection; and introduction to the basic tools for selection of books, magazines, pamphlets, phonograph records, films, etc., for all types of libraries. (3 cr; limited to 50 students; V MTWThF; Lib 12) Amundson
- 105 HISTORY OF LIBRARIES AND LIBRARIANSHIP**
Library development from ancient times to the present; library service in the United States in the 19th and 20th centuries. Libraries as social agencies. (3 cr; limited to 90 students; III MTWThF; Ph 210) Lindsay
- 173 READING GUIDANCE FOR ADULTS**
Selection and evaluation of materials in terms of adult learning, reading ability, and interests; reading guidance techniques and programs used with adults in public libraries. (3 cr; prereq 104; III MTWThF; Lib 12) Amundson
- 194 NONPRINT MATERIALS IN LIBRARIES**
Selection, organization, and administration of nonprint materials in library programs; emphasis upon the instructional and recreational use of nonprint materials. (3 cr; limited to 40 students; prereq 104; IV MTWThF; Lib 12) Kittilson
- 243 ADVANCED INFORMATION RETRIEVAL**
Advanced topics in library mechanization and information retrieval. (3 cr; limited to 30 students; prereq 241, 242; II MTWThF; Lib 14) Simonton
- 257 SCHOOL LIBRARIES**
Library objectives in relation to educational objectives, larger units of school service, value and effect of standards. (3 cr; prereq 101; II MTWThF; Lib 4B) Olson
- 260 LITERATURE OF THE SOCIAL SCIENCES**
Bibliographical and other reference sources. The development of knowledge, landmark books, and current trends in the subjects covered. (3 cr; limited to 20 students; prereq 102; V MTWThF; Lib 14) Lindsay
- 265 ADVANCED BIBLIOGRAPHY**
The national and trade bibliographies of the world, with emphasis on those of the United States, Great Britain, France, Germany, and Russia. Their use in the selection and acquisition of books and in the preparation of subject bibliographies. (3 cr; prereq 102; I MTWThF; Lib 4B) Shove
- 268 RESEARCH METHODS IN LIBRARIANSHIP**
Purposes and principles of research with emphasis upon the distinctive characteristics of library science problems; critical examination of research studies; preparation of tentative research proposals. (3 cr; limited to 30 students; IV MTWThF; Ph 236A) Olson
- 275 PUBLISHERS AND PUBLISHING**
Publishing in the United States in the 19th and 20th centuries. Economics and organization, copyright, influence of machines, important publishers and booksellers, special publishing, censorship, etc. Book production and book distribution. (3 cr; III MTWThF; Lib 4B) Shove

Linguistics (Ling)

- 121 TRANSFORMATIONAL GRAMMAR**
(3 cr; prereq 120; IV MTWThF; FoH 108) Hutchinson

Middle Eastern Languages

Arabic (Arab)

B BEGINNING INTENSIVE ARABIC

See section on 10-week courses, pages 142-148.

Persian (Pers)

52 INTERMEDIATE PERSIAN

See section on 10-week courses, pages 142-148.

Music (Mus)

4 FUNDAMENTALS OF MUSIC

(2 cr; limited to 24 students; for nonmusic majors — primarily child development students and elem tchrs)

- Sec 1, I MTWThF, ScH 3, Byrne
- Sec 2, II MTWThF, ScH 3, Byrne
- Sec 3, III MTWThF, ScH 103, Lauritzen
- Sec 4, IV MTWThF, ScH 3, Byrne
- Sec 5, V MTWThF, ScH 3, Lauritzen
- Sec 6, VI MTWThF, ScH 3, Lauritzen

7B EAR TRAINING

Résumé of aural work included in Mus 4T-6T, with concentration on their application. (3 cr; prereq §; I MTWThF, IV MWF; ScH 103) McHugh

8B HARMONY

Résumé of part writing and harmonization of chorales which are included in Mus 4T-6T, with concentration on their application. (3 cr; prereq §; II MTWThF; ScH 103; IV TTh; ScH 103) McHugh

Note — Applied music courses 11 through 30 are offered as electives for nonmusic majors and as part of degree programs for Lower Division and Upper Division music majors. When taken for no credit, place the letter V after the appropriate number.

11** PIANO

(2 cr; prereq entr exam; hrs ar; ScH 107) Freed

12** VOICE

(2 cr; prereq entr exam; hrs ar; ScH 107) Wittich

13** VIOLIN

(2 cr; prereq entr exam; hrs ar; ScH 107) Saslav, Roche, Sambuco

14** VIOLA

(2 cr; prereq entr exam; hrs ar; ScH 107) Ar

15** CELLO

(2 cr; prereq entr exam; hrs ar; ScH 107) Ar

16** BASS

(2 cr; prereq entr exam; hrs ar; ScH 107) Clute

17** FLUTE

(2 cr; prereq entr exam; hrs ar; ScH 107) Niosi

18** OBOE

(2 cr; prereq entr exam; hrs ar; ScH 107) Angelucci

19** CLARINET, SAXOPHONE

(2 cr; prereq entr exam; hrs ar; ScH 107) Williams

20** BASSOON

(2 cr; prereq entr exam; hrs ar; ScH 107) Ar

- 21** TRUMPET**
(2 cr; prereq entr exam; hrs ar; ScH 107) Chenette
- 22** FRENCH HORN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 23** TROMBONE**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 24** TUBA**
(2 cr; prereq entr exam; hrs ar; ScH 107) Walton
- 25** PERCUSSION**
(2 cr; prereq entr exam; hrs ar; ScH 107) Brunelle, Dahlgren, Fine
- 26** HARP**
(2 cr; prereq entr exam; hrs ar; ScH 107) Miller
- 27** ORGAN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Fleischer
- 28** HARPSICHORD**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 29** CLASSICAL GUITAR**
(2 cr; prereq entr exam; hrs ar; ScH 107) Pederson
- 30** CLASSICAL ACCORDION**
(2 cr; prereq entr exam; hrs ar; ScH 107) Hane, Malmberg

Note — Applied music courses 61 through 80 are offered as electives for nonmusic majors and as part of degree programs for Lower Division and Upper Division music majors. When taken for no credit, place the letter V after the appropriate number.

- 61** PIANO**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Freed
- 62** VOICE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Wittich
- 63** VIOLIN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Saslav, Roche
- 64** VIOLA**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 65** CELLO**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 66** BASS**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Clute
- 67** FLUTE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Niosi
- 68** OBOE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Angelucci
- 69** CLARINET, SAXOPHONE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Williams
- 70** BASSOON**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 71** TRUMPET**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Chenette
- 72** FRENCH HORN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 73** TROMBONE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 74** TUBA**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Walton
- 75** PERCUSSION**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Brunelle, Dahlgren, Fine

- 76** HARP**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Miller
- 77** ORGAN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Fleischer
- 78** HARPSICHORD**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 79** CLASSICAL GUITAR**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Pederson
- 80** CLASSICAL ACCORDION**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Hane, Malmberg
- 100** ADVANCED APPLIED MUSIC**
Advanced literature in piano, voice, organ, and orchestral instruments. (2 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 103B ASIAN MUSIC IN PERFORMANCE, PART II: INDIA**
Development of vocal and/or instrumental skills through applied training and lecture-demonstrations. (2-4 cr; prereq 103A; hrs ar; ScH 107) Higgins, Ranganathan
- 104A AMERICAN MUSIC**
From early colonial times to present through reading and record listening. American Indian music, European folk music on this continent, origin and development of jazz and contemporary American music. (3 cr; prereq 36, or 9 cr in American history or American studies, #; IV MTWThF; ScH 104) Riedel
- 110 MUSIC BIBLIOGRAPHY**
General reference sources. Music bibliographical materials in English and other languages; bibliographical drills in music history, theory and composition, music education, applied music. (3 cr; prereq one of following: 36, 56, 99, or #; VI MTWThF; ScH 104) Riedel
- 127-128-129* COMPOSITION**
Original work in various forms. (2 cr each; prereq 99 and 123; VII MTWThF; ScH 203) Fetler
- 131 SYMPHONIES OF BEETHOVEN**
Evolution of Beethoven's symphonic form and style as reflection of intellectual, political, and artistic currents of Napoleonic era. (3 cr; prereq 6 cr in musical history or art history or political history since 1750 or English or German literature since 1750, or #; I MTWThF; WuH 320) Oberg
- 132 SYMPHONIES OF THE ROMANTIC ERA**
Schubert, Schumann, Mendelssohn, Berlioz, Liszt, Brahms, Franck, Dvorak, Tchaikowsky, Bruckner, Richard Strauss; their relation to the dominant romantic trends of the 19th century. (3 cr; prereq 6 cr in music history or art history or political history since 1750 or English or German literature since 1750, or #; II MTWThF; WuH 320) Oberg
- 160 CHORAL COMPOSITION AND ARRANGING**
Composition and arranging for choral ensembles — choirs, glee clubs, and chamber groups. (3 cr; prereq 6T, 99, 143 or #; VII MTWThF; ScH 203) Fetler
- 174 ADVANCED EAR TRAINING**
Dictation of melodic, harmonic, and rhythmic materials in a variety of styles. Introduction to contemporary sonorities. (3 cr; prereq 6T or #; VI MTWThF; ScH 103) Fetler
- 188B RABINDRANATH TAGORE: MUSIC AND POETRY**
Life, philosophy, and works; influence of three cultural sources: Europe, India's classical and folk traditions; his poetic forms and themes and their subsequent influence upon Bengali literature. Songs and operas with bilingual texts, musical scores and recordings. (3 cr; 2:15-3:40 MWF; ScH 4) Kagan, VanMeter
- 188C TRADITIONAL INDIAN MUSIC: THE SACRED AND PROFANE**
Vedic chant of Hinduism, Indian dance-drama and folk music. Analysis of the music and its associations with belief systems, social institutions, history and aesthetic expression. (3 cr; III MTWThF; ScH 2) Kagan
- 204** GRADUATE APPLIED MUSIC**
Individual lessons. (4 cr; prereq entr exam; hrs ar; ScH 107) Staff

212* SPECIAL PROBLEMS

(3-9 cr; prereq 110; hrs ar; ScH 107) Staff

227-228-229* SEMINAR: COMPOSITION AND ORCHESTRATION

(3 cr each; prereq #; VII MTWThF; ScH 203) Fetler

Natural Science (NSci)

2†† ORIENTATION IN THE NATURAL SCIENCES

(See NSci 1, First Term) The second quarter continues with chemistry, introduces geology, and finishes with physics and astronomy. (5 cr; prereq 1; III-IV MTWThF, Ph 133; 2 hrs lab, Ph 246) Dahl and staff

- Lab 1, I MTh
- Lab 2, I TF
- Lab 3, II MTh
- Lab 4, II TF
- Lab 5, V MTh
- Lab 6, V TF
- Lab 7, VI MTh
- Lab 8, VI TF
- Lab 9, VII MTh
- Lab 10, VII TF
- Lab 11, VIII MTh
- Lab 12, VIII TF

Philosophy (Phil)

1A PROBLEMS OF PHILOSOPHY

Introduction; main fields of investigation; permanent problems; principal methods and schools of philosophy; historical and contemporary views. (3 cr; I MTWThF; Ph 170) Dahl

2A LOGIC

Difference between logical and fallacious reasoning; functions and uses of language; rules of good definition and sound argument. (3 cr)

- Sec 1, II MTWThF, ForH 120, Mason
- Sec 2, IV MTWThF, ForH 120, Cohen

3A ETHICS

Examination of problems that arise when human beings attempt to think systematically about conduct and values (are there absolute standards?) Problem of free will, and survey of historical views about the right and the good. (3 cr; III MTWThF; ForH 120) Dahl

50A HISTORY OF WESTERN PHILOSOPHY

Origin of Greek thought; pre-Socratics, Socrates, Plato, Aristotle. (3 cr; II MTWThF; ForH 285) Cohen

70 LOGIC OF SCIENTIFIC REASONING

Introduction to principles of scientific method, including survey of various contemporary approaches to scientific inference. (3 cr; prereq 2; IV MTWThF; ForH 285) Hanson

108 POLITICAL AND SOCIAL ETHICS

Ethical principles, theoretical and practical, at basis of social order. (3 cr; prereq 3 or #; IV MTWThF; ForH 349) Mason

154 ELEMENTS OF SYMBOLIC LOGIC

Development of a formalized language. Syntax and semantics of sentential and first-order predicate logic, deductive systems. (3 cr; prereq 2 or #; II MTWThF; Arch 20) Hanson

†† To receive credit, a student must complete both NSci 1 and 2, but not necessarily in the Summer Session.

Political Science (Pol)

- B THE STATE IN THE MODERN WORLD**
The development, principles, and operation of the modern nation state. (3 cr; II MTWThF; AndH 330) Blue
- 2 AMERICAN GOVERNMENT AND POLITICS**
Organization of national, state, and local government; legislative, executive, and judicial branches and their procedures. (3 cr; IV MTWThF; AndH 350) Koepfen
- 26 AMERICAN FOREIGN POLICY**
An introduction to the institutions and processes which determine American foreign policy. Traditional and postwar foreign policies. (3 cr; II MTWThF; AndH 350) Hopmann
- 108 LEGISLATIVE ORGANIZATION AND PROCEDURE**
Congress and the state legislatures at work. (3 cr; prereq 2 or §; II MTWThF; BlegH 235) Koepfen
- 137 AMERICAN POLITICAL PARTIES**
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. (3 cr; prereq 2 or §; IV MTWThF; BlegH 235) Kvavik
- 148 GOVERNMENT AND POLITICS OF AFRICAN COUNTRIES**
Political institutions of sub-Saharan African countries in their social and cultural settings, influence of class and tribal structure; parties and elections; source and nature of ideologies; economic and social policies. (3 cr; prereq B or 12 cr in social science or §; III MTWThF; BlegH 135) Kvavik
- 149 GOVERNMENT AND POLITICS OF SOUTH ASIA**
Political institutions of South Asian countries in their social setting; sources and nature of ideologies; politics and class structure; parties and elections; economic and social policies. (3 cr; prereq 6 cr or 12 cr in social science or §; IV MTWThF; BlegH 215) Blue
- 160 AMERICAN POLITICAL THOUGHT**
From colonial times to present; Puritanism; Constitution; utopianism; Calhoun; history of anarchist, socialist, populist, and syndicalist thought; social Darwinism; conservatism; political thought in law and literature. (3 cr; prereq B or 9 cr in social science or §; II MTWThF; BlegH 250) Shaw
- 161 PROBLEMS OF DEMOCRACY**
Analysis of postulates and implications; moral foundations; democratic theory and the economic order; liberty and authority; equality; representation; spiritual order; democracy and practical politics; critics of democracy. (3 cr; prereq B or 9 cr in social science or §; IV MTWThF; BlegH 250) Shaw
- 184 INTERNATIONAL POLITICS I**
Study of state action in international relations; forms of state action; foreign policy-making analysis, capabilities analysis. (3 cr; III MTWThF; BlegH 220) Hopmann

Psychology

Psychology (Psy)

- 1-2† GENERAL PSYCHOLOGY**
General introduction to study of human behavior. Prerequisite for all advanced courses in psychology. (3 cr for each; prereq soph or 3rd qtr fr with B avg; I-II MTWThF; NH 45)
- 4-5† INTRODUCTORY LABORATORY PSYCHOLOGY**
Experiments illustrating contemporary subject matter such as: human and animal learning, motivation, verbal behavior, problem solving, visual percep-

tion, psychological measurement, personality, and social psychology. (2 cr for each; prereq soph)

Sec 1, I-III MTWThF, WeH 101

Sec 2, IV-VI MTWThF, WeH 101

100 THEORIES OF LEARNING

Examination of major theories of learning and discussion of basic issues of learning and performance in man and animals. (3 cr; prereq 75 except for students in Sequence A and grads; II MTWThF; Arch 40) Bull

105 HUMAN LEARNING

Examination of major processes involved in human learning; emphasis upon verbal and perceptual learning. Topics include discrimination learning, choice and probability learning, concept formation, and programmed learning. (3 cr; prereq 75 except for students in Sequence A and grads; III MTWThF; Arch 35) Shaw

120-121† PERSONALITY

Presentation and discussion of several major theories and concepts. (3 cr for each; prereq 9 cr in psychology; II-III MTWThF; SciB 325) Tellegen

133 PSYCHOLOGY OF MOTIVATION

Classical and contemporary theories of motivation. Elaboration of basic drives into motives, acquisition of new drives and goals; dynamics of elaborated drive structure. Motivation in complex situations involving set, level of aspiration, Zeigarnik effect, frustration, etc. (3 cr, 132-133†; prereq 132; I MTWThF; FraH B1) Davisson

150 PERCEPTION

Critical analysis of methods of investigation and data obtained in study of selected problems of perception: psychophysical methods, form perception, space perception, constancy, spatially coordinated behavior and attention. Emphasis primarily but not exclusively on visual perception. (3 cr; prereq 55, 90 or ‡; IV MTWThF; ForH 55) Shaw

190 PROJECT IN PSYCHOLOGY (Section 1)

Individual library study or experimental investigation. (Cr and hrs ar; prereq sr, §) Darley

190 PRINCIPLES OF BEHAVIOR MODIFICATION (Section 2)

History, theories, and applications of behavior modification. A survey of the broad area of behavior modification. Not designed to teach the specific skills necessary for the application of the techniques. (3 cr; prereq 2; I MTWThF; Arch 130) Phillips

Personal Orientation (PO)

1 HOW TO STUDY

Practical assistance to the student in developing efficient study habits, organizing materials, preparing for examinations, and improving the speed and comprehension of reading. (2 cr, but cr added to CLA grad requirement; limited to 30 students; I MTWThF; JohH 105)

Public Administration (PA)

114B WORKSHOP ON MINNESOTA GOVERNMENT

Lectures, panel discussions, and seminar sessions on selected public policy issues which currently confront Minnesota's governmental units. This workshop course will focus on State Development Planning and will include such topics as Minnesota's environment, physical planning, social development, urban-rural regionalism, and intergovernmental coordination. Some 25 legislators, government officials, civic leaders, and university professors will serve as faculty for the course. (3 cr; 1:30-4:30 W, AndH 270; 1:15-3:15 Th, BlegH 435) Warp, Olsen, and others

182B ADMINISTRATIVE INTERNSHIP

Field work in an approved administrative agency under the joint supervision of an employee of the agency and a member of the faculty. Rotation through

various administrative assignments, solution of special problems, seminar discussion of experiences, and preparation of an internship report. (3 cr; prereq Δ ; 1:15-3:15 T; BlegH 435) Likins

214B CURRENT ISSUES OF PUBLIC ADMINISTRATION AND POLICY DEVELOPMENT IN MINNESOTA

(See PA 114B) (3 cr; 1:30-4:30 W, AndH 270; 1:15-3:15 Th, BlegH 425) Warp and others

224 SOCIAL WELFARE ADMINISTRATION

Critical analysis of the administration of social welfare programs; development of Social Security Act, intergovernmental context of administrative issues and problems, relation of program concepts to administrative feasibility, and accommodation of social welfare programs to general management functions of government. (3 cr; prereq grad; 3:30-5:30 TTh; BlegH 435) Helberg

270A PUBLIC ADMINISTRATION SEMINAR: ORGANIZATION THEORY AND ADMINISTRATIVE BEHAVIOR

Factors conditioning organization; theories of organization; models and typologies; leadership, authority, and decision making; communication; automation; operations research and management systems. (3 cr; prereq Δ ; 8:00-10:00 TTh; BlegH 435) Warp

270C PUBLIC ADMINISTRATION SEMINAR: PERSONNEL

Modern bureaucracies; history and background of personnel policy and administration in the United States; legal foundation and organization; position classification and compensation; recruitment and selection process; training; employment policies and morale; employee relations and organization; retirement systems. (3 cr; prereq Δ ; 10:30-12:30 TTh; BlegH 435) Jackson

282A ADMINISTRATIVE INTERNSHIP

See section on 10-week courses, pages 142-148.

283A RESEARCH SEMINAR: PUBLIC ADMINISTRATION

See section on 10-week courses, pages 142-148.

Scandinavian Languages

Finnish (Finn)

1-2-3 INTENSIVE BEGINNING FINNISH

See section on 10-week courses, pages 142-148.

Swedish (Swed)

1-2-3 INTENSIVE BEGINNING SWEDISH

See section on 10-week courses, pages 142-148.

Slavic Languages

Russian (Russ)

1-2-3 BEGINNING INTENSIVE RUSSIAN

See section on 10-week courses, pages 142-148.

4-5-6 INTENSIVE RUSSIAN (INTERMEDIATE)

See section on 10-week courses, pages 142-148.

Social Science (SSci)

62 STRUCTURE AND DYNAMICS OF POVERTY

Structural characteristics of poverty as described by social, legal, and economic criteria. Specific problems of poverty, unemployment, immobility, il-

literacy, crime, and others. Private and public programs designed to alleviate poverty. Field work in depressed areas. (3 cr; prereq 9 cr in related social sciences; III MTWThF; BlegH 255) Riggi

93 URBAN CRISIS

An examination of the effects of white racism and projections of the image of white supremacy on the socio-economic and political life chances of black people in America followed by an examination of the nature of and basis for social unrest in Minneapolis. Will combine classroom work and field experience. Resource persons from the black community will be utilized, visits to agencies providing services to the black community, and to selected black families will be made in an effort to gain first-hand experience. (5 cr; prereq Δ) Glover

Social Work (SW)

90 AMERICAN SOCIAL WELFARE

Analysis of American social welfare as a basic social institution. (5 cr; prereq Soc 3; III-IV MTWTh; BlegH 440) Lavelle

91 INTRODUCTION TO SOCIAL WORK PROCESS

Analysis of the nature of social work helping processes through a study of development of social work theory and its implementation in the field of practice. (4 cr; prereq 90; II MTWTh, III-IV F; BlegH 440) Lavelle

96 FIELD EXPERIENCE

Direct experience under supervision in a social welfare agency. (1-3 cr; prereq sr, 91; hrs ar) Broeker

102 SPECIAL TOPIC: GROUP INFLUENCE ON PERSONALITY

Analysis of the nature of small group experiences on individual development of attitudes and ways of meeting life problems. Open to teachers, institutional personnel, and others. (3 cr; IV MTWThF; Arch 135) Kamps

124 GOVERNMENT AND SOCIAL WELFARE

Philosophy, policy development, and administration of federal, state, and local programs in the fields of social insurance, public assistance, welfare services, housing, and like public programs. (3 cr; prereq Pol 2 or #; III MTWThF; BlegH 450) Newhouse

160 ADMINISTRATION IN SOCIAL WORK

Study of the process of transforming social policy into services with emphasis on human relations in administration. Open to those with some social science background who seek a better understanding of administration. (3 cr; I MTWThF; SocSci 860) Kidneigh

207 READINGS IN SOCIAL WORK

Independent study under tutorial guidance. (Cr and hrs ar; for grad students only; SocSci 909) Newhouse

287 SPECIAL STUDIES IN SOCIAL WORK

Selected projects previously approved by the instructor. (Cr ar; open only to social work students in their second grad yr; VII MTWThF; SocSci 860)

Sociology (Soc)

1 MAN IN MODERN SOCIETY

Characteristics of human group life. Analysis of factors associated with development of human group life and man's social environment; structure of social environment and its influence upon individual's behavior. (3 cr; II MTWThF; AndH 210; CCTV) McNall and others

3 SOCIAL PROBLEMS

Survey: contemporary social problems; special emphasis on personal demoralization and social disorganization. (3 cr; IV MTWThF; BlegH 5) Zwerman

120 SOCIAL PSYCHOLOGY

Research and theory regarding relation of the individual to social groups. Emphasis on socialization processes; effects of social interaction and isola-

tion; individual behavior under conditions of social organization and disorganization; cultural influence and its limits. (3 cr; prereq 1 or #; I MTWThF; AndH 210) Sykes

140 SOCIAL ORGANIZATION

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. (3 cr; prereq 1 or #; III MTWThF; BlegH 235) Sykes

141 THE FAMILY

Evolution of the family, development of unity or disunity, roles of the several members of the family, methods of investigation of the family. (3 cr; prereq 1 or #; II MTWThF; AndH 310) Johnson

142 RELIGION AS A SOCIAL INSTITUTION

Structure and function of religious organizations in various types of societies, nature of religious leadership, type of religious participation, and relationship of religion to other social institutions. (3 cr; prereq 1 or #; IV MTWThF; BlegH 10) Johnson

145 URBAN SOCIOLOGY

Introduction to study of cities; urban ecology; urban institutions and urban way of life. (3 cr; prereq 1 or #; I MTWThF; BlegH 5) Zwerman

South Asian Languages

For complete course listings, see section on 10-week courses, pages 142-148.

Indic (Indc)

2 SURVEY OF INDIAN CIVILIZATION

Social and economic life. (3 cr; VI MTWThF; FolH 104) Kale

172 TOPICS IN DRAVIDIAN LINGUISTICS

An examination of problems of linguistic interest in the Dravidian languages. The exact content of the course will depend on the backgrounds and interests of the students. (3 cr; IV MTWThF; FolH 110) Asher

Spanish and Portuguese

Portuguese (Port)

1-2-3 BEGINNING PORTUGUESE

See section on 10-week courses, pages 142-148.

Spanish (Span)

2 BEGINNING SPANISH

(5 cr; prereq 1, or 1 yr of high school Spanish; I-II MTWThF; Arch 15)

25 INTERMEDIATE SPANISH

(5 cr; prereq 3 or 3A, or 3 yrs of high school Spanish; III-IV MTWThF; Arch 20)

54 SPANISH COMPOSITION

(3 cr; prereq 25 or equiv; II MTWThF; FolH 202)

55 SPANISH CONVERSATION

(3 cr; prereq 25 or equiv; III MTWThF; FolH 202)

58 ADVANCED SPANISH CONVERSATION

(3 cr; prereq 55; III MTWThF; FolH 205) Narváez

- 108 STRUCTURE OF MODERN SPANISH: MORPHOLOGY**
(3 cr; prereq 57 or § or ¶57; IV MTWThF; FolH 201) Narváez
- 120 BALLAD**
(3 cr; prereq 65, 66, 67; II MTWThF; FolH 203) Jones
- 171 SPANISH NOVEL FROM VALERA TO PALACIO VALDEZ**
(3 cr; prereq 65, 66, 67; III MTWThF; FolH 202) Rundorff
- 189 INDEPENDENT READINGS FOR UPPER DIVISION STUDENTS**
(1-3 cr; prereq § and consent of dept chm; hrs ar) Jones, Narváez, Rundorff
- 260 DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq §; hrs ar) Rundorff

Speech, Communication, and Theatre Arts

Speech (Spch)

5 FUNDAMENTALS OF SPEECH

Development of basic skills in meeting variety of speech situations; extemporaneous speaking, oral reading, discussion. Development of basic understanding of speech processes and forms. (5 cr; limited to 22 students; I-II MTWThF; FolH 305)

6 FUNDAMENTALS OF SPEECH

Emphasis on investigation and persuasion ranging from informal committee session to formal meeting requiring parliamentary rules. (3 cr, §5; limited to 22 students; prereq 2 or ¶2; I MTWThF; FolH 306)

52 DISCUSSION AND CONFERENCE METHODS

Cooperative thinking in task-oriented groups. Planning, preparing for, participating in, and leading private and public meetings. (3 cr; limited to 25 students; prereq 5 or 6 or §; I MTWThF; FolH 406) Jensen

65 INTRODUCTION TO BROADCASTING PRODUCTION

Fundamentals of practice and theory in radio and television. Emphasis on projects and exercises in performance and scripting; introduction to studio equipment and procedures. Historical and sociological aspects of broadcasting. (3 cr; limited to 16 students; prereq 5 or 6; V MTWThF; MurH 302 and Aero 309) Bart

69 TELEVISION PRODUCTION

Introduction to problems of production. Equipment and staff organization; interrelationships with program design. Exercises in production. (3 cr; limited to 18 students; VI MTWThF; Aero 309) Bart

81 INTERPRETATIVE READING

Aesthetic theory of literature and of oral reading. Practice in reading for interpretation and mastery of technique. (3 cr; limited to 24 students; prereq 5, jr or sr or 6; II MTWThF; FolH 306) Thompson

101 PROCESS OF PERSUASION

Theories of modern motivational communication. Analysis of process of social control through persuasive speech. (3 cr; prereq 5 or 6, Psy 2, 10 cr in social science or §; III MTWThF; FolH 305) Howell

122 INTRODUCTION TO RESEARCH

Graduate research in speech; selection of topics and methods of investigation. Required of all graduate majors in speech. (3 cr; prereq sr, 5 or 6, Psy 2; VI MTWThF; FolH 406) Bormann

125 INTRODUCTION TO RHETORICAL CRITICISM

Introduction to traditional and contemporary rhetorical theory and its application to contemporary public address. (3 cr; prereq 5 or 6...55 recommended; II MTWThF; FolH 307) Jensen

126A HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS

Survey; history and criticism of religious and reform speaking in the United States from 1620 to 1920. (3 cr; prereq 5 or 6, Psy 2; V MTWThF; FolH 306) Bormann

181, 182, 183 READINGS IN SPEECH

Directed reading and preparation of reports on selected subject. (Cr ar; prereq 9 cr in Upper Division speech courses and #) Staff

207 SEMINAR: PERSUASION

Contemporary public address. Literature of persuasion, methods in study of persuasion. (3 cr; prereq 5, 101, 102, 103, Psy 2, 140, 10 cr of social science; hrs ar) Howell

223 SEMINAR: ORAL INTERPRETATION OF LITERATURE

Problems of silent and oral reading. Speech in relation to language and types of literature. (3 cr; prereq 81, 82, 83, 105; III MTWThF; FoH 306) Thompson

291, 292, 293 RESEARCH

(Cr ar; open to grad students engaged in research on special problems) Staff

Speech Science, Pathology, and Audiology**101, 102, 103 READINGS**

Directed readings and preparation of reports on selected subjects. (Cr and hrs ar; prereq #) Chaiklin, Lassman, Martin, Siegel, Speaks, Starr

121 ACOUSTIC PHONETICS

Physiological and acoustical variables differentiating speech signals. Various phonemic classification systems including I.P.A. and Distinctive Feature Analysis; phonemic transcription is practiced. (3 cr; prereq 120 or #120; II MTWThF; FoH 406) Speaks

146 CLEFT PALATE

A survey of medical, dental, and communication problems which occur in conjunction with cleft palate. (2 cr; prereq 120, 143; II MTWThF; FoH 102) Starr

190, 191, 192 CLINICAL METHODS AND PRACTICE IN AUDIOLOGY

Methods and supervised practice in analysis, diagnosis, and habilitation of communication disorders of persons with auditory impairments. (3 cr; prereq 173 or 174 or #; hrs ar) Chaiklin, Lassman, McClellan, Hoel

204, 205, 206 RESEARCH

Open to graduate students engaged in research on special problems. (Cr ar; prereq #) Chaiklin, Lassman, Siegel, Speaks, Starr

225 SEMINAR: EXPERIMENTAL PHONETICS

Critical analysis of significant research in physiological and acoustic phonetics. Examination of theory, method, instrumentation, and data. (3 cr; prereq 122; IV MTWThF; FoH 409) Speaks

266 CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY: SPECIALIZED PRACTICA

Specialized practica may be taken in one or more of the following areas: cleft palate, voice, articulation, stuttering, neuromuscular disorders, aphasia, laryngectomy, and hearing impaired. (1-3 cr; may be repeated; prereq #; hrs ar) Starr, Martin

Theatre (Th)**12 LABORATORY SECTION: INTRODUCTION TO THEATRE**

Practice of arts and crafts of theatre; scenery and particularly construction and painting, stage operation, publicity and promotion, theatre lighting, costuming, or make-up. (1 cr; prereq 11 or #11; meets first day VII hr in Sch 108; hrs and rm thereafter ar)

18 VOICE PRODUCTION FOR THEATRE

Physical exercises designed to improve voice production. Work on prose, poetry, and drama. Vocal exercises with piano. (2 cr; limited to 20 students; prereq soph, 12 or #12; II MTThF; ShH 115) Corrigan

24 STAGE MAKE-UP

Theory and practice in the art of stage make-up. (1 cr; limited to 15 students; prereq 12 or #12; VI-VII TTh; Sch 23)

- 54 STAGE FENCING AND COMBAT: HISTORY AND EXECUTION**
History of weapons through the ages; fighting and fencing with these weapons—their use in stage combat. (1 cr; limited to 12 students; prereq 12 or ¶12; VI MWF; WeH 302)
- 75 PLAY PRODUCTION IN SECONDARY SCHOOL**
Fundamentals including the analysis and production of selected scenes. (3 cr; limited to 15 students; prereq 74; III MTWThF; ScH 19) Adey
- 101, 102, 103 THEATRE PRACTICUM**
Directed individual creative projects meeting approval of a faculty committee in one or more of these areas: playwriting, directing, acting, and design. (2-6 cr; prereq Δ, §) Adey and staff
- 101A SHOWBOAT LABORATORY**
(2-6 cr; prereq Δ, §; hrs ar) Whiting
- 111 STAGE DIRECTION**
Theory of direction. Exercises in blocking and production of short scenes. (3 cr; prereq sr, 21, 6 cr from 90, 91, 92, and §; NH 304) Balk
- 114 THEATRE MANAGEMENT AND PROMOTION**
Theory and practice in ticket office procedures, house management, publicity, and promotion; special problems in college, community, children's, and professional theatre. (3 cr; limited to 15 students; prereq 12 or ¶12 or §; VI MTWThF; ScH 108) Loppnow
- 118 VOICE PRODUCTION FOR THEATRE**
Physical exercises designed to improve voice production. Work on prose, poetry, and drama. Vocal exercises with piano. Required attendance at taped listening sessions. (2 cr; limited to 18 students; prereq grad and theatre major; III MTThF; ShH 115) Corrigan
- 136 THEATRE AND DRAMA IN ANCIENT INDIA**
Dramatic literature and the theory and practice of theatre craft in Ancient India with reference to the socio-historical and cultural setting. (3 cr; III MTWThF; FoH 406) Kale
- 171 HISTORY OF THEATRE**
Plays, arts, and crafts of theatre from their beginnings to present. Reports and projects. (3 cr; prereq sr, 12 and 100 or §; IV MTWThF; NH 304) Balk
- 211 SEMINAR: STAGE DIRECTION**
Great plays and their potentials for meaningful and effective production in the modern theatre (classical period). (3 cr; prereq 111, 112, 113; hrs ar) R Smith

Statistics (Stat)

- 90 INTRODUCTION TO PROBABILITY AND STATISTICS**
Elementary probability and probability distributions; sampling and elements of statistical inference. (3 cr; prereq differential and integral calculus; III MTWThF; ForH 160) Ar
- 122 THEORY OF STATISTICS**
Estimation, hypothesis testing, confidence intervals. (3 cr; for nonmajors; prereq 121, Math 43 or equiv; II MTWThF; ForH 175) Ar
- 182 TUTORIAL COURSE**
Students whose needs are not met by current offerings may obtain content of regular courses or special areas by directed study. (3 cr; prereq §) Ar

College of Medical Sciences

For general information on the College of Medical Sciences, see section on Schools, Colleges, and Special Programs.

MEDICAL SCHOOL

Anatomy (Anat)

ELECTIVE COURSES

156 ADVANCED ANATOMY

Individual problems in gross anatomy, embryology, histology, or neuroanatomy. (Cr and hrs ar; prereq §) Staff

204 RESEARCH IN ANATOMY

Gross anatomy, cytochemistry, histology, endocrinology, embryology, hematology, or neuroanatomy. (Cr and hrs ar; prereq §) Staff

Anesthesiology (Anes)

All anesthesiology courses are listed in the section on 10-week courses, pages 142-148.

Biochemistry (MdBc)

REQUIRED COURSES

101 BIOCHEMISTRY

(7 cr; prereq 100; lect IV, VI MTWTh, II-III F, Owre 15; lab I-III MTWTh, MH 201) Ungar, Van Pilsum, Edstrom

ELECTIVE COURSES

153 PROBLEMS IN BIOCHEMISTRY

Special work arranged with qualified students. May be taken one or both terms. (Cr and hrs ar; prereq 100, 101) Ungar, Van Pilsum, Edstrom

205 RESEARCH IN BIOCHEMISTRY

(Cr and hrs ar) Armstrong, Lerner, Ungar, Wetlaufer, Wold, Van Pilsum, Edstrom, Dempsey

Laboratory Medicine

Laboratory Medicine (LMed)

180 FLUID, ELECTROLYTE, AND ACID-BASE METABOLISM

(Cr and hrs ar; prereq §) Mulhausen and staff

181 PROBLEMS IN CLINICAL LABORATORY MEDICINE

(Cr and hrs ar; prereq §) Benson, Quie, Strandjord, Sundberg, E Yunis, J Yunis

- 235 ADVANCED CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Quie, Strandjord, Sundberg, E Yunis, J Yunis
- 236 RESEARCH: CLINICAL LABORATORY PROBLEMS**
(Cr and hrs ar; prereq #) Benson and staff
- 251 RESEARCH: HUMAN GENETICS**
(Cr and hrs ar; prereq #) J Yunis

Medical Technology (MedT)

- 111 ADVANCED CLINICAL LABORATORY TECHNIQUES**
Assignment on individual basis for observation, study, and practice in special problems; techniques and methodology in one or two of the units of the clinical laboratories (chemistry, hematology, histology, immunology, or microbiology). (5 cr; prereq 110; hrs ar) Hovde and staff

Medicine (Med)

Division of Internal Medicine

REQUIRED COURSES

- 104 INTRODUCTION TO INTERNAL MEDICINE**
Combined with Pediatrics and Laboratory Medicine. (2 cr per qtr for 4 qtrs; prereq 101, LMed 102; 1:15-2:00 W; Todd Amph) Ebert and staff
- 112 CLERKSHIP: INTERNAL MEDICINE**
(16 cr; prereq regis med; 8:00-5:00 MTWThFS) Murray and staff

ELECTIVE COURSES††

- 180 EXTERNSHIP IN MEDICINE**
Care of medical patients on an inpatient service at an advanced level of responsibility. (6 cr per period; offered 3 elective periods; hrs ar) University, Murray; Veterans Administration, Hall; Hennepin County General, Schultz; St. Paul-Ramsey, Frost; Mount Sinai, Lewis; and Northwestern, Watson
- 181 RESEARCH IN MEDICINE**
Research opportunities in the following areas are available at University and affiliated hospitals (as in Med 180): gastroenterology, hypertension and sodium metabolism, lipid metabolism as related to atherosclerosis, liver disease, adrenal disease, carbohydrate metabolism and clinical diabetes, immunology and infectious diseases, cardiovascular and pulmonary disease, experimental hemodynamics, internal medicine. A detailed listing of these opportunities is available in the departmental office. (6 cr per period; offered 3 elective periods; hrs ar) Staff
- 184 SPECIAL CLINICAL PROBLEMS**
Opportunities for study in the following areas of clinical interests are available at University or affiliated hospitals (as in Med 180): clinical electrocardiography and vectorcardiography, clinical and basic problems in bile pigment and porphyrin metabolism, infectious diseases, endocrinology and metabolic disease including diabetes and thyroid disturbances, immunology and allergy, cardiovascular and pulmonary disease, clinical hemodynamics. A detailed listing of these opportunities is available in the departmental office. (6 cr per period; offered 3 elective periods; hrs ar) Staff
- 201 CLINICAL MEDICINE**
(Cr and hrs ar) Ebert and staff
- 202 DISEASES OF THE CARDIOVASCULAR APPARATUS**
(Cr and hrs ar) Frantz and staff

†† Prior arrangements with departmental office.

- 203 **RESEARCH IN MEDICINE**
(Cr and hrs ar) Ebert and staff
- 205 **DISEASES OF CHEST**
(Cr and hrs ar) Ebert, Hall, Lillehei
- 206 **CLINICAL CONFERENCE**
Presentation of problem cases. Discussion of diagnosis and treatment and consideration of pertinent literature. (1 cr; 11:00-11:50 S; Eustis Amph) Ebert and staff
- 207 **CLINICAL PATHOLOGICAL CONFERENCE**
Presentation of clinical features, necropsy findings, and discussion. Medical and surgical cases. (1 cr; 10:30-11:00 T; Todd Amph) Dawson and staff
- 208 **CLINICAL RADIOLOGICAL CONFERENCE**
Presentation and discussion of X-ray films from the Medical Service, with clinical correlation. (1 cr; 10:00-10:30 T; Todd Amph) Peterson, Ebert, and staff
- 210 **SEMINAR: INFECTIOUS DISEASE**
(1 cr; hrs ar) Spink
- 211 **ELECTROCARDIOGRAPHIC CONFERENCE**
(1 cr; 4:00-4:50 T; VCHH 299) Tuna and staff
- 214 **CARDIAC CONFERENCE**
Weekly conference on clinical cardiovascular problems, held jointly by the Departments of Medicine, Surgery, and Radiology. (1 cr; 4:00-4:50 M; VCHH 299) Wang and staff

Division of Dermatology

REQUIRED COURSES

- 123 **DERMATOLOGY, SYPHILOLOGY**
(2 cr; prereq 101; 3:15-4:00 alt W; Eustis Amph) Lynch and staff
- 124 **SENIOR CLERKSHIP: DERMATOLOGY**
(2 cr; prereq regis med; 8:00-9:00 MTThF, 1:00-5:00 MTTh, 9:00-11:00 Th, 1:00-4:00 W, 1:30-2:30 F; Eustis Amph) Lynch and staff

ELECTIVE COURSES

- 182 **EXTERNSHIP IN DERMATOLOGY**
(Cr and hrs ar) Lynch
- 183 **PROBLEMS IN DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 225 **CLINICAL DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 226 **SEMINAR: DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 227 **HISTOPATHOLOGY OF THE SKIN**
(1 cr; hrs ar) Orkin and staff
- 228 **RESEARCH: DERMATOLOGY**
(Cr and hrs ar) Lynch and staff
- 230 **FUNCTIONAL BIOLOGY OF THE SKIN**
(Cr and hrs ar) Fusaro, Rukavina, and Smith

Microbiology (MicB)

- 152 **SPECIAL PROBLEMS**
(Cr and hrs ar; prereq #) Staff

153 BIOLOGY OF MICROORGANISMS

(Same as Biol 52) Lectures and laboratory exercises in taxonomy, anatomy, physiology, biochemistry, and ecology of microbes, with emphasis on fundamental properties of bacteria, and a study of the major groups of bacteria and other protista. (4 cr, §Biol 52; prereq Biol 49 or 2, OrCh 62; lect II MTWThF, Z 313; lab III-IV MTWTh, Mayo 205) Klein

201 RESEARCH

(Cr and hrs ar) Staff

Obstetrics and Gynecology (Obst)

REQUIRED COURSES

120 OBSTETRICS AND GYNECOLOGY

Physiology of pregnancy, labor, and the puerperium. (4 cr; prereq 124; 2:15-3:00 W) Sciarra and staff

135 CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY

Includes clinics in obstetrics and gynecology. (12 cr; prereq regis med) Sciarra and staff

ELECTIVE COURSES

184 EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY

Elective for junior and senior medical students and recent graduates. Course will consist of clinical work in obstetrics and gynecology. Under exceptional circumstances investigative work can be done. Registration may be for one or both terms. (Cr and hrs ar; limited to 10 students) Sciarra and staff

COURSES FOR GRADUATE STUDENTS

201 ADVANCED OBSTETRICS AND GYNECOLOGY, PART I

(Cr ar) Sciarra and staff

202 ADVANCED OBSTETRICS AND GYNECOLOGY, PART II

(Cr ar) Sciarra and staff

203 ADVANCED OBSTETRICS AND GYNECOLOGY, PART III

(Cr ar) Sciarra and staff

204 ADVANCED OBSTETRICS AND GYNECOLOGY, PART IV

(Cr ar) Sciarra and staff

205 ADVANCED OBSTETRICS AND GYNECOLOGY, PART V

(Cr ar) Sciarra and staff

206 ADVANCED OBSTETRICS AND GYNECOLOGY, PART VI

(Cr ar) Sciarra and staff

207 ADVANCED OBSTETRICS AND GYNECOLOGY, PART VII

(Cr ar) Sciarra and staff

208 ADVANCED OBSTETRICS AND GYNECOLOGY, PART VIII

(Cr ar) Sciarra and staff

209 ADVANCED OBSTETRICS AND GYNECOLOGY, PART IX

(Cr ar) Sciarra and staff

210 ADVANCED OBSTETRICS AND GYNECOLOGY, PART X

(Cr ar) Sciarra and staff

211 ADVANCED OBSTETRICS AND GYNECOLOGY, PART XI

(Cr ar) Sciarra and staff

212 ADVANCED OBSTETRICS AND GYNECOLOGY, PART XII

(Cr ar) Sciarra and staff

216 RESEARCH

(Cr ar) Staff

301 EXTERNSHIP

(6 cr) Staff

Ophthalmology (Oph)

- 200 **CLINICAL OPHTHALMOLOGY**
(6 cr; 8:00-6:00 MTWThF; O-P Clin) Harris and staff
- 201 **PRACTICAL OCULAR SURGERY**
(3 cr; 7:30-12:00 MTWThF; Oper Rm) Harris and staff

Otolaryngology (Otol)

COURSES FOR GRADUATE STUDENTS

- 230 **CLINICAL OTOTOLOGY**
(3 cr; 1:00-4:00 MTWThF; O-P Clin) Paparella and staff
- 231 **CLINICAL RHINOLOGY AND LARYNGOLOGY**
(3 cr; 1:00-4:00 MTWThF; O-P Clin) Paparella and staff
- 232 **SURGERY OF EAR, NOSE, AND THROAT**
(3 cr; 9:00-12:00 MTWThF; Oper Rm) Paparella and staff
- 241 **SEMINAR: CURRENT LITERATURE**
(1 cr; 9:00-11:00 S; Mayo A-675) Staff
- 248 **RESEARCH**
(Cr and hrs ar) Staff

Pathology (Path)

- 104 **AUTOPSIES**
(Cr ar; prereq 102; hrs ar) Dawson, Hebbel
- 106 **DISEASES OF THE HEART**
See section on 10-week courses, pages 142-148.
- 111 **CONFERENCE ON AUTOPSIES**
See section on 10-week courses, pages 142-148.
- 112 **DIAGNOSIS OF TUMORS**
See section on 10-week courses, pages 142-148.
- 113 **SURGICAL PATHOLOGY**
(Cr and hrs ar; prereq 102) Hebbel
- 121 **DISEASES OF THE ALIMENTARY TRACT**
(1 cr; prereq 102; hrs ar) Hebbel
- 150 **PROBLEMS IN PATHOLOGY**
See section on 10-week courses, pages 142-148.
- 201 **RESEARCH**
Students with the necessary preliminary training may elect research either as a major or minor in pathology. (Cr and hrs ar; prereq #) Dawson, Hebbel

Pediatrics (Ped)

REQUIRED COURSES

- 120 **CLINICAL LECTURES IN PEDIATRICS**
(2 cr; prereq regis med; 1:00-2:00 W; Eustis Amph) J Anderson and staff
- 135 **CLINICAL CLERKSHIP**
(12 cr; prereq regis med) J Anderson and staff

ELECTIVE COURSES

181 EXTERNSHIP

Care of pediatric patients on an inpatient service at an advanced level of responsibility. Offered at University and affiliated hospitals. (Cr ar)

182 SPECIAL CLINICAL PROBLEMS

Opportunities for study in the following areas of clinical interest are available at University and affiliated hospitals: pediatric cardiology, pediatric neurology, pediatric endocrinology and metabolism; and renal diseases. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

183 RESEARCH IN PEDIATRICS

Research opportunities in the following areas are available at University or affiliated hospitals: hematology, infectious disease, immunology and inflammatory diseases, renal diseases, metabolic and endocrinologic research. A detailed listing of these opportunities is available in the departmental office. (Cr ar)

COURSES FOR GRADUATE STUDENTS

All pediatric medical fellows, medical fellow specialists, teaching assistants, and research assistants are required to register for one or more of the following courses. Credit obtained may be applied to the M. S. or the Ph.D. degree. The clinical experience in these courses is obtained in the outpatient and inpatient services of the University of Minnesota Hospitals. Research opportunities will be provided by arrangement in either the basic science departments of the Medical School or in the laboratories of the Department of Pediatrics.

200 GRADUATE SEMINAR: PEDIATRICS

(1½ cr; VIII T; Mayo 1450) J Anderson and staff

202 PEDIATRIC CLINIC

(5 cr; II-IV MTWThF; O-P depts of Hennepin County General Hospital or University Hospitals) J Anderson and staff

204 RESIDENCY IN PEDIATRICS

Three-month residency in pediatrics at University Hospitals, Hennepin County General Hospital, St. Paul Children's Hospital, St. Paul-Ramsey Hospital. (7 cr; I-X MTWThF) J Anderson and staff

206 PEDIATRIC SPECIAL INTEREST

Pediatric graduate students who have completed at least 1½ years of their general graduate pediatric training may obtain advanced clinical and basic training in one or more of the following special fields: allergy, neurology, cardiology, psychiatry, pathology, endocrinology and metabolism, hematology. Clinical training in these areas is obtained in the inpatient and outpatient services of the University Hospitals and its affiliated hospitals. Training in the basic sciences related to these fields of special interest may be obtained in the preclinical divisions of the Medical School. (Cr and hrs ar; prereq #) J Anderson and staff

208 PEDIATRIC RESEARCH

Special problems. Students may collaborate with members of the staff or with other students. (Cr and hrs ar; ped labs) J Anderson and staff

Pharmacology (Phc)

109 PHARMACOLOGICAL PROBLEMS

(Cr and hrs ar) Shideman and staff

203 RESEARCH IN PHARMACOLOGY

(Cr and hrs ar) Shideman and staff

Physical Medicine and Rehabilitation (PMed)

- 103 **PHYSICAL THERAPY CLINIC**
(Cr and hrs ar) Gullickson
- 161 **CLINICAL MEDICINE IN REHABILITATION**
(5 cr) Staff
- 180 **PROBLEMS IN PHYSICAL THERAPY**
(Cr ar; prereq physical therapist) Staff
- 181 **EXTERNSHIP IN PHYSICAL MEDICINE AND REHABILITATION**
(Cr ar; prereq regis med) Kottke, Kubicek
- 191 **SEMINAR: REHABILITATION LITERATURE**
(Cr ar; prereq regis med) Staff
- 200 **PHYSICAL MEDICINE SERVICE**
(Cr and hrs ar) Staff
- 204 **CLINIC: PERIPHERAL VASCULAR DISEASE**
(Cr and hrs ar) Gullickson
- 205 **READINGS**
(1 cr; 1 M) Kottke
- 206 **CONFERENCE**
(Cr and hrs ar) Staff
- 210 **RESEARCH IN PHYSICAL MEDICINE**
(Cr and hrs ar) Staff
- 212 **ELECTROMYOGRAPHY**
(Cr and hrs ar) Awad

Occupational Therapy

- 94-95-96 **CLINICAL TRAINING IN OCCUPATIONAL THERAPY**
A total of 9 months of supervised training in affiliated hospitals. (18 cr per qtr for sr O T students)

Physical Therapy

- 88 **CLINICAL TRAINING**
Five weeks of supervised practice at affiliating hospitals. (3 cr; limited to physical therapy students in the professional program; hrs ar at affiliating hospitals) Clayton

Physiology (Phsl)

- 113 **PROBLEMS IN PHYSIOLOGY**
Topics assigned for laboratory study, conferences, and reading. (Cr and hrs ar) Staff
- 202 **READINGS IN PHYSIOLOGY**
Topics selected for each student, written reviews prepared and discussed. (Cr and hrs ar) Staff
- 203 **RESEARCH IN PHYSIOLOGY**
(Cr and hrs ar) Staff

Psychiatry and Neurology (NPsy)

- 101 **CLINICAL NEUROLOGY**
(4 cr; prereq regis med or grad clin psychol; 8:00 a.m. S) Baker

- 103 **CLINICAL CLERKSHIP**
(12 cr) Staff
- 145 **READINGS IN PSYCHIATRY**
(Cr ar) Staff
- 145 **READINGS IN NEUROLOGY**
(Cr ar) Staff
- 151 **SURVEY OF NEUROPATHOLOGY**
(Cr ar) Staff
- 181 **EXTERNSHIP IN NEUROLOGY**
(Cr ar) Staff
- 182 **PROBLEMS IN BASIC AND CLINICAL NEUROLOGY**
(Cr ar) Staff
- 191 **EXTERNSHIP IN ADULT PSYCHIATRY**
(Cr ar) Staff
- 192 **EXTERNSHIP IN CHILD PSYCHIATRY**
(Cr ar) Jensen
- 193 **PROBLEMS IN PSYCHIATRY**
(Cr ar) Staff
- 202 **SPECIAL RESEARCH TOPICS**
(Cr ar; prereq §) Staff
- 203 **PSYCHOMETRIC CLERKSHIP**
(Cr ar) Staff
- 204 **INTERNSHIP IN CLINICAL PSYCHOLOGY**
(2 or 4 cr; prereq PhD candidate in clinical psychology with §) Staff
- 208 **CLINICAL NEUROLOGY**
(Cr ar) Baker and staff
- 209 **RESEARCH IN NEUROLOGY**
(Cr ar) Baker and staff
- 212 **SURVEY OF NEUROPATHOLOGY**
(1 cr) Sung
- 226 **NEUROLOGICAL-NEUROSURGICAL CONFERENCE**
(1 cr) Baker and staff
- 231 **APPLIED ELECTROENCEPHALOGRAPHY, MYOGRAPHY**
(Cr ar) Torres, Kennedy
- 233 **APPLIED NEUROPATHOLOGY**
(Cr ar) Sung
- 245 **CLINICAL CORRELATIVE NEUROANATOMY**
(1 cr) Riley
- 251 **CLINICAL INPATIENT PSYCHIATRY**
(Cr ar) Staff
- 252 **CLINICAL OUTPATIENT PSYCHIATRY**
(Cr ar) Anderson and staff
- 253 **CLINICAL CHILD PSYCHIATRY**
(Cr ar) Jensen and staff
- 254 **ADVANCED CLINICAL INPATIENT PSYCHIATRY**
(Cr ar) Staff
- 255 **ADVANCED CLINICAL OUTPATIENT PSYCHIATRY**
(Cr ar) Anderson and staff
- 256 **ADVANCED CLINICAL CHILD PSYCHIATRY**
(Cr ar) Jensen and staff
- 257 **SPECIAL ASSIGNMENTS**
(1 cr) Staff
- 258 **RESEARCH IN PSYCHIATRY**
(Cr ar) Staff

- 260 **ORIENTATION TO CLINICAL PSYCHIATRY**
(1 cr) Staff
- 291 **SEMINAR: CURRENT LITERATURE**
(1 cr) Staff
- 292 **SPECIALIZED SUPERVISED PSYCHOTHERAPY**
(1 cr) Hastings and staff

Radiology (Rad)

ELECTIVE COURSES FOR THIRD- AND FOURTH-YEAR STUDENTS

- 180 **EXTERNSHIP IN RADIOLOGY**
(Cr and hrs ar)
- 181 **EXTERNSHIP IN DIAGNOSTIC RADIOLOGY**
(Cr and hrs ar)
- 182 **EXTERNSHIP IN RADIATION THERAPY**
(Cr and hrs ar)
- 183 **PROBLEMS IN RADIATION BIOLOGY AND RADIOACTIVE ISOTOPE METHODS**
(Cr and hrs ar)
- 184 **PROBLEMS IN DIAGNOSTIC RADIOLOGY**
(Cr and hrs ar)
- 186 **ROENTGEN TECHNIQUE**
(Cr and hrs ar)

REQUIRED COURSES FOR GRADUATE STUDENTS

- 110 **RADIATION BIOLOGY INSTITUTE**
Effects of irradiation on living systems. Radioisotopic procedures. Physics and chemistry fundamental to radiation biology and effects on all types of chemical and biological systems. (Cr and hrs ar) Maruyama, Hahn
- 111 **MEDICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the medical staff at which all the important medical cases which have X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; III T; Todd Amph) Peterson and staff
- 124 **PEDIATRIC ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the pediatric staff at which all the important pediatric cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; II T; Eustis Amph) Wolfson
- 135 **SURGICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the surgical staff at which all the important surgical cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological standpoints. (1 cr; II S; Todd Amph) Amplatz, Gedgaudas
- 163 **NEUROSURGICAL ROENTGENOLOGIC CONFERENCE**
Weekly meetings with the neurosurgical staff at which all the important neurosurgical cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; VI F; Todd Amph) Peterson
- 200 **RESEARCH IN ROENTGENOLOGY**
Problems in roentgen diagnosis. (Cr ar) Peterson, others
- 202 **CARDIOVASCULAR ROENTGENOLOGIC CONFERENCE**
(1 cr; VIII M; Todd Amph) Amplatz, Gedgaudas
- 204 **TUMOR CLINIC CONFERENCE**
(Cr ar; IV Th; Todd Amph) Charyulu
- 205 **RESEARCH: RADIATION THERAPY, NUCLEAR MEDICINE, RADIOBIOLOGY**
(Cr ar) Loken, Hahn

- 206 ROENTGENOSCOPY**
Theory and practical application of roentgenoscopy, particularly to diseases of the gastrointestinal tract, lungs, and heart. (3 cr) Peterson and others
- 209 ROENTGEN DIAGNOSIS**
Theory and practical application of roentgen diagnostic methods to medical cases in general. (3 cr) Peterson and others
- 210 ROENTGEN TECHNIQUE**
Theory and practical application of the principles of roentgen technique including the study of X-ray machines and X-ray tubes, exposure, technique, and darkroom. (2 cr) Peterson and others
- 211 DOSIMETRY OF INTERNAL, EXTERNAL RADIATION EMITTERS**
(1 cr; 7:00-8:00 a.m. W; Mayo B-142) Moore
- 212 SEMINAR: RADIATION BIOPHYSICS AND NUCLEAR MEDICINE**
Research approaches to problems in radiation biophysics; use of radioactive isotopes discussed. Recent advances reviewed. (1 cr; V M) Loken, Moore
- 236 NUCLEAR MEDICINE CONFERENCE**
Current topics in nuclear medicine. (1 cr; 4:00-5:00 T; Rigler Library) Loken
- 238 ROENTGEN-SURGICAL PATHOLOGY CONFERENCE**
Weekly meetings with the surgical pathology staff at which surgical specimens and roentgenograms are reviewed from the pathologic and roentgenologic points of view. (1 cr; 4:00-5:00 Th; Todd Amph) Lober, Peterson, and others
- 240 RADIATION THERAPY CONFERENCE**
Recent advances in clinical radiotherapy. (1 cr; 4:00-5:00 M; Rigler Library) Charyulu, Maruyama

Surgery (Surg)

Division of General Surgery

REQUIRED COURSES FOR UNDERGRADUATE SURGERY

- 135 CLINICAL CLERKSHIP**
(16 cr; prereq regis med) Najarian and staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 181 CARDIOVASCULAR SURGERY**
Clinical problems and participation in surgery. (Cr and hrs ar; for srs only) Varco, Castaneda
- 182 PROBLEMS IN CLINICAL INVESTIGATIONS AND PROBLEMS IN EXPERIMENTAL SURGERY**
(Cr and hrs ar; University and affiliated hospitals) Najarian and staff
- 183 CLINICAL TISSUE TRANSPLANTATION**
Participation in transplantation operations, ward rounds, and seminars. Additional time may be spent in the laboratories participating in experimental organ transplantation studies. (Cr and hrs ar) Najarian
- 184 EXTERNSHIP IN AFFILIATED HOSPITALS**
(Cr and hrs ar) Najarian, Eisenberg, Hitchcock, Humphrey, and Perry

REQUIRED COURSES FOR GRADUATE STUDENTS

- 200 OUTPATIENT CLINIC IN SURGERY**
Student is required to assist in the outpatient surgical clinic and to participate in diagnosis and treatment. (1 cr) Najarian and staff
- 203 PROCTOSCOPY AND SIGMOIDOSCOPY**
Diagnosis and treatment of lesions of the lower bowel. (1 cr; hrs ar) W Bernstein and staff

- 204 TUMOR CLINIC**
Combined clinical-pathological consideration of tumors as seen by the general surgeon. Tumor Conference follows. (1 cr; hrs ar) Staff
- 205 SURGICAL DIAGNOSIS**
Surgical fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in Outpatient Department. (1 cr; hrs ar) Najarian and staff
- 208 STUDY OF SURGICAL PROBLEMS**
Surgical fellow acts as house surgeon at University Hospitals. (1 cr; hrs ar) Najarian and staff
- 211 OPERATIVE SURGERY**
Surgical fellow acts as the first assistant at operations in University and affiliated hospitals and later may be permitted to operate. (1 cr; hrs ar) Najarian and staff
- 214 SURGICAL WARD CONFERENCE**
Presentation of interesting cases by the fellows. (1 cr; hrs ar) Najarian and staff
- 215 SURGICAL-ROENTGENOLOGICAL-PATHOLOGY CONFERENCE**
Weekly reviews of selected surgical patients. (1 cr; hrs ar) Radiology, Pathology, and Surgery staffs
- 216 SURGICAL RESEARCH**
Problems in experimental surgery. (1 cr; hrs ar) Najarian and staff
- 217 SURGICAL SEMINAR**
Conferences for review of surgical literature, for presentation of cases, and as research. (1 cr; hrs ar) Najarian and staff
- 218 SURGICAL CLINICS-PATHOLOGIC CONFERENCE**
Review of interesting cases by the medical, surgical, pediatrics, and pathology staffs. (1 cr; hrs ar) Najarian and staff
- 219 SURGERY-LITERATURE CONFERENCE**
Leading surgical journals are assigned to the fellows who review and report selected articles at weekly conference. (1 cr; hrs ar) Najarian and staff
- 220 PERIPHERAL VASCULAR CONFERENCE**
Vascular clinic with conference following. (1 cr; hrs ar) Najarian and staff
- 221 SURGERY-PHYSIOLOGY CONFERENCE**
Seminar discussing the physiological aspects of surgery. (1 cr; VIII T) Najarian, Sosin
- COMPLICATIONS CONFERENCE**
Discuss complications encountered postoperatively. (Cr and hrs ar) Najarian, Delaney

Division of Neurosurgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 127 CLINICAL LECTURES IN NEUROSURGERY**
(1 cr per yr; prereq regis med; W) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 188 NEUROSURGERY EXTERNSHIP, UNIVERSITY HOSPITALS**
(Cr ar; prereq regis med; MTWThF) Staff
- 189 NEUROSURGERY EXTERNSHIP, VETERANS ADMINISTRATION HOSPITAL**
(Cr ar; prereq regis med; MTWThF) Staff
- 190 NEUROSURGERY INVESTIGATION**
(Cr ar; prereq regis med; MTWThF) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

305 NEUROSURGICAL DIAGNOSIS

The neurosurgical fellow assists in instruction of clinical clerks and interns, and studies problems in diagnosis in the Outpatient Department and in University Hospitals. (3 cr; MTWThF) French, Chou, Long

308 STUDY OF NEUROSURGICAL PROBLEMS

The neurosurgical fellow acts as house surgeon at University Hospitals. (4 cr; MTWThF) French, Chou, Long

311 OPERATIVE NEUROSURGERY

The neurosurgical fellow acts as first assistant at operations in University Hospitals and later may be permitted to operate. (4 cr; MTWThF) French, Chou, Long

316 NEUROSURGICAL RESEARCH

Problems in experimental or clinical surgery. (3 cr; MTWThF) French, Chou, Long

318 NEUROSURGICAL CONFERENCE

A review of X-rays and case histories on neurosurgical service. (1 cr; F) French, Chou, Long

Division of Orthopedic Surgery

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

185 EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES

(Cr ar; prereq regis med) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

401 ORTHOPEDIC CONFERENCE

Review of X-rays and case histories of patients on the orthopedic inpatient or outpatient service. (3 cr) Moe, Kane, Patterson, House, Bunch, and staff

403 FRACTURES

The orthopedic fellow acts as house surgeon on the fracture service at Hennepin County General Hospital. (5 cr) Gustilo and staff
The orthopedic fellow acts as house surgeon on the fracture service at St. Paul-Ramsey Hospital. (5 cr) Comfort and staff

405 ORTHOPEDIC DIAGNOSIS

The orthopedic fellow assists in instruction of clinical clerks and interns and studies problems in diagnosis in the Outpatient Department and in the University Hospitals. (3 cr) Moe, Kane, Patterson, House, Bunch, and Staff

407 PEDIATRIC ORTHOPEDICS

The orthopedic fellow acts as house surgeon at Gillette State Hospital for Crippled Children. (5 cr) Moe and staff

408 STUDY OF ORTHOPEDIC SURGERY PROBLEMS

The orthopedic fellow acts as house surgeon at University Hospitals. (5 cr) Moe, Kane, Patterson, House, Bunch, and staff

410 ORTHOPEDIC PATHOLOGY

Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities. (2 cr) Moe, Kane, Patterson, House, Bunch, and staff

411 ORTHOPEDIC OPERATIVE SURGERY

The orthopedic fellow acts as first assistant at operations at University Hospitals and later may be permitted to operate. (5 cr) Moe, Kane, Patterson, House, Bunch, and staff

412 ORTHOPEDIC ANATOMY

The orthopedic fellow dissects upper and lower extremities and aids in instruction of medical students in anatomy of the extremities. (2 cr) Moe, Kane, Patterson, House, Bunch, and staff

416 ORTHOPEDIC RESEARCH

Problems in experimental or clinical surgery. University Hospitals. (5 cr) Moe, Kane, Bunch, and staff

Division of Urology

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 180 EXTERNSHIP IN UROLOGY**
(Cr and hrs ar) Staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 250 UROLOGICAL SURGERY**
Urological fellow first assists at operations at University Hospitals and later is permitted to operate under supervision of the staff. (4 cr; hrs ar) Staff
- 251 CYSTOSCOPY AND UROLOGICAL DIAGNOSIS**
Urological fellow performs cystoscopies and other diagnostic procedures. (4 cr; hrs ar) Staff
- 252 UROLOGICAL CONFERENCE**
Problems in diagnosis and treatment are discussed. (4 cr; hrs ar) Staff
- 253 RESEARCH IN UROLOGY**
Problems in experimental and clinical surgery. (4 cr; hrs ar) Staff

SCHOOL OF NURSING (Nurs)

82B NURSING TREATMENT AND DELEGATED MEDICAL ACTIVITY

Modification of nursing treatment and the planning and providing of delegated medical care. (4 cr; prereq 82A) Staff

- Sec 1, Lect II-III TTh, PoH 2309
Sec 2, Lect II-III TTh, Owre 113
Sec 3, Lect II-III TTh, Owre 117
Sec 4, Lect II-III TTh, MH 118
Sec 5, Lect II-III TTh, PoH 2317
Lab II-IV, VI-VIII MW

SCHOOL OF PUBLIC HEALTH (PubH)

53 INTRODUCTION TO PUBLIC HEALTH

Basic concepts of disease prevention and control through community programs. (5 cr; prereq 3, 50 or equiv and a course in bacteriology; I-II MTWThF; MMA 125) G Anderson

65 FIELD PRACTICE IN PUBLIC HEALTH NURSING

See section on 10-week courses, pages 142-148.

100A ELEMENTS OF PUBLIC HEALTH

Occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; maternal and child health. (3 cr; prereq 3, 50 and a course in microbiology; I-II MTWThF; MMA 125) G Anderson

102 ENVIRONMENTAL HEALTH

Methods for promoting man's health and comfort by controlling environment. (3 cr; prereq #; I-II MTWThF; Mayo 1250) Bond, Michaelsen, and staff

107 MATERNAL AND CHILD HEALTH

Health needs and services for mothers and children in public health programs. (3 cr; prereq #; hrs ar) Bridge

123 TOPICS IN PUBLIC HEALTH

Selected readings in public health with discussion based on these readings. (Cr ar; prereq #) Staff

138** HOSPITAL ENGINEERING PROBLEMS

Application of environmental engineering, sanitation, and maintenance principles to planning, administration, and operation of hospitals. (Cr ar; prereq #) Michaelsen and visiting lecturers

- 179A LONG-TERM PATIENT CARE AND REHABILITATION**
Problems associated with rehabilitation; selected experience correlated with seminars. (Cr ar; prereq §) E Anderson
- 179B LONG-TERM PATIENT CARE AND REHABILITATION**
Independent study. Exploration of a comprehensive multidiscipline approach in the continuity of care for long-term patients. (Cr ar; prereq 179A) E Anderson
- 179C FIELD WORK: PHYSICAL THERAPY IN COMMUNITY AGENCIES**
Supervised experience in local public health agencies. Includes advisory service and planning in-service programs for nursing staff; selected experiences in county and state health departments. (Cr ar; §) E Anderson
- 181A FOUNDATIONS IN PUBLIC HEALTH EDUCATION PRACTICE**
Role and function of health education specialist; relationship to other public health disciplines; overview of public health and related fields; introduction to health education principles and methods. (3 cr; prereq §) Craig, Ellis
- 186 PROBLEMS OF AIR POLLUTION CONTROL**
Special supervised studies involving laboratory and field investigation procedures; pertinent literature review. (Cr ar; prereq 155, §) Paulus
- 187A COMMUNITY HEALTH EDUCATION LABORATORY**
Practical experience in community agencies and organizations; background studies in specific neighborhood areas; supervised health education practice; action planning for health education. (Cr ar; prereq ¶181A, B, C, D, or E) Craig, Ellis
- 189 FIELD COURSE IN PUBLIC HEALTH NUTRITION**
Placement in an approved agency with opportunity for experience in nutritional aspects of public health programs. (Cr ar; prereq §) Stief and associates
- 190** FIELD PRACTICE IN PUBLIC HEALTH EDUCATION**
See section on 10-week courses, pages 142-148.
- 194 HEALTH EDUCATION PREPARATION OF HEALTH AND ALLIED PERSONNEL**
Methods, procedures, and techniques for planning, implementing, and evaluating programs for in-service and short-course preparation in health education for health and allied personnel. (2 cr; prereq ¶181D and §) Craig, Ellis
- 196* SEMINAR: PUBLIC HEALTH NUTRITION**
(Cr ar; prereq §) Stief
- 200 RESEARCH**
Opportunities will be offered by the School of Public Health and by various cooperating organizations for qualified students to pursue research work. (Cr ar) Staff
- 222 SEMINAR: SCHOOL NURSING AND RELATED FIELD PRACTICE**
Exploration of nursing in the school setting; role relationships; review of current research. (Cr ar; prereq §) Fredlund
- 230** FIELD PRACTICE IN ENVIRONMENTAL HEALTH**
(Cr ar; prereq §) Bond, Paulus, Greene, and staff
- 232** FIELD WORK IN GROUND WATER DEVELOPMENT**
See section on 10-week courses, pages 142-148.
- 233 WATER QUALITY INVESTIGATION AND RESEARCH TECHNIQUES**
Field techniques and special research methods for establishing pollution base-lines; recognition and appraisal of advancing eutrophication. (6 cr; prereq §) Olson, Odlag
- 234 WATER QUALITY RESEARCH**
Design and implementation of independent short-term research activity. Literature review, statistical design, and data processing. (6 cr; prereq §) Olson, Odlag

Biometry (PubH)

- 110B BIOMETRY II**
Further consideration of testing statistical hypotheses and interval estimation; regression analysis; correlation; use of ratios; analysis of variance; con-

trasts and multiple comparison techniques. (3 cr; prereq 110A, 111B; IV MTWThF; ForH 130) Jeffries

111B BIOMETRY LABORATORY II

Application of concepts of testing and estimation concerning the parameters of the basic probability models; application of regression to bioassay; examples of the use and misuse of ratios; application of analysis of variance to bioassay. (2 cr; prereq 110B; III TThF and 7 hrs per wk ar during morning, afternoon hrs by special ar only; ForH 80) Jeffries

120E* BIOMEDICAL COMPUTING

See section on 10-week courses, pages 142-148.

180 INTRODUCTION TO BIOMETRY

Variation; frequency distribution; probability; estimation; significance tests; binomial, normal, Poisson distributions; serial dilutions; most probable number. (6 cr; prereq environmental health students only, others ‡; III MTWThF, Owre 111, plus 9 hrs per wk lab ar, Mayo 1220) Martin

211 SEMINAR: BIOMETRY

(Cr ar) Boen

MORTUARY SCIENCE (Mort)

90B PRACTICUM IN FUNERAL SERVICE

See section on 10-week courses, pages 142-148.

99 INDEPENDENT STUDY

A report based on study and research in an area of student's interest in funeral service. (Cr ar; prereq sr)

Institute of Technology

For general information about the Institute of Technology, see section on Schools, Colleges, and Special Programs.

COLLEGE OF ENGINEERING

Aeronautics and Engineering Mechanics

Mechanics and Materials (MM)

36 DYNAMICS

Introduction to vector calculus. Kinematics. Application of principles of particle motion. Conservation principles. Dynamics of particle systems and plane rigid bodies. Technical applications. (4 cr, §Phys 100 or §Phys 100A; prereq Math 32 or ¶Math 32 and Phys 21; I-II MWF, II TTh; AE 21)

37 DEFORMABLE BODY MECHANICS

Introductory treatment of stress and strain at a point. Stress-strain relation in two dimensions. Linear theory of torsion. Bending stresses. Deflection of determinate and indeterminate beams. Instability. (4 cr; prereq 35, Math 31 or ¶Math 31; III-IV MWF, III TTh; AE 21)

Electrical Engineering (EE)

31 CIRCUIT ANALYSIS

Steady-state AC analysis of linear passive circuits; instantaneous and average power. Complex frequency; natural and forced response. Magnetically coupled circuits. (3 cr; prereq 30; lect, I-II MWF; Arch 50) Ar

Rec 1, III-IV M, ME 302

Rec 2, I-II T, ME 208

Rec 3, I-II Th, ME 208

31A ELECTRICAL ENGINEERING LABORATORY

Laboratory to accompany 31. (1 cr; prereq 30A, ¶31) Ar

Lab 1, III-IV MW, EE 118

Lab 2, VI-VII MW, EE 118

Lab 3, I-II TTh, EE 118

Lab 4, III-IV TTh, EE 121

Lab 5, III-IV TTh, EE 118

Lab 6, VI-VII TTh, EE 121

Lab 7, VI-VII TTh, EE 118

Lab 8, III-IV WF, EE 118

66 NONLINEAR ELECTRONIC CIRCUITS

Nonregenerative switching circuits, diode and transistor logic circuits; multi-vibrators, oscillators. (4 cr, §118; prereq 65, 107 or ¶107; I-II MTWThF; Arch 55)

86 JUNIOR ELECTRICAL ENGINEERING LABORATORY

Experimental study of electromagnetic fields and linear systems. (2 cr; prereq 75, 85, 66 or ¶66, 107 or ¶107) Ar

Lab 1, V-VIII MW, EE 216

Lab 2, V-VIII MW, EE 205

Lab 3, V-VIII TTh, EE 205

107 LINEAR SYSTEM ANALYSIS

Development of time-invariant linear models for electrical, mechanical, thermal, and acoustic systems; analysis of the models in time and frequency domains. Applications of transform techniques to linear systems. (3 cr; prereq 31, Math 60A; III-IV MWF; Arch 55) Ar

Mechanical Engineering

Mechanical Engineering (ME)

22 ANALYSIS OF MECHANISM SYSTEMS

Kinetic analysis of mechanisms based upon constraint equations and Newtonian mechanics. Degrees of freedom of rigid body mechanisms. Geometric synthesis with three and four accuracy points. (4 cr; prereq MM 36; lect III MTWThF, 1 hr ar, ME 214; lab VI-VII MW, ME 321) Frohrib

34 MEASUREMENTS LABORATORY II

Static and dynamic characteristics of generalized measurement systems. Electromechanical transducers. Measurement of temperature, pressure, vacuum, humidity, density, viscosity, heating valves, speed, power, force, stress, strain, and radioactivity. (2 cr; prereq 30A or ¶30A; lect IV TTh, ME 221; lab VII-IX TTh, ME 370) McFarland

90, 91, 92, 93 INDUSTRIAL ASSIGNMENT, PART II

See section on 10-week courses, pages 142-148.

146A AN INTRODUCTION TO COMBUSTION AND PROPULSION

Flame propagation, quenching, and ignition in a gaseous mixture; combustion of solid and liquid particles, and gaseous jets. Principles of propulsion, thrust, specific impulse and exhaust velocity. (4 cr; prereq 133 or ¶133; III MTWThF, IV MWF; ME 321) Murphy

170 MANUFACTURING PROCESSES

Analysis and description of the physical and economic principles underlying manufacturing processes. Illustration of the principles as they are applied in basic manufacturing operations. (4 cr; prereq MetE 56; lect VI MTWThF and 1 hr ar; ME 110) Holtby

Lab 1, VII-IX MW, ME 70

Lab 2, VII-IX TTh, ME 70

Industrial Engineering (IE)

100 INTRODUCTION TO INDUSTRIAL ENGINEERING ANALYSIS

Management and decision making, analytical methods in production management, design of production systems, operation and control of production systems. (3 cr; prereq ME 99 or ¶; lect V MTWThF and 1 hr ar; ME 106) Arora

120 PROBABILITY MODELS IN INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH

Concepts of compound statements, sets and functions, conditional probabilities and simple stochastic processes (including finite Markov chains) and their relation to selected problems in industrial engineering and operations research. Waiting line models, renewal and replacement models, dynamic programming, Markov processes with rewards; Monte Carlo methods. (3 cr; prereq ME 99 or equiv; 3 lect hrs per wk; IV MTWThF and 1 hr ar; Arch 140) Arora

SCHOOL OF ARCHITECTURE (Arch)

21 ARCHITECTURAL THEORY AND HISTORY

An introduction to architecture, the philosophy and principles of architecture as an art, a survey of the development of architecture from the ancient

periods until the present time. (3 cr; prereq for all architectural history; II MTWThF; Arch 130) Winterowd

56 MODERN ARCHITECTURE

The history of architecture in America and Europe from the late 19th century until the present time. (3 cr; prereq 21; IV MTWThF; Arch 130) Winterowd

81-83, 91-93, 111-113, 121-122 ARCHITECTURAL DESIGN

See section on 10-week courses, pages 142-148.

130 SEMINAR: THE DEVELOPMENT OF URBAN FORM

The physical development of urban places—from the early Middle East urban revolution to the Industrial Revolution—as a manifestation of the changes in underlying social, political and economic forces as well as to planning theories—if any—to which they gave rise. (3 cr; hrs ar; Arch 130) Iskander

SCHOOL OF CHEMISTRY

Chemistry

Analytical Chemistry (AnCh)

111 PHYSICOCHEMICAL METHODS OF ANALYSIS

Optical and electrochemical methods and methods of separation. Lecture. (3 cr; prereq 47 and PCh 101; V-VI MWF; C 325) Lingane

112 PHYSICOCHEMICAL METHODS OF ANALYSIS

Quantitative application of electrochemical, optical, and other physical techniques. Laboratory. (3 cr; prereq 111 or 111; I-III MTWThF; C 310) Lingane

212 PHYSICOCHEMICAL METHODS OF ANALYSIS

Quantitative application of electrochemical, optical, and other physical techniques. Laboratory. (3 cr; prereq 211; I-III MTWThF; C 310) Lingane

202 SPECIAL TOPICS

Analytical topics not covered in regular courses are selected after discussion with instructor. (Cr and hrs ar; prereq 4) Lingane

302 RESEARCH IN QUANTITATIVE ANALYSIS

(Cr and hrs ar) Staff

General Chemistry (GeCh)

5 GENERAL PRINCIPLES OF CHEMISTRY

General laws of chemistry, principles of structure, and chemical behavior of matter. (5 cr, 4-5†; for premedics, predentals, etc.; prereq 4; lect I MTWThF, SciCB 325; rec V MWF, lab VI-VIII MWF, C ar) Staff

15 GENERAL PRINCIPLES OF CHEMISTRY

Basic principles and concepts of chemistry with a similar but more rigorous treatment than that of GeCh 5. (4 cr, 14-15†; limited to College of Engineering students; prereq 14; lect I MTWThF, SciCB 175; rec V MWF, lab VI-VIII MWF, C ar) Staff

25 GENERAL PRINCIPLES OF CHEMISTRY

Basic principles and concepts of chemistry with a similar but more rigorous treatment than that of GeCh 5. (3 cr, 24-25†; for chemistry and chemical engineering majors; prereq 24; lect I MTWThF, SciCB 175; rec V MWF, lab VI-VIII MWF, C ar) Staff

Organic Chemistry (OrCh)

62 ELEMENTARY ORGANIC CHEMISTRY

Important classes of organic compounds, both aliphatic and aromatic, together with some heterocyclic compounds. Laboratory work includes the preparation of typical substances. (5 cr; for all colleges; prereq 61 or 41; lect I MTWThF, C 325; rec II TTh, C 325; lab II-IV MWF, C 390; lab conf III TTh, C 325) Ar

97 SENIOR THESIS

A written final senior thesis report is required. (Cr ar; prereq #, 4th yr) Staff

302 RESEARCH IN ORGANIC CHEMISTRY

(Cr ar; prereq 238 and Δ) Staff

GRADUATE THESIS IN ORGANIC CHEMISTRY

(0 cr; prereq Δ) Staff

Physical Chemistry (PCh)

106A-B LABORATORY

(1-2 cr; prereq 105; VI-VIII MW; C 190) Wertz

108 ELEMENTARY PHYSICAL CHEMISTRY

(3 cr; prereq 107; II MTWThF; C 111) Wertz

117 FUNDAMENTALS OF REACTION KINETICS

(4 cr; prereq minimum of 2 qtrs of physical chemistry; II-III MTThF; C 315) Prager

SCHOOL OF EARTH SCIENCES

Geology and Geophysics (Geo)

2 HISTORICAL GEOLOGY

Evolution of the earth from its origin to the present with special attention to the succession of physical and biological events of the past 600 million years. (4 cr; limited to 60 students; prereq 1 or 11; lect II MTWThF; P 110) Sloan

Lab 1, III-IV MWF, ForH 85

Lab 2, VI-VII MWF, ForH 85

62 INTRODUCTORY MINERALOGY

Introduction to crystallography, crystal chemistry, and mineralogy. Descriptive and determinative mineralogy. Study of minerals in natural rock systems. (5 cr; prereq 1 or 11 or #, 1 term of college chemistry, Math 15; lect III MTWThF, P 110; lab VI-VIII MTWTh, P 100) Bartels

103 PROBLEMS IN GEOLOGY AND GEOPHYSICS

(Cr and hrs ar; prereq #)

122C HISTORICAL GEOLOGY FOR TEACHERS

An introduction to the origin of the earth, the physical evolution of its crust through geological time, and the biological changes that occurred during its history. (4 cr, \S old Geol 2, \S old Geol B, Geo 2, Geo 22; limited to 12 students; only for students holding degrees in education; prereq 1 or 11 or 109C or #; lect II MTWThF, seminar V TTh, P 110; lab III-IV MWF, ForH 85) Sloan

162 MINERALOGY

Introduction to crystallography, crystal chemistry, and mineralogy. Descriptive and determinative mineralogy. Study of minerals in natural rock systems. (4 cr, \S 62; not open to geology, geophysics and geological, mineral and metallurgical engineering majors; open to majors in College of AFHE and postgrad students in education; prereq 1 or 11 or #, a term of college chemistry, Math 15; lect III MTWThF, P 110; seminar V TTh, P 125; lab VI-VIII MTWTh, P 100) Rapp, Bartels

SCHOOL OF MATHEMATICS (Math)

T (Arts) TRIGONOMETRY

Analytic trigonometry emphasizing identities, equations, and properties of the functions; right and oblique triangles without logarithmic computation. (3 cr [open for cr if taken before 43, even to students with high school trigonometry]; prereq plane geometry and high school higher algebra, ¶10 allowed; II MTWThF; ME 110) Ar

Z (Arts) PREPARATORY MATHEMATICS

Designed to supplement the background in algebra for those students whose background is insufficient. Covers most of the material of the high school elementary and higher algebra courses, with emphasis on the latter. (0 cr; I-II MTWThF; E 203) Ar

5B (Arts) FOUNDATIONS OF ARITHMETIC

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. (3 cr; available for graduation cr only for elementary education students in College of Education; prereq 5A; III MTWThF; Arch 5) Ar

10A (Arts) ALGEBRA, ANALYTIC GEOMETRY, AND ELEMENTARY FUNCTIONS

A first course of a 2-quarter sequence, specifically designed for students in the pre-business administration curriculum and for other students requiring an introduction to algebra, analytic geometry, elementary functions, and calculus of one and several variables. Students who plan to take several quarters of mathematics should register for the Math 15, 42-43-44 sequence. Inequalities and elementary set theory, functions and graphs, quadratic equations in two variables, conic sections, complex numbers, theory of equations, mathematical induction, general systems of linear equations, combinations, permutations and probability, vectors and lines and planes in space. (5 cr, §10, §15, §21A; prereq high school higher algebra, T or high school trigonometry, and satisfactory mathematics placement score; III-IV MTWThF; E 104) Ar

15 (Arts) COLLEGE ALGEBRA

A standard college algebra course for students planning to take the sequence in analytic geometry and calculus. Functions and graphs, quadratic equations in one and two variables, progressions, complex numbers, inequalities, theory of equations, permutations and combinations, binomial theorem, probability, mathematical induction, determinants. (5 cr, §10, §10A, §21A; prereq high school higher algebra, T or high school trigonometry, and satisfactory mathematics placement score; III-IV MTWThF; E 203) Ar

22A (IT) ANALYSIS II: ANALYTIC GEOMETRY AND CALCULUS

Functions and derivatives, limits, continuity, slopes, tangents, differentiation of algebraic functions, applications, differentials, the indefinite integral, physical, and geometrical applications. (5 cr, §42; prereq 21A; I-II MTWThF; E 225) Ar

23A (IT) ANALYSIS III: ANALYTIC GEOMETRY AND CALCULUS

The definite integral, the fundamental theorem, differentiation of transcendental functions, methods of integration, parametric equations and polar coordinates, application of integration to physical and geometrical problems in two and three dimensions. (5 cr; prereq 22A; III-IV MTWThF; ME 106) Ar

31 (IT) CALCULUS IV: CALCULUS AND ANALYTIC GEOMETRY

Study of solid analytic geometry and vectors in space involving dot and cross products, planes, quadric surfaces, derivatives of vector functions. Definition of double and triple integrals. Iterated integrals in rectangular, polar, cylindrical, and spherical coordinates. Applications to moments and centroids. Partial differentiation including the chain rule, implicit functions, directional derivative, maxima and minima. (5 cr; prereq 23A; I-II MTWThF; E 229) Ar

32 (IT) CALCULUS V: CALCULUS, LINEAR ALGEBRA, DIFFERENTIAL EQUATIONS

Standard topics of infinite series including tests for convergence and divergence. Power series, and Taylor expansions. Introduction to linear algebra.

Matrices, determinants, and theorems on systems of algebraic equations. Differential equations involving the standard first order types plus higher order linear equations with constant coefficients. (5 cr; prereq 31; I-II MTWThF; E 104) Ar

33 (IT) CALCULUS VI: VECTOR CALCULUS AND DIFFERENTIAL EQUATIONS

Functions defined by integrals, differentiation under the integral sign, improper integrals, the Gamma function. Vector field theory, divergence and curl, surface integrals. Green's and Stokes' theorems. Linear systems of differential equations with constant coefficients, matrix methods. Series solution of differential equations. (5 cr; prereq 32; III-IV MTWThF; MinMet 120) Loye

40A (Arts) INTRODUCTION TO CALCULUS OF ONE AND SEVERAL VARIABLES

A second course of a 2-quarter sequence, specifically designed for students in the pre-business administration curriculum and for other students requiring an introduction to algebra, analytic geometry, elementary functions, and calculus of one and several variables. Students who plan to take several quarters of mathematics should register for the Math 15, 42-43-44 sequence. Limits and derivative, differentiation of the elementary functions of one and several variables with applications to rates of change, maxima and minima, approximations by differentials, integration with standard forms and applications to area and volume, simple differential equations. (5 cr, §22A, §40, §42; prereq 10A, 10, or 15, and T or high school trigonometry; I-II MTWThF; Arch 5) Ar

42 (Arts) ANALYTIC GEOMETRY AND CALCULUS I

(Course description covers sequence 42-43-44) A full-year course in the elements of analytic geometry and calculus. Plane analytic geometry including straight line, conic sections, parametric representations, polar coordinates, translation and rotation of axes. Introduction to solid analytic geometry, functions and limits, differentiation of algebraic, trigonometric, exponential, and logarithmic functions with applications to velocity and acceleration, rates, maxima and minima, curve tracing, indeterminate forms, approximations by differentials. Introduction to partial differentiation. Integration by standard forms with applications to area, volume, work, moments. Improper integrals. Infinite series. Taylor's theorem. Multiple integrals in two and three dimensions. (Math 43-44 are available for Upper Division credit to all except mathematics and physics majors.) (5 cr, §40, §40A, §22A; prereq 10, 10A or 15 and either T or high school trigonometry...may enter 43 from 40 or 40A if grade in 40 or 40A is A or B; III-IV MTWThF; E 217) Ar

43 (Arts) ANALYTIC GEOMETRY AND CALCULUS II

(See Math 42 for course description) (5 cr; prereq 42, or 40 or 40A with grade of B; III-IV MTWThF; E 229) Ar

44 (Arts) ANALYTIC GEOMETRY AND CALCULUS III

(See Math 42 for course description) (5 cr; prereq 43; III-IV MTWThF; E 226) Ar

55 (Arts) INTERMEDIATE CALCULUS

Advanced topics in partial differentiation. Total differentials, directional derivatives, maxima and minima of functions of several variables. Applications of multiple integrals. Taylor's theorem for functions of several variables. Elements of differential equations. (3 cr; prereq 44; II MTWThF; E 215) Ar

60A (IT) OPERATIONAL METHODS FOR LINEAR SYSTEMS

Review of Fourier series and their applications to linear ordinary differential equations. The Fourier transform, mathematical properties, amplitude and phase spectra, energy. The Laplace transform, mathematical properties and elementary inversion techniques, applications to systems of ordinary differential equations, transfer function of a filter, time and frequency domain relations. (3 cr; primarily for EE students; prereq 32; IV MTWThF; E 225) Ar

65 (IT) INTRODUCTION TO COMPUTER PROGRAMMING

Basic FORTRAN computer language with extensions. Programming applications and techniques. The binary number system and elements of computer organization and machine language. Integral laboratory. Three lectures and nonscheduled laboratory. (4 cr, §164; prereq 23A or 43; IV MTWThF; Arch 5) Ar

107B (Arts) ADVANCED CALCULUS

Line and surface integrals; Stokes' theorem; convergence of infinite series; orthogonal functions; uniform convergence; integration and differentiation of series. (3 cr; prereq 107A; III MTWThF; E 215) Ar

109 (Arts) THEORY OF NUMBERS

Elementary properties of integers; prime and composite numbers; Euclid's algorithm; congruences; the theorems of Fermat and Wilson; primitive roots; indices; Diophantine equations. (3 cr; prereq 31 or 44; II MTWThF; E 217) Ar

126C (IT) FUNDAMENTALS OF ANALYTIC GEOMETRY AND CALCULUS

See section on 10-week courses, pages 142-148.

135 INTEGRAL EQUATIONS

Introduction to integral equations with emphasis on applications and techniques of solution including the Fredholm formula, Neumann series, Laplace transforms, successive approximations, and numerical methods. Relation of integral equations to systems of linear algebraic equations and to differential equations. (3 cr; prereq 32 or 106; V MTWThF; E 104) Ar

143 VECTOR AND MATRIX THEORY WITH APPLICATIONS

Systems of linear equations, determinants, finite dimensional vector spaces, matrices, characteristic values and their numerical estimation, reduction to canonical forms, quadratic and bilinear forms. Application to engineering problems. (3 cr; prereq 142; V MTWThF; E 217) Ar

149 (IT) DETERMINANTS AND MATRICES

Determinants, matrices, linear equations, vector spaces, quadratic and bilinear forms, characteristic roots, applications to systems of ordinary differential equations. (3 cr, §63, §131A, §142; prereq 32 or 55; I MTWThF; E 217) Ar

178 PROBABILITY

Elementary principles of probability, total and compound probability, expectation, repeated trials, and as time permits topics chosen from the following: Stirling's formula, the probability integral, geometrical probability, probability of causes, Bayes' theorem, errors of observation, principle of least squares. (3 cr; prereq 31 or 44; IV MTWThF; E 215) Ar

181B INTRODUCTION TO TOPOLOGY

Metric spaces: completeness, compactness, uniform continuity. Abstract topologies: comparison of topologies, separation axioms, homeomorphisms. Product and function spaces. Connectedness. Local connectedness, Hahn-Mazurkiewicz theorem, characterization of arc, Jordan curve theorem. Introduction to algebraic topology. (3 cr; prereq 181A; III MTWThF; E 225) Ar

185-186 (IT) NUMERICAL ANALYSIS IN ENGINEERING

Approximation of functions and least squares. Approximate solution of ordinary and partial differential equations, Moulton's, Runge's, relaxation and iteration methods. Calculation of eigenvalues of matrices and differential problems, Rayleigh-Ritz method. Integral equations. Programming of computers. (6 cr; prereq 184 or #; III-IV MTWThF; Ex 193) Ar

187 NON-EUCLIDEAN GEOMETRY

Foundations of Euclidean geometry, Euclid's fifth postulate and its implications. Hyperbolic plane geometry and trigonometry. Consistency of non-Euclidean geometry. (3 cr; prereq 31 or 44; III MTWThF; ME 202) Ar

SCHOOL OF PHYSICS AND ASTRONOMY**Physics (Phys)****2 INTRODUCTORY PHYSICS**

Introductory lectures on the principles of physics and physical phenomena underlying these principles. Electricity and magnetism. (3 cr; prereq 1 or #; lect I MTWThF; Ph 133) Ar

- 2A INTRODUCTORY PHYSICS LABORATORY**
Laboratory course in conjunction with Phys 2. (1 cr; combination of 2 and 2A may be applied toward group requirements in CLA; prereq 2 or 112) Ar
- 23 GENERAL PHYSICS, PART II**
See section on 10-week courses, pages 142-148.
- 23A PHYSICS LABORATORY, PART II**
See section on 10-week courses, pages 142-148.
- 50 INTERMEDIATE GENERAL PHYSICS, PART II**
See section on 10-week courses, pages 142-148.
- 50A PHYSICS LABORATORY, PART II**
See section on 10-week courses, pages 142-148.
- 114C INTERMEDIATE GENERAL PHYSICS**
See section on 10-week courses, pages 142-148.
- 130C GEOMETRICAL AND PHYSICAL OPTICS**
See section on 10-week courses, pages 142-148.
- 190 INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS**
See section on 10-week courses, pages 142-148.
- 208 SYMMETRY AND ITS APPLICATIONS TO PHYSICAL PROBLEMS**
See section on 10-week courses, pages 142-148.

College of Veterinary Medicine††

All classes scheduled by arrangement.

Veterinary Anatomy (VAna)

191* TOPICS IN ORGANOLGY

Lecture and laboratory presentations regarding selected organ systems of domestic and laboratory animals. (1-5 cr; regis for more than 1 term permitted; prereq 151 or equiv, §) Weber, Fletcher, Czarnecki, Vanden Berge

Veterinary Microbiology and Public Health (VMic)

128* PROBLEMS IN VETERINARY BACTERIOLOGY AND PUBLIC HEALTH

(Cr ar; prereq 103 or equiv, §) Pomeroy, Anderson, Lindorfer, Loken, Diesch

201* ADVANCED POULTRY DISEASES

Investigations of specific infectious disease problems of poultry. (Cr ar; prereq 131, §) Pomeroy, Higbee, Nelson, Bergeland

205* ADVANCED VETERINARY BACTERIOLOGY

Special topics, techniques, collateral reading, and conferences. (Cr ar; prereq §) Pomeroy, Anderson, Loken, Lindorfer, Diesch

Veterinary Medicine (VM)

122A-B CLINICS

Medical, obstetrical, radiological, surgical, and laboratory examination of diseases of animals. (3 cr; for 4th yr VMed; prereq 121) Low and others

202* ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES

Detailed examination, discussion, treatment, and prevention of animal disease problems. (Cr ar; prereq 104, 132, §) Sorensen, Low, Mather, L Johnson, Finco, Larson

Veterinary Obstetrics (VObs)

204* SPECIAL PROBLEMS IN ANIMAL REPRODUCTION

(Cr ar; prereq §) Zemjanis

Veterinary Pathology and Parasitology (VPaP)

157 VETERINARY NECROPSIES

Necropsy techniques, examination of tissue sections, and preparation of records. (1-5 cr; prereq 153 or equiv, Δ) Staff

†† Tuition fees per term in College of Veterinary Medicine are \$76.50 for resident and \$190 for nonresident students; incidental fee per term is \$16.25. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

- 158* SURGICAL PATHOLOGY**
Preparation and interpretation of surgical and necropsy specimens. (3 cr; prereq 157, §, Δ) Bergeland and staff
- 160* DIAGNOSTIC PATHOLOGY**
Interpretation of history, necropsy findings, laboratory findings and histopathology in the diagnosis of animal diseases. (5 cr; prereq 157, §, Δ) Bergeland and staff
- 241* PROBLEMS IN VETERINARY PARASITOLOGY**
(Cr ar; prereq 102 or equiv, §) Griffiths

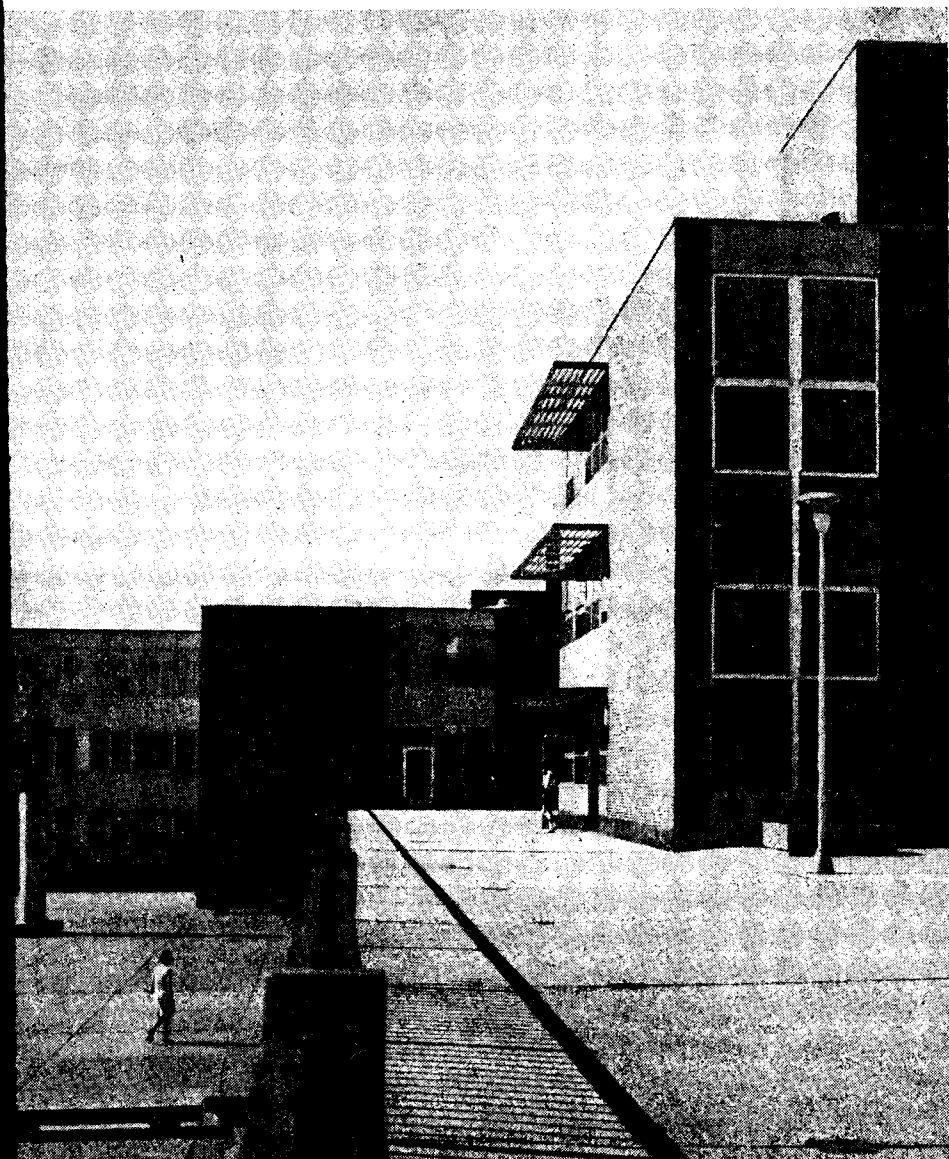
Veterinary Physiology and Pharmacology (VPP)

- 171* PROBLEMS IN VETERINARY PHARMACOLOGY**
(Cr ar; prereq 152 or equiv, §) Hammond, Stowe
- 231* RESEARCH IN ANIMAL PHYSIOLOGY**
(Same as AnSc 231) 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. (Cr and hrs ar; prereq §) Staff

Veterinary Surgery and Radiology (VSR)

- 210* ADVANCED VETERINARY RADIOLOGY**
Lecture and laboratory. Radiological diagnostic procedures and interpretation as applied to veterinary medicine. (2 cr; prereq 121 or equiv, §) Hanlon
- 220* ANESTHESIA**
Selection of proper anesthetic agent; administration of local, regional, and general anesthesia in large or small animals. (Cr ar; prereq 103 or equiv, §) Arnold, Usenik, Piermattei
- 225* ADVANCED SMALL ANIMAL SURGERY**
Surgery of the various systems in small animals with preoperative and post-operative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Piermattei
- 230* ADVANCED LARGE ANIMAL SURGERY**
Surgery of the various systems in large animals with preoperative and post-operative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Arnold, Usenik, Myers

Duluth Campus



University of Minnesota, Duluth

The Duluth Campus is an exciting location for Summer Session study. Situated on a 200-acre site overlooking Lake Superior, the campus enjoys ideal summer temperatures, perfect for the student who wants 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, and Duluth International Harbor.

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 families. Bridge and golf lessons, family swimming, concerts, lectures, theatrical productions, group discussions, dances, tours, films, a steak cook-out, and a wilderness canoe trip are a few of the regularly scheduled activities.

More than 200 courses are scheduled for both Summer Session terms at the undergraduate and graduate levels. Students may earn credits in 34 major fields toward the A.A., B.A., or B.S. degrees and in 15 areas of concentration for the M.A. or M.S. degrees.

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, Communications Center, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Graduate Program

The Graduate School offers, on the Duluth Campus, a master of arts degree with majors in art, education, educational administration, curriculum and instruction, and in educational psychology (counseling). These studies are designed to serve elementary school teachers and principals, secondary school teachers and principals, counselors, and persons interested in the field of rural education. In addition, majors in English and history are available. They provide advanced work for individuals now in teaching or those interested in progressing toward a general degree in the discipline. Students may complete all course work at Duluth.

Course work necessary for the completion of a master of science degree in biology, botany, analytical, inorganic, organic, or physical chemistry, physics, and zoology is also available. These courses are for college teachers and those planning additional graduate study or careers

in industry. The 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 given in the 1968-70 University of Minnesota, Duluth *Bulletin*, which may be obtained by writing to the News Service office, Communications Center.

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, University of Minnesota, Duluth, Duluth, Minnesota 55812. Information concerning selection of courses and other degree requirements can also be obtained from the Graduate School assistant dean.

Applications for 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 — *at least 4 weeks* prior to the opening of the quarter or summer term in which the applicant expects to register. Students who wish to become candidates 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)

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 designated primarily for public school art teachers, but others may be admitted when the program seems particularly adaptable to the educational purposes of the student. Both art history and art education are available as related fields.

Courses are so scheduled that a degree program may be completed during a series of summer sessions and/or the regular session. Inquiries concerning the specific program should be directed to: Department of Art, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Master's Degree in Biology, Botany, Zoology

Plan A for the M.S. is available during the academic year in both botany and zoology; Plan B is available only in biology. In addition to course work, Plan A requires a research problem and a thesis. Botany majors may minor in zoology, and zoology majors may minor in botany. With either major, other minors such as chemistry, geology, and physics are also available.

The Plan B biology program is directed toward enrichment of the subject-matter area for high school biology teachers, as well as for

others who might desire a broader base of course work in the life sciences rather than the research experience required by the Plan A approach. Biology majors may use any of the following as related fields: botany, chemistry, education, geology, physics, and zoology.

Master's Degree in Chemistry

The major in chemistry is a Plan A program; that is, research leading to a thesis is required. A student can major in analytical, inorganic, organic, or physical chemistry.

The program is suited for students who wish to go on for further study elsewhere, as well as 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 at the Duluth Campus during both terms will involve the research phase of the M.S. degree.

Master's Degree in Curriculum and Instruction

Although this program is the one normally chosen by elementary teachers, it is also open to secondary teachers. Candidates, with the help of an adviser, select certain EdCI courses to fulfill the requirements for a major. Their work in related fields may include other education courses (such as educational psychology, history of education, physical education, industrial education, home economics education, and educational administration) as well as courses in subjects which are ordinarily taught in the schools. Inquiries should be addressed to: Director of Graduate Study in Curriculum and Instruction, Department of Elementary Education, or Director of Graduate Study in Curriculum and Instruction, Department of Secondary Education.

Master's Degree in Education

This program is the one normally elected by secondary teachers. Candidates choose courses for their major from the fields of curriculum and instruction, educational psychology, educational administration, and history of education. Their two related fields (comprising a minimum total of 18 credits) must include only courses in subjects which are ordinarily taught in the schools. Further details may be obtained from: Director of Graduate Study in Education.

Master's Degree in Educational Administration

A master of arts degree with a major in educational administration is available to students desiring to qualify for certification as elementary or secondary school principals. A rather wide variety of courses is offered during the summer. Inquiries should be addressed to: Director of Graduate Study in Educational Administration, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Master's Degree in Educational Psychology

A complete Master's degree program in school guidance and counseling is available on the Duluth Campus. Major courses in educational psychology, and various required related courses, are offered in both summer terms.

Certain courses in this program may have limited enrollments or require special arrangements. Therefore, persons interested should make every effort to consult with the adviser prior to and 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, Duluth, Minnesota 55812.

Master's Degree in English

A graduate major is offered, leading to a Master's degree in English. Two programs are provided: one designed primarily for secondary school English teachers, and a more general one suited to students preparing for doctoral studies. Courses carrying graduate credit are offered in all academic quarters and in both summer terms. 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: English Department, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Master's Degree in Geology

Plans A and B for the M.S. are planned for fall 1969 in geology. Although no graduate level courses are offered in this field during the 1969 Summer Session, students interested in beginning their course work in the fall of 1969 are reminded that the application deadline is August 29. Details concerning prerequisites for the geology M.S. degree may be obtained from: Director of Graduate Study in Geology, University of Minnesota, Duluth.

Master's Degree in History

A graduate major is offered leading to the master of arts degree in American history. This program is designed to serve those interested in pursuing either the Plan A or Plan B programs of the Graduate School.

Master's Degree in Physics

A graduate major on Plan A requiring a research thesis is offered. Current departmental research interests include atmospheric physics, atomic physics, and solid state physics. Summer work on the Duluth Campus involves the research phase of the degree work.

Economic Education

A special program in economic education for teachers is scheduled for the First Term of the 1969 Summer Session. Econ 150A and B, Current Economic Issues (6 graduate or undergraduate credits), and EdCI 134, Materials and Methods in Economic Education (3 graduate or undergraduate credits) will be offered.

This program is intended to assist students in teaching economics at the elementary and secondary levels. Scholarships are available. Information may be obtained from: Division of Social Sciences, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Remedial Reading

Experienced teachers who desire to meet requirements for certification as elementary remedial reading teachers, secondary reading teachers (developmental or remedial), or reading consultants, supervisors, or coordinators will find appropriate courses available during the summer. All persons holding such positions in Minnesota must meet specific requirements.

Certain courses in this program may have limited enrollment or may require the making of special arrangements. Persons, therefore, who are interested in enrolling in this program, or who wish to have an evaluation of transcripts for the purpose of outlining a pattern of requirements, should write: Reading Clinic, Division of Education and Psychology, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Special Education

Teaching Mentally Retarded Children — Teachers wishing endorsement for a special certificate to teach the mentally retarded will find the following courses pertinent: CPsy 179, Clinical Procedures with Children; EdCl 145, Reading Disabilities; EPsy 110, Measurement in the Classroom; EPsy 116, 116A, Statistical Methods in Education; EPsy 159, Personality Development and Mental Hygiene; EPsy 182, Education of Exceptional Children; EPsy 193, Psychology of Human Learning; Spch 119, Speech Improvement. Questions about the minor and about state certification should be directed to: Special Education Laboratory, 14 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Speech Correction — Opportunity is provided for observation at the annual clinic for children with speech and hearing disorders, held June 16 to July 25. Supervised *clinical* experience with University credit may also be attained, based upon teaching experience and course background. Those interested in such an experience may obtain details from the clinic director.

Special Courses in Beginning and Intermediate French, German, and Spanish, and Advanced French

Beginning French, German, and Spanish — Ten-week courses will be offered to provide the student with basic proficiency in the chosen language with special emphasis on the spoken language. The classes will meet five times a week, 3 hours per day; 2 hours will be spent in the classroom, 1 hour in the language laboratory. Upon completion of the course, the student will have earned 15 credits. This is equivalent to the regular first-year sequence (Fr 1-2-3, Ger 1-2-3, or Span 1-2-3). Credit for the First Term will not be granted without completion of the Second Term. A student should not take any other courses.

Intermediate French, German, and Spanish — Ten-week courses will be offered to provide advanced training with a grammar review, further development of the spoken language, and special emphasis on the development of reading skills. The class will meet five times a week, 1½ hours a day with the time being equally divided between the language laboratory and the classroom. Upon completion of the course, the student will have earned 9 credits. This is equivalent to the regular second-year sequence (Fr 7-8-9, Ger 7-8-9, or Span 7-8-9). A student should plan to attend both summer terms.

Advanced French — A 10-week course will be offered to further develop speaking and reading skills with special emphasis on grammatical and stylistic refinement.

Courses for Recent High School Graduates

Many courses are open to students who have graduated from high school but who have not taken any university work. These courses enable a person to strengthen areas in which he is weak, or to pursue his special interests. They also allow a student to accelerate his program — and this possibility may be especially attractive to a person intending to enter one of the professions or graduate study.

Courses for New Engineering Students

Engineering courses with mathematics prerequisites are planned, assuming the student begins his studies at the level of Math 15 (or higher). Students unsure of their high school mathematics preparation would profit by taking Math 14 during First or Second Term. Math 15 will be offered Second Term for those wishing to start their engineering studies in the fall quarter with advanced standing in mathematics.

Workshop in Advanced Painting

The 21st annual workshop in advanced painting will be conducted this year by Mr. Abe Ajay, New York artist. Mr. Ajay brings to the workshop a fresh and unique approach, having divided his efforts in the past between the commercial world and fine arts world. He has attended the Art Student's League and American Artists School, worked on the Federal Arts Project of the 1930's and later became a commercial artist and designer working in a free-lance capacity for a number of years. He later resumed his fine arts career and had the first of several one-man shows in New York in the early 1960's. Mr. Ajay has taught at Pratt School of Art as a visiting artist. His contemporary work has been shown at the Aldrich Museum, the Addison Museum of American Art, the De Cordoba Museum, Albright-Knox Art Gallery, and the Pennsylvania Academy of the Fine Arts. He is represented in the art collections of the Guggenheim Museum, the Hirshhorn Collection, and the Aldrich Museum of Contemporary Art, and many others. Mr. Ajay is the latest on the list of distinguished American artists including Charles Burchfield, Max Weber, Philip Evergood, Yasuo Kunioshi, and Morris Kanter, who have taught on this campus during the past 20 years.

This painting workshop will again be offered during the Second Term. Enrollment will be limited, and interested students should write to: Department of Art, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Workshop in Crafts

A workshop in crafts will be offered during the First Term by Mr. Rudy Schauer, associate professor of art at Duluth. The workshop will emphasize creative experience in gem cutting, jewelry, metal casting, enameling, and weaving, with projects being developed relative to the student's interest and preparation. The workshop may be taken for graduate or undergraduate credit. Enrollment will be limited, and interested students should write to: Department of Art, University of Minnesota, Duluth, Duluth, Minnesota 55812.

General Extension Division Workshops — Duluth

For complete information about the following workshops and institutes write: Regional Director, Conferences, Institutes, and Special Projects, 106 Laboratory School, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Aerospace Workshop

An aerospace workshop (Ed 89) will be conducted for elementary and secondary school teachers. The 3-credit course includes: instruction in basic knowledges and skills; attitudes about aviation and aerospace activities; and the total impact of air and space vehicles upon young people in a changing world. There will be flight indoctrination in both light and heavy aircraft, as well as a field trip to a missile site and a visit to a major Air Force installation at no cost to participants.

The course will satisfy professional growth credits, as well as certification for teaching aerospace subjects in evening school classes. Since the class size is limited, early registrants will be given preference.

Home Economics Tailoring Workshop

Mrs. Marjorie Arch, nationally known teacher of the Edna Bryte Bishop Clothing Construction Method, will conduct a home economics institute. It will be held on the Duluth Campus in the Home Economics Building. This noncredit program is available to teachers and other interested persons. A minimal registration fee will be charged.

Sex and Family Life Workshop

A workshop dealing with sexual attitudes, problems, and education of adolescents and young adults will be held on the Duluth Campus. The workshop is for those persons who work with young people and therefore

must be both comfortable and knowledgeable with the subject of sexual behaviors and patterns. Emphasis will be placed on understanding and appreciation of man as a sexual creature, and the younger generation's view of the place of sex in dating, engagement, and marriage. This workshop carries 3 graduate or undergraduate credits.

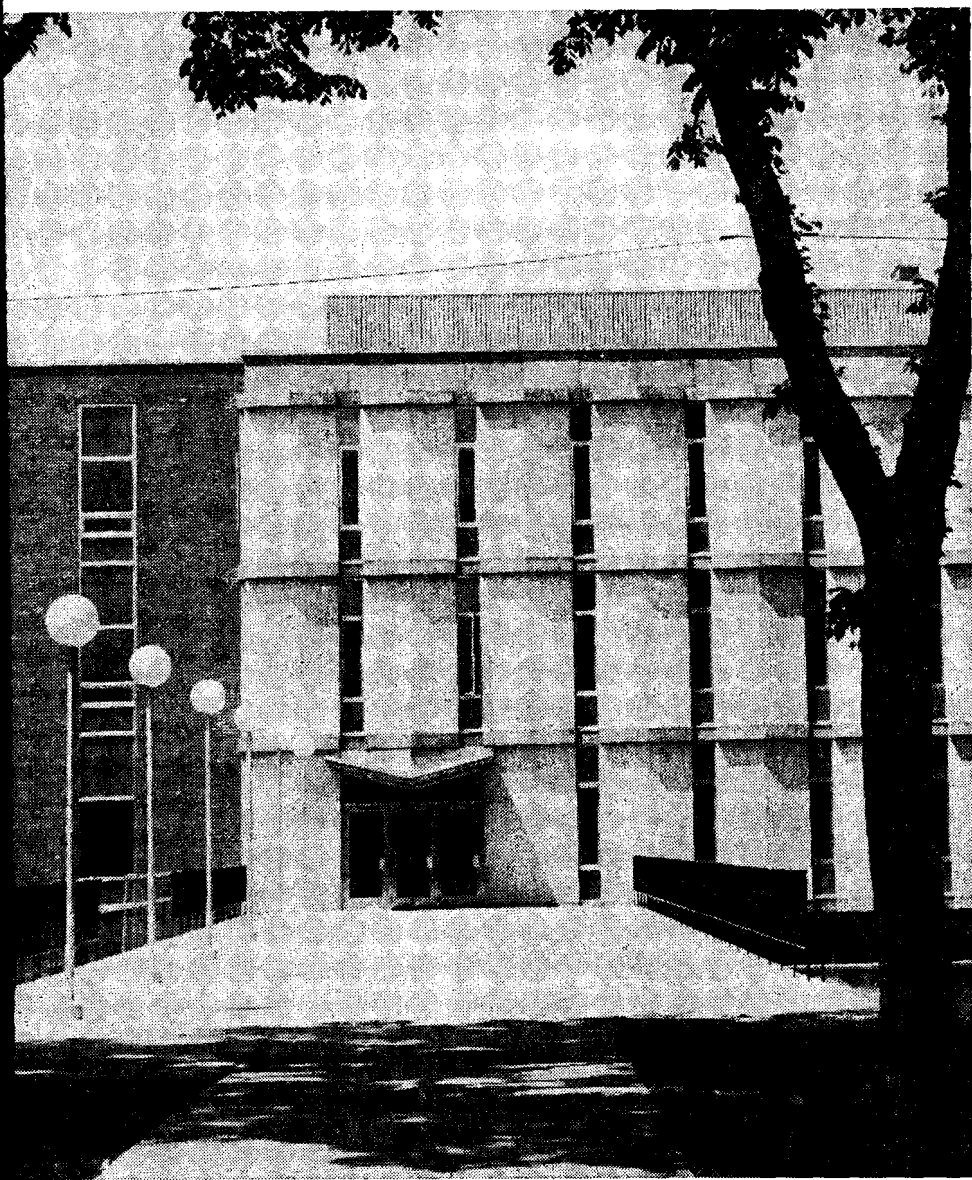
Choral Directors Workshop

Roger Tenney, 1967 USA teacher of the year, and supervisor of vocal music at the Owatonna Public Schools, will be coordinator for this workshop (Ed 140, 3 graduate credits). It will focus upon singing through a wide range of choral repertoire using new choral music. Emphasis will be placed upon "the high school voice," demonstrations of private teaching techniques or vocal techniques used in a choral situation appropriate to the young student. Additional emphasis will be placed on small ensemble materials, the voice lesson, tone production, and other vocal techniques. Demonstrations will show how to incorporate style, form, and theory during an actual rehearsal.

Elementary Education Workshop: Teaching by Inquiry

Conducted by Mrs. Mona Dayton, USA teacher of the year in 1965, and William Gemeinhardt, assistant professor of elementary education at UMD, this workshop will emphasize individualizing instruction, using techniques applicable to all grade levels. It will attempt to answer the questions: How can we personalize teaching? — How can we incorporate time to wonder? — Can the teacher help students to establish thinking patterns of inquiry? Many innovative approaches will be explored such as team teaching, how to use TV effectively, and nongraded approaches. Through the open approach the workshop will endeavor to enhance the skill of the teacher to take advantage of opportunities for instant creativity. Three graduate credits may be earned in this workshop.

Morris Campus



University of Minnesota, Morris

FIRST TERM

Division of Humanities

Art 45 WATERCOLOR PAINTING

A course in studio art which introduces the beginning student to the medium and materials of watercolor and provides the student already familiar with the medium further practice and development. Problems of visual form and perception will be dealt with in relation to the subjects of still-life and landscape and to the materials and techniques of watercolor. Because of the tutorial method employed, this course is equally suited to the beginning and the advanced student. It may be repeated for credit. (3 cr; limited to 18 students; III-IV MTWThF; Hum 6) Ingle

Engl 60 THE DRAMA I

English drama to 1642. Reading and discussion of representative plays, including *Everyman*, *Gorboduc*, *Doctor Faustus*, *The Spanish Tragedy*, *Hamlet*, *Volpone*, and *'Tis Pity She's a Whore*. (3 cr; II MTWThF; Hum 111) Ness

Engl 71 ENGLISH AND AMERICAN POETRY SINCE 1945

Younger poets such as Robert Lowell, James Wright, Dylan Thomas, and Philip Larkin will be studied against the background of literary and social movements of the postwar decades. (3 cr; I MTWThF; Hum 105) Grant

Ger A BEGINNING GERMAN

Basic principles of grammar and syntax; reading and writing of simple German prose; correct pronunciation and rudimentary conversation. (7½ cr; limited to 30 students; 9:00-12:00 MTWThF; Hum 211) Wood

Hum 60 THE INDIVIDUAL AND HIS SOCIETY IN CONTEMPORARY FRENCH LITERATURE

Designed to give a view of the contemporary French novel and drama — the aims and values they express. Special attention will be given to the crucial question of the individual's search for a meaningful place in society. Works by such important and controversial writers as André Gide, François Mauriac, Jean Anouilh, Jean-Paul Sartre, and Albert Camus will be read. Reading, lectures, and discussion will be in English. No previous knowledge of French literature is required. (3 cr; III MTWThF; Hum 105) Farrell

Mus 9 INTRODUCTION TO EFFECTIVE LISTENING

An introduction to basic musical concepts designed to lead to more intelligent listening and understanding of music of various styles and periods. Recorded musical examples will be used as the basis for study; discussion will be carried on in layman's terms, with a minimum of technical language. The course is designed for non-music majors. (3 cr; IV MTWThF; MH 109) C Johnson

Spch 71 TECHNICAL THEATRE PRODUCTION

Will present to elementary and secondary school teachers the fundamentals of stagecraft, scene design, and stage lighting. Ways in which teacher can modify his present facilities (stage, lighting, capabilities, props, etc.) for specific productions. (3 cr; III MTWThF; Hum 205) Bowers

Division of Social Sciences

Soc 86 THE FAMILY

A study of the development of family unity or disunity, roles of members, methods of investigation, the cycle of family life, and cultural and subcultural variations of the family. (3 cr; prereq 1 or ♯; I MTWThF; Hum 212) Najmi

Pol Sci 63 AMERICAN POLITICAL THOUGHT

The development of the American political tradition from the Puritan theocracy to recent phases of American political life. (3 cr; prereq ♯; IV MTWThF; Hum 205) Lee

Hist 55 AMERICA IN TRANSITION: 1877-1917

Organization of labor, industry, and agriculture; disappearance of the frontier; Populist movement; imperialism in the late 19th century; Progressive movement; foreign policies of Roosevelt, Taft, and Wilson to 1917. (3 cr; II MTWThF; Hum 212) Landever

Hist 66 MODERN EUROPE FROM 1648 TO 1750

Topics in the political, social, intellectual, or economic history of Europe from the Peace of Westphalia into the Enlightenment of the 18th century. (3 cr; prereq 1; III MTWThF; Hum 212) Underwood

Psy 1 GENERAL PSYCHOLOGY

Survey of methods and results in the study of the human behavior of man; the course of his development, the role of motivation, processes of learning, the organization of his personality, the nature of intelligence, higher mental processes, and properties of social interaction. (3 cr; 3 hrs lect; III MTWThF; Hum 111) Kemble

Division of Science and Mathematics

Phys Sci 10 BASIC CONCEPTS IN PHYSICAL SCIENCE

Survey of some of the major concepts or physical laws in the areas of astronomy, chemistry, physics, and earth sciences; analysis of physical laws by relating common experiences to physical phenomena; principles of the scientific method. (5 cr; 5 hrs lect, 4 hrs lab; lect I MTWThF, Sci 150; lab II MTWTh, Sci 105) Burkey

Math 1 CONTEMPORARY CONCEPTS IN MATHEMATICS

Designed to give the student an overview of many areas of mathematics without requiring previous mathematics background. Some of the topics that will be developed are mathematical history, mathematical philosophy, the real numbers system, and set notation. There will also be an introduction to such areas as statistics, calculus, and non-Euclidean geometries. (5 cr [no elective cr for mathematics majors or minors]; 1 hr video tape and 1 hr discussion; I-II MTWThF; Hum 205) Wu

Division of Education

PE 51 PHYSICAL EDUCATION FOR CHILDREN

A survey of physical activities for children. Content will include movement education, rhythms, games, and self-testing activities in the life and development of the child. (3 cr; II MTWThF; Sci 150) Kelly

Ed 70H METHODS OF SOCIAL STUDIES TEACHING IN THE ELEMENTARY SCHOOL
The objectives, curriculum, and philosophical base for social studies in the elementary school will be discussed. Special emphasis will be placed on units and unit planning, and also on the use of selected new social studies materials. (3 cr; IV MTWThF; Sci 150) Henjum

SECOND TERM

Division of Humanities

Ger B BEGINNING GERMAN

(Continuation of Ger A, First Term) Basic principles of grammar and syntax; reading and writing of simple German prose; correct pronunciation and rudimentary conversation. (7½ cr; limited to 30 students; 9:00-12:00 MTWThF; Hum 211) Sibul

Spch 76 CREATIVE DRAMATICS (WORKSHOP)

Principles and methods of developing original dramatizations with children. Topics include: choice of appropriate materials for different age groups, presentation of stories as the basis for informal drama, planning the dramatization, conducting evaluations, and handling special problems. (3 cr; July 21 to August 1; 10:20-12:30 MTWThF; MH 109 and MH 210) Lammers

Division of Education

EdCI 105 AUDIO-VISUAL MATERIALS IN EDUCATION (WORKSHOP)

Characteristics, advantages, limitations, and practical schoolroom use of audio-visual materials of nonprojected and projected types. Practice in operation of accepted audio-visual equipment such as slide projectors, opaque projectors, film strip projectors, tape recorders, 16mm projectors, and overhead projectors. Opportunity to operate newer media, such as teaching machines and closed circuit television equipment. (3 cr; limited to 30 students; prereq sr, qualified students may register for grad cr; July 21 to August 1; 8:00-10:10 MTWThF; SSci 45 and SSci 130) Henjum

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INSTRUCTIONS

1. Who should file a Statement of Intent to Register?
Summer-only students as defined on pages 13-14.
2. Students with previous college work who were dropped by their previous college for any reason or are not in good standing should apply directly to the Office of Admissions and Records, 6 Morrill Hall.
3. If you are in doubt about your status, see Admissions and Registration section of this bulletin.
4. Fill in form completely (please print) except for boxes in bold outline. Incomplete forms will not be processed. Do not send in more than one form. Do not use nicknames.
5. Do not use this form to request other information.
6. Filing of this Statement of Intent to Register does not imply any obligation on the part of the student.
7. Return the form to Office of Admissions and Records, 105 Morrill Hall, University of Minnesota, Minneapolis, Minnesota 55455. If you plan to register during the advance registration period, the Intent to Register *must* be received by May 1. If you plan to register on June 16, the Intent to Register *must* be received by May 20. Failure to submit an Intent to Register or failure to receive a Confirmation of Intent to Register does not prevent qualified students from registering. Additional copies of this form may be obtained upon request.
8. No registrations accepted by mail.

Appl. No. _____

Statement of Intent to Register

UNIVERSITY OF MINNESOTA
A-82 SUMMER SESSION — 1969

Name ↓	LAST	FIRST	MAIDEN	MIDDLE	File No.
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Current Mailing Address ↓	STREET	CITY
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COUNTY	STATE	ZIP	S	C	Date of Birth	MO	DAY	YEAR
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Last School or Attended:	High School or College	NAME	CITY	STATE
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C	Plan on	1 _____	Minnesota Resident	1 _____	Sex:	Male _____
	Summer Term	2 _____	Non-Resident	2 _____		Female _____

NH	NA	PR	O	Have you ever been registered in University of Minnesota day classes, including summer?	Yes _____	Last College _____
1	2	3	3		No _____	(Inc. Duluth, St. Paul, Morris, Crookston)
					When _____	

College of the U of M in which you plan to register _____

Do you expect to earn a degree from the University of Minnesota? Yes _____
No _____ College _____

Are you in a "dropped" status from any college? Yes _____ If yes Where _____
No _____ When _____

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