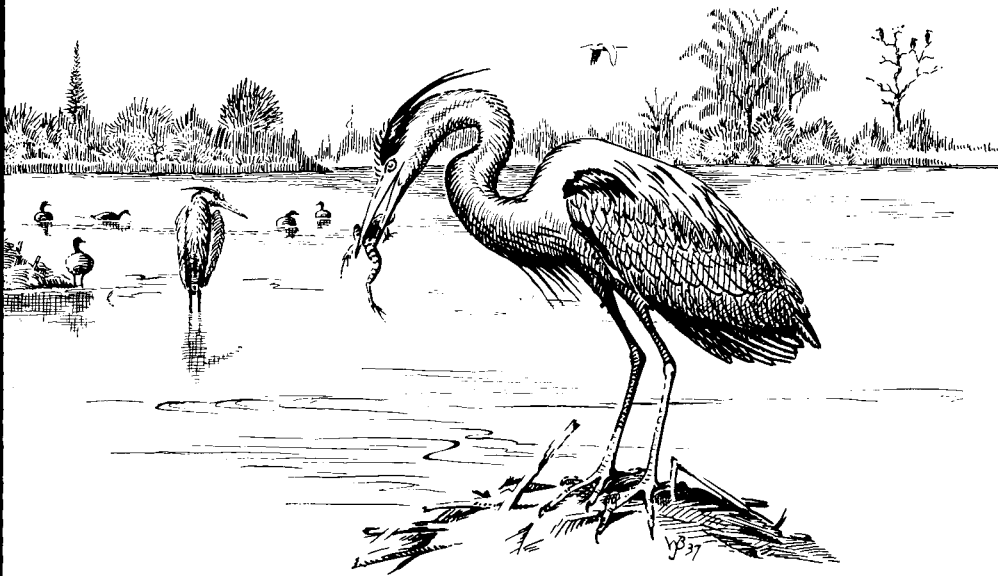


LAKE ITASCA BIOLOGY SESSION



Summer Session • 1967

First Term • June 12 - July 15

Second Term • July 17 - August 19

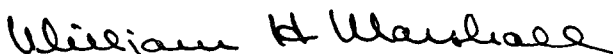
UNIVERSITY OF MINNESOTA BULLETIN

FOREWORD

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.

The wide array of courses available during the summer will provide the student interested in field aspects of biology with many opportunities. The very fine laboratories and library make an excellent base for research workers at all levels to explore the truly fine aquatic and terrestrial habitats of the area. Facilities now allow for research throughout the year.

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

Volume LXX, Number 1-11

January 1, 1967

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.

**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.

Location

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.

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.

Mail

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

Inquiries

Requests for bulletins for the Biology Session should be addressed to:

Dean of the Summer Session
6760 Johnston Hall
University of Minnesota
Minneapolis, Minnesota 55455

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

**FIELD STUDY
OPPORTUNITIES**

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 of the year.



*The new Aquatics
Laboratory-Library*

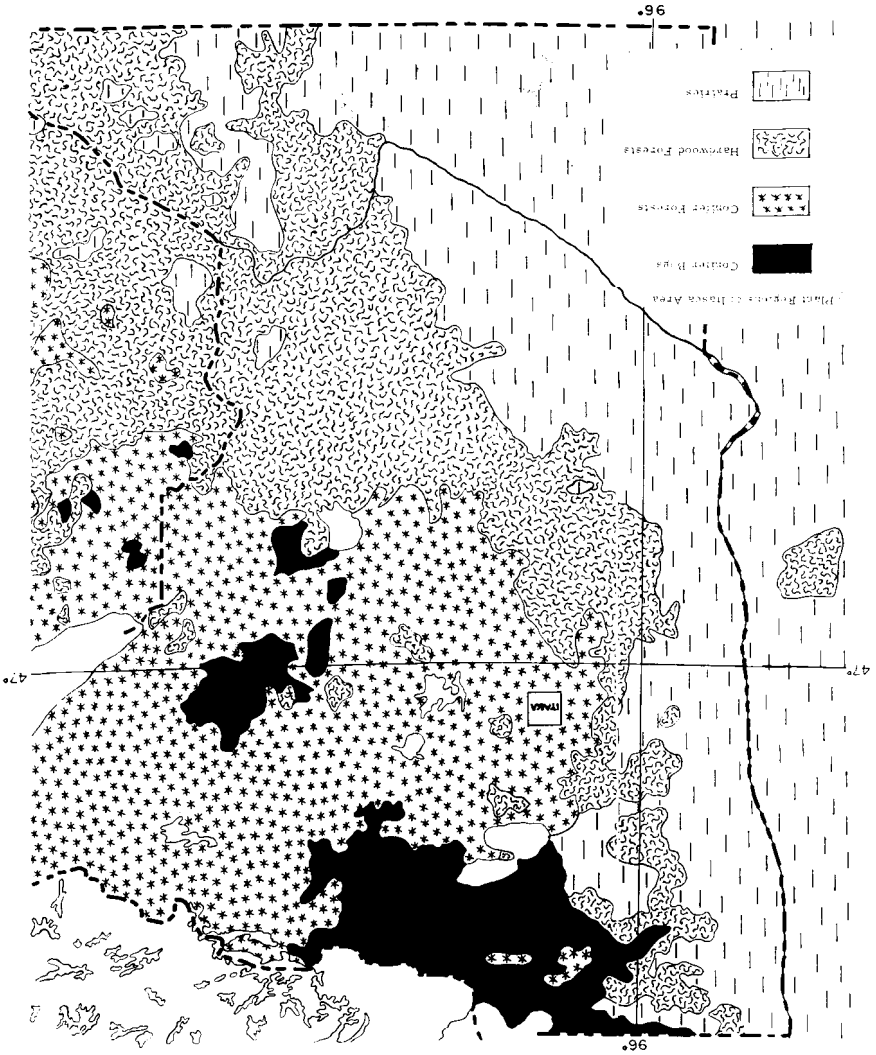


**COURSE WORK
AND RESEARCH**

Both graduate and undergraduate students of biology will find an excellent field laboratory for research and course work. Graduate students may devote themselves exclusively to research problem work under staff supervision and guidance. 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 and those wanting to carry on research during the entire year should make prior arrangements with the director and the instructor involved.



NATURAL VEGETATION OF MINNESOTA

**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 most of the necessary compound and dissecting microscopes, binoculars, collecting equipment, various types of nets, rowboats, and launches, and the minor accessories for instruction and research.

The new 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.

*The research and
teaching buildings*



**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 with previous college work, who wish to attend the Summer Session only, may do so without filing credentials, provided they are in good standing and are not candidates for a degree. Students are advised to consult these regulations in the general *Bulletin of the Summer Session*.

**Graduate
School**

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 at least 4 weeks* prior to the opening of the summer term in which the student expects to register.

Graduate students in good standing in a degree program at another recognized graduate school, may apply for admission as transient students on the Transient Graduate Student Form No. 218. The completed form should be returned to the Dean of the Graduate School, 322 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

It should be noted that registration as a transient student is limited to registration in one or both terms of a single summer session. If a person has been registered at the University of Minnesota as a transient student previously he is not eligible for continued registration in that status, but must seek regular admission. If a person has been registered in the Graduate School previously and is not sure of his eligibility to continue, he should write the Graduate School, 322 Johnston Hall, for clarification.

Graduate work taken during the Biology Session may be considered for resident requirement at the University of Wisconsin upon application to the Graduate School at Madison and upon recommendation of the department concerned.

Only courses numbered 100 or over and taught by approved members of the graduate faculty carry graduate credit.



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.

The *Fishery and Wildlife Management Summer Scholarship* provided by Minnesota Izaak Walton League chapters for undergraduates in this field.

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

AERIAL PHOTOMOSAIC OF ITASCA STATE PARK



**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) postdoctoral 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 in each category will vary. 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, 1967.

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, St. Paul, Minnesota 55101. *This form must be accompanied by a recent transcript of academic record and a deposit of \$25.* 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.

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.

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 15.

Registration by out-of-town students can be completed at the station on *June 11, Term I* or *July 16, Term II* where the necessary IBM cards will be held with the 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.

Academic Fees The following fees, per term, are payable by each regular registrant on or before June 13 or July 18:

Tuition fee	\$63.00
Incidental fee	13.50
Laboratory fee	8.50
	<hr/>
	\$85.00

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 15 for the first term, or July 3 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

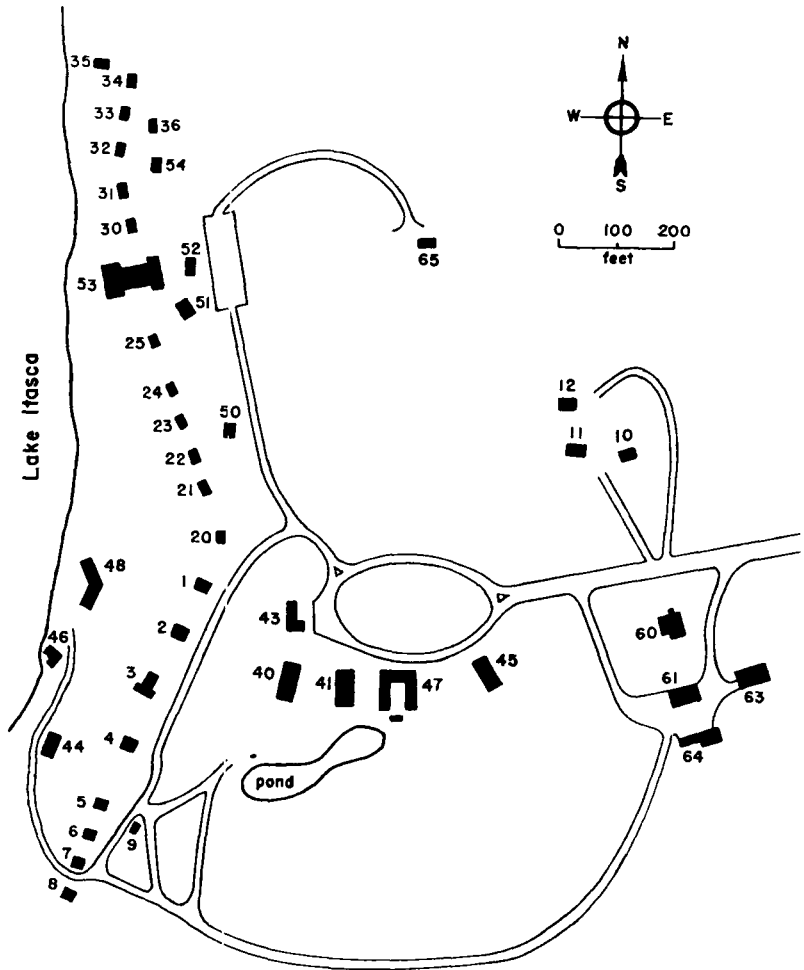
Tuition and fees are payable at the time of registration on or before June 13 or July 18. After June 13 or July 18, late fees will be charged as follows:

June 14-19 or July 19-21	\$ 3.00
June 19-23 or July 24-28	5.00
Thereafter	10.00

Many lakes are easily accessible



PLAN OF ITASCA FORESTRY AND BIOLOGY STATION



- | | | | |
|-------|-----------------------|-------|---------------------------|
| 1-12 | Faculty cabins | 53 | Assembly and Dining Hall |
| 20-36 | Student cabins | 50-54 | Service Buildings |
| 43 | Office | 60-64 | Resident Manager Facility |
| 40-45 | Laboratory-Classrooms | 65 | Campground |
| 46-48 | Research Laboratories | | |

No registration will be accepted after June 14 or July 19 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 \$15 per term service charge for dormitory facilities. An initial payment of \$75 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.

BOARD AND LODGING
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 co-operative 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 seven 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 application well in advance of the session. The weekly charge for the use of this area is \$12.

**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.

**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

Swimming, fishing, boating, and hiking are relaxing counterbalances for a busy educational program. Social events in the large assembly hall are planned by the students, with some guidance. Weekly popular lectures by staff or visitors are scheduled for the entire campus population.

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.

**STAFF
MEMBERS**

Ernest O. Beal, professor, North Carolina State University, has major research interests in experimental approaches to the ecology, taxonomy, and evolution of aquatic vascular plants.

Alan J. Brook, associate professor, University of Minnesota, specializes in fresh-water algae; he has had extensive experience in the Sudan and Scotland which has led to many publications on the ecology and systematics of the algal floras of these areas. He is the author of the recent text, *The Living Plant*.

Murray F. Buell, professor, Rutgers University, has been concerned with the study of vegetation, having worked primarily with forest communities of northern Minnesota, eastern North Carolina, and New Jersey.

Dale Chelberg, associate professor, Mankato State College, specializes in the systematics and ecology of fresh-water crustacea.

Edwin F. Cook, professor, University of Minnesota, specializes in the taxonomy of Diptera and of immature aquatic insects.

Clarence F. Dineen, professor, Saint Mary's College, Notre Dame, Indiana, has worked in the areas of trophic dynamics of ponds and comparative osteology of fresh-water fishes.

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.

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*.

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 the book, *Fungi in Oceans and Estuaries*.

William H. Marshall, professor and director of Field Biology, University of Minnesota, has published articles on ecology of game animals and is currently doing research on ground squirrels and ruffed grouse.

John C. Mehner, professor and chairman, Department of Biology, Mary Baldwin College, has published on the behavior of robins and carried out intensive studies on the evening grosbeak in Itasca Park.

Richard L. Meyer, assistant professor, Chico State College, 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.

Philip C. Miller, assistant professor, San Diego State College, is interested in combining, at the macroscopic level, theories of physical micrometeorology with classical ecological problems.

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.

Orrin J. Rongstad, research fellow, University of Minnesota, has completed studies on the ecology of ground squirrels, cottontails, and snowshoe rabbits using radioactive calcium isotopes and is now working with a variety of mammals using radio telemetry techniques.

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.

John W. Thieret, associate professor, University of Southwestern Louisiana, has made extensive studies of the flora of Illinois and of the Northwest Territories of Canada. He is currently preparing a flora of the state of Louisiana.

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

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

COURSES OF INSTRUCTION

An asterisk (*) indicates courses in which papers may be prepared by graduate students for independent work under Plan B.

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 or #; MTh; II term) Beal

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 or #; TF, I term; WS, II term) Ownbey, Thieret

135. Ecology of the Itasca Region. The plant communities represented in Itasca Park and vicinity and their dynamic relationships. Also the relationships of the local communities to the vegetation of Minnesota as a whole. Use of modern methods of vegetational analysis and measurement of environmental factors. (5 cr; limited to 20 students; prereq 50 or 130 or #; MTh; I term) Buell

152. Ecology of Freshwater Algae. Aspects of algal ecology in lakes and ponds with special reference to phytoplankton, benthos, and periphyton; also in streams, bogs, soils, and other terrestrial habitats. Field and laboratory instruction in relevant research techniques. Text: Fogg, *Algal Culture and Phytoplankton Ecology*. (5 cr; limited to 20 students; prereq 150 or 155 or #; MTh; II term) Brook

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, or #; MTh, I term; TF, II term) Brook, Meyer

158. See Forestry 158.

160. See Plant Pathology 160.

99. Research Problems. (5 cr; prereq major in biological sciences, #) Staff

299.* Research Problems. (Cr ar; prereq grad) 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 habits 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 Entomology*. (5 cr; limited to 15 students; prereq Biol 2 or equiv; TF; I term) Cook

124. The Biology of Immature Insects. A field and laboratory course treating of habits, habitats, life history, and identification of immature insects with particular emphasis on aquatic forms. Text: Peterson, *Larvae of Insects, Parts I and II*. (5 cr; limited to 15 students; prereq 59 or 74 or equiv or #; WS; I term) Cook

129. Aquatic Entomology. Identification and biology of aquatic and littoral insects in all states. (5 cr; limited to 15 students; prereq 59 or 74 or equiv or #; MTh; II term) Cook

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; MTh, I term; WS, II term) Tester, Rongstad, Marshall

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, and fisheries and wildlife. (Cr ar; prereq #) Staff

FORESTRY

158. Theory and Practice in Environmental Measurement. Studies of the physical factors of the forest environment emphasizing energy budget, water budget, and microclimate variations. Modern field instrumentation will be stressed. Texts: Platt and Griffiths, *Environmental Measurement*, and Geiger, *The Climate Near the Ground* (rev. ed.). (5 cr; limited to 20 students; prereq college physics, ecology, or physiology; MTh; II term) Miller

215.° Research Problems in Forest-Tree Physiology. Individual research work in physiology of forest vegetation. (Cr ar; prereq #; II term) Miller

**PLANT
PATHOLOGY
and
PHYSIOLOGY**

56. Introduction to the Study of Fungi. The structure, development, and identification of fungi, especially those of economic importance. (5 cr; limited to 7 students; prereq 9 cr in botany, or #; WS; II term) French

156. Study of Fungi for Advanced Students. General characters of fungi; especially those used in identification; cultural and taxonomic procedures and practices. (5 cr; limited to 8 students; prereq 9 cr in botany, or #; WS; II term) French

160. Aquatic Fungi. The collection, culture, taxonomy, and morphology of fresh-water fungi. (5 cr; limited to 12 students; prereq 3 cr in mycology, or #; TF; II term) Johnson

210.° Special Problems in Mycology. Individual research work in taxonomy and biology of special groups of fungi. (Cr ar; prereq grad, Myc 107; II term) French, Johnson

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 or #; TF; I term) Farnham

ZOOLOGY

72. Natural History of Invertebrates and Fishes. 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 or #; MTh, I term; TF, II term) Chelberg, Dineen

115. Advanced Natural History of Invertebrates and Fishes. 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 or #; MTh, I term; TF, II term) Chelberg, Dineen

119. **Limnology.** 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 or #; WS; I and II term) Underhill
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 or #; WS; I term) Warner
136. **Avian Behavior.** Field studies stressing courtship, nesting, and other facets in the breeding behavior of birds in the Itasca area. Text: Tinbergen, *Social Behavior in Animals*. (5 cr; limited to 15 students; prereq Zool 75-76 or 135, or #; TF; I term) Mehner
- 195.° **Problems in Ornithology, Ecology, and Limnology.** Principles and further work in special lines adapted to needs of individual students. (Cr ar; prereq Biol 2 or equiv, and #) Staff

GRADUATE STUDENT THESES

- MCANDREWS, J. H. Post-glacial vegetation history of the prairie-forest transition of northwestern Minnesota. Ph.D. Thesis. 1963.
- FORBES, RICHARD B. Ecological studies of the eastern and least chipmunk. Ph.D. Thesis. 1964.
- FROYD, JAMES D. Studies of the biology of hypoxylon canker of aspen. M.S. Thesis. 1964.
- MANION, PAUL D. Epidemiology and edeology of nectria canker. M.S. Thesis. 1964.
- BAKER, RICHARD G. Present vegetation related to macroscopic plant remains in surface samples from Floating Bog Bay, Lake Itasca, Minnesota. M.S. Thesis. 1965.
- DANGER, DENNIS L. An examination of the summer science institutes at Itasca State Park (1954-63). M.S. Thesis. 1965.
- CHRISTIANSOON, LEE. A comparison of the Calcanea of two species of *Peromyscus* from northern Minnesota. M.S. Thesis. 1965.
- CLINE, DAVID R. Woodland pond habitat selection in ducks. M.S. 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.
- CHAPMAN, MARY. Isolation and experimental studies on some *Trichomyces*. M.S. Thesis. 1966.
- DEAN, RUSSELL A. High temperature tolerances of anuran amphibians. M.S. Thesis. 1966.
- ETNIER, DAVID A. The biology of hybrid sunfishes of the genus *Lepomis* in three Minnesota lakes. Ph.D. Thesis. 1966.
- HOHN, BONNIE M. A study of the movements and activity patterns of the thirteen-lined ground squirrel, *Citellus tridecemlineatus*. M.S. Thesis. 1966.
- WUJEK, DANIEL E. Ultrastructure of selected flagellated Chrysophytes. Ph.D. Thesis. 1966.
- ZINER, MARVIN DALE. A taxonomic study of *Picea mariana*: *P. Glauca* in the Lake Itasca Region in Minnesota. M.A. Thesis. 1966.

RECENT RESEARCH PUBLICATIONS

- DENNIS, CLIFFORD J. Observations on Treehopper behavior (*Homoptera, membracidae*). Amer. Midl. Nat., 71:452-459. 1964.
- SCHMID, WILLIAM D. and JAMES UNDERHILL. Sodium transport by the skin of amphibian species from different habitats. Ecology, 45:864-865. 1964.

- TESTER, JOHN R. and W. J. BRECKENRIDGE. Population dynamics of the Manitoba Toad, *Bufo Hemiophrys*, in northwestern Minnesota. Ecology, 45:592-601. 1964.
- TESTER, JOHN R. and W. J. BRECKENRIDGE. Winter behavior patterns of the Manitoba Toad, *Bufo Hemiophrys*, in northwestern Minnesota. Annales Academiæ Scientiarum Fennicæ, Ser. A, IV Biologica 71-31:423-431. 1964.
- BLOOM, WILLIAM L. Karyotypes in the Alismataceae of Itasca State Park. Michigan Botanist, 4:87-91. 1965.
- COLE, G. A. and J. C. UNDERHILL. The summer standing crop of sublittoral and profundal benthos in Lake Itasca, Minnesota. Limnology and Oceanography, 10:591-597. 1965.
- ETNIER, DAVID A. An annotated list of the *Trichoptera* of Minnesota, with description of a new species. Ent. News, 86(6):1965.
- HICKEY, J. J., J. T. EMLÉN, and S. E. KENDEIGH. Early summer bird life of Itasca State Park. Loon, 37(1):3-15. 1965.
- JOHNSON, ARTHUR A. *Hydromermis itascensis* sp. n. (Nematoda: Mermithidae) a parasite of *Glyptotendipes lobiferus* (Say) (Diptera: Chironomidae) and the taxonomic status of *Gastromermis*. Journal of Parasitology, 51:53-56. 1965.
- PEARSON, L. C. Lichens as microclimate indicators in Northwestern Minnesota. Amer. Midl. Nat., 74(2):257-268. 1965.
- SCHMID, WILLIAM D. Distribution of aquatic vegetation as measured by line intercept with SCUBA. Ecology, 46(6):816-823. 1965.
- SCHMID, WILLIAM D. Energy intake of the mourning dove, *Zenaidura macroura marginella*. Science, 150(3700):1171-72. 1965.
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- SCHMID, WILLIAM D. Some aspects of the water economies of nine species of anuran amphibians. Ecology, 46:261-269. 1965.
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I TERM

CONDENSED COURSE SCHEDULE	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
	Bot 135	Bot 116	Ent 124	Bot 135	Bot 116	Ent 124
	Bot 155	Ent 59	Zool 119	Bot 155	Ent 59	Zool 119
	Ent 162	Soil 137	Zool 135	Ent 162	Soil 137	Zool 135
	Zool 72/115	Zool 135		Zool 72/115	Zool 136	

II TERM

<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
Bot 112	Bot 155	Bot 116	Bot 112	Bot 155	Bot 116
Bot 152	PIPa 160	PIPa	Bot 152	PIPa 160	PIPa
Ent 129	Zool	56/156	Ent 129	Zool	56/156
For 158	72/115	Ent 162	For 158	72/115	Ent 162
		Zool 119			Zool 119

Request for Reservation—ITASCA BIOLOGY SESSION

Name _____ Date _____

Address _____

_____ Zip Code _____

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

College now attending: _____

U. of M. college last enrolled in _____ year _____

Reserve a place in following two courses 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)

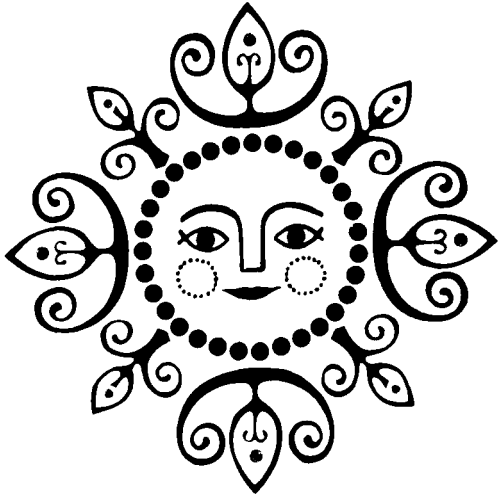
Enclosed find \$25 deposit to be credited to the tuition fee on completion of registration, and a recent transcript of my academic record.

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





• UNIVERSITY OF MINNESOTA BULLETIN •



Summer
ession
1967

UNIVERSITY OF MINNESOTA

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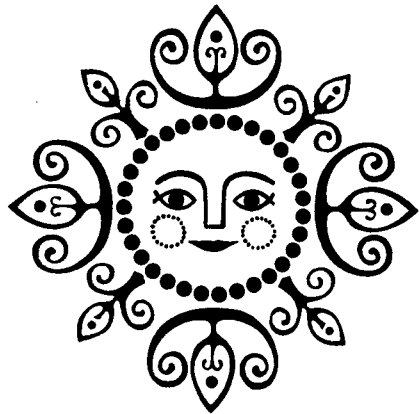
Willard L. Thompson, Ph.D., Dean, General Extension Division and Summer Session
John G. Geier, Ph.D., Assistant Dean, Summer Session

UNIVERSITY OF MINNESOTA

Founded in the faith that men are ennobled by understanding

Dedicated to the advancement of learning and the search for truth

Devoted to the instruction of youth and the welfare of the state



Summer Session 1967

FIRST TERM • JUNE 12-JULY 15

SECOND TERM • JULY 17-AUGUST 19

Calendar

First Term

June	12	Monday	Orientation and Registration; fees due
June	13	Tuesday	First Term classes begin
July	4	Tuesday	Independence Day; holiday
July	14	Friday	Classes end at close of VI hour; Commencement, 4 p.m.
July	15	Saturday	First Term closes

Second Term

July	17	Monday	Orientation and Registration; fees due
July	18	Tuesday	Second Term classes begin
August	18	Friday	Classes end at close of VI hour; Commencement, 4 p.m.
August	19	Saturday	Second Term closes

Convocation, 8 p.m., Thursday

(See Official Daily Bulletin for announcement)

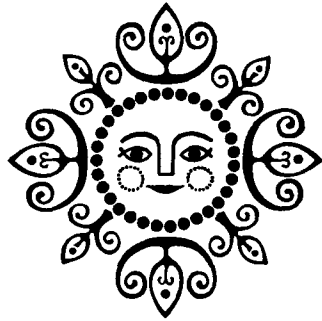
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Compliance with the regulations in this bulletin is expected of each student. This is particularly true with respect to fees, cancellations, and refunds.

Please note that the appropriate late fee will be assessed for registrations subsequent to Monday, June 12, 1967; and registrations subsequent to Monday, July 17, 1967.

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



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 reference should be made to the *Bulletin of General Information* and 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 2 or 5 and Psy 1 (you must have had Psychology 1 plus either course 2 or 5).

Example: prereq C, or Comp 3 or Comm 3 and 5 addtl cr, or 5 cr in 21-22-23 (you must have had either course C, or 5 credits in the subject matter plus either Composition 3 or Communication 3, or 5 credits from either course 21, course 22, or course 23).

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

Acct, Accounting	Hlth, School Health Education
Aero, Aeronautical Engineering	Hort, Horticultural Science
AgEc, Agricultural Economics	Hum, Humanities
AgEd, Agricultural Education	Hydr, Hydromechanics
AgEn, Agricultural Engineering	
Agro, Agronomy and Plant Genetics	IE, Industrial Engineering
AmSt, American Studies	InCh, Inorganic Chemistry
Anat, Anatomy	Ind, Industrial Education
AnCh, Analytical Chemistry	Ins, Insurance
Anes, Anesthesiology	IR, Industrial Relations
AnHu, Animal Husbandry	Ital, Italian
Anth, Anthropology	
Arab, Arabic	Jour, Journalism
Arch, Architecture	
ArEd, Art Education	Lat, Latin
Art, Studio Arts	Lib, Library School
ArtH, Art History	Ling, Linguistics
Ast, Astronomy	LMed, Laboratory Medicine
BFin, Business Finance	Math, Mathematics
BioC, Biochemistry (Agriculture)	MdBc, Biochemistry (Medical)
Biol, Biology	ME, Mechanical Engineering
BLaw, Business Law	MeAg, Mechanized Agriculture
Bot, Botany	Med, Medicine
	MedT, Medical Technology
CPsy, Child Psychology	MetE, Metallurgical Engineering
CE, Civil Engineering	Mgmt, Management
ChEn, Chemical Engineering	MicB, Microbiology
Clas, Classics	MinE, Mining Engineering
Comm, Communication	Mktg, Marketing
Comp, Composition	MM, Mechanics and Materials
	MdGk, Modern Greek
DInd, Dairy Industries	Mort, Mortuary Science
DyHu, Dairy Husbandry	MuEd, Music Education
	Mus, Music
Econ, Economics	
Ed, Education	NPsy, Psychiatry and Neurology
EdAd, Educational Administration	NSci, Natural Science
EdCI, Curriculum and Instruction	NuAd, Nursing Administration
EdT, Methods and Student Teaching	NuEd, Nursing Education
EE, Electrical Engineering	Nurs, Nursing
EG, Engineering Graphics	
Engl, English	Obst, Obstetrics and Gynecology
Ent, Entomology, Fisheries, and Wildlife	OMgt, Office Management
EPsy, Educational Psychology	Oph, Ophthalmology
	OrCh, Organic Chemistry
FamS, Family Studies	Otol, Otolaryngology
For, Forestry	
Fren, French	PA, Public Administration
FS, Foreign Study	Path, Pathology
FScI, Food Science and Industries	PCh, Physical Chemistry
	Ped, Pediatrics
GC, General College	PEM, Physical Education for Men
GeCh, General Chemistry	PetE, Petroleum Engineering
GE, General Engineering	PEW, Physical Education for Women
Gen, Genetics	Phcg, Pharmacognosy
Geog, Geography	Phcl, Pharmacology
Geo, Geology and Geophysics	Phil, Philosophy
Ger, German	Phsl, Physiology
Grk, Greek	Phys, Physics
	PIPa, Plant Pathology and Physiology
HE, Home Economics	PMed, Physical Medicine and Rehabilitation
Heb, Hebrew	PO, Personal Orientation
HED, History and Philosophy of Education	Poul, Poultry Science
HEEd, Home Economics Education	Pol, Political Science
Hist, History	

Port, Portuguese
 Prod, Production
 Psy, Psychology
 PubH, Public Health
 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
 VBac, Veterinary Bacteriology and Public Health
 VM, Veterinary Medicine
 VObs, Veterinary Obstetrics
 VPAP, Veterinary Pathology and Parasitology
 VPP, Veterinary Physiology and Pharmacology
 VSR, Veterinary Surgery and Radiology
 Zool, Zoology

Building Name Abbreviations—Abbreviations followed by (StP) indicate buildings located in St. Paul. Those followed by (W) indicate buildings located on the West Bank. All other buildings are on the East Bank, Minneapolis.

A, Armory
 Aero, Aeronautical Engineering
 AgBot (StP), Agricultural Botany
 AgEng (StP), Agricultural Engineering
 Agr (StP), Agronomy
 AH, Appleby Hall
 Arch, Architecture

 BA (W), Business Administration
 Bo, Botany
 BoG, Botany Greenhouse
 Bu, Burton Hall

 C, Chemistry
 CB (W), Classroom Building
 CD, Child Development
 CH, Cooke Hall
 ChE, Chemical Engineering
 CMU, Coffman Memorial Union
 CofH (StP), Coffey Hall

 DCB (StP), Dairy Cattle Barn
 DI (StP), Dairy Industries
 DiehlH, Diehl Hall

 E, Main Engineering
 EdH, Eddy Hall
 EE, Electrical Engineering
 Ex, Experimental Engineering

 FieldHse, Fieldhouse
 FolH, Folwell Hall
 ForH, Ford Hall
 FP (StP), Forest Products
 FraH, Fraser Hall

 GH (StP), Green Hall
 Gy (StP), Gymnasium

 HH (StP), Haecker Hall
 HL, Hydraulic Lab (Hennepin Island)
 HolB, Holman Building (2035 Univ Ave)
 Hosp, University Hospitals
 Hr (StP), Horticulture
 HS, Health Service

 J, Jones Hall
 JacH, Jackson Hall
 JohH, Johnston Hall

 Lib, Walter Library
 LinA, Linear Activator
 LinL, Linac Laboratory
 LsPav (StP), Livestock Pavilion
 LyonL, Lyon Laboratories

 Mayo, Mayo Memorial
 McNH (StP), McNeal Hall
 ME, Mechanical Engineering

MEx, Mines Experiment Station
 MH, Millard Hall
 MinMet, Mines and Metallurgy
 MMA, Mayo Memorial Auditorium
 MNH, Museum of Natural History
 MorH, Morrill Hall
 MurH, Murphy Hall
 MusE, Music Education

 NCCE, Nolte Center for Continuing Education
 NGW, Norris Gymnasium for Women
 NH, Nicholson Hall
 NMA, Northrop Memorial Auditorium

 Owre, Owre Hall

 P, Pillsbury Hall
 PB, Poucher Building (2007 Univ Ave)
 PeikG, Peik Hall Gymnasium
 PeikH, Peik Hall
 PetH (StP), Peters Hall
 Ph, Physics
 PP (StP), Plant Pathology
 Psy, Psychology
 Pt, Pattee Hall

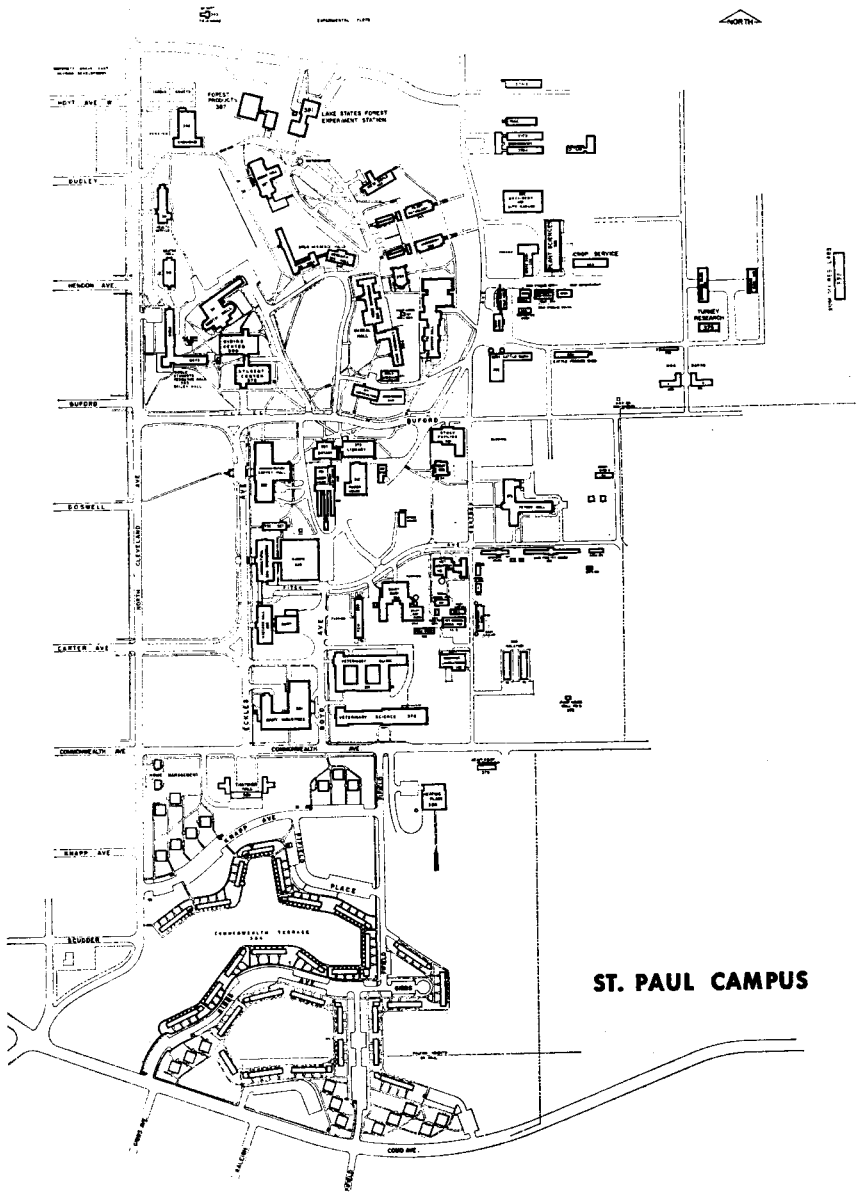
 SBH, State Board of Health
 ScH, Scott Hall
 SciCB, Science Classroom Building
 ShH, Shevlin Hall
 SnH (StP), Snyder Hall
 So (StP), Soils
 SocSci (W), Social Sciences Building

 TEH (StP), Temporary, East of Haecker Hall
 TNCD, Temporary, North of Child Development
 TNCE, Temporary, North Court of Engineering
 TNM, Temporary, North of Mines (Appleby Hall)
 TSC (StP), Temporary, South of Coffey Hall
 TSCE, Temporary, South Court of Engineering
 TSF, Temporary, South of Folwell

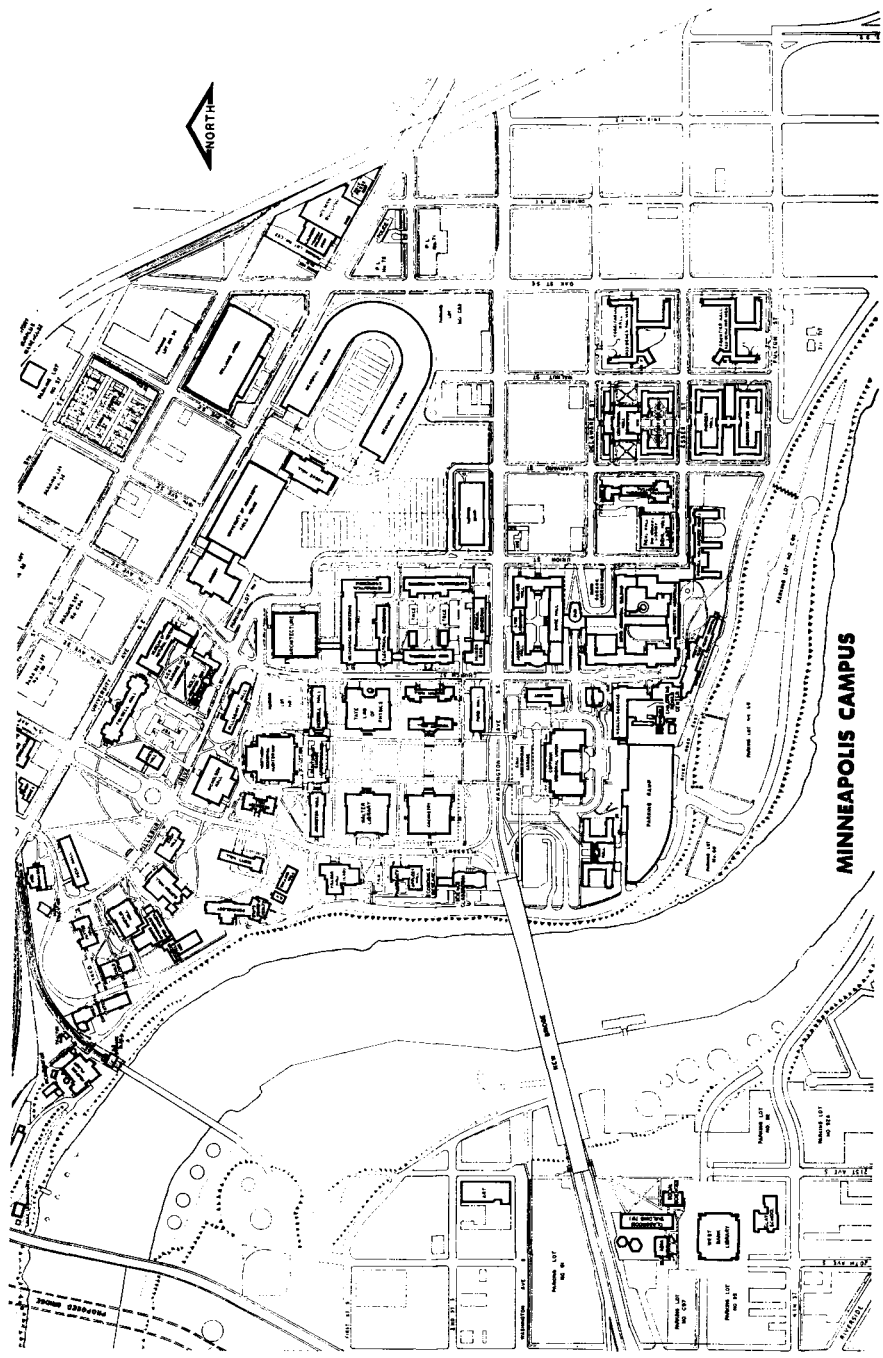
 VCHH, Variety Club Heart Hospital
 VetA (StP), Veterinary Anatomy
 VetC (StP), Veterinary Clinic
 VetS (StP), Veterinary Science
 VH, Vincent Hall

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

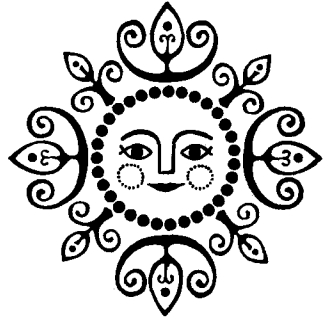
 Z, Zoology



ST. PAUL CAMPUS



MINNEAPOLIS CAMPUS



Admission and Registration

Admission

The courses of the Summer Session 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. Recent high school graduates must be regularly admitted before enrolling in the Summer Session. Students beginning their University attendance during the Summer Session who wish to attend during the academic year must submit credentials in the usual way.

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 must be received by the Admissions 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 *Bulletin of General Information* or write to Office of Admissions and Records, University of Minnesota, Minneapolis, Minnesota 55455.

Summer Students—Students with previous college work who wish to attend the Summer-Session-only may do so without filing credentials if they are not in a “dropped” status in 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 students.”

—Persons about 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 students.”

—High school graduates under 24 years of age without previous college work will also be considered for admission as “summer students” but must have specific approval of the Office of Admissions.

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

Graduate Students—The procedure for admission of graduate students is discussed in the section on the Graduate School in this bulletin.

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 *Bulletin of General Information* 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 code **MUST** accompany request 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 students” in the preceding section on “Summer Students” 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 1967, 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 Dates

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 following periods:

FIRST TERM

Advance Registration—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 Wednesday, May 31 through Friday, June 2, 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.

Final Registration—Monday, June 12, 8 a.m. to 3:15 p.m.

—Students registering in Coffman Memorial Union will find congestion in the lines during the early part of the day and may find it more convenient to register during the afternoon.

Registration on Tuesday, June 13, incurs late fee.

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

June 13-16	\$ 3.00
June 19-23	5.00
Thereafter	10.00

SECOND TERM

Advance Registration—Students who register for the First Term and who plan to attend Second Term should register for both terms at the same time. Students registered for the First Term who have not registered for Second Term should register during the advance registration period for Second Term, July 11-15. Students who are not registered for the First Term may register during the advance registration period for Second Term or on July 17.

Final Registration—Monday, July 17, 8 a.m. to 4 p.m.

Registration on Tuesday, July 18, incurs late fee.

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

July 18-21	\$ 3.00
July 24-28	5.00
Thereafter	10.00

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 of Registration

ADVANCE REGISTRATION

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 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)	Social Sciences, 214 Social Sciences 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 Johnston 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 Memorial Building
Institute of Technology, 133 Main Engineering Building	Pharmacy, 115 Appleby Hall
Liberal Arts	Physical Therapy, 860 Mayo Memorial Building
Summer Students	Public Health, 1325 Mayo Memorial Building
122 Johnston Hall	University College, 106 Nicholson Hall
Regularly Admitted Students	Veterinary Medicine, 225 Coffey Hall (St. Paul)
Lower Division, 214 Johnston Hall	
Upper Division:	
Humanities, 206 Folwell Hall	
Science and Math (and Central), 223 Johnston Hall	

The advance registration for Second Term will take place in the college offices listed above, with the exception that Summer Students in the College of Liberal Arts will register at the appropriate Division office as listed. There will be no registration in 122 Johnston Hall.

FINAL REGISTRATION

First Term—June 12

A. Registration at Coffman Union Ballroom

Education

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

Medical School

Public Health

College of Liberal Arts (Summer Students)

B. Registration at College Offices

Agriculture, Forestry, Home Economics, and Veterinary Medicine, 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

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)

Adult Special Students, 214 or 225 Johnston Hall

Honors, 115 Johnston Hall

University College, 106 Nicholson Hall

Veterinary Medicine, 225 Coffey Hall (St. Paul)

Second Term—July 17

A. There is no special registration at Coffman Memorial 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) or 307 Zoology

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 Engineering Building

Liberal Arts

Summer Students

122 Johnston Hall

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

Special Students, 216B or 225 Johnston Hall

Medical Technology, C-205 Mayo Memorial Building

Medicine, 1360 Mayo Memorial Building

Mortuary Science, 114 Vincent Hall

Nursing, 125 Owre Hall

Occupational Therapy, 860 Mayo Memorial Building

Pharmacy, 115 Appleby Hall

Physical Therapy, 860 Mayo Memorial Building

Public Health, 1325 Mayo Memorial Building

University College, 106 Nicholson Hall

Veterinary Medicine, 225 Coffey Hall (St. Paul)

Registration Procedure

REGISTRATION PROCEDURE AT COFFMAN UNION

First Term—June 12

(Education; Graduate School; Medical School; Public Health; 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 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, Medical School and Public Health—North Star Room. Follow the blue line.)
- Step 5. Class reservations—Ski-U-Mah room. If any of your courses are listed on pages 27-30 of the bulletin, you must obtain a class reservation IBM 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—Game Room, 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 13. Your fee statement for the Second Term will be mailed to you on June 26, and it will be payable on or before July 18.

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 (a nearby building).

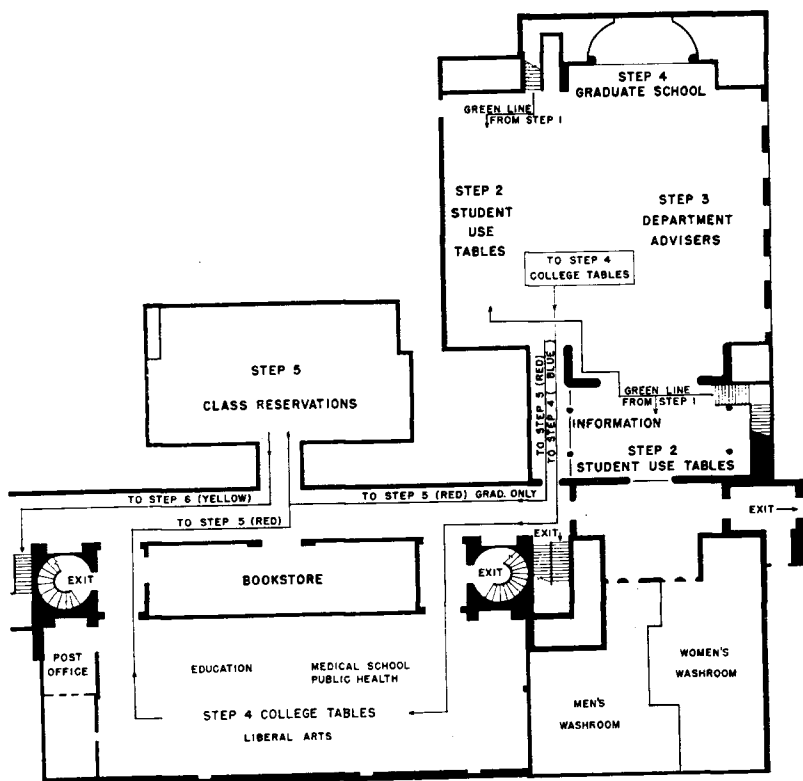
If you are a student enrolling for the Summer Session *only*, you will have a Confirmation of Intent to Register or a Statement of Intent

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 8:30 a.m.-12 noon and 1-4 p.m. Fees must be paid, or postmarked if mailed, not later than Tuesday, June 13.

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)

First Term—June 12

- 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—July 10-17

- 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. Fees must be paid or postmarked, if mailed, not later than Tuesday, July 18.

Changes in Registration

After a student's registration has been accepted by the 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.*

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)	\$50.00	\$63.00
Incidental fee†† (per term)	13.50	13.50
Total fee (per term)	\$63.50	\$76.50

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 4 credits, \$52 per term; 4 credits, \$50 per term; less than 4 credits or thesis-only, \$26 per term; plus incidental fee.

Please refer to the index for fees in the bulletins of the following schools, colleges, and stations:

Medical School	School of Nursing
School of Dentistry	College of Veterinary Medicine
Biology Session	

†† The incidental fee of \$13.50 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) \$7.13 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

††\$35.00—Z (Preparatory Mathematics)

Modern Language Residence Houses (Summer Session)

\$40.00 per term—French (22, 56A, 106); or German (22, 67, 106)

Music

\$35.00 for two, \$70.00 for four half-hour individual lessons per week—A, D (no cr)

\$35.00 for two (2 cr), \$70.00 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, 100

\$70.00—204

\$15.00—Piano for children, ages 6-16
Students paying \$35.00 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.

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)

\$100.00—138 (Hospital Problems)

\$200.00—230 (September Field Course)

\$251.00—231, 232 (Ground Water)

†† In lieu of tuition.

†† Students taking Math Z only will pay 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—\$3.00 plus \$1.00 deposit

Gym clothing rental fee—\$3.00

Norris Gymnasium

Locker and towel fee—\$3.00 plus \$1.00 deposit

St. Paul Gymnasium

Locker and towel fee—\$3.00

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 session—\$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 correspondence 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 14, 4 p.m.

Second Term Friday, August 18, 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 from such attendance 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)	10.00
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 full (100 per cent) refund of fees. Students who cancel after having attended classes shall be allowed a refund of fees on the following basis:

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

Auditors

Fees for auditors are the same as for students registered for credit. Permission to attend 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 students, including graduate students, must obtain IBM class reservation cards for the courses listed below. Students registering for College of Education and College of Liberal Arts courses on June 12 will obtain class reservation cards for these courses in Coffman Memorial 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—JohH 205

American Studies

100-200—JohH 205

Analytical Chemistry

57A, 57B—225 CofH for AFHE,
E 136 for IT, and JohH 205 for
other students

All other courses under 200—E 136

Anthropology

140—JohH 205

Architecture

All courses—E 136

Art Education

10, 53—Bu 206

Biology

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

Botany

121—CofH 225

See Itasca Biology Session

Business Law

58, 158—BA 225

Child Psychology

223—Bu 206

Civil Engineering

All courses—E 136

Curriculum and Instruction

60, 61, 62, 63, 64, 65, 101A, 101B,
103, 107, 109, 121, 126, 143A,
145, 149A, 165A, 192B—Bu 206

Economics

1, 2, 65—JohH 205

Education

55A, 75A—Bu 206

Educational Administration

128, 239—Bu 206

Educational Psychology

110, 116, 125, 148, 150, 159, 193,
210, 216A, 218, 218A, 257, 281,
282A, 282B, 286—Bu 206

Electrical Engineering

All courses—E 136

Engineering Graphics

All courses—E 136

English

55, 56—JohH 205

English Composition

1, 3—JohH 205

Entomology, Fisheries and Wildlife

See Itasca Biology Session

Family Studies

All courses—JohH 205

Forestry

See Itasca Biology Session

General Chemistry

4, 6—CofH 225 for AFHE, E 136
for IT, and JohH 205 for other
students.

All other courses—E 136 for IT,
and JohH 205 for other students

- General College**
All courses—NH 106
- Geology and Geophysics**
1, 109C—E 136 for IT and JohH
205 for other students
- German**
All courses under 100—JohH 205
- Health**
See School Health Education
- History**
139B—JohH 205
- History and Philosophy of Education**
90—Bu 206
- Home Economics**
All courses under 200 except 179—
CofH 225
- Humanities**
1, 55, 131—JohH 205
- Industrial Relations**
52, 152—BA 225
- Inorganic Chemistry**
All courses under 200—E 136
- Library**
268—JohH 205
- Mathematics**
All IT—E 136
All Arts—JohH 205
- Mechanical Engineering**
All courses—E 136
- Mechanics and Materials**
All courses under 200—E 136
- Metallurgical Engineering**
All courses under 200—E 136
- Methods and Student Teaching**
50, 52, 53A—Bu 206
- Mortuary Science**
All courses—VH 114
- Music**
4—JohH 205
- Music Education**
51, 52—Bu 206
- Natural Science**
1—JohH 205
- Organic Chemistry**
61—CofH 225 for AFHE, E 136
for IT, and JohH 205 for other
students
All other courses under 200—E 136
- Personal Orientation**
1—JohH 205
- Philosophy**
2A—JohH 205
- Physical Chemistry**
All courses—E 136
- Physical Education for Men**
1A, 1B, 1C, 2A, 2B—JohH 205
- Physical Education for Women**
2A, 3, 7, 8, 11, 32—JohH 205
46, 70—Bu 206
- Physics**
1A—CofH 225 for AFHE, E 136
for IT, and JohH 205 for other
students
All other courses—E 136
- Psychology**
4-5—JohH 205
- Quantitative Analysis**
61—BA 225
- Rhetoric**
1, 22, 51—CofH 225
47—CofH 225 for AFHE, and
JohH 205 for other students
- School Health Education**
25, 70—Bu 206
- Sociology**
1, 3—JohH 205
- Soil Science**
See Itasca Biology Session

Speech
5X, 50, 65, 81, 106—JohH 205

Studio Art
All courses under 193—JohH 205

Theatre Arts
21, 24, 34, 54, 131—JohH 205

Zoology
See Itasca Biology Session

Twin Cities Campus—Second Term

Accounting
25, 26—JohH 205

Analytical Chemistry
All courses under 200—E 136

Architecture
All courses—E 136

Art Education
10, 18, 80—Bu 206

Biology
2—CofH 225 for AFHE and JohH
205 for other students

Botany
See Itasca Biology Session

Civil Engineering
All courses—E 136

Curriculum and Instruction
60, 61, 62, 63, 64, 65, 100, 101A,
101B, 108, 135, 143A, 145—Bu
206

Economics
1, 2, 66, 103, 103A—JohH 205

Education
55B—Bu 206

Educational Administration
128, 218—Bu 206

Educational Psychology
110, 116, 148, 150, 159, 193, 208,
211, 217A, 218A, 237, 257, 268,
—Bu 206

Electrical Engineering
All courses—E 136

English
55, 56—JohH 205

English Composition
1, 2—JohH 205

Entomology, Fisheries and Wildlife
See Itasca Biology Session

Family Studies
1—JohH 205

Forestry
See Itasca Biology Session

General Chemistry
5—CofH 225 for AFHE, E 136 for
IT and JohH 205 for other stu-
dents
All other courses—E 136 for IT
and JohH 205 for other students

General College
All courses—NH 106

Geology and Geophysics
2, 122C—E 136 for IT and JohH
205 for other students

German
All courses under 100—JohH 205

History
98—JohH 205

History and Philosophy of Education
90—Bu 206

Home Economics
All courses under 200 except 179—
CofH 225

Humanities
54—JohH 205

Industrial Engineering
All courses—E 136

Inorganic Chemistry
All courses under 200—E 136

Library
268—JohH 205

Mathematics
All IT—E 136
All Arts—JohH 205

Mechanical Engineering
All courses—E 136

Mechanics and Materials
All courses under 200—E 136

Mortuary Science
All courses—VH 114

Music
4—JohH 205

Music Education
51, 52—Bu 206

Natural Science
2—JohH 205

Organic Chemistry
62—CofH 225 for AFHE, E 136
for IT, and JohH 205 for other
students
All other courses under 200—E 136

Personal Orientation
1—JohH 205

Physical Education for Men
1A, 1B, 1C, 2B, 2C—JohH 205

Physical Education for Women
3, 7, 8, 32—JohH 205
45—Bu 206

Physics
2A—CofH 225 for AFHE, E 136
for IT, and JohH 205 for other
students
All other courses—E 136

Plant Pathology
See Itasca Biology Session

Psychology
4-5—JohH 205

Quantitative Analysis
61—BA 225

Rhetoric
2, 22, 51—CofH 225
47—CofH 225 for AFHE, and
JohH 205 for other students

Soil Science
See Itasca Biology Session

Speech
5X, 6, 51, 65, 69, 81—JohH 205

Studio Art
All courses under 200—JohH 205

Theatre Arts
23, 24, 34, 61, 121, 132, 174, 211—
JohH 205

Zoology
See Itasca Biology Session

Itasca Biology Session

FIRST TERM

Botany
116, 135, 155—CofH 225

Entomology, Fisheries and Wildlife
59, 124, 162—CofH 225

Soil Science
137—CofH 225

Zoology
72, 115, 119, 135, 136—CofH 225

SECOND TERM

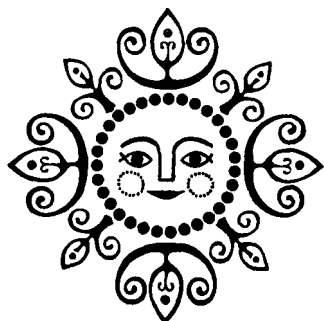
Botany
112, 116, 152, 155—CofH 225

Entomology, Fisheries and Wildlife
129, 162—CofH 225

Forestry
158—CofH 225

Plant Pathology
56, 156, 160—CofH 225

Zoology
72, 115, 119—CofH 225



General Information

On its Twin Cities Campus the University of Minnesota makes available to Summer Session students the facilities of the schools and colleges comprising this great educational institution—their faculties, libraries, laboratories, observatory, and museums.

In addition a program of recreational activities is offered, including concerts and lectures, swimming, golf, tennis, billiards, and folk and ballroom dancing.

Interurban bus lines connect the Twin Cities Campus with the cities of Minneapolis and St. Paul, providing the added cultural advantage of these large metropolitan centers—an attraction for the Summer Session student that is unique with the University of Minnesota.

Dates of Summer Session

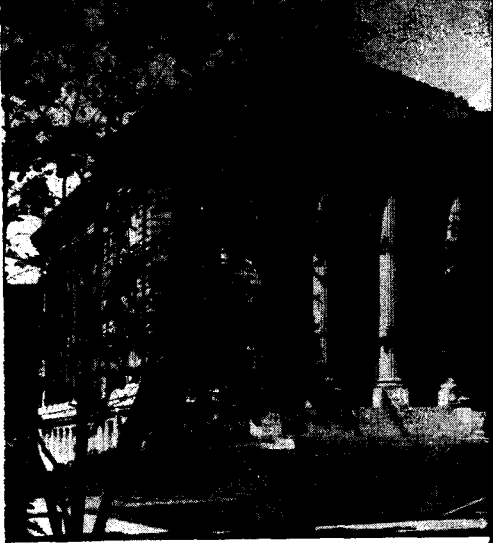
The Summer Session consists of two terms of 5 weeks each: June 12 to July 15, and July 17 to August 19. Students may register for subjects of their choice in either or both terms. Payment of fees for the First Term closes at 4 p.m. on Monday, June 12. First Term classes in Minneapolis (East and West Banks) will begin Tuesday, June 13 at 8 a.m. Classes in St. Paul will begin at 7:30 a.m., Tuesday, June 13.

Payment of fees for the Second Term closes at 4 p.m. on Monday, July 17. Classes for Second Term will open Tuesday, July 18.

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

General Offices

Johnston Hall—right



The Office of the Dean of Summer Session is in 135 Johnston Hall. The Office of Admissions and Records and the Bursar's Office are in Morrill Hall. For the convenience of students registered in colleges located in St. Paul, branch offices are established on the second floor of Coffey Hall. The offices of the several schools and colleges together with the Office of Student Affairs function during the Summer Session just as during any other quarter of the year.

*College of Education
Burton Hall—below*



Library Facilities and Services

The University library system, with over 2 million volumes, is one of the 10 largest of its kind in the United States. Most of the publications which students need to consult, in addition to the required reading assignments for individual courses, are available in the University's libraries.



Walter Library

The major portion of the library's resources are housed here. In addition to the thousands of books, periodicals, and reference works in the general collection, there are several noteworthy special collections. The James Ford Bell collection of rare volumes deals with exploration and trade with major emphasis on the 16th through 18th centuries. The Ames Library of South Asia is one of the notable specialized libraries on South Asia in the United States. The Department of Special Collections has custody of rare books and unique collections.

Other specialized resources in Walter Library are the newspaper and microfilm collection, which contains extensive holdings of foreign and domestic newspapers in either original format or on microfilm; the Education Library, a subject collection which contains the works on education, psychology, and library science; and the browsing collection containing books for recreational reading.

Freshman-Sophomore Library

Students in their first 2 years of study will find most of their course-related materials on the open shelves of this library, which is located on the ground floor of Johnston Hall. The patrons of this library are encouraged to use the Walter Library when they have need of more specialized information or services.

West Bank Branch Library

This library houses class-related materials for courses taught on the West Bank. It is located on the third floor of the West Bank Classroom Building.

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 both the East and West Banks in Minneapolis. On the East Bank are the Art, Architecture, Math-Physics, Chemistry, Music, Mines and Metallurgy, Journalism, Geology, and Pharmacy Libraries. Also on the East Bank are the more extensive collections of the Law, Bio-Medical and Engineering Libraries. The Public Administration Library and the Map Library are both located on the West Bank.

St. Paul Libraries

A modern central library houses publications relating to agriculture and home economics. Outlying specialized collections in forestry, biochemistry, plant pathology, entomology, and veterinary medicine form a departmental library system for this area of the campus.

Library Hours

Library hours of service during the Summer Session are posted in all of the libraries and are published in the Official Daily Bulletin. In general, except for holidays and the vacation period following Second Term, the Walter

Library is open from 7:45 a.m. to 11 p.m. on weekdays, from 7:45 a.m. to 5 p.m. on Saturdays, and from 1 p.m. to 11 p.m. on Sundays.

A pamphlet containing more detailed information about the use of the library and its collections is available at any of the service desks in Walter Library.

Full library privileges are available to all Summer Session students.

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 pre-existing conditions is not provided.

Student Employment Office

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.

Student Counseling Bureau

The Student Counseling Bureau, 101 Eddy Hall, offers specialized counseling and testing services to students who wish to learn more about themselves or who have personal problems which they would like to discuss with a professional counselor. Nearly one-third of our University students have talked at some time with a counselor about courses they wish to take, vocations they are considering, problems they have with study skills, or personal situations involving dating, engagements, marriage, or family relations. Special services are provided for physically handicapped students and a special library of information about occupations is available to students. The bureau's Reading and Study Skills Center offers help in spelling as well as in development of reading and study skills.

A problem may make itself felt in any one of several ways. Worrying about the lack of money, for example, may show itself through seriously affecting a student's grades. If a student wishes to review his progress in school

or if he has problems that worry him, he is urged to talk with a bureau counselor.

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). As one considers applying for admission to the University, he is encouraged to come to the Student Counseling Bureau for information about the different colleges in the University, courses available to him, 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

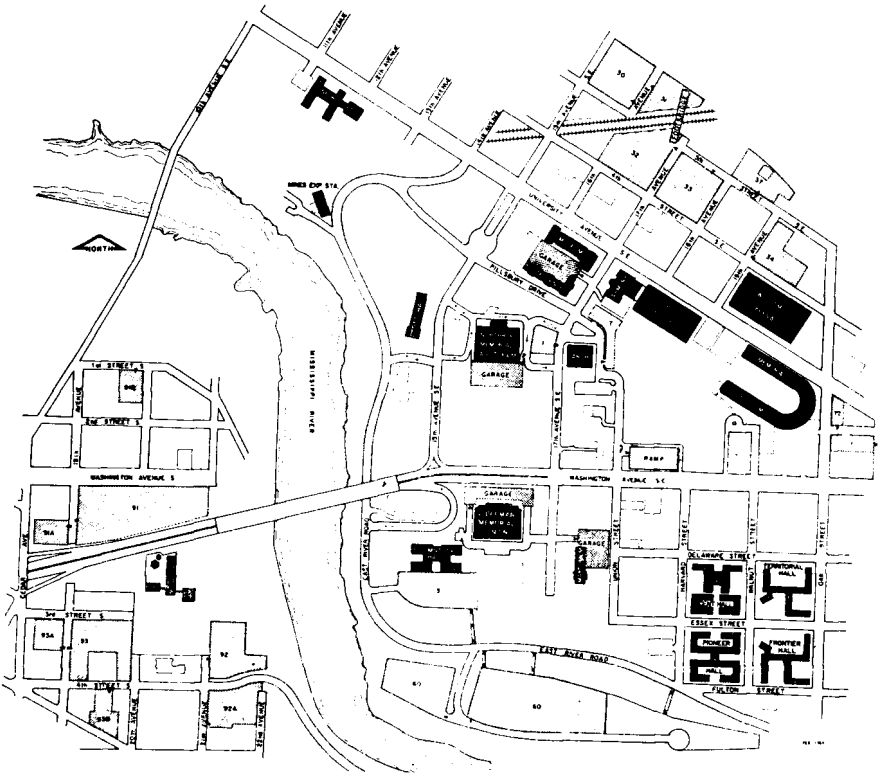
The University post offices are located on the ground floor of Coffman Memorial Union in Minneapolis; and in Coffey Hall in St. Paul. All regular post office services are available at these stations.

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.



**PARKING FACILITIES
(Minneapolis Campus)**

Official Daily Bulletin

Throughout the Summer Session an Official Daily Bulletin is published in the *Minnesota Daily*, the student newspaper of the University of Minnesota. The *Minnesota Daily* is delivered, each morning on which it is published, to boxes strategically placed on the campus. *Each student is held responsible for a knowledge of such information appearing in the official notices as may affect him.*

Religious Activities

Thirty-one student religious organizations, representing 36 faiths and denominations, function on the Twin Cities Campus. There are nine religious center buildings in the University Avenue area which maintain programs of study, discussion, worship, and recreation. Information may be secured from the Office of the Co-ordinator of Students' Religious Activities, 211 Eddy Hall (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 Comstock Hall every day of the week. Meals will not be served in either term until 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 ultra-modern men's residence, offers comfortable living in large double and single rooms. A room and board contract will be offered. Meals will not be served in either term until 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.

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 board contract will be offered, provided there is a sufficient number of residents. Meals will not be served until 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.

Private Residences—Many rooms in private homes, rooming houses, fraternities, sororities, and a newly remodeled private co-educational residence hall, Andrew House, are available. Rooms in Andrew House may be arranged in advance, but vacancy listings for the other types of private residences can be secured after arrival on campus. Upon request, lists of sublets in house-keeping units such as apartments and houses are available beginning in May. Residences of regularly enrolled students are inspected for health, safety, and study conditions.

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.

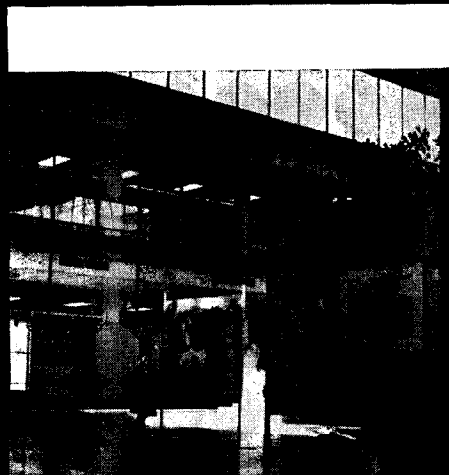
A lunchroom with a full line of vending machines is furnished in the basement of the Classroom Building on the West Bank in Minneapolis. Milk and other vending machines are located in many of the other academic buildings on the Twin Cities Campus.

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 lake shores 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 . . . 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.

Delta Field facilities for baseball and softball.

One 18-hole golf course and a 9-hole short course; and 20 tennis courts. University golf courses 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.

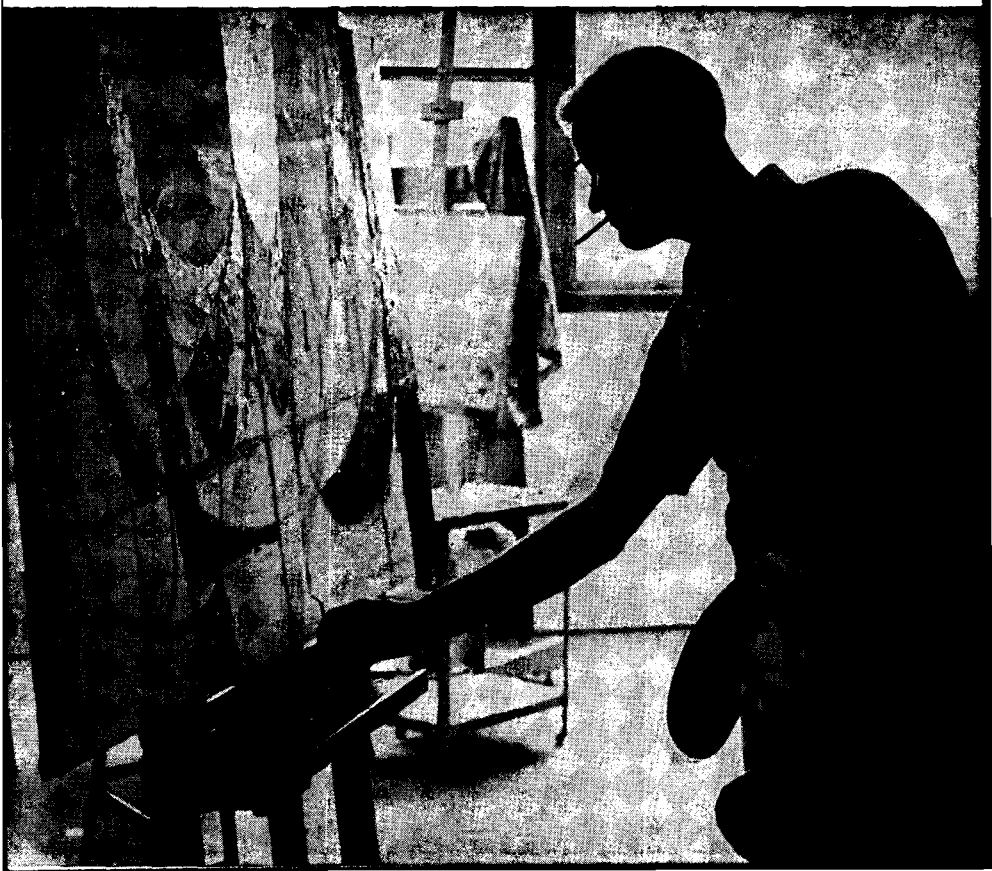
University Gallery

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 professional training in the arts, the gallery provides research facilities and specialized exhibitions, as well as workshop training in museum principles and practices.

The University Gallery also maintains programs for the loan of framed paintings, prints, and other original works of art to students for their homes and to staff for their campus offices.

During the summer months, the exhibition areas of the University Gallery are open from 8:30 a.m. until 4 p.m., Mondays through Fridays; the loan program for students is open during the first week of each summer term; the selection of pictures for offices is by appointment during the second week of each summer term only. For further information, please inquire at the offices of the University Gallery, 316 and 306 Northrop Memorial Auditorium, or call 373-3424 or 373-3225.



St. Paul Student Center

The St. Paul Student Center will be open throughout the Summer Session. Complete information about the Student Center and St. Paul activities may be obtained at the information desk on the first floor of this building.

Facilities include lounges, a ballroom, a craft shop, television, magazines, a photo darkroom, conference rooms, and a games area, which includes 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. Quiet and comfortable lounges, efficient dining rooms, and varied recreation rooms 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 8 a.m. to 4:30 p.m. daily to assist you.

Facilities

Facilities include billiards, table tennis, and a coeducational game room for recreation . . . modern bowling lanes with automatic pinspotters . . . an Art Craft Studio for general hobby craft—woodworking, leather work, ceramics, jewelry, photography . . . the large cafeteria and fountain grill for dining . . . men's, women's, and coeducational lounges for resting and studying . . . the outdoor terrace overlooking the Mississippi for lounging or dining . . . the Terrace Reading Room for recreational reading . . . a spacious ballroom for

informal dancing, parties, and dance instruction sessions . . . the University Post Office and Union Bookstore . . . and barber and beauty shops.

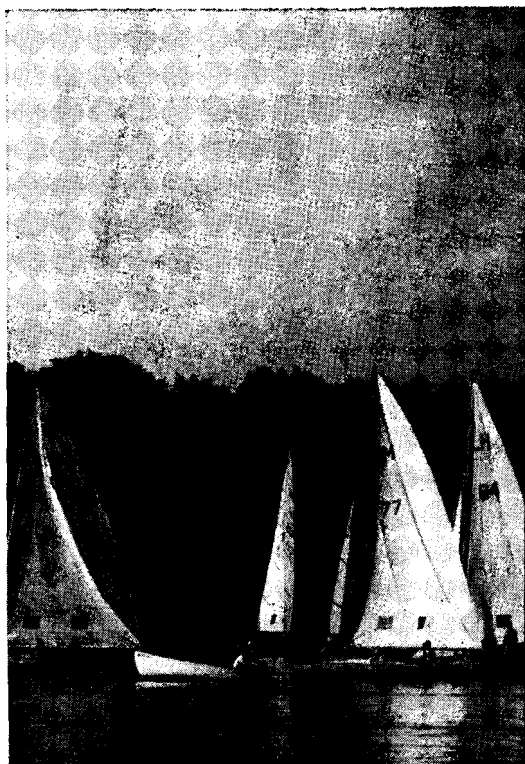
Union Program

The Union provides a diversified program during the summer which includes instruction in bowling, billiards, crafts, dancing (ballroom and square), and sailing. Art exhibits, band concerts, jazz programs, student-faculty coffee hours, Friday night dances, and weekend trips are some of the events for the summer student.

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

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 a program covering a wide field of musical features . . . symphonies . . . chamber music . . . piano and vocal soloists. Convocations and numerous lectures are also features in this program. Addresses are by outstanding scientists, literary figures, artists, and observers of national and international affairs.

Museum of Natural History

The Minnesota Museum of Natural History, located in Minneapolis at Seventeenth and University avenues, contains a series of lifelike exhibits of animal and plant life selected from various parts of the state.

In addition to public exhibits, extensive scientific series of birds, mammals, and other natural history materials are housed here for those interested in more careful study in these fields.

The exhibition corridors are open to the public from 8:30 a.m. to 4:30 p.m. Monday through Saturday and from 2 to 5 p.m. on Sundays.

The museum's modern auditorium is widely used by many campus departments.

University Theatre

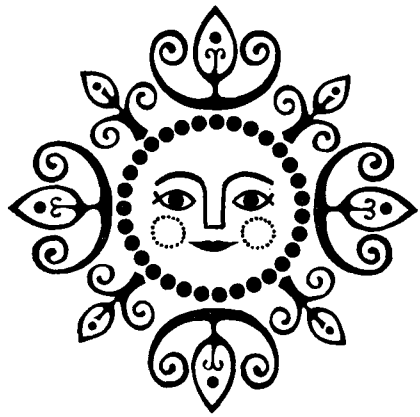
The University Theatre has won world-wide acclaim with its presentation of exceptionally fine plays on campus, its International Touring Companies, and the Minnesota Centennial Showboat. The Showboat will again be operated on the Mississippi River by the University Theatre, producing *Romeo and Juliet* and *Charlie's Aunt*.

Presentations in the newly air-conditioned Scott Hall auditorium during the coming summer will include a musical, "Orpheus and the Underworld," by Offenbach, produced during First Term in conjunction with the Music Department. Tennessee Williams' *Cat on a Hot Tin Roof*, directed by Theodore Hersland, will be presented during the Second Term.

A gala season of four plays for children's audiences is also being developed for the presentation of matinees in a Circus Tent on the Mississippi River bank beside the Showboat. The plays will be selected from such titles as "Circus Days," "Jack and the Beanstalk," "The Land of the Dragon," "Elves and the Shoemaker," "Indian Captive," and "Buffalo Bill."



MINNESOTA
CENTENNIAL 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)

109 AGRIBUSINESS

Intensive study of the character, extent and economic implications of the existing interrelationships between agriculture and the industries which supply agriculture and which process and distribute the products of agriculture. (3 cr; III-IV MTWThF [meets first 3 wks only]; HH 100) Smith

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) Royer

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 4, 23, AgEd 91; hrs ar; AgEng 35 and 20) 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, max 9 cr; 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; prereq 121, 127) 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 Husbandry (AnHu)

- 165 **BEEF CATTLE PRODUCTION**
Adaptability, breeding, feeding, care, and management of commercial and purebred beef cattle. (3 cr; prereq 37, 52 or §; III-IV MTWThF; PetH 108) Meiske
- 213 **RESEARCH IN ANIMAL HUSBANDRY**
Special problems assigned to students to be worked out under the supervision of a faculty member. (3-5 cr; prereq §; hrs ar) Hanson, Jordan, Meade, Rempel, Boylan, Meiske, Goodrich, Melliere

Dairy Husbandry (DyHu)

- 202° **RESEARCH IN DAIRY PRODUCTION**
Special problems assigned to fit student needs. (Cr ar; prereq prelim grad work; hrs ar) Cole, Graham, Williams, Young, Otterby

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.

- 243° **RESEARCH IN ENTOMOLOGY**
(Cr ar) Hodson, Chiang, Cook, Peterson, Brooks, Kulman, Price, Radcliffe
- 267° **RESEARCH IN FISHERY BIOLOGY**
(Cr ar) Smith, Waters
- 280° **RESEARCH IN WILDLIFE BIOLOGY**
(Cr ar) Marshall, Beer, Tester, 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) Coulter, Morr, Morris, Thomas
- 180° **SPECIAL PROBLEMS IN DAIRY AND FOOD MICROBIOLOGY**
Laboratory or library research on problems related to the microbiology of dairy products. (1-3 cr; prereq sr or §; hrs ar) Jezeski, Olson

Forestry (For)

OFFERED ON THE TWIN CITIES CAMPUS (ST. PAUL)

- 200° **RESEARCH PROBLEMS IN SILVICULTURE**
(Cr ar) Hansen, B Brown, Bakuzis

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

- 203° RESEARCH PROBLEMS IN FOREST MANAGEMENT
(Cr ar) Irving, B Brown, Winsness, Meyer
- 205° RESEARCH PROBLEMS IN FOREST ECONOMICS
(Cr ar) Skok, Hughes
- 207° RESEARCH PROBLEMS IN FOREST PRODUCTS ENGINEERING
(Cr ar) Hossfeld, Kaufert, Haygreen, Gertjensan
- 213° RESEARCH PROBLEMS IN FOREST UTILIZATION
(Cr ar) Hossfeld, Kaufert, Haygreen, Gertjensan, Thompson
- 215° RESEARCH PROBLEMS IN FOREST TREE PHYSIOLOGY
(Cr ar) Sucoff
- 218° RESEARCH PROBLEMS IN FOREST MEASUREMENTS AND PHOTOGRAM-
METRY
(Cr ar) Meyer, John
- 219° RESEARCH PROBLEMS IN FOREST RECREATION
(Cr ar) Merriam, Hughes, Hansen
- 220° RESEARCH PROBLEMS IN FOREST TREE GENETICS
(Cr ar) Pauley
- 221° RESEARCH PROBLEMS IN FOREST INFLUENCES
(Cr ar) Ar
- 222° RESEARCH PROBLEMS IN FOREST POLICY
(Cr ar) Irving, Skok, Winsness, Merriam

First
Term
Courses

Home Economics (HE)

FamS 15 THE HOME AND ITS FURNISHINGS

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 cost. (3 cr, but cr added to CLA grad req; I MTWThF; JohH 122) Ludwig

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; prereq soph; IV MTWThF; McNH 360) Ludwig

28 CONSTRUCTION AND REFINISHING OF HOME FURNISHINGS (WORKSHOP)

Laboratory problems in refinishing and reupholstering of furniture and the making of slip covers and draperies. Emphasis on design. Techniques suitable for homemakers, extension workers, and homemaking teachers. Students furnish own materials. (3 cr; prereq #; June 12-28; I-VII MTWThF; McNH 433) Myren

31 INTRODUCTION TO NUTRITION

Application of nutrition principles to the food selection of college students. Includes information on the relation of food to the promotion and maintenance of health. (3 cr, §GC 14, §GC 14X, or HE 30; not open to seniors in HE; III MTWThF; McNH 201) Doyle

49 HOUSEHOLD EQUIPMENT

Principles that should guide in selection, operation, care and convenient arrangement of equipment in the home. (3 cr; prereq soph, Phys I or #; V-VI MTThF; McNH 128) 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 21, 50 and #; hrs ar; McNH 339) Ludwig

69 ADMINISTRATIVE FOOD SERVICE EXPERIENCE

Planned experience in selected type of food service including menu planning, purchasing and storage of food, supervision and preparation and serving and maintenance of high sanitary conditions, accounting and bookkeeping. (5 cr; prereq 67; hrs ar) Verstraete

- 76 NUTRITION OF THE FAMILY**
Principles of nutrition and the problems of food selection most commonly met in everyday living. (3 cr, \$170, \$171; prereq 31, physiology or human biology; V MTWThF; McNH 201) Swan
- 86 HOME MANAGEMENT LABORATORY**
(Students should not register for a first period class) Residence for 5 weeks in one of the two home management houses, 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 [184, 40... 41 recommended; \$10 deposit required) Jeary
- 86A HOME MANAGEMENT LABORATORY**
(4 cr; prereq #; VI-VII TTh; McNH 201) Ar
- 87 FAMILY RELATIONSHIPS**
Analysis of the family as an institution and system of relationships. Survey of current developments in study of family. Analysis of changes in American society and their influence on family life. (3 cr; prereq Psy 2, Soc I or IA; II MTWThF; McNH 201) Ar
- 116 FAMILY CLOTHING PROBLEMS**
Clothing problems and issues relating from family characteristics, value orientations and social mores. Interpersonal influences in clothing behavior. (3 cr; prereq 50, AgEc 2 or Econ 2, Soc I or IA, Psy 2, or #; IV MTWThF; McNH 303) Grindeng
- 134 CONSUMER SELECTION GUIDES FOR HOUSEHOLD EQUIPMENT (WORKSHOP)**
Important construction and operating components of current models of selected appliances. Suitability of the appliances for kitchen and laundry plans that are in accord with research-based recommendations on kitchen and laundry planning. (3 cr; prereq 49 or equiv, 86 or equiv, 3 cr in related art, and 1 yr experience in teaching, extension or business or #; June 29-July 15; 8:30-11:30 and afternoon field trips; McNH 128) Ehrenkranz
- 144 TOPICS IN EXPERIMENTAL FOODS**
Assigned readings, reports, and discussions of topics in experimental foods. (2-3 cr; prereq OrCh 42 or equiv, 15 cr in foods and nutrition; hrs and room ar) Noble
- 152 PROBLEMS IN CONSUMER TEXTILES**
Contemporary textiles, their physical characteristics in relation to use performance; agencies aiding consumer through development of standards; problems students have met in the textile field. (3 cr; prereq 50 or equiv; I MTWThF; McNH 303) Davison
- 172 CURRENT DEVELOPMENTS IN NUTRITION (WORKSHOP)**
Fundamental facts and techniques for solving current nutrition problems (3 cr; limited to college teachers; prereq 31, 40, BioC IA, Phsl 51, or #; 8:30-11:30 and ar; McNH 144) Ar
- 179 READINGS IN NUTRITION**
Survey of literature in the field; oral and written reports. (2 cr; prereq 170; ar) Sirny
- 182 PARENT IN AMERICAN SOCIETY**
Analysis of the relationships between changes in American social structure and parental behavior. Analysis of contribution by psychological and sociological behavior theories to research and knowledge in parenthood and parental behavior. (3 cr; prereq 87 or equiv; IV MTWThF; McNH 201) Ar
- 184 HOME MANAGEMENT PRINCIPLES**
A study and discussion of managerial aspects of homemaking; work simplification of household activities; financial records and budgetmaking for the individual and the family. (3 cr; prereq 40...41 recommended; III MTWThF; McNH 227) Jeary
- 197A ENVIRONMENTAL STUDIES IN INTERIOR DESIGN (WORKSHOP)**
Exploration of space, color, light, and arrangement in interiors. Work in specially designed laboratories. (3 cr; prereq 6 cr in housing, home furnishings and interior design or equiv; June 29-July 15; 8:30-11:30 and ar; McNH 360) Esteros

- 201 READINGS IN TEXTILES AND CLOTHING**
Independent study—survey of literature in selected areas. Written reports. (1-3 cr; prereq 102, 115 or 116, and #; ar) Davison
- 220 READINGS IN RELATED ART**
Independent study and review of books and periodicals. Written reports. (1-3 cr; prereq #; McNH 354) Esteros
- 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; prereq #) Graduate faculty

**First
Term
Courses**

Horticultural Science (Hort)

- 134 FLORICULTURE**
Lectures, laboratory, and field trips. Technical aspects of the production, use and maintenance of herbaceous flowering plants. Factors discussed include the effects of water, nutrition, temperature, light, growth regulators and chemical weed control. (3 cr; prereq #) Widmer
- 190-191-192 SPECIAL PROBLEMS**
Problems based upon work given in preceding courses. (2-4 cr each; prereq #; hrs and room ar) Staff
- 251x° ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING**
Written report based on library, laboratory, or field research. (3-9 cr; prereq #) Staff
- 252x° 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, Anderson, Kennedy, Mirocha, Rowell, Bantari, Calpuzos, MacDonald, Moore
- 207° PROBLEMS IN MYCOLOGY**
Research along such lines as taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; investigation of fungi involved in industrial or natural processes; morphology or physiology of special forms. (Cr ar; prereq 105, 106, 107) Christensen, Anderson

Poultry Science (Poul)

- 214° RESEARCH IN POULTRY SCIENCE**
Research problems assigned to meet the needs of the student. (Cr ar; prereq #; hrs ar) Staff
- 215° RESEARCH IN POULTRY NUTRITION**
(Cr ar; prereq #; hrs ar) Waibel, Snetsinger
- 216° RESEARCH IN POULTRY BREEDING**
(Cr ar; prereq #; hrs ar) Shoffner

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

- 219° **RESEARCH IN AVIAN PHYSIOLOGY**
(Cr ar; prereq ‡; hrs ar) Phillips

Rhetoric (Rhet)

1 COMMUNICATION I

Written communication. Writing from observation and experience. Attention to grammar, sentence, and paragraph construction, punctuation, spelling, Progress tests. (3 cr; limited to 25 students; IV MTWThF; AgEng 108) Lair

22 PUBLIC SPEAKING

A practical course in the fundamentals of speech making. 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 105) McBride

41 HUMANITIES: THE ENLIGHTENMENT

An introduction to the humanities. The development of rationalism and humanism. Readings in Pope, Voltaire, Locke, Rousseau, Tolstoy. (3 cr; V MTWThF; AgEng 108) Price

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, King, Price, Forston

Sec 1, I MTWThF, ForH 115

Sec 2, II MTWThF, ForH 115

Sec 3, III MTWThF, ForH 115

Sec 4, IV MTWThF, ForH 115

Sec 5, V MTWThF, ForH 115

Sec 6, III MTWThF, AgEng 315

51 EXPOSITION

Essays and articles, technical writing, application letters, review of English usage. (3 cr; limited to 25 students; prereq jr; II MTWThF; PetH 108) Lair

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

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 Biological 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

College of Biological Sciences

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

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) Briggs, Dagley, Henderson, Jenness, Kirkwood, Liener, Schultze, Gander, Glass, Lovrien, Warner

Biology (Biol)

- 111 **GENERAL BIOLOGY**
Introduction to living things, both plant and animal, and to the major biological concepts. Structure, function, classification, and evolution of organisms. (5 cr; limited to 168 students; lect V MTWTh, V-VI F, Aero 313, 317, 319, 321; lab VI-VIII MTWTh, Z 101ABCD) Ar

Botany (Bot) ††

- 121 **DEVELOPMENTAL PLANT ANATOMY**
Microscopic structure of vascular plants with particular attention to development in the root, stem, and leaf. (5 cr; prereq Biol 2 or 51 or equiv; limited to 15 students) Ar
- 299 **RESEARCH PROBLEMS**
(Cr ar; prereq $\$$) Staff

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, $\$$ Zool 66; II MTWThF; Bo B6) Huether

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.

†† The entire course in elementary biology includes both Biol 1 and 2. No credit is given for Biol 1 until the satisfactory completion of Biol 2.

Biology Session

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, 6790 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 or #; TF) Ownbey
- 135 **ECOLOGY OF THE ITASCA REGION**
(5 cr; limited to 20 students; prereq 50 or 130 or #; MTh) Buell
- 155 **FRESHWATER ALGAE**
(5 cr; limited to 20 students; prereq 10 cr in botany, biology, or zoology, or #; MTh) Brook
- 99 **RESEARCH PROBLEMS**
(5 cr; prereq maj biol sci, #) Staff
- 299* **RESEARCH PROBLEMS**
(Cr ar; prereq grad) Staff

Entomology, Fisheries, and Wildlife (Ent)

- 59 **FIELD ENTOMOLOGY**
(5 cr; limited to 15 students; prereq Biol 2 or equiv; TF) Cook
- 124 **THE BIOLOGY OF IMMATURE INSECTS**
(5 cr; limited to 15 students; prereq 59 or 74 or equiv or #; WS) Cook
- 162* **VERTEBRATE ECOLOGY**
(5 cr; limited to 20 students; prereq Biol 80, or equiv; MTh) Tester, Marshall
- 196* **SPECIAL PROBLEMS IN ENTOMOLOGY, FISHERIES, AND WILDLIFE**
(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 or #; TF) Farnham

Zoology (Zool)

- 72 **NATURAL HISTORY OF INVERTEBRATES AND FISHES**
(5 cr; limited to 10 students; prereq Biol 2 or #; MTh) Chelberg
- 115 **ADVANCED NATURAL HISTORY OF INVERTEBRATES AND FISHES**
(5 cr; limited to 10 students; prereq 15 cr in zoology or #; MTh) Chelberg

- 119 **LIMNOLOGY**
(5 cr; limited to 20 students; prereq 15 cr in biology or #; WS) Underhill
- 135 **FIELD ORNITHOLOGY**
(5 cr; limited to 15 students; prereq 15 cr in zoology or #; WS) Warner
- 136 **AVIAN BEHAVIOR**
(5 cr; limited to 15 students; prereq Zool 76 or 135 or #; TF) Mehner
- 195° **PROBLEMS IN ORNITHOLOGY, ECOLOGY, AND LIMNOLOGY**
(Cr ar; prereq Biol 2 or equiv, and #) Staff

First
Term
Courses

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, II MTWThF, CB 145, Simmons
Sec 2, IV MTWThF, CB 205, Ar
- 25 PRINCIPLES OF ACCOUNTING**
Continuation of Acct 24. (3 cr, §55B; prereq 24)
Sec 1, III MTWThF, CB 205, Stanley
Sec 2, IV MTWThF, CB 225, Khemakhem
- 55A ELEMENTARY ACCOUNTING**
The equivalent of Acct 24 (Principles of Accounting) for School of Business Administration students and for 4-year combined engineering and business students. (4 cr, §24, 25, 26; counts as Lower Division course when transferred to CLA; prereq soph [summer only]; 7:30-8:50 MTWThF; CB 225) Stanley
- 55C MANAGERIAL COSTS**
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, §115A, §115B, §265A; prereq 26 or equiv; II MTWThF; CB 430) Khemakhem
- 75A†† ACCOUNTING LABORATORY I**
Application of principles of accounting to a series of transactions. (1 cr for both terms; prereq 26 or equiv, ¶105A; VI-VII W; CB 255) Ar
- 105A†† INTERMEDIATE ACCOUNTING I**
Review of accounting processes, nature and measurement of business income. (3 cr for both terms; prereq 26 or equiv; IV MWF; CB 255) Smith
- 115A COST ACCOUNTING**
Concepts and procedures of cost accumulation including job order, process, and standard cost systems. Use of standard costs and budgets as tools of planning and control. Examination of the informational needs in the design of systems for data accumulation. (3 cr, §55C; prereq 26 or equiv; III MTWThF; CB 430) Simmons
- 115B†† COST ACCOUNTING**
Analysis of the use of cost information in managerial decision-making. Topics include direct costing, capital budgeting, nonmanufacturing costs, inventory planning and control, appraisal of managerial performance, and other applications of accounting data. (3 cr for both terms, §55C; prereq 115A; II MWF; CB 255) Smith
- 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 for both terms; prereq 105C or ¶105C and 105B; 7:30-8:50 MWF; CB 430) Smith

†† The course runs for 2 terms. No credit is given for First Term until satisfactory completion of Second Term.

Business Law (BLaw)

58 BUSINESS LAW: CONTRACTS

Law of contracts. Case method used. (3 cr, §158; prereq Econ 2 or equiv)

Sec 1, I MTWThF, CB 130, Wright
Sec 2, II MTWThF, CB 130, Wright

158 BUSINESS LAW: CONTRACTS

(See BLaw 58) (3 cr, §58; prereq grad or #)

Sec 1, I MTWThF, CB 130, Wright
Sec 2, II MTWThF, CB 130, Wright

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; CB 125) 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; CB 115) Stevenson

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; CB 125) Stevenson

156 BUSINESS FINANCE FUNDAMENTALS

Study of the financial management of firms. Principles governing the planning, raising, and control of short- and long-term funds. Attention directed to capital structures, valuation situations, capital budgeting, dividend policy. Presented through text, problem, and case material. (3 cr, §56; prereq grad, Acct 26 or Acct 155B; I MTWThF; CB 125) Ar

257 FINANCIAL MANAGEMENT

Analysis of financial problems of business enterprises, including the planning, raising, and control of short- and long-term funds. Application of principles to case situations, supplemented with readings covering fund flows, debt-equity choices, valuation, capital budgeting, mergers. Discussions and written reports. (3 cr, §57, §old 76; prereq 56 or 156; II MTWThF; CB 115) Stevenson

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; CB 135) Whitman

- 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; CB 135) Whitman
- 153 RISK MANAGEMENT AND INSURANCE I**
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, §53; prereq Econ 2 or equiv; III MTWThF; CB 135) Whitman
- 223 PROPERTY AND LIABILITY INSURANCE I**
Nature and relative importance of insurable property and liability insurance contracts; insurance surveys—optimum property and liability insurance programs. (3 cr, §93; prereq 53 or 153; I MTWThF; CB 135) Whitman

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 association, industrial unrest and conflict, employment and unemployment, wage problems. (3 cr, §152; prereq Econ 2 or equiv)
Sec 1, I MTWThF, CB 150, Zaidi
Sec 2, II MTWThF, CB 125, Zaidi
- 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; CB 205) Weitzel
- 152 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING**
(See IR 52) (3 cr, §52; prereq Econ 2 or equiv; I MTWThF; CB 150) Zaidi
- 172 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT**
(See IR 72) (3 cr, §72; prereq Econ 2; II MTWThF; CB 205) Weitzel
- 242 MANAGEMENT DEVELOPMENT**
Examination of today's management development movement including management development programs within industry and in universities. Basic policy, current problems, and research findings concerning selection of management trainees, management appraisal and inventory, management motivation and compensation, and methods and techniques of development. (3 cr; prereq 72 or 172; III-IV MWF; CB 440) Mahoney
- 262 COMPENSATION AND REWARD ADMINISTRATION**
Analysis of concepts and procedures for administration of compensation and rewards within an organization. Examination of approaches to determination of compensation levels, forms of compensation and rewards, compensation structures and differentials, and determination of individual compensation. (3 cr; prereq 152 and 172; III-IV TTh; CB 440) Mahoney

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; prereq sr and completion of business core or concurrent regis in final core course; 7:30-8:50 MTThF; CB 425) Juralewicz

70 FUNDAMENTALS OF MANAGEMENT

The principal functional areas of management: planning, organizing, staffing, directing, and controlling. Examines attributes of good organization; establishment of goals, policies, and procedures; control systems and techniques; providing necessary factors and relationships to achieve organizational objectives. (3 cr; 9:05-10:20 MTThF; CB 425) Juralewicz

Marketing (Mktg)

57 PRINCIPLES OF MARKETING

Marketing functions and institutions. Channels of distribution. Retail and wholesale trade. Pricing policies and practices. Marketing policies and methods for consumers' goods, producers' goods, and raw materials. (3 cr, §157; prereq Econ 2 or equiv; II MTWThF; CB 150) Pennington

107 RETAIL MANAGEMENT I

Retailing principles and methods; relations of retailing to other parts of the economy; problems associated with operation of stores of various types. (3 cr, §227 [available for grad cr only by §]; prereq 57; IV MTWThF; CB 240) Pennington

187 PRICE POLICY

Managerial problems concerning pricing and price policy. Methods used and factors considered in pricing goods and services in industrial and consumer markets. Topics include administered pricing, price behavior, non-price competition, government intervention, pricing objectives, organization for pricing, price leadership. (3 cr [not available for grad cr]; prereq 57; III MTWThF; CB 225) Harper

227 RETAIL MANAGEMENT

Retailing principles and methods; relation of retailing to other parts of the economy; problems associated with operation of stores of various types. (3 cr, §107; prereq 57; IV MTWThF; CB 240) Pennington

287 PRICE POLICY

Managerial problems concerning pricing and price policy. Methods and factors considered in pricing goods and services in industrial and consumer markets. Topics include administered pricing, price objectives, organization for pricing, price leadership, and others. (3 cr, §187; prereq 57 or 157; III MTWThF; CB 115) Harper

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, §150B; prereq Econ 2 or equiv; IV MTWThF; CB 140) Hoffmann

150B 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 Mgmt 150A or §; II MTWThF; CB 105) Hoffmann

Quantitative Analysis (QA)

5 ELEMENTS OF STATISTICS

Sources and collection of data, tabular and graphic presentation; frequency distributions; probability; sampling; introduction of statistical estimation and decision-making. (3 cr, §151, §Soc 45, §Psy 70; prereq Math 10 or equiv; II MTWThF; CB 110) Olson

51 BUSINESS STATISTICS

Basic concepts of regression and correlation; statistical estimation and decision-making, applications to survey sampling, acceptance sampling, and statistical quality control; time series analysis and index numbers. (3 cr, §151; prereq soph with #, 5 or equiv; I MTWThF; CB 110) Hastings

61†† INTRODUCTION TO ELECTRONIC COMPUTERS

Basic concepts of computer logic and construction. Flow charting and programming problems for computers. Operating a computer. Programming and processing short problems. (2 cr for both terms; prereq QA 5, Math 10 or equiv; lect II TTh; CB 255) R Johnson

Sec 1, ar, CB 93, Ar

Sec 2, ar, CB 93, Ar

150 MATHEMATICS FOR BUSINESS ANALYSIS

Introduction to mathematical concepts and notation as applied to the description and analysis of business operations. Applications of differential and integral calculus to business problems. For graduate students with limited mathematical background. (3 cr, §Math 40, §ITM 24A; prereq grad or #, Math 10 or equiv; III MTWThF; CB 140) Hastings

258 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; prereq 151, Acct 155A, 155B, Econ 65 or 165 or equiv; II MTWThF; CB 140) Olson

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; prereq Econ 2 or equiv; IV MTWThF; CB 150) Harper

154 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, §54; prereq grad only, Econ 2 or equiv; IV MTWThF; CB 150) Harper

†† The course runs for 2 terms. No credit is given for First Term until the satisfactory completion of Second Term.

College of Education

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

Agricultural Education (AgEd)

- 144 **SUPERVISED OCCUPATIONAL EXPERIENCES IN AGRICULTURE**
Organization and administration of an occupation experience program in agriculture for high schools and area schools. (3 cr per qtr, total 9 cr; prereq 10 cr in education or §; III-IV MTWThF; Hr 301) Kitts
- 221 **FIELD PROBLEMS**
The development and study of special problems in the field of the individual student's choice. (3 cr; hrs ar) Peterson, Nelson, Persons, McMillion
- 232° **RESEARCH IN AGRICULTURAL EDUCATION**
Selecting research problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts. (Cr ar; prereq 15 cr in education) Peterson, Nelson, Persons, McMillion
- 250 **SUPERVISION OF VOCATIONAL AGRICULTURE**
Objectives, functions, responsibilities of state and local supervision at the secondary level; role in teaching-learning process; supervisory activities. (1-3 cr; prereq §; I-II MTWThF; Hr 301) Ar

Art Education (ArEd)

- 10 **ELEMENTARY SURVEY**
Introduction to pictorial expression, design, and the function of art in the social environment as a foundation for elementary teachers. (2 cr; each section limited to 30 students)
Sec 1, I MTWThF, WuH 240, 2 hrs ar, Salome
Sec 2, III MTWThF, WuH 210, 2 hrs ar, Sontag
- 53 **INTRODUCTION TO WEAVING**
Equipment, design, setting up and operation of table and floor looms. (3 cr; limited to 30 students; I-II MTWThF; WuH 340) Smits
- 151 **CURRICULUM BUILDING IN ART EDUCATION**
Selection, evaluation, and organization of material for teaching units and projects. Critical survey. (3 cr; III MTWThF; WuH 110) 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; prereq tohg exper or §; IV MTWThF; WuH 240) Salome
- 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; I MTWThF; WuH 110) Hastie
- 284 **RESEARCH IN ART EDUCATION**
Research techniques; locating, defining, and studying basic problems. (3 cr; II MTWThF; WuH 110) Gayne

- 295* **PROBLEMS: ART EDUCATION**
Independent projects under staff guidance; may include advanced studio practice or technical problems requiring experimental or library research. (Cr ar; prereq §) Gayne, Hastie
- 296 **SEMINAR: ART EDUCATION**
Reports, evaluation of problems, recent literature. Participation by art education staff and guest specialists from related departments and off campus. (1 cr; VI T; WuH 130) Salome

Institute of Child Development

Child Psychology (CPsy)

- 80 **CHILD PSYCHOLOGY**
Introduction to the science of child behavior. Emphasis is placed upon a critical review of theories and research in child psychology. (3 cr; prereq Psy 2; II MTWThF; NH 211) Turnure
- 126 **CASE STUDY OF CHILDREN**
Supervised intensive study of the intellectual, personality, and social development and functioning of individual normal children. (3 cr; prereq CPsy 80 and §; IV MTWThF and lab hrs ar; CD 105) Goldin
- 132 **ADOLESCENT DEVELOPMENT**
Physical, personal, and social changes occurring during adolescent years. (3 cr, §81; prereq sr, 12 cr in psychology, child psychology, or educational psychology; III MTWThF; NH 211) Shelton
- 140 **BEHAVIOR PROBLEMS**
Types, origin, development, and treatment of behavior difficulties in normal children. (3 cr; prereq 80 or equiv; II MTWThF; FraH 102) Goldin
- 143 **PROBLEMS OF MENTAL DEFICIENCY**
Diagnosis, care, training; social and vocational problems. (3 cr; prereq 80 or equiv; III MTWThF; CD 218) Best
- 179 **CLINICAL PROCEDURES WITH CHILDREN**
Survey of methods of clinical psychology emphasizing 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; CD 218) Gross
- 180 **PERSONALITY DEVELOPMENT**
Development of personality in children. Emphasis on psychoanalytic and behavior theory formulations and related research literature. (3 cr; prereq 80; IV MTWThF; CD 218) Hagen
- 186 **COGNITIVE DEVELOPMENT**
Development of cognitive processes; theories of intelligence and intellectual functioning; related research literature. (3 cr; prereq 80 or equiv; II MTWThF; AH 150) Hagen
- 190 **TOPICS: CHILD PSYCHOLOGY**
Independent reading or research. (Cr and hrs ar; prereq §) Staff
- 223 **SEMINAR: DEVELOPMENTAL PSYCHOLOGY**
(Cr and hrs ar; limited to 15 students; prereq §) Triandis

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 major in EdAd; prereq sr, 9 cr in education; II MTWThF; AH 350) Popper

- 128†† WORKSHOP: EDUCATIONAL ADMINISTRATION (Data Processing for Schools)**
A review of basic concepts and operations in electronic data processing. Emphasis on school applications in administrative, business, fiscal, pupil, and instructional functions. (1-6 cr; limited to 25 students; prereq practicing educational administrators or ‡; June 28-July 15; IV-VII MTWThF; WuH 230) Davis, Mueller
- 200 SEMINAR: ELEMENTARY SCHOOL ADMINISTRATION**
Problems of administration and organization of instruction. (3 cr; prereq 215 or ‡; III MTWThF; CD 105) Lambert
- 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; FraH 101) Pierce
- 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 co-ordination and operation of public elementary and secondary schools. (3 cr; III MTWThF; AH 150) Ar
- 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; I MTWThF; CD 105) 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 ‡; II MTWThF; CD 218) Ar
- 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) Davis, Domian, Hooker, Mueller, 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) Curtin, Davis, Domian, Firth, Hooker, Lambert, Mueller, Pierce, Popper
- 237 SEMINAR: EDUCATIONAL LAW**
Legal theory as it applies to education. (1-3 cr; prereq 224 or ‡; IV MTWThF; Arch 135) Hooker
- 238 SEMINAR: RESEARCH AND THEORY**
Problems of theory, models, and design in administration, developing and testing hypotheses. Consideration of designs used in behavioral sciences. Students develop proposals and models for empirical research. (1-3 cr; I MTWThF; AH 350) Pierce
- 239†† SCHOOL PRINCIPAL'S WORKSHOP**
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 principal. During the workshop each person will make more than 110 decisions relative to operation of the simulated school. (1-4 cr; limited to 25 students; IV-VII MTWThF; June 12-June 28; VH 309) Curtin, Popper
- 241 SEMINAR: INTERNSHIP IN EDUCATIONAL ADMINISTRATION**
For trainees in Research Training Program. (1 cr; IV MTWThF; JohH 105) Ammentorp

†† 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.

- 253 ADMINISTRATION IN HIGHER EDUCATION**
Control, faculty and employee personnel administration, budget making and administration, financial accounting and reporting, protection of college funds, public relations. (3 cr; prereq EdCI 250; V MTWThF; Bu 125) Ammentorp
- 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; I MTWThF; Ph 143) Ar
- 270A* PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION**
(Cr ar; prereq §; hrs ar) Curtin, Lambert
- 270B* PROBLEMS: SECONDARY SCHOOL ADMINISTRATION**
(Cr ar; prereq §; hrs ar) Ammentorp, Davis, Domian, Firth, Hooker, Mueller, Pierce, Popper

Educational Psychology (EPsy)

GENERAL COURSES

- 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, IV MTWThF, Bu 123
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) Ar
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; AH 9) Ar
- 125 GROUP DYNAMICS IN EDUCATION**
Review of literature, practical application of social-psychological concepts to analysis of group behavior. (3 cr; each section limited to 50 students) Ar
Sec 1, I MTWThF, ME 110
Sec 2, III MTWThF, Arch 145
- 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; Bu 120) Tennyson
- 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 sr, 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 20 students; prereq EdCI 145) Ar
Sec 1, II MTWThF, AH 9
Sec 2, III MTWThF, AH 9
- 150 CLINICAL PRACTICE IN REMEDIAL TEACHING**
Remedial tutoring of individual children who have difficulty in school learning. (3 cr; each section limited to 35 students; prereq EdCI 145 or 151 and §) Ar
Sec 1, I MTWThF, WuH 130
Sec 2, II MTWThF, WuH 130

- 152 **INTRODUCTION TO SCHOOL PSYCHOLOGICAL SERVICES**
Relationship of the psychologist to teachers, administrators, parents, and community. Problems of normal children; diagnosis and treatment of education and psychological disabilities. (3 cr; VI MTWThF; CD 218) Duker
- 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 50 students) Kaul
Sec 1, IV MTWThF, Bu 120
Sec 2, V MTWThF, Bu 120
- 182 **EDUCATION OF EXCEPTIONAL CHILDREN**
Overview of the field of special education. For classroom teachers, counselors, supervisors, and administrators; also the initial course for students working for special class certificates. (3 cr; prereq Ed 55B or 75B; VI MTWThF; Pt 111) Force
- 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; WuH 130) Reynolds
- 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; ME 110) Grismer
- 185 **EDUCATION OF THE AUDITORIALLY HANDICAPPED CHILD**
Group and individual observation of classes for auditorially handicapped children; individual and small group conferences. (3 cr; hrs and room ar) Fulton
- 186 **EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MAL-ADJUSTED CHILDREN**
Discussion and evaluation of curriculum, materials, and methods for instruction of disturbed and delinquent children in hospital, training school, and public school settings. (3 cr; prereq grad or §; I MTWThF; AH 150) Ar
- 188 **EDUCATION OF THE CULTURALLY DISADVANTAGED CHILD**
Education needs of children handicapped by behavior related to deficiencies of physical and/or cultural environment; adaptations of educational programs for such children. (3 cr; prereq HEd 90, CPsy 80 or equiv; II MTWThF; WuH 230) Wood
- 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, §old 193, 196-197; each section limited to 60 students)
Sec 1, II MTWThF, FraH 120, Ar
Sec 2, III MTWThF, FraH 120, Neale
Sec 3, IV MTWThF, FraH 120, Ar
- 208° **METHODS IN EDUCATIONAL RESEARCH**
Methods and techniques employed in the 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; VI MWF; Pt 110) Hoyt
- 210 **INDIVIDUAL MENTAL TESTING**
Revised Stanford-Binet and Wechsler Adult or Wechsler Intelligence Scale for Children. Student supplies material for at least one test. (3 cr, §142; limited to 15 students; prereq 110 or 117 or §117 and §; VII-VIII MTWThF; CD 218) Ar
- 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; Bu 120) Ar

- 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) Ar
- 218 STATISTICAL METHODS (Part I)**
This course extends through both summer terms. Students will register for this course at the beginning of first term and will receive credit at the end of second term. Students will not register for this course second term. (3 cr total for combined course, †Part I-II; limited to 40 students; prereq 217; IV MWF; WuH 130) Ar
- 218A STATISTICAL METHODS—LABORATORY (Part I)**
This course extends through both summer terms. See EPsy 218. (2 cr total for combined course, †Part I-II; limited to 22 students; prereq ¶218; II-III MF; WuH 330) Ar
- 225-226 COUNSELING THEORY AND PROCEDURE I AND II**
Influences bearing on definition of counseling; theoretical approaches to counseling and vocational choice theories; measurement versus appraisal; diagnostic principles utilized. (6 cr total for combined course; prereq 140 or ¶140 and any one of the following: 133, 250 or Psy 130; II-III MTWThF; Bu 125) Parker
- 233° PROBLEMS: GUIDANCE AND PERSONNEL WORK**
Independent study. (1-9 cr; VI-VII MW; Bu 120) Parker, Borow, Blocher, Ten-nyson, A Anderson
- 253° RESEARCH PROBLEMS**
(Cr and hrs ar; prereq §) Hoyt, Reynolds, Wilk, Duker, Force, Neale, Turnure, Wood
- 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 6 students; prereq 210 or equiv, EdCI 145, §; 1:00-4:00 MTWThF; ar) Wesen-berg and clinical staff
- 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; limited to 22 students; prereq §; IV MTWThF; AH 9) Ar
- 288 PRACTICUM IN SPECIAL EDUCATION**
Supervised experience in special education, including supervision, administration, or co-ordination, teaching, and related work in schools, agencies, institutions, and other facilities for exceptional children. (3-9 cr; prereq §; hrs ar) Elliott, Wood
- 298° PSYCHOLOGICAL THEORIES OF TEACHING**
Evaluation of recent research on teaching; analysis of theories; methods of re-search. (3 cr; prereq 196-197 or §; hrs and rm ar) Neale

SECONDARY EDUCATION

- 236 GROUP COUNSELING—PRINCIPLES AND PROCEDURES**
Introduction to basic principles of group dynamics related to the group counsel-ing process. Intended for counselors and student personnel workers; emphasis on developing concepts, attitudes, and skills necessary for group counseling. In-cludes theory and laboratory experiences. (3 cr; prereq 133 or 250 and one course in group or counseling theory; VI-VII MTWThF; Bu 125) A Anderson
- 282A-B SUPERVISED PRACTICUM IN COUNSELING**
Individual assignments in counseling under supervision. (3 cr for each; limited to 10 students; prereq §; V-VIII MTWThF; rm ar) Blocher

General Education

First
Term
Courses

Curriculum and Instruction (EdCI)

GENERAL COURSES

- 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; use of materials and equipment. (3 cr; each section limited to 15 students; prereq 105 or ¶105; lect IV MTWThF; WeH 206) Ar
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; VH 303) Jenkins
- 116 BRAILLE I**
Mastery of literary Braille code and introduction to use of mathematics and music codes; analysis of specialized equipment with emphasis on use of Braille writers and slates. (3 cr; prereq 115 or #: 1:00-2:30 MTWThF; Pt 214) Gable
- 126 ORIENTATION AND MOBILITY FOR BLIND CHILDREN**
Provides teachers with basic techniques which help blind children gain skill in orientation and mobility. Lectures and demonstrations; films and observation of blind children; practice in travel techniques. (For application write to Mrs. Glenda Martin, 108 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455) (3 cr; limited to 8 students; prereq #: V-VI MTWThF; A 12) 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 #: II MTWThF; VH 303) Fulton
- 145 READING DIFFICULTIES**
(3 cr; each section limited to 60 students; prereq 143A or 144 or equiv)
Sec 1, III MTWThF, Pt 214, Goudey
Sec 2, IV MTWThF, FraH 102, Ar
- 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; I MTWThF; Pt 214) Goudey
- 174-175-176 CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY**
(3 cr; limited to students attending full time spring quarter 1967; prereq #: hrs ar) McDermott, Starr
- 178 STRUCTURE AND FUNCTION OF THE EYE—EDUCATIONAL IMPLICATIONS**
An ophthalmologist discusses the 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; A 202) Fink, Jenkins
- 185 ADVANCED METHODS IN TEACHING FOREIGN LANGUAGES**
New curriculums, classroom procedures; use of language laboratory and other mediums and evaluation techniques. (3 cr; III MTWThF; PeiH 225) Lange
- 189 MATERIALS AND CURRICULUM CONSTRUCTION IN MODERN LANGUAGES**
Curriculum development, preparation of units, testing techniques; material for classroom, language laboratory, televised instruction, and programmed learning. (3 cr; prereq 185 and #: I MTWThF; PeiH 225) Lange

- 201° **PROBLEMS: TEACHING SOCIAL STUDIES**
Individual research. (Cr and hrs ar; prereq 102 or 155 or 168; 204 or §) Gardner, Keach, Rogers
- 203 **SUPERVISION AND ADMINISTRATION OF SPECIAL EDUCATION**
Procedures in establishing and improving educational programs for exceptional children. (3 cr; prereq §; I MTWThF; Bu 125) Force
- 205° **PROBLEMS: AUDIO-VISUAL EDUCATION**
(Cr and hrs ar; prereq §) Pearson
- 207° **PROBLEMS: RADIO-TELEVISION EDUCATION**
(1-3 cr; prereq 107; hrs ar) Pearson
- 232° **PROBLEMS: TEACHING MATHEMATICS**
(Cr and hrs ar; prereq 230 or 231 or 291) Jackson, David C Johnson
- 271° **PROBLEMS: CURRICULUM CONSTRUCTION**
(Cr and hrs ar; prereq §) Boeck, Bormuth, Chase, Curtin, Firth, Gardner, Hill, Humphreys, Jackson, David C Johnson, Keach, Kimpston, Lambert, Lange, Odland, Rogers
- 273° **PROBLEMS: READING**
(Cr ar; prereq 143A or 144 or §) Bormuth, Chase, Odland
- 296° **PROBLEMS: TEACHING ENGLISH**
(Cr and hrs ar) Chase, Piche

ELEMENTARY EDUCATION

- 60 **TEACHING READING IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; III MTWThF; Bu 120) Chang
- 61 **TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; II MTWThF; Pt 214) Keach
- 62 **TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL**
(3 cr; each section limited to 35 students; prereq Ed 75A, Math 5A-B) Hatfield
Sec 1, I MTWThF, JohH 113 Sec 2, IV MTWThF, JohH 113
- 63 **CHILDREN'S LITERATURE**
(3 cr; each section limited to 35 students) Peterson
Sec 1, III MTWThF, Bu 123 Sec 2, IV MTWThF, Bu 125
- 64 **TEACHING ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; I MTWThF; AH 9) Lilja
- 65 **TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; 10 cr in natural science; II MTWThF; Pt 111) Humphreys
- 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. Undergraduate students should register for EdCI 61.
(3 cr; prereq Ed 75B or equiv; II MTWThF; Pt 110) Rogers
- 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. Undergraduate students should register for EdCI 65.
(3 cr; limited to 50 students; prereq sr, Ed 75B or tchg exper; III MTWThF; Pt 111) Humphreys
- 118 **EDUCATION OF BLIND CHILDREN IN THE ELEMENTARY GRADES**
Adaptation of broad curriculum areas for blind children in elementary grades; procedures in teaching specialized curriculum, i.e., Braille reading, typing, orientation, and mobility; utilization of family, school, and community resources. (3 cr; prereq 115, 116, and §; III MTWThF; VH 303) Gable
- 119 **ELEMENTARY SCHOOL CURRICULUM**
(3 cr; prereq Ed 75B or equiv; IV MTWThF; Pt 110) Ar
- 121 **LITERATURE FOR THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; II MTWThF; Bu 123) Odland

- 123 **SPEECH IN THE ELEMENTARY SCHOOL**
Lectures; discussion; individual projects; role of the elementary teacher in promotion of good speech; prevention of speech problems; handling of speech defects. Projects related to the teacher's own teaching situation. (3 cr; prereq sr; II MTWThF; C 115) Henrikson
- 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. Undergraduate students should register for EdCI 60. (3 cr; each section limited to 55 students; prereq 9 cr in education) Ar
Sec 1, I MTWThF, Pt 110 Sec 2, II MTWThF, Ph 210
- 149A **TEACHING AND SUPERVISION OF MATHEMATICS IN THE ELEMENTARY SCHOOLS**
Present practices and trends in methods, evaluation, and diagnosis; objectives, psychology and philosophy related to improvement of instruction. (3 cr, §149; limited to 50 students; I MTWThF; JohH 114) Jackson
- 150 **SUPERVISION AND IMPROVEMENT OF INSTRUCTION**
(3 cr; prereq 9 cr in education; III MTWThF; Pt 110) Curtin
- 153 **TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; prereq 64 or elementary school tchg exper; III MTWThF; Arch 135) Chase
- 165A **MATHEMATICS FOR GIFTED CHILDREN**
(3 cr; limited to 50 students; prereq 62 or 149A or §; II MTWThF; JohH 113) Jackson
- 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; IV MTWThF; NH 107) Ar
- 186 **LABORATORY IN ELEMENTARY INSTRUCTIONAL PRACTICES**
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; Bu 120) 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, and 154 or §; III MTWThF; FraH 102) Rogers
- 208 **RESEARCH IN ELEMENTARY SOCIAL STUDIES**
Critical review of research findings and relevant theoretical formulations of major studies; criteria for appraising research methods, educational implications. (3 cr; prereq 61 or 102, and 154 or §; IV MTWThF; Pt 214) Keach
- 261* **PROBLEMS: IMPROVEMENT OF INSTRUCTION**
(Cr and hrs ar; prereq §) Boeck, Bormuth, Chase, Curtin, Humphreys, Jackson, Keach, Lambert, Odland, Rogers

SECONDARY EDUCATION

- 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; limited to 32 students; prereq Δ; 1:00-2:20 MTWThF; Arch 135, and behind-the-wheel hrs ar) Stephens

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

- 101B† DRIVER EDUCATION II**
(4 cr; limited to 32 students; prereq 101 or 101A and Δ; 2:30-3:50 MTWThF; Arch 135 and behind-the-wheel hrs ar) Stephens
- 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; II MTWThF; FraH 20) Firth, Kimpston
- 122 LITERATURE FOR ADOLESCENTS**
(3 cr; prereq Ed 55B or jr-sr high school tchg exper; II MTWThF; Arch 135) Kemp
- 124 FOUNDATIONS OF CAREER DEVELOPMENT**
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; Ph 131) Borow
- 125 OCCUPATIONAL INFORMATION LABORATORY**
Using, reviewing, and evaluating occupational information. Sources and types of material, occupational filing plans, and practical techniques at the secondary school level. (3 cr; prereq #; IV MTWThF; PeiKH 152) Ar
- 136 ORGANIZATION AND ADMINISTRATION OF DISTRIBUTIVE EDUCATION**
Principles, practices and legislation followed in developing co-operative part-time and adult programs under federal vocational acts. Basic course for teacher-co-ordinators and vocational administrators. (3 cr; III MTWThF; Bu 105) Meyer
- 137A MATERIALS AND METHODS IN CO-OPERATIVE PART-TIME CLASSES**
For co-operative part-time distributive, office, miscellaneous trades, and diversified occupations classes. (3 cr; IV MTWThF; Bu 105) Little
- 144 TEACHING READING IN SECONDARY SCHOOLS**
(3 cr; prereq 9 cr in education; II MTWThF; Arch 35) Chase
- 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; I MTWThF; Bu 105) Ashmun
- 156 TRENDS IN BUSINESS EDUCATION**
(3 cr; II MTWThF; Bu 105) Ar
- 158 MATERIALS AND METHODS IN OFFICE AND STENOGRAPHIC PROCEDURES**
(3 cr; IV MTWThF; Ph 131) Ar
- 168 CURRENT DEVELOPMENTS IN THE SOCIAL STUDIES**
(3 cr; prereq grad or #; II MTWThF; Ph 236A) Gardner
- 172 SUPERVISION OF SECONDARY INSTRUCTION**
Achievement of appropriate teaching expectations focusing on problems of personnel responsible for their improvement. (3 cr; prereq 113; IV MTWThF; PeiKH 275) Firth, Hill
- 177 DIRECTING SECONDARY SCHOOL SPEECH ACTIVITIES**
Method in preparing students for debate, discussion, and public speaking activities in interscholastic contests and in the classroom. Observation and practice in coaching high school students. (3 cr; III MTWThF; Arch 60) Brock
- 191 ADVANCED TEACHING AND SUPERVISION OF SECONDARY MATHEMATICS**
Methods, materials, and curriculum development, principles of learning, review of research; preparation and evaluation of units, tests, and materials of instruction. (3 cr; II MTWThF; PeiKH 315) David C Johnson
- 192B COMPUTER ASSISTED MATHEMATICS INSTRUCTION**
Trends and practices in methods, materials and curriculum developments in computer science; utilization and evaluation of apparatus; instruction in a simple algorithmic computer language; development of materials. (3 cr; limited to 25 students; prereq 149A or 191 or #; IV-V MWF; PeiKH 315) David C Johnson

- 195 CURRENT DEVELOPMENTS AND CURRICULUM CONSTRUCTION IN ENGLISH** **First Term Courses**
 Analysis and evaluation of curriculums and trends; emphasis on articulation. (3 cr; prereq EdT 75C or D or equiv; III MTWThF; PeikH 275) Kemp, Piche
- 199E INTERNSHIP: RECREATION LEADERSHIP**
 (Cr and hrs ar; available for master of education students in recreation) Ostrander, Scott
- 225° PROBLEMS: SECONDARY SCHOOL SUPERVISION**
 (Cr and hrs ar; prereq #) Firth
- 237 SEMINAR: RESEARCH IN BUSINESS, DISTRIBUTIVE, AND ECONOMIC EDUCATION**
 (No cr; prereq #; hrs ar) Meyer, Price
- 238° PROBLEMS: DISTRIBUTIVE EDUCATION**
 (Cr and hrs ar; prereq #) Ashmun, Meyer
- 239° PROBLEMS: BUSINESS EDUCATION**
 (Cr and hrs ar; prereq #) Price
- 287° RESEARCH FOUNDATIONS OF SECONDARY SCHOOL SCIENCE TEACHING**
 (3 cr; II MTWThF; PeikH 355) Boeck
- 295 READINGS IN ENGLISH AND MODERN LANGUAGE EDUCATION**
 (1-3 cr; hrs ar) Lange, Piche

HIGHER EDUCATION

- 228° PROBLEMS: HIGHER EDUCATION AND TEACHER EDUCATION**
 Selected topics on college programs, instruction, organization and administration. (Cr and hrs ar; prereq #) Eckert
- 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; prereq a year of grad study in any field or 18 cr in education; II MTWThF; VH 210) Eckert
- 252 EFFECTIVE COLLEGE TEACHING**
 Teaching-learning relationship; study and appraisal of methods employed to encourage, guide, and appraise students' learning. (3 cr; prereq year of grad study in any field or 18 cr in education; I MTWThF; VH 210) Williams

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. The course is 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 150) Kimpston
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| Sec 1, II MTWThF, Ph 143, Hill | Sec 4, III MTWThF, Ph 145, Ar |
| Sec 2, II MTWThF, Ph 145, Ar | Sec 5, IV MTWThF, Ph 143, Ar |
| Sec 3, III MTWThF, Ph 143, Ar | Sec 6, IV MTWThF, Ph 145, 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 35 students; prereq Psy 2, Δ; lect I MTWThF; Arch 25) Ar
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|-------------------------------|-------------------------------|
| Sec 1, II MTWThF, Arch 25, Ar | Sec 3, II MTWThF, Arch 10, Ar |
| Sec 2, II MTWThF, Arch 30, 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, Arch 40, Travisano

Sec 2, II MTWThF, Arch 40, Travisano

Sec 3, III MTWThF, Arch 40, Bagley

155 HISTORY OF WESTERN EDUCATIONAL THOUGHT

Examination of the major educational classics of Western civilization; Plato, Cicero, Locke, Rousseau, Dewey, and others. (3 cr; IV MTWThF; Arch 35) Bagley

241* PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION

For graduate students interested in research and work in these areas. (Cr ar; prereq §; hrs ar) Bagley

Home Economics Education (HEEd)

64 ADULT EDUCATION IN HOME ECONOMICS

Objectives of adult education in homemaking; problems affecting family and community life; methods of helping adults and out-of-school youth in solving problems in home living. (3 cr, §194A; prereq 60; III MTWThF; McNH 103) Ar

160A HOME ECONOMICS CURRICULUM (SECONDARY LEVEL)

Examination of research and literature; development of units of study and programs at the secondary level; production and evaluation of materials. (3 cr, §193A; prereq 63 or §; hrs ar; June 12-28; McNH 102) Henrie

161 METHOD IN TEACHING HOME ECONOMICS: THEORY AND TECHNOLOGY

Derivation of theory for educational method from relevant research; application to the educational objectives of home economics; analysis of technology related to the teaching method. (3 cr, §191; prereq 61, 63 or §; hrs ar; June 29-July 15; McNH 102) Henrie

190 READINGS IN HOME ECONOMICS EDUCATION

Independent study under tutorial guidance. (1-3 cr; prereq §; hrs ar) Brown, Ford

196B WORKSHOP: CHILD DEVELOPMENT AND HUMAN RELATIONS

Recent emphasis on growth and guidance of individuals; materials and techniques for high school and adult levels to attain better understanding. (4 cr; prereq grad; hrs ar; June 12-28; McNH 144) Burkland, consultants

200A RESEARCH METHODS

Overview of methods of inquiry appropriate for home economics education. Descriptive and causal-comparative methods with some attention to experimentation. (3 cr, §294; prereq 162, §) Brown

201* PROBLEMS: HOME ECONOMICS EDUCATION

Independent study of current educational problems. (1-9 cr, §293; prereq 200A and §; hrs ar) Brown, Ford

295* SEMINAR: HOME ECONOMICS EDUCATION

Discussion and reports. (1 cr; hrs ar; McNH 108) Ford

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; TNCD 116) Sulentic

107 CO-ORDINATION

Duties and responsibilities of co-ordinators in trade schools, part-time programs, and comprehensive high schools. (3 cr; prereq 35 or 125 or §; I MTWThF; TNCD 113) Miletich

- 125 PHILOSOPHY AND PRACTICE OF INDUSTRIAL EDUCATION**
History, objective, development, and current practices of the field. (3 cr, §35; III MTWThF; TNCD 113) Miletich
- 136 INSTRUCTIONAL MATERIALS LABORATORY**
Instruction will include basic information about research procedures and individual assistance in developing specific proposals. Classes will meet 3 hours daily during first 2 weeks; remaining time will be devoted to individual consultations. (6 cr; prereq major, tchg exper or §; V-VII MTWThF; June 12-23; TNCD 116; individual conferences ar June 26-July 14) Moss
- 300* 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; TNCD 103) Nelson, 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. (Cr and hrs ar; limited to 1 student; prereq §) Reynolds
- 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) Mork
- 53A TEACHING HANDICAPPED CHILDREN**
Observing work with special classes; teaching under direction. (3 cr; limited to 1 student; prereq §) Reynolds
- 69J†† STUDENT TEACHING IN THE SOCIAL STUDIES**
(1 cr; prereq jr, ¶Ed 55A) Ar
- 77†† STUDENT TEACHING IN THE NURSERY SCHOOL**
Five half days per week in supervised classroom participation. (3 cr; prereq sr, §; hrs ar) Jones

Music Education (MuEd)

(See also Music in the section on College of Liberal Arts)

- 51 TEACHING MUSIC**
Kindergarten-Primary grades. For nonmusic majors. Appreciation; methods. (2 cr; each section limited to 20 students; prereq Mus 4) Swanson
Sec 1, I MTWThF, WuH 320 Sec 3, V MTWThF, WuH 320
Sec 2, II MTWThF, WuH 320
- 52 TEACHING MUSIC**
Intermediate grades. For nonmusic majors. Appreciation, methods, materials. (2 cr; each section limited to 25 students; prereq 51, Mus 4 or §) Sieber
Sec 1, I MTWThF, NMA 5 Sec 2, III MTWThF, ScH 3
- 61†† STUDENT TEACHING AND SUPERVISION OF MUSIC**
(3-12 cr; prereq sr, 53, Ed 55B, §; ar) Caswell, Borg
- 110 GENERAL MUSIC EDUCATION WORKSHOP**
Teaching elementary school children to hear tonal and rhythmic patterns before the first instrumental techniques are taught. Laboratory demonstrations of tech-

†† Student teaching is open only to students in College of Education regular degree programs. Application must be made prior to May 26. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

- niques for all band instruments by beginning fifth grade and second year sixth grade students. (3 cr; IV MTWThF; WuH 320) Papke
- 115 ADVANCED STRING TECHNIQUES**
Research reports, lecture-demonstrations, and performance by class members and by school age laboratory groups. (3 cr; prereq Bachelor's degree in music education or ‡; V MTWThF; MusEd 200) Sieber
- 118 ADVANCED WIND AND PERCUSSION TECHNIQUES**
Research reports, practical performances and lectures. (3 cr; prereq Bachelor's degree in music education or ‡; VII MTWThF; NMA 4) Bencriscutto
- 121 MUSIC FOR THE EXCEPTIONAL CHILD**
Trends, methods and materials for a functional program of singing, playing, rhythm, listening and creative activities for mentally and physically handicapped and musically gifted pupils. (3 cr; prereq MuEd 52 or ‡; II MTWThF; ScH 104) Borg
- 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
- 152 SUPERVISION AND ADMINISTRATION OF JUNIOR HIGH MUSIC**
Evaluation of instructional techniques and materials for the required and elective courses; supervisory and administrative practices; readings; new trends. (3 cr; prereq major or minor in music or music education; I MTWThF; ScH 3) Caswell, Borg
- 224° RESEARCH PROBLEMS**
(3-9 cr; prereq knowledge of elementary statistics) Caswell, Borg

Physical Education

Physical Education for Men (PEM)

Courses leading to a State of Minnesota teaching credential in physical education—PEM 9B, 67, 68, 71.

Courses applying to an advanced degree in physical education—PE 101, 104, 106, 118E, 124, 130, 135, 136, 137, 224A, 224B, 236, 238.

Courses applying to a college requirement in physical education or taken for elective credit—PEM 1A, 1B, 1C, 2A, 2B, 2C.

- 1A†† BEGINNING ARCHERY**
(1 cr each; each section limited to 22 students) Shick
Sec 1, IV MTWTh, NGW 60 (co-ed, see PEW 3)
Sec 2, V MTWTh, NGW 60 (co-ed, see PEW 3)
- 1B†† BEGINNING GOLF**
(1 cr each; each section limited to 20 students)
Sec 1, IV-V MW, Golf Course, Tutt
Sec 2, IV-V TTh, Golf Course, Tutt
Sec 3, VI-VII MW, Golf Course, Bolstad
Sec 4, VI-VII TTh, Golf Course, Bolstad
- 1C†† BEGINNING SWIMMING OR TENNIS**
(1 cr each; each section limited to 20 students) Piper
Sec 1, Swimming, VII MTWTh, CH Pool
Sec 2, Tennis, III MTWTh, CH 214
Sec 3, Tennis, V MTWTh, CH 215
Sec 4, Tennis, VI MTWTh, CH 215

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

- First
Term
Courses**
- 2A†† LIFE SAVING**
(1 cr; limited to 20 students; prereq swim 1 qtr mile; VI MTWTh; CH Pool; co-ed, see PEW 2A) Mowerson
- 2B†† WATER SAFETY INSTRUCTOR'S COURSE**
(2 cr; limited to 24 students; prereq Life Saving Certificate; IV MTWThF; NGW 58; co-ed, see PEW 46) Ost
- 9B†† SQUARE AND BALLROOM DANCE**
Instruction in circle, line, square, mixer, couple dances; square dance calling. (1 cr; VI MTWTh; NGW 151; co-ed, see PEW 2A) Shick
- 68 BASKETBALL COACHING**
Theory, styles of offense and defense, the conditioning and handling of players. (2 cr; prereq 4B; III MTWThF; CH 215) Kundla
- 71 PHYSIOLOGICAL APPLICATION 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, pre-game meals and ergogenic aids in athletics. Required for the Minnesota Coaching Certificate. (3 cr, §PubH 91, 92; prereq Anat 27 or 50; IV MTWThF; CH 214) Richardson
- 101 FOUNDATIONS OF PHYSICAL EDUCATION**
Establishment of guidelines for individual and group professional action based upon an examination of pertinent social forces, educational philosophies, and general ethics. (3 cr; prereq grad or MEd student; II MTWThF; CH 214) McAdam
- 104 TEACHING PHYSICAL EDUCATION FOR THE HANDICAPPED CHILD** (See PEW)
- 118E PROBLEMS**
Focus on teaching of physical education. (Cr ar; prereq MEd candidate, §) McAdam, Richardson, Alexander
- 124 SUPERVISION OF SCHOOL HEALTH AND PHYSICAL EDUCATION** (See PEW)
- 130 CONTRIBUTIONS OF BASIC SCIENCES TO PHYSICAL EDUCATION** (See PEW)
- 136 INTRODUCTION TO RESEARCH**
Methods and design for research in health, physical education and recreation. (3 cr; prereq §; V MTWThF; CH 214) McAdam
- 137 READINGS: PHYSICAL EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq grad, §; ar) McAdam, Richardson, Alexander
- 224A° RESEARCH PROBLEMS** (See PEW)
- 224B° RESEARCH PROBLEMS**
Individual problems. (Cr ar; prereq 224A or §; ar) McAdam, Richardson, Alexander
- 238 ADMINISTRATION OF PHYSICAL EDUCATION IN COLLEGES AND UNIVERSITIES**
Programs and facilities; field trips and surveys of neighboring colleges. (3 cr; prereq 63 or §; I MTWThF; CH 214) Richardson

Physical Education for Women (PEW)

Teaching Requirements for Physical Education—Those interested in teaching physical education in the state of Minnesota must qualify in one of the following professional programs.

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

1. Courses offered this summer which apply to the minor in physical education are PEW 2A, 7, 8, 11, 22A, 46, 55; PE 104.
2. Courses offered this summer which apply to the undergraduate major in physical education are PEW 2A, 7, 8, 22A, 45, 46, 55.
3. Courses offered this summer which apply to advanced and graduate degrees with a major in physical education are PE 101, 104, 106, 118E, 124, 130, 135, 136, 137, 224A, 224B, 236, 238.

Required Physical Education—Those interested in meeting a college requirement in physical education may register for PEW 2A, 3, 7, 8, 11, 32, 46.

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

For Special Fees—See page 24.

ACTIVITY COURSES

- 2A†† LIFE SAVING**
(1 cr; limited to 20 students; co-ed, see PEM 2A; prereq swim 1 qtr mile; VI MTWTh; CH Pool) Mowerson
- 3†† ARCHERY FOR BEGINNERS**
Instruction will include shooting skills and techniques, proper handling of equipment, and rules and etiquette of the sport. Individual coaching will be stressed. Equipment provided. (1 cr; each section limited to 22 students) Shick
Sec 1, IV MTWTh, NGW 60 (Co-ed, see PEM 1A)
Sec 2, V MTWTh, NGW 60 (Co-ed, see PEM 1A)
- 7†† TENNIS FOR BEGINNERS**
Open to those with little or no experience in tennis. Instruction will include the service, forehand drive, backhand drive, rules, and etiquette of the game. Individual coaching will be stressed. (1 cr; each section limited to 20 students)
Sec 1, I MTWTh, NGW 151, Bartosh
Sec 2, II MTWTh, NGW 151, Bartosh
Sec 3, III MTWTh, NGW 151, Bartosh
Sec 4, IV MTWTh, NGW 151, Boaz
- 8†† GOLF**
Fundamental strokes and individual analysis of the player's game are stressed along with the rules and etiquette of the game. (1 cr; each section limited to 20 students)
Sec 1, Intermediate Golf, I MTWTh, NGW 60, Mold
Sec 2, Beginning Golf, II MTWTh, NGW 60, Mold
Sec 3, Beginning Golf, III MTWTh, NGW 60, Mold
- 11†† POSTURE AND INDIVIDUAL EXERCISE**
Instruction will include posture appraisal and exercises selected on the basis of individual needs. (1 cr; limited to 20 students; II MTWTh; NGW 153) Shick

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

- 32†† **SWIMMING**
 Instruction includes orientation activities, crawl, side stroke, backstroke, diving, and water safety skills. (1 cr; each section limited to 20 students) Ost
 Sec 1, Beginning Swimming, V MTWTh, NGW 58
 Sec 2, Intermediate and Advanced Swimming, VI MTWTh, NGW 58

PROFESSIONAL COURSES OPEN TO WOMEN ONLY

- 55†† **TEACHING OF INDIVIDUAL AND TEAMSPORTS**
 General methods of teaching sports; techniques for class organization; skill analysis; individual and group guidance; evaluations; applications of methods to badminton, golf, tennis, ball team sports, volleyball, basketball, and softball; observations and practical experience. (3 cr; prereq 20A, 22B, 22C, 20B, 21A, 22D; V MTWThF; NGW 60, 153, 3) Hauptfuehrer

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)

- 22A†† **FOLK AND BALLROOM DANCE**
 Techniques of ballroom dance and basic square, round, circle, and line dances including methods of organizing classes and calling. (1 cr; VI MTWTh; NGW 151; Co-ed, see PEM 9B) Shick
- 46†† **TEACHING OF AQUATICS**
 Methods and procedures related to organization, content, and teaching of swimming and life saving; opportunity to qualify for the American Red Cross Water Safety Instructor's Certificate. Pool control and sanitation. (2 cr; limited to 24 students; prereq current American Red Cross Life Saving Certificate; IV MTWThF; NGW 58; Co-ed, see PEM 2B) Ost
- 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; limited to 40 students; prereq 45; 3rd qtr soph; elementary education major; III MTWThF; NGW 201) Hauptfuehrer
- 101 (See PEM)
- 104 **TEACHING PHYSICAL EDUCATION FOR THE HANDICAPPED CHILD**
 Selection and organization of appropriate activities; planning of physical activity at all levels; observations, demonstrations, special lectures. (3 cr; prereq §; II MTWThF; NGW 3) Wilson
- 118E **PROBLEMS**
 Focus on teaching of physical education. (Cr ar; prereq MEd candidate, §) Jaeger, Slocum, Wilson
- 124 **SUPERVISION OF SCHOOL HEALTH AND PHYSICAL EDUCATION**
 Functions; adaptations of accepted procedures for observation, guidance, and training of teachers. (3 cr, §Hlth 124; prereq §; III MTWThF; NGW 3) Slocum
- 130 **CONTRIBUTIONS OF BASIC SCIENCES TO PHYSICAL EDUCATION**
 Pertinent research in basic sciences; applications in selected areas. (3 cr; prereq §; I MTWThF; NGW 3) Wilson
- 136 (See PEM)
- 137 **READINGS: PHYSICAL EDUCATION**
 Independent study under tutorial guidance. (1-3 cr; prereq §; ar) Graduate Faculty
- 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; NGW 4) Jaeger, Graduate Faculty

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

- 224B° RESEARCH PROBLEMS**
Individual problems. (Cr and hrs ar; prereq 224A or #) Jaeger, Wilson
- 238 (See PEM)

Recreation and Park Administration (Rec)††

Courses for the summer terms in the field of recreation and park administration include subjects in programming, school recreation, therapeutic recreation, and supervised field work.

- 84 FIELD WORK IN RECREATION**
(Cr and hrs ar; prereq recreation major) Ostrander, Scott
- 85 FIELD WORK IN RECREATION**
(Cr and hrs ar; prereq sr, recreation majors or minors) Ostrander, Scott
- 112 PROGRAMMING IN RECREATION**
Principles of program planning for an organized offering of recreation opportunities. (3 cr; prereq 57, 58; I MTWThF; CH 215) Schultz
- 118F. PROBLEMS**
Focus on conduct of recreation programs. (Cr and hrs ar; prereq MEd candidate, #) Anderson
- 137 READINGS: RECREATION**
Independent study under tutorial guidance. (1-3 cr; prereq sr, honor, grad, #; hrs ar) Anderson, Schultz
- 141 INTRODUCTION TO HOSPITAL RECREATION**
General field of recreation in hospitals as background for the recreation leader, hospital administrator, and other personnel. (3 cr; prereq #; III MTWThF; CH 206) Scott
- 151 SCHOOL RECREATION**
Principles of organizing recreation events, activities and tournaments in school settings for pupils and residents of school districts. (3 cr; II MTWThF; CH 215) Anderson
- 224B° RESEARCH PROBLEMS**
Individual problems. (Cr ar; prereq 224A or #) Anderson

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 59.
 2. Courses offered this summer which apply to advanced and graduate degrees in school health education are Hlth 117B, 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 Advanced Certificate in First Aid received upon

†† Students in M.Ed. programs may elect EdCI 199E, Internship: Recreation Leadership. See EdCI for listing.

- successful completion of course. (2 cr; limited to 35 students; V MTWThF; NGW 3) Boaz
- 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, §PEW 70; prereq PEW 45, 3rd qtr soph, elementary education majors; limited to 45 students; III MTWThF; NGW 201) Hauptfuehrer
- 117B ADVANCED INSTRUCTION IN SCHOOL HEALTH FOR SECONDARY SCHOOLS**
 Instructional and individual problems. (3 cr; prereq 83 or §; IV MTWThF; NGW 3) 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 §; III MTWThF; NGW 3) Slocum
- 137 READINGS: HEALTH EDUCATION**
 Independent study under tutorial guidance. (1-3 cr; prereq §; ar) Slocum
- 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; NGW 4) Jaeger and Graduate Faculty
- 224B° RESEARCH PROBLEMS**
 Individual problems. (Cr ar; prereq 224A or §; ar) Graduate Faculty

**First
Term
Courses**

General College

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

2B FIELDS OF APPLIED PSYCHOLOGY

This survey examines the contributions of psychology, as a technology of behavior, to areas such as teaching and learning, vocational guidance, mental health, personnel selection and training in industry, measurement and improvement of worker efficiency and morale, law and crime, and consumer research and advertising. (3 cr; prereq 2A; III MTWThF; NH 213) Shapiro

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; III MTWThF; NH 207) 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 213) Pavlos

7B ASTRONOMY

A study of the universe is made. Topics include proofs for the earth's rotation and revolution; the motion and physical attributes of the sun, moon, and planets; measuring distances of stars; spectral classification of stars; theories of evolution of the universe. Observations through the University telescope are made when possible. (5 cr; III-IV MTWThF; SciCB 175) Policoff

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. (3 cr; I MTWThF; NH 207) Schwabacher

10A PRINCIPLES OF BIOLOGY

A study of the variety and relationships of living organisms illustrates 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) Dearden

15 INTRODUCTION TO MODERN BUSINESS

Designed for the student who intends to pursue a business career, this course covers the economic and social setting of business, structure and management of business, manpower management, financing a business, production and physical supply, marketing, and business and the future. (5 cr; I-II MTWThF; NH 216) Kroll

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; III MTWThF; NH 216) Donnelly

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

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 213) Rathburn

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, character sketches, incidents, and autobiographies. 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, FolH 102, Kurak

Sec 2, III-IV MTWTh, NH 201, Reisman

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; for practical nursing students only; V MTWThF; NH 107) Hagen

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; II-III MTWThF; JohH 122) F Harris

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; IV MTWThF; NH 216) D Jones

43B BIOGRAPHY

Studying the careers of persons who have profoundly influenced their times helps to illustrate and illuminate the history of a movement, a period, or a country. It introduces the student to a variety of fields of endeavor, and to biography as a form of historical writing. (3 cr; I MTWThF; NH 213) Buckley

College of Liberal Arts

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

American Studies (AmSt)

(See section on Special Programs)

Hum 23 AMERICAN LIFE III

The rise of American intellectual and cultural nationalism and its place in the modern world. (3 cr; I MTWThF; VH 6) Korth

100-200 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; VH 6) Stenerson

250 INDEPENDENT READINGS IN AMERICAN CIVILIZATION

(Cr ar; prereq consent of program chairman; ar) 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; I MTWThF; ForH 155) Staff

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; III MTWThF; ForH 155) Salovesh

101 PRINCIPLES OF BIO-CULTURAL 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; II MTWThF; ForH 285) Krantz

119 PEOPLES AND CULTURES OF MIDDLE AMERICA

A survey of both Indian-Spanish speaking people of Middle America. Analysis of the processes of acculturation which have produced the contemporary cultures of Mexico and Central America. (3 cr; prereq 2A or 100 [waived for major in Latin-American Area Studies]; V MTWThF; ForH 285) Salovesh

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) Cooper

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 ; IV MTWThF; ForH 155) Sarles

170 PRIMATE AND HUMAN EVOLUTION

Origins and relationships of extinct forms of nonhuman primates and man. (3 cr; prereq 1A, 101, or Δ ; IV MTWThF; Arch 60) Krantz

Art History (Arth)

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; NH 45) Torbert

4 SURVEY: HISTORY OF ART

From 15th to 18th century, including Renaissance, 16th-century Baroque and Rococo periods. (3 cr, §58; IV MTWThF; Arch 25) Soth

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; II MTWThF; J 207B) Poor

50 INTRODUCTION TO VISUAL ARTS

Similar to Art 1 in organization and basic content. Expanded program of reading and more extensive contact with works of art. (3 cr, §1; II MTWThF; NH 45) Torbert

58 SURVEY: HISTORY OF ART

Similar to Art 4 in organization and content. Expanded program of reading and contact with works of art. (3 cr, §4; IV MTWThF; Arch 25) Soth

59 SUMMER 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, Mediaeval, Renaissance and Modern Art in a series of lectures, guided visits and discussions held at important cultural centers, museums and cathedrals. Among the places to be visited are Athens, the Greek Isles, Delphi, Olympia, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Paris, Copenhagen and London. (6 cr; prereq §; about June 28-August 12, approx 6 wks in Europe) Torbert

107 EARLY FIFTEENTH-CENTURY ART IN ITALY AND NORTHERN EUROPE

Early Italian Renaissance architecture, sculpture, and painting; and Early Netherlandish painting. (3 cr; III MTWThF; J 207B) Soth

112 ART OF JAPAN

Development of painting, sculpture, and minor arts from earliest times to the present. (3 cr; prereq 3 cr in art history; IV MTWThF; J 207A) Poor

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 the skyscraper. (3 cr; prereq sr, grad or §; IV MTWThF; J 207B) Torbert

(For studio courses in art, see Studio Arts, page 114.)

Classics

Classics (Clas)††

45 GREEK AND ROMAN MYTHOLOGY

Classical myths which acquaint the student with the stories of gods, demi-gods, and heroes which are a basic component of the European cultural heritage, with

†† No knowledge of Latin or Greek is required.

attention to their artistic, religious, psychological, and anthropological interpretations. (3 cr, §42; I MTWThF; FolH 308) Sutton

- 81 GREEK TRAGEDY IN TRANSLATION (AESCHYLUS, SOPHOCLES, EURIPIDES)**
Introductory lectures on the origin of European drama as a distinct literary form, the characteristics of Greek tragedy, and the ancient theaters and theatrical conventions. Careful discussion of selected tragedies. Emphasis on understanding the problems posed in relation to cultural patterns of the time. (3 cr, §181; prereq 9 cr in English literature, English beyond C, or foreign literature, or Δ; open to qualified Lower Division students; II MTWThF; A 116) Weber
- 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, §45; I MTWThF; FolH 308) Sutton
- 181 GREEK TRAGEDY IN TRANSLATION**
Meets with Clas 81 but students will do additional work for advanced credit. (3 cr, §81; prereq grad; II MTWThF; A 116) Weber

Greek (Grk)

- 174B GREEK LITERATURE: TRAGEDY**
(3 cr; prereq Δ; III MTWThF; A 12) Ferguson

Latin (Lat)

- 174B LATIN LITERATURE: EPISTLES AND ESSAYS**
(3 cr; prereq Δ; IV MTWThF; A 12) Ferguson

Modern Greek (MdGk)

- 1 INTRODUCTION TO MODERN GREEK**
Provides initial experience in speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar. (3 cr; does not provide sufficient credits to fulfill CLA language requirement for B.A. degree; I MTWThF; FolH 305) Staff

Communication (Comm)

- 1 COMMUNICATION**
(3 cr, §Comp 1 or Engl A or 1A or 1B or 10H; prereq classif card 1 or 1A or 2 or 3; I MTWThF; AH 101) Norton
- 3 COMMUNICATION**
Continuation of Comm 1-2. (3 cr, §Comp 3 or Engl C or 3A or 3B or 10H; prereq 2; II MTWThF; AH 101) Jensen

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, §IT, §C, §50A; prereq 3rd qtr fr)
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|----------------------------------|---------------------------------|
| Sec 1, I MTWThF, CB 230, Staff | Sec 4, IV MTWThF, CB 230, Staff |
| Sec 2, II MTWThF, CB 230, Staff | Sec 5, V MTWThF, CB 230, Staff |
| Sec 3, III MTWThF, CB 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, II MTWThF, CB 240, Staff Sec 2, III MTWThF, CB 240, 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, §85T, §165; prereq 1-2 or †)
Sec 1, II MTWThF, CB 220, Coen
Sec 2, III MTWThF, CB 220, 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 †; II MTWThF; CB 135) Green
- 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; CB 130) Green
- 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; II MTWThF; CB 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 †; IV MTWThF; CB 415) 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 equiv; I MTWThF; CB 140) Coen
- 160 COMPARATIVE ECONOMIC SYSTEMS**
Functions of all economic systems; theories of alternative economic systems—the market economy, liberal socialism, the centrally planned economy. Analysis of American and Soviet economies. (3 cr, §160A; prereq 2 or equiv, no econ maj; III MTWThF; CB 120) Buttrick
- 160A ADVANCED COMPARATIVE ECONOMIC SYSTEMS**
Functions of all economic systems; theories of alternative economic systems—the market economy, liberal socialism, the centrally planned economy. Analysis of American and Soviet economies. (3 cr, §160; prereq 65, 66, or †; III MTWThF; CB 120) Buttrick
- 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; CB 220) Coen
- 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 †; II MTWThF; CB 135) Green
- 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 †; IV MTWThF; CB 220) Brownlee

- 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; II MTWThF; CB 225) Buttrick
- 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 §§

Composition (Comp)

- 1 **FRESHMAN COMPOSITION**
(3 cr, §Engl A or 1A or 1B or 10H or Comm 1; each section limited to 28 students; prereq **classif card 1 or 1A or 2 or 3**)
- Sec 1, I MTWThF, VH 205, Haga
Sec 2, II MTWThF, VH 205, Ar
Sec 3, III MTWThF, VH 205, Haga
Sec 4, IV MTWThF, VH 205, Ar
Sec 5, IV MTWThF, VH 307, Ar
- 3 **FRESHMAN COMPOSITION**
(3 cr, §Engl C or 3A or 3B or 12H or Comm 3; each section limited to 28 students; prereq 2)
- Sec 1, I MTWThF, VH 307, Ar
Sec 2, I MTWThF, VH 306, Ar
Sec 3, II MTWThF, VH 307, Ar

Literature (Engl)

- 22 **INTRODUCTION TO LITERATURE**
The Restoration and the 18th century. Pope, Swift, Addison, Steele, Johnson, Boswell, Fielding, and Sheridan. (6 cr; prereq ††; I-II MTWThF; VH 301) Leyasmeyer
- 39 **MODERN LITERATURE**
Readings in modern drama, British and American. (3 cr; prereq ††; IV MTWThF; VH 207) Haley
- 55 **SHAKESPEARE**
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 selected by the instructor. (3 cr; limited to 35 students; prereq ††, may not be taken concurrently with 56)
- Sec 1, III MTWThF, VH 113, Levy
Sec. 2, IV MTWThF, VH 113, Ar
- 56 **SHAKESPEARE**
Plays from Shakespeare's middle and later 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; III MTWThF; VH 306) Ar

†† 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.

- 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; 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; I MTWThF; VH 1) Allen
- 73 AMERICAN LITERATURE**
Notable authors from Whitman through James. (3 cr; prereq ††; I MTWThF; Arch 145) Alsen
- 75 CHAUCER**
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 ††; I-II MTWThF; VH 207) Joseph
- 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)
- 105 HAWTHORNE AND MELVILLE**
(3 cr; prereq ††; III MTWThF; VH 6) Stenerson
- 106 WHITMAN AND MARK TWAIN**
(3 cr; prereq ††; II MTWThF; VH 1) Kwiat
- 113 AMERICAN SHORT STORY**
(3 cr; prereq ††; III MTWThF; VH 1) Alsen
- 162 MILTON**
The minor poems. *Areopagitica*, *Paradise Lost*, and *Samson Agonistes*. (3 cr; prereq ††; IV MTWThF; VH 6) Levy
- 185 THE STRUCTURE OF MODERN ENGLISH**
An introductory study of English phonemics, morphemics, and syntax. (3 cr; prereq ††; III MTWThF; VH 301) Allen
- 170 SHAKESPEARE'S LATER CONTEMPORARIES**
Selected plays of Chapman, Jonson, Dekker, Marston, Webster, Heywood, Beaumont and Fletcher, and others. (3 cr; prereq 56 or 169; II MTWThF; VH 2) O'Brien
- 199 DRYDEN AND HIS CONTEMPORARIES**
(3 cr; prereq ††; II MTWThF; VH 306) Haley
- 213 BIBLIOGRAPHY AND METHODS OF LITERARY RESEARCH**
Basic library reference works, scholarly and critical journals, bibliographies of periods and prominent literary figures; exercises and problems in methods and exposition of research. (3 cr; IV-V TTh; VH 210) O'Brien
- 287 INDEPENDENT READING**
(3 cr; prereq M.A. degree or equiv)

Family Studies (FamS)

- I 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; JohH 106) Torbett
- 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; JohH 106) Torbett

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

- 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 added to CLA grad requirements; limited to 40 students; I 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 interaction. Effects of parenthood on husband-wife relations. (3 cr, §CPsy 80; limited to 40 students; II MTWThF; JohH 105) Huyck

Foreign Study (FS)

- 161 **SEMINAR FOR FOREIGN STUDY I**
Directed field study (SPAN Program) in Czechoslovakia, Israel, Uganda, or Venezuela, 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 1966 by a faculty selection committee [grad students must also have approval of adviser]) Stavrou, administrative official; White, Youngblood, Johnson, Norton

Geography (Geog)

- 4 **HUMAN GEOGRAPHY**
Geography of population and principal ways of life; capacity of the earth for future population. (5 cr; II-III MTWThF; CB 10) Rice
- 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; prereq soph, 5 cr or §; IV MTWThF; CB 455) Brown
- 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; prereq 5 cr or §; VI MTWThF; CB 455) Hsu
- 122 **EAST ASIA**
Physical and human geography of China, Korea, and Japan; geographic aspects of population pressure, development of resources, and international relations. (3 cr; prereq 5 cr or §; II MTWThF; CB 435) Hsu
- 141 **MIDDLE AMERICA**
Physical and human geography of West Indies and mainland from Mexico to Colombia. (3 cr, §109; V MTWThF; CB 235) Barrett
- 151 **CLIMATOLOGY**
World distribution of climatic elements; methods of arranging climatic data; climatic classifications, and world distributions of climatic types; general circulation; climatic change and climatic fluctuations. (3 cr, §133; III MTWThF; CB 435) Barrett
- 184A **AIR PHOTO INTERPRETATION—FIELD COURSE**
Directed study in use of air photos in the field. Emphasis on field identification, mapping and interpretation, and on development of photo logic and photo keys. Field study in rural, urban, and industrial landscapes in Twin Cities and neighboring areas. (3 cr, §139A; VII MTWThF; CB 445) Brown
- 190 **DIRECTED READINGS**
(1-3 cr; prereq sr) Rice

German (Ger)

First
Term
Courses

- 1A BEGINNING GERMAN
(5 cr; I-II MTWThF; ME 102) Staff
- 3A BEGINNING GERMAN
(5 cr; prereq 2A or 2 yrs high school German; I-II MTWThF; Arch 60) Staff
- 4 INTERMEDIATE GERMAN
Selected readings from literature. (3 cr; prereq 3A or 3B or 3 yrs high school German...¶5 recommended; I-II MWF; FolH 109) Staff
- 5 INTERMEDIATE GERMAN
Elementary composition and conversation. (2 cr; prereq 3A or 3B or 3 yrs high school German...¶4 recommended; I-II TTh; FolH 109) 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 high school German; III MTWThF; FolH 109) C Wood
- 68 CONTEMPORARY GERMANY
An introduction to the culture and civilization of present-day Germany. (3 cr; prereq 56 or 4 and Δ; II MTWThF; FolH 110) Weiss
- 74 NINETEENTH-CENTURY DRAMA
(3 cr; prereq 56 or 4 and Δ; I MTWThF; FolH 110) Menze
- 122†† HISTORY OF THE GERMAN LANGUAGE
(6 cr for both terms; prereq ‡; VI-VII MW; Arch 60) 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 14; FolH 217; individual consultations for remainder of course) Ramras
- 151 LITERATURE FROM 1500 TO 1600
(Prereq 14 cr in courses 70 and above or equiv; VI-VII TTh; Arch 45) Weiss
- 166 SCHILLER
Dramatic works including *Die Räuber*, *Kabale und Liebe*, *Don Carlos*, *Wallenstein*. (Prereq 14 cr in courses 70 and above or equiv; III-IV TTh; Arch 45) Ramras

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‡‡

- 22** INTERMEDIATE CONVERSATION AND ORAL PRACTICE
For students who understand German fairly well but need assurance in self-expression and a 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 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 criticisms of books and articles. (5 cr; prereq 4 or equiv) Staff

†† To receive credit for this course, a student must complete both Ger 122 and 123.

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

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 #) Staff

History (Hist)

- 2 CIVILIZATION OF THE MODERN WORLD, PART II**
Struggle for control over the Western states system, and emergence of liberal democracy in the modern world. (3 cr; III MTWThF; CB 5) Thayer
- 3 CIVILIZATION OF THE MODERN WORLD, PART III**
Impact of industrialism upon Western and world civilization in the 20th century. (3 cr; II MTWThF; CB 5) Munholland
- 14 ANCIENT CIVILIZATION, PART I**
Near East to 500 B.C. (3 cr; I MTWThF; CB 410) Nelson
- 19 HISTORY OF ASIA, PART III**
Modern Asia; the impact of Europe, nationalism. (3 cr; II MTWThF; SciCB 325) Marshall
- 23 AMERICAN HISTORY, PART I**
Colonial, early national period through the sectional crisis. (4 cr; 11:00-12:05 MTWThF; CB 5) Brauer
- 24 AMERICAN HISTORY, PART II**
Modern America. (4 cr; 10:00-11:05 MTWThF; SciCB 125) A Jones
- 50 ANCIENT CIVILIZATION, PART I**
Near East to 500 B.C. (3 cr; I MTWThF; CB 410) Nelson
- 61 HISTORY OF ASIA, PART III**
Modern Asia; the impact of Europe, nationalism. (3 cr; II MTWThF; SciCB 325) Marshall
- 79 UNITED STATES IN THE TWENTIETH CENTURY, PART I**
Political, economic, diplomatic and social history of the United States from 1898 to 1914. (3 cr; IV MTWThF; SciCB 125) A Jones
- 86 AMERICAN COLONIES, PART I**
In the 17th century. (3 cr; II MTWThF; VH 6) Rutman
- 95 HISTORY OF AMERICAN FOREIGN POLICY, PART III**
American foreign policy since Versailles. (3 cr; II MTWThF; ForH 155) 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. (3 cr; II MTWThF; C 111) Sawyer
- 111V THE VIKINGS**
Problems of interpretation of the Vikings and their impact on other cultures. (3 cr; IV MTWThF; CB 110) Sawyer
- 115D EUROPE IN THE TWENTIETH CENTURY, PART I**
From 1890 to 1918. (3 cr; IV MTWThF; CB 130) Munholland
- 118F MODERN RUSSIA, PART I**
18th century background. (3 cr; II MTWThF; CB 450) Stavrou
- 118C 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; CB 255) Stavrou

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|------|--|--------------------------|
| 121C | INTELLECTUAL AND CULTURAL HISTORY OF MODERN EUROPE, PART I
The 18th and early 19th centuries. (3 cr; II MTWThF; CB 120) Thayer | First
Term
Courses |
| 139B | PURITANISM IN AMERICAN HISTORY
Puritanism as a reality and as a concept for historical interpretation. (3 cr; limited to 12 students; IV-V MW; SocSci 860) Rutman | |
| 141J | RACE AND NATIONALITY IN AMERICAN HISTORY, PART III
Historical role of ethnic minorities in American society. Changing attitudes of Anglo-Americans toward Negroes, Orientals and European immigrants and the varying responses of these groups to their minority status, from 1920 to the present. (3 cr; III MTWThF; CB 110) Spear | |
| 144C | HISTORY OF AMERICAN LABOR, PART III
From 1917 to the present. (3 cr; II MTWThF; CB 250) Ar | |
| 149F | HISTORY OF JAPAN, PART II
Since 1700. (3 cr; VI MTWThF; CB 110) Marshall | |
| 184E | PROSEMINAR: THE NEGRO IN AMERICAN HISTORY, PART I
(3 cr; IV MTWThF; SocSci 633) Spear | |
| 189F | PROSEMINAR: AMERICAN LABOR HISTORY, PART III
(3 cr; III MTWThF; SocSci 633) Ar | |
| 200 | HISTORICAL BIBLIOGRAPHY AND CRITICISM
(3 cr; IV-V TTh; SocSci 628) Altholz | |

Humanities (Hum)

- 1 HUMANITIES IN THE MODERN WORLD I
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, §1A or §51)
 - Sec 1, I MTWThF, Ph 166, Powell
 - Sec 2, IV MTWThF, Ph 166, Milgrom
- 2 HUMANITIES IN THE MODERN WORLD II
The Industrial Revolution, liberalism, and socialism. Period from about 1776 to 1890. Authors: the classical economists, Marx, Mill, Ibsen, Dostoevski. (3 cr, §2A or §52; II MTWThF; Ph 133) Todd
- 4 HUMANITIES IN THE MODERN WORLD IV
The humanities since World War I. 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; III MTWThF; JohH 113) Hallberg
- 23 AMERICAN LIFE III
The rise of American intellectual and cultural nationalism and its place in the modern world. (3 cr; I MTWThF; VH 6) Ar
- 51 HUMANITIES IN THE MODERN WORLD
(See Hum 1) (3 cr, §1 or §1A; IV MTWThF; JohH 114) Kwiat
- 53 HUMANITIES IN THE MODERN WORLD
(See Hum 3) (3 cr, §3 or §3A; III MTWThF; JohH 114) Todd
- 54 HUMANITIES IN THE MODERN WORLD
(See Hum 4) (3 cr, §4; IV MTWThF; JohH 122) Louden
- 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, II MTWThF, JohH 114, Kliger
 - Sec 2, IV MTWThF, Arch 145, Kliger

- 61 **GREEK HERITAGE**
The Heroic Age: Homer. The Golden Age of Athens: Aeschylus, Sophocles. The philosophers: Plato, Aristotle. (3 cr, §11; I MTWThF; Ph 170) Weber
- 62 **ROMAN AND MEDIEVAL HERITAGE**
Late Hellenistic philosophy; Stoicism, Epicureanism, Neoplatonism, Jesus and the world of Christendom; Paleo-Christian anarchy, Augustinian synthesis, Gothic art, Scholasticism, the world of Dante. Readings in Lucretius, Marcus Aurelius, the New Testament, St. Augustine, Dante. (3 cr, §12; II MTWThF; Arch 145) Louden
- 131 **HUMANITIES PROSEMINAR**
The humanities in the ancient world. Student reports, paper, guided discussion of the arts and values of Sumerian, Cretan, Egyptian civilizations, the idea of a hero in Homer and in the Old Testament. Parallels in ancient Middle America. The legend of Atlantis. (3 cr; limited to 15 students; prereq sr; IV MTWThF; JohH 106) Ames

Journalism and Mass Communication (Jour)

- 1 **INTRODUCTION TO MASS COMMUNICATIONS**
Nature, functions and responsibilities of communication agencies examined from point of view of professional journalist. News, opinion, entertainment, and persuasive functions. Specialized communication; aspects of advertising. Laboratory exercises in fact-gathering and journalistic writing. (3 cr; prereq 2nd qtr fr with B avg in English, 3rd qtr fr with C avg in English, or soph; IV MTW, IV-V ThF; MurH 212) Barden
- 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; prereq 3rd qtr fr; I MWF, Arch 45; I TTh, MurH 302) Schuneman
- 16 **MASS COMMUNICATIONS LAW**
Study of the 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, and other legal problems of communications media. (2 cr; prereq 1 or 11; III MTWTh; MurH 302) Gillmor
- 18 **PRINCIPLES OF ADVERTISING**
Theory, principles, and functions of advertising; its role in social, economic, and marketing structure. Newspapers, magazines, and radio and television as advertising media. (3 cr; prereq soph, C avg; IV MTWThF; MurH 311) Peterman
- 60 **GRAPHIC ARTS: PROCESSES**
Letterpress, offset lithography, and gravure printing processes; engravings and copy preparation; significant graphic arts developments. (3 cr; prereq jr; I MTWThF; MurH 308) Wilson
- 80 **SURVEY OF JOURNALISM TECHNIQUES**
An overview of the principal journalistic techniques: Writing for news media, magazines, broadcasting; advertising copy; layout and design; copy editing and preparation; visual presentation. Lectures and laboratory exercises. (3 cr; prereq 1 or audit of 1, 16 or audit of 16 and §; open only to graduate or summer special students; VI MTWThF, VII WThF; MurH 212) Charnley
- 121 **MASS MEDIA IN A DYNAMIC SOCIETY**
Economic, political, and social determinants of the character and content of mass communications. Patterns of operations, their effect on content, and their relative social utility. Government and mass communications. (3 cr; prereq 50 or 18 for jour maj, § for others; I MTWThF; MurH 311) Gillmor
- 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 2 and principles of economics; II MTWThF; MMA 125) Peterman

182 PUBLICATIONS WORKSHOP

Intensive study of the role of the high school and college newspaper and year-book; 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 U of Minn jour maj; prereq jr, sr, and grad or §; 1:00-4:30 MTWThF, June 19-30; MurH 311) Wilson and others

Library School (Lib) ††

53 SCHOOL LIBRARY MANAGEMENT

A practical introduction to the management of the small school library. Primarily for students without previous experience in a school library. (3 cr; V MTWThF; Lib 4A) Fatka

74 LIBRARY MATERIALS IN THE CLASSROOM

Correlating the library, as a materials center, with the school program. Sources of information and evaluation of materials for teaching and resource units. (3 cr; I MTWThF; Lib 4A) Ar

102 REFERENCE I

General reference tools and other sources of information. Theory and practice of reference work. (3 cr; II MTWThF; Lib 4A) Ar

103 CATALOGUING AND CLASSIFICATION

Basic principles of descriptive cataloguing rules of entry, subject headings and classification in libraries. (3 cr; III MTWThF; Lib 4A) Peterson

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; IV MTWThF; Lib 4A) Kittilson

171 READING GUIDANCE FOR CHILDREN

Reading interests of children and the various kinds of materials that meet these interests. Knowledge of the sources, selection, evaluation, and methods of introducing books to children. (3 cr; prereq 104; IV MTWThF; Lib 4B) Ar

172 READING GUIDANCE FOR ADOLESCENTS

The library's relationship to the teen-ager in terms of his interests and needs. Methods of introducing books and developing and guiding reading. (3 cr; prereq 104; II MTWThF; Lib 4B) Fatka

194 NON-PRINT MATERIALS IN THE SCHOOL PROGRAM

Selection, organization and administration of non-print instructional materials in elementary and secondary school libraries. (3 cr; prereq 104; VI MTWThF; Lib 4B) Kittilson

241 LIBRARY MECHANIZATION

Application of data processing and systems analysis principles to library operations; principles, problems, and examples of library mechanization. (3 cr; prereq 101 and 103 or §; VI MTWThF; Lib 4A) Brekhus

†† 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, for it is not possible for us to give appropriate advice to students who appear on the last registration day.

- 255 THE COLLEGE AND UNIVERSITY LIBRARY**
The place of the library in the college and university organization. The influence on the library of developments and trends in higher education. (3 cr; prereq 101; III MTWThF; FraH 101) McDiarmid
- 257 SCHOOL LIBRARY PROBLEMS**
Library objectives in relation to educational objectives, larger units of school service, value and effect of standards. (3 cr; prereq 101; III MTWThF; Lib 4B) Olson
- 262 LITERATURE OF THE NATURAL SCIENCES**
Bibliographical and other reference sources, with emphasis on indexing, abstracting, and reviewing mediums. The growth and development of scientific literature and its control and dissemination. (3 cr; prereq 102; V MTWThF; Lib 4B) Peterson
- 268 RESEARCH METHODS IN LIBRARIANSHIP**
Evaluation of research reported in library literature. (3 cr; limited to 25 students; prereq 3; I MTWThF; Lib 4B) Olson

Linguistics (Ling)

- 173 LINGUISTICS AND LANGUAGE TEACHING**
Intensive introduction to linguistics; contrastive analysis and applications in language teaching. (3 cr; prereq 3; II MTWThF; FolH 308) Lehn

Middle Eastern Languages

Arabic (Arab)

- A 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. (7½ cr; I-III MTWThF; FolH 302) Chejne, Koury

Hebrew (Heb)

- A BEGINNING INTENSIVE HEBREW**
Fundamentals of grammar, written and oral exercises. Reading of selected chapters in *Genesis*. Equivalent to the first 1½ quarters of the regular first-year sequence, Heb 1-2-3. (7½ cr; I-III MTWThF; FolH 303) Paradise, Toledano

Music (Mus)

(See also Music Education under College of Education)

- 4 FUNDAMENTALS OF MUSIC**
(2 cr; for nonmusic majors—primarily child development students and elementary teachers)
Sec 1, II MTWThF, NMA 4, Lauritzen
Sec 2, III MTWThF, NMA 4, Lauritzen
Sec 3, IV MTWThF, ScH 3, Lauritzen
- 7A EAR TRAINING**
Résumé of aural work included in Mus 1T-3T, with concentration on their application. (3 cr; prereq 3; I MTWThF, IV MWF; ScH 103) Argento
- 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 3; II MTWThF, IV TTh; ScH 103) Argento

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. For elective credit, place an E after course number. When taken for no credit, place the letter V after the appropriate number.

**First
Term
Courses**

- 11** **PIANO**
(2 cr; prereq entr exam; hrs ar; ScH 107) Weiser, McNab, Ivory
- 12A **VOICE PRODUCTION FOR THE THEATRE**
(2 cr; for undergrad theatre majors, no previous singing or voice experience is necessary; II MTThF; ShH 115) Corrigan
- 12** **VOICE**
(2 cr; prereq entr exam; hrs ar; ScH 107) Schuessler, Knowles
- 13** **VIOLIN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Sambuco
- 14** **VIOLA**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 15** **CELLO**
(2 cr; prereq entr exam; hrs ar; ScH 107) Jamieson
- 16** **BASS**
(2 cr; prereq entr exam; hrs ar; ScH 107) Fitch
- 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, 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, Tetzlaff
- 22** **FRENCH HORN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Binstock
- 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) 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) Van
- 30** **CLASSICAL ACCORDION**
(2 cr; prereq entr exam; hrs ar; ScH 107) Hane, Malmberg
- 43 **UNIVERSITY CHORUS**
(1 cr; prereq #; IV MTWThF, NMA 4, 5; and/or 7:30-9:30 p.m. MTh, SciCB 325) Schwartz

- 46 CONCERT BAND**
(1 cr; prereq ♯; V MTWThF; NMA 4, 5) Bencriscutto
- 54 INSTRUMENTAL ENSEMBLE**
Performance of chamber music of great composers; sonatas, trios, quartets, quintets, etc. (2 cr; hrs ar; ScH 107) Oberg
- 60 INTRODUCTION TO ORCHESTRAL REPERTOIRE**
Twice weekly in Northrop Auditorium a distinguished guest conductor delivers a half-hour lecture, then conducts Minneapolis Symphony Orchestra in a 2-hour demonstration-concert of master works. Emphasis upon structure, elements of orchestral tone color, and roles of performer and conductor. (2 cr; primarily for nonmusic majors; VI-VII TTh; NMA)

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. For elective credit, place an E after course number. 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) Schuessler, Knowles
- 63** VIOLIN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Sambuco
- 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) Jamieson
- 66** BASS**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Fitch
- 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, 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, Tetzlaff
- 72** FRENCH HORN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Binstock
- 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) 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) Van
- 80** CLASSICAL ACCORDION
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Hane, Malmberg
- 90 ADVANCED INSTRUMENTAL ENSEMBLE
Performance of more difficult chamber music looking toward public presentation.
(2 cr; prereq sr, 56; hrs ar; ScH 107) Oberg
- 97 COUNTERPOINT
Strict, 16th-century and Bach-style counterpoint in two and three parts; writing of canons, motets, inventions, fugues. (2 cr; prereq 6T; V MTWTh; ScH 103) Fetler
- 100** ADVANCED APPLIED MUSIC
Advanced literature in piano, voice, organ, and orchestral instruments. (2 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 101 VOICE PRODUCTION FOR THE THEATRE
(2 cr; prereq grad in theatre arts; no previous singing or voice experience is necessary; III MTThF; ShH 115) Corrigan
- 106A AMERICAN MUSIC
From colonial times to the present through reading and record listening. American Indian music, European folk music on this continent, the origin and development of jazz and contemporary American music. (3 cr; prereq 36 or 9 cr in American history or American studies, #; I MTWThF; ScH 104) Riedel
- 110 MUSIC BIBLIOGRAPHY
General reference sources. Music bibliographical materials in English, other languages; bibliographical drills in music history, theory and composition, music education, applied music. (3 cr; prereq one course from 36, 56, 99, or #; II MTWThF; ScH 3) Riedel
- 116 VOCAL LITERATURE
Preparation and performance of representative solo vocal works from major and minor composers. (2 cr; prereq 12 cr in 12, or #; VI MTWTh; ScH 103) Schuessler
- 127-128-129* COMPOSITION
Original work in various forms. (2 cr each; prereq 99 and 123; VII MTWThF; ScH 205) Argento
- 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 #; III MTWThF; WuH 320) Oberg
- 140 INTERPRETATION OF CHORAL MASTERPIECES
Interpretation and analysis of choral compositions from Renaissance through the 20th century. (3 cr; prereq sr and grad, 6T or #; V MTWThF; ScH 104) Schwartz
- 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 #; VI MTWThF; NMA 4, 5) Benriscutto
- 167 TECHNIQUE AND PRODUCTION OF OPERA AND OPERETTA
The singer prepares and performs roles in opera and operetta. Special projects, including stage direction, musical direction, and accompanying coaching, are offered for the nonsinger. (3 cr; offered during Summer Session only; prereq singers with #; IV MTWThF; WuH 7) Knowles
- 175 TRAINING IN ADVANCED MUSICIANSHIP
Dictation of melodic, harmonic, rhythmic, two- and three-part contrapuntal materials; score reading, both vocal and instrumental; training in tonal memory. (3 cr; prereq 6T; III MTWThF; ScH 103) Fetler
- 190 HYMNOLOGY
History of hymn texts and tunes. Byzantine, Lutheran, Anglican, Baptist, Congregational, Methodist, Presbyterian, Unitarian and other hymns. History of hymn

books. (3 cr; prereq 6 cr in 34, 35, 36 or Art 56, 57, 58 or Phil 11 or Phil 50, 51, 52 or Engl 66, 67 or §; IV MTWThF; ScH 104) Fleischer, Riedel

- 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 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 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, §equiv courses in science depts; prereq 1 yr high school algebra or §; III-IV MTWThF, Ph 133; 2 hrs lab, Ph 246) Dahl

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

165 SCIENCE IN WORLD AFFAIRS

A survey of major aspects of science that exert an impact on modern history: (1) atomic energy; (2) race and evolution; (3) population and natural resources; (4) life on other planets and space travel. Object is to organize data and ideas and help students and teachers present an intelligent perspective of issues. (3 cr; prereq 1 yr of biological and of physical science in high school, or §; III MTWThF; Ph 236a) Craubard

175 A SURVEY OF SCIENCE HISTORY

Brief glimpses into major works constituting classics of science from Hippocrates to Einstein. Actual books and experimental efforts are stressed, rather than secondary sources. Representative scientific works are chosen from antiquity, and medieval, early modern, and recent periods. (3 cr, §171, §172, §173; prereq 1 yr of biological and of physical science in high school or college, or §; IV MTWThF; Ph 236a) Craubard

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 210) Potter

2A LOGIC

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

Sec 1, IV MTWThF, Ph 210, Cohen
Sec 2, I MTWThF, ForH 130, Mason

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

- 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; Ph 210) Potter
- 50A HISTORY OF WESTERN PHILOSOPHY**
Origin of Greek thought; pre-Socratics, Socrates, Plato, Aristotle. (3 cr; II MTWThF; ForH 150) Cohen
- 70 LOGIC OF SCIENTIFIC REASONING**
Introduction to principles of scientific method; definition and classification; observation, measurement, experiment, elementary statistical concepts; hypotheses, evidence, and confirmation; nature and limits of the scientific enterprise. (3 cr; prereq 2; II MTWThF; Arch 55) Hanson
- 108 POLITICAL AND SOCIAL ETHICS**
Ethical principles, theoretical and practical, at the basis of the social order. (3 cr; prereq 3, or §; III MTWThF; ForH 130) Mason
- 140 SURVEY OF CONTEMPORARY PHILOSOPHY**
Current systematic and critical philosophies, especially idealism, naturalism, realism, pragmatism, positivism as represented by their principal exponents. (3 cr; prereq 52 or §; I MTWThF; ForH 150) Matthews
- 154 ELEMENTS OF SYMBOLIC LOGIC**
Systematic introduction to modern logic. Topics include dimensions of language; calculus of propositions, classes, and relations; applications to foundations of mathematics. (3 cr; prereq 2 or §; IV MTWThF; ForH 285) Hanson
- 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 285) Matthews

Political Science (Pol)

- A THE STATE IN THE MODERN WORLD**
(Part A of A-B) The development, principles, and operation of the modern nation state. (3 cr; III MTWThF; CB 150) Schwarz
- 1 AMERICAN GOVERNMENT AND POLITICS**
(Part 1 of 1-2†) Fundamentals of American government, nature and growth of the Constitution, citizenship, individual rights and liberties, political parties, public opinion, nominations, and elections. (3 cr; II MTWThF; CB 410) Eidenberg
- 25 WORLD POLITICS**
Introduction to contemporary international relations, policies of the great powers, nationalism, internationalism. (3 cr; IV MTWThF; CB 155) Riggs
- 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; III MTWThF; CB 155) Cooperman
- 60 INTRODUCTION TO LEGAL SYSTEMS**
Elementary survey, primarily for social science students, of principal legal systems of the Western world. Emphasis upon organization, procedures, methods of growth, relation to political and economic systems, basic juristic conceptions, rather than upon substantive rules of law. The latter are drawn in when needed for illustration. (3 cr; prereq jr or §; II MTWThF; CB 155) Gerstein
- 101 PRINCIPLES OF AMERICAN CONSTITUTION I**
Nature of constitutions, judicial review, national-state and interstate relations. (3 cr; prereq 2 or equiv; IV MTWThF; CB 145) Gerstein
- 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 §; III MTWThF; CB 145) Eidenberg
- 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 §; IV MTWThF; CB 105) Backstrom
- 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 §; II MTWThF; CB 215) Backstrom
- 141 **EUROPEAN GOVERNMENT AND POLITICS I**
Government and politics of Great Britain. Emphasis is on political customs, party system, elections, problems of administration, and crisis government. (3 cr; prereq A-B or 12 cr in social science or §; II MTWThF; CB 440) Schwarz
- 162 **RECENT POLITICAL THOUGHT**
Main currents from Marx to present; Marx, Marxism, and their critics; non-Marxist socialism; syndicalism; anarchism; Catholic and Protestant theories; conservatism; pacifism; political thought in law and literature. (3 cr; prereq B or 9 cr in social science or §; IV MTWThF; CB 215) Cooperman
- 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; III MTWThF; CB 450) 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; II-III MTWThF; MNH Aud) Winokur
- 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; I-III MTWThF; WeH 101) Yonce
- 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; II-III MTWThF; Ph 150) Phillips
- 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, §Jour 156; prereq 2 and Principles of Economics; II MTWThF; Mayo 125) Peterman
- 215 **SEMINAR: BEHAVIORAL ENGINEERING**
(For full description see section on Special Programs, page 164) (3 cr; prereq §; III-IV MTWThF; MMA 100) Visiting Lecturers

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) Cranney

Public Administration (PA)

First
Term
Courses

- 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 ; hrs ar) 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; III-IV TTh; SocSci 1383) Jernberg
- 265 INTERGOVERNMENTAL ADMINISTRATIVE RELATIONS**
Seminar examination and analysis of the evolution of intergovernmental relations in the United States and of the special administrative problems and issues, with particular attention to the fields of housing, urban development, health, education, and welfare. (3 cr; prereq $\#$; VIII-IX TTh; SocSci 1383) Rosenthal
- 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 ; I-II TTh; SocSci 1383) Warp
- 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 ; VI-VII TTh; SocSci 1383) Jernberg
- 282A ADMINISTRATIVE INTERNSHIP**
Supervised field work in an approved local, state, or federal government agency; preparation of an acceptable formal report. (Cr ar; prereq Δ ; hrs ar) Steen

Romance Languages

French (Fren)

- 1 BEGINNING FRENCH**
(5 cr; III-IV MTWThF; FolH 110) Fadell
- 3 BEGINNING FRENCH**
(5 cr; prereq 2 or 2 yrs high school French; I-II MTWThF; ME 106) Macoubrie
- 25 INTERMEDIATE FRENCH**
(5 cr; prereq 3, or 3 yrs high school French; III-IV MTWThF; NH 209A) Todd
- 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 high school French or $\#$; I MTWThF; NH 122) Jones
- 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; NH 122) Strong
- 56 FRENCH PHONETICS**
(3 cr; prereq 25 or $\#$; II MTWThF; NH 201) Simval
- 66 SURVEY OF FRENCH LITERATURE: THE AGE OF ENLIGHTENMENT**
(3 cr; prereq 30...¶86 for majors; III MTWThF; FolH 108) Mantini

- 107 **STRUCTURE OF MODERN FRENCH**
(3 cr; prereq 57 or ¶57 or §; II MTWThF; Aero 327) Mantini
- 121 **PRE-RENAISSANCE AND PLÉIADE POETRY**
(3 cr; prereq sr with §, grad; III MTWThF; NH 107) Francis
- 148 **DRAMA OF THE TWENTIETH CENTURY: CLAUDEL, GIRAUDOUX, ANOUILH, MONTHERLANT, CAMUS, SARTRE**
(3 cr; II MTWThF; NH 107) Francis
- 190 **DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq §; hrs ar) Staff
- 259 **DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq §; hrs ar) Francis

OFFERED ONLY IN LA MAISON FRANCAISE††

- 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) 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)

- 1 **BEGINNING ITALIAN**
(5 cr; III-IV MTWThF; FolH 102) de Gregory

Portuguese (Port)

- 1-2-3†† **BEGINNING PORTUGUESE**
(15 cr for both terms; I-II MTWThF; FolH 108) Hamilton
- 190 **DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq §; hrs ar) Hamilton
- 259 **DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq §; hrs ar) Hamilton

Spanish (Span)

- 1 **BEGINNING SPANISH**
(5 cr; III-IV MTWThF; Arch 15) Collins

†† See Modern Language Residence Houses under Special Programs.
†† Student must enter the course in the First Term and complete both terms of the course to receive any credit.

- 1A BEGINNING SPANISH: CONVERSATIONAL APPROACH**
(5 cr; I-II MTWThF; Arch 15) Cúneo
- 3 BEGINNING SPANISH**
(5 cr; prereq 2 or 2 yrs high school Spanish; I-II MTWThF; Arch 5) Rudder
- 25 INTERMEDIATE SPANISH**
(5 cr; prereq 3 or 3A, or 3 yrs high school Spanish; I-II MTWThF; ME 208) Cooke
- 30 INTRODUCTION TO SPANISH AND SPANISH-AMERICAN 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 high school Spanish or #; III MTWThF; ME 102) Sullivan
- 54 SPANISH COMPOSITION**
(3 cr; prereq 25 or equiv; II MTWThF; NH 207) Gonzales
- 55 SPANISH CONVERSATION**
(3 cr; prereq 25 or equiv; III MTWThF; NH 122) Franklin
- 57 ADVANCED SPANISH COMPOSITION**
(3 cr; prereq 54; II MTWThF; ME 214) Narváez
- 60 SPANISH CIVILIZATION AND CULTURE**
(3 cr; prereq 30 or equiv; III MTWThF; ME 106) Rundorff
- 63A LATIN-AMERICAN CIVILIZATION AND CULTURE OF THE NINETEENTH CENTURY**
(3 cr; prereq 60 or #; IV MTWThF; FolH 108) Cúneo
- 67 SURVEY OF SPANISH LITERATURE: NEOCLASSICISM TO EARLY TWENTIETH CENTURY**
(3 cr; prereq 30...¶87A for majors; IV MTWThF; NH 207) Sullivan
- 107 STRUCTURE OF MODERN SPANISH**
(3 cr; prereq 57 or # or ¶57; IV MTWThF; ME 102) Narváez
- 130 CERVANTES: DON QUIXOTE**
(3 cr; prereq 65, 66, 67; V MTWThF; NH 201) Rundorff
- 142 LATIN-AMERICAN LITERATURE: NOVEL**
(3 cr; prereq 65, 66, 67 or 76; II MTWThF; Arch 45) Floripe
- 175 TWENTIETH-CENTURY SPANISH LITERATURE: PROSE**
(3 cr; prereq 65, 66, 67; IV MTWThF; ME 214) Floripe
- 190 DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq #; hrs ar) Staff
- 259 DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq #; hrs ar) Pattison

Note—The General Extension Division will offer Spanish for graduate students (Span 17A). Please address all inquiries to the General Extension Division.

Scandinavian Languages

Swedish (Swed)

- 1-2-3†† INTENSIVE BEGINNING SWEDISH**
(15 qtr cr for both terms [10 semester cr]; I-III MTWThF; A 205) Ar

†† This course runs through both terms. The student must enter in the First Term and complete both terms in order to receive credit.

Slavic and East European Languages

Russian (Russ)

- A-B†† **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; A 11A) Donchenko
- 4-5-6†† **INTENSIVE RUSSIAN (INTERMEDIATE)**
(See section on Special Programs) (9 cr for both terms; I-II MTWTh, I F; A 12) Prokopov
- 24 **SCIENTIFIC RUSSIAN I**
(See section on Special Programs) Concentration on structure of the language for the development of reading skills; basically for students of science. (5 cr; II-III MTWThF; A 105) Hudgins

Social Science (SSci)

- 1 **PERSONALITY**
An investigation of the factors that influence individual human action. Among the topics studied are personality in nature, culture, and society; personality as a shaper of society; the American character; the validation of theories of personality. (3 cr; II MTWThF; CB 235) Roshwald
- 3 **COMMUNITY**
The web of human relations in traditional and modern societies. Types of group behavior. Caste and class in the United States. The government of societies: Democracy and totalitarianism. (3 cr; prereq 1 or 2; III MTWThF; CB 235) Roshwald

Social Work (SW)

- Soc 90 **AMERICAN SOCIAL WELFARE**
(See Sociology) Milstone
- Soc 91 **INTRODUCTION TO SOCIAL WORK PROCESS**
(See Sociology) Milstone
- 102 **SPECIAL TOPIC: GROUP INFLUENCES ON PERSONALITY**
Analysis of the force 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; CB 450) Kamps
- 103 **SPECIAL TOPIC: MANAGEMENT OF CHILDREN WITH SOCIAL-EMOTIONAL PROBLEMS**
Primarily for elementary and secondary school personnel interested in gaining further understanding regarding children whose problems interfere with their adjustment and educational progress. Open to teachers, social workers, counselors, and others. (3 cr; VI MTWThF; ForH 115) Merl
- 105 **SPECIAL TOPIC: THE MULTI-PROBLEM FAMILY**
An analysis of the multi-problem family and a review of research approaches to develop an increased understanding, especially the trend toward more comprehensive approaches. Open to teachers, social workers, counselors, correctional personnel, and others interested in working with families. (3 cr; IV MTWThF; CB 430) Goodman

†† This course runs through both terms. The student must enter in the First Term and complete both terms in order to receive credit.

160 ADMINISTRATION IN SOCIAL WELFARE

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; II MTWThF; SocSci 860) Kidneigh

First
Term
Courses

Sociology (Soc)

1 INTRODUCTION TO SOCIOLOGY: 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; IV MTWThF; CB 10) Gerson

2 THE 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 1A or 1H or 3; III MTWThF; CB 410) Zwerman

3 SOCIAL PROBLEMS

Survey; contemporary social problems; special emphasis on personal demoralization and social disorganization. (3 cr; I MTWThF; CB 10) Ar

90 AMERICAN SOCIAL WELFARE

Analysis of American social welfare as a basic social institution. (3 cr; prereq 3; IV MTWThF; CB 235) Milstone

91 INTRODUCTION TO SOCIAL WORK PROCESS

Analysis of the nature of social work helping process through a study of development of social work theory and its implementation in field of practice. (3 cr; prereq 90 or consent of major adviser; VI MTWThF; CB 235) Milstone

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 §; II MTWThF; SciCB 175) Ar

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 §; II MTWThF; MMA 100) Gerson

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 §; IV MTWThF; CB 250) Ar

144 SOCIAL STRATIFICATION AND MOBILITY

Relationship of social mobility to social stratification and social organization. Analysis of the hierarchical structure of society in relation to class and status. (3 cr; prereq 1 or §; III MTWThF; CB 250) Ar

145 URBAN SOCIOLOGY

Introduction to study of cities; urban ecology; urban institutions and urban way of life. (3 cr; prereq 1 or §; I MTWThF; CB 250) Zwerman

Speech, Communication, and Theatre Arts

(See University Theatre and programs in speech pathology and audiology in section on Special Programs)

Speech (Spch)

5X† FUNDAMENTALS OF SPEECH

Development of basic skills in meeting a variety of speech situations; extemporaneous speaking, oral reading, discussion. Development of basic understanding of speech processes and forms. (3 cr; limited to 25 students) D H Smith and staff

Sec 1, I MTWThF, FolH 306
Sec 2, II MTWThF, FolH 305

Sec 3, III MTWThF, Arch 60

50 PUBLIC SPEAKING

The principles of preparing and presenting public speeches; directed practice in public speaking. Consideration of the functions of public speaking in contemporary life. (3 cr, \$5; limited to 25 students; prereq Upper Division standing; I MTWThF; FolH 307) D H Smith

65 RADIO AND TELEVISION SPEECH

Fundamentals of practice and theory in speaking for radio and television. Emphasis on projects and exercises in radio and television performance and scripting; introduction to studio equipment and procedures. (3 cr; limited to 20 students; prereq 5; V MTWThF; MurH 302 and Aero 309) Morrisette

67 PHONETICS

Sounds of American English as they occur separately and in connected speech. Strong and weak forms, stress, assimilation, practice in ear training. (3 cr; prereq 5; II MTWThF; FolH 406) Wendahl

81 INTERPRETATIVE READING

Aesthetic theory of literature and of oral reading. Practice in reading fiction for interpretation and mastery of technique. (3 cr; limited to 25 students; prereq 5; III MTWThF; FolH 305) Thompson

106 DISCUSSION

Co-operative thinking; recognition and definition of problems; critical analysis, examination of possible solutions. Planning, preparing for, participation in, and leading classroom, public, and radio and television discussions. (3 cr; limited to 30 students; prereq 5; III MTWThF; FolH 307) Cashman

110 HISTORY AND CRITICISM OF BRITISH PUBLIC ADDRESS

British orators, their works, the historical setting. British theoretical theory. (3 cr; prereq 5 and Δ; IV MTWThF; FolH 307) Jensen

124 QUANTITATIVE RESEARCH IN COMMUNICATION

Review and discussion of experimental and descriptive research; analysis of research design and procedures; individual research projects. (3 cr; prereq 61 or 169, 122, or ♯; II MTWThF; FolH 307) D H Smith

170 RADIO AND TELEVISION PROGRAMMING

Principles of program effectiveness; program policies of the industry. The FCC and programming. (3 cr; prereq 65 or ♯; V MTWThF; FolH 303½) Browne

174 EDUCATIONAL TELEVISION PROGRAMMING AND ADMINISTRATION

Television applied to educational needs; current practices; significant research findings; relative effectiveness of differing types of television utilization; impact of various modes of transmission on programming and administrative concepts. (3 cr; prereq 173 or ♯; V MTWThF; FolH 108) Goldstein

181, 182, 183 READING IN SPEECH ARTS

Directed reading and preparation of reports on selected subject. (Cr ar; prereq Spch 5 and 6 adttl cr and ♯; hrs ar) Staff

222 SEMINAR: ORAL INTERPRETATION OF LITERATURE

Problems of silent and oral reading. Speech in relation to language and types of literature. (3 cr; prereq 105 or 221; VI-VII TTh; FolH 307) Thompson

241 SEMINAR: RADIO AND TELEVISION RESEARCH

Evaluation of research methods in mass communication by radio and television. Research literature. (3 cr; prereq ♯; III MTWThF; FolH 303½) Browne

†† Students in programs requiring 5 credits in speech fundamentals may fulfill the requirement by taking Spch 5X and Spch 6.

- 276 SEMINAR: RHETORIC**
History and critical study of rhetorical theory. Examination of research in rhetoric. (3 cr; prereq 109 or #; ar) D K Smith, Piché
- 291, 292, 293 RESEARCH**
Open to graduate students engaged in research on special problems. (Cr and hrs ar) Staff

The following course is offered by the College of Education:

- EdCI 177 DIRECTING SECONDARY SCHOOL SPEECH ACTIVITIES**
Acquaint students with the philosophy, organization, and administration of extemporaneous speaking, oratory, interpretation, and debate. (3 cr; III MTWThF; Arch 60) Brock

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 functions. Introduction to the causes, characteristics, and modification of communication problems. (3 cr; II MTWThF; A 201) McDermott
- 101, 102, 103 READINGS**
Directed readings and preparation of reports on selected subjects. (Cr ar; prereq #; hrs ar) Henrikson, Martin, McDermott, Siegel, Wendahl
- 150 SPEECH RETARDATION**
Theory and experimental research dealing with speech development as related to delayed or retarded speech. (3 cr; prereq 99; VI MTWThF; FolH 306) Siegel
- 166C CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY: ARTICULATION**
(1-3 cr; prereq 141, 142 or #; ar) McDermott
- 166D CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY: STUTTERING**
(1-3 cr; prereq 141, 142 or #; ar) Martin
- 166F CLINICAL METHODS AND PRACTICE IN SPEECH PATHOLOGY: APHASIA**
(1-3 cr; prereq 141, 142 or #; ar) Greenberg
- 170 HEARING DISORDERS**
Basic orientation to audiology. Symptomatology and pathology of hearing disorders, their medical and surgical treatment. Clinical and educational management. Psychological effects of hearing impairment. (3 cr; prereq 99, 119 or #; V MTWThF; FolH 406) Chaiklin
- 171 AUDIOMETRY I**
Pure tone and audiometry; air and bone conduction; screening audiometry; hearing conservation programs. (4 cr; prereq 99 and 119; II MTWThF; FolH 305½) Hoel
- 175 GALVANIC SKIN RESPONSE AUDIOMETRY**
Galvanic skin response audiometry in the differential diagnosis of auditory disorder; nature of the GSR mechanism; historical aspects; conditioning literature relevant to audiometry; special applications such as instrumental avoidance and delayed feedback techniques. (3 cr; prereq 173; IV MTWThF; FolH 305½) Chaiklin
- 177 INDUSTRIAL AUDIOLOGY AND OCCUPATIONAL HEARING LOSS**
Temporary and permanent effects of steady, intermittent, and impulse noises on hearing. Noise measurement, reduction, and control; ear defenders and their limitations. Hearing conservation programs; pre-employment testing and monitoring audiometry. (3 cr; prereq 170 or #; VI MTWThF; FolH 305½) Ward

†† 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 Professor Clark Starr, director of the Speech and Hearing Clinic, 110 Shevlin Hall.

- 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) Lassman and Whitcomb
- 201 SEMINAR: ADVANCED PROBLEMS**
 Behavior modification and speech pathology. (3 cr; can be repeated; prereq §; VII MTWThF; FolH 305½) Martin
- 204, 205, 206 RESEARCH**
 Open to graduate students engaged in research. (Cr ar; prereq §; hrs ar) Henrikson, Martin, McDermott, Siegel
- 242 SEMINAR: VOICE**
 Advanced study and independent research in the area of voice. (3 cr; prereq 142 or §; III MTWThF; FolH 409) Wendahl
- 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 §; V MTWThF; FolH 305½) Henrikson
- 249 SYMPOSIUM: 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 §; III MTWThF; FolH 308) McDermott and visiting professors: Klefner, Sommers, Wilson
- 283 SEMINAR: CURRENT ISSUES IN AUDIOLOGY**
 Significant problem areas in audiology and its relation to other rehabilitation programs and personnel. Class projects involving in-depth exploration of a specific problem. (3 cr; prereq §; II MTWThF; FolH 303½) 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 123 SPEECH IN THE ELEMENTARY SCHOOL**
 Lectures; role of the elementary teacher in promotion of good speech; prevention of speech problems; handling of speech defects. Projects related to the teacher's own teaching situation. (3 cr; prereq sr; II MTWThF; C 115) Henrikson
- 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. (Cr ar, §SSPA 164 for 174, §SSPA 165 for 175, §SSPA 166 for 176; prereq SSPA 141, 142 or §; hrs ar) McDermott, Starr

Theatre Arts (Th)

- 11 INTRODUCTION TO THE THEATRE ARTS**
 History and theory of plays and writing as well as various arts and crafts of the theatre. (3 cr; II MTWThF; Sch 108) Ballet
- 12 LABORATORY SECTION: INTRODUCTION TO THE THEATRE**
 A laboratory in the practice of the arts and crafts of the theatre; scenery and particularly construction and painting, stage operation, theatre lighting, costuming, or make-up. (1 cr; prereq 11 or ¶11; meet first day with Th 11, then hrs and room ar) Seay
- 21 BEGINNING ACTING: CREATIVE APPROACH**
 Creation and presentation of original scenes and skits. Ability to respond to the imaginative situation with individuality and effectiveness is stressed. (3 cr; limited to 18 students; prereq fr with Δ, or soph, 12; II MTWThF; WeH 302) Howard

- 24 STAGE MAKE-UP**
Theory and practice in the art of stage make-up. (1 cr; limited to 15 students; prereq 12; VI-VII TTh; ScH 23) Sloane
- 34 STAGECRAFT: CONSTRUCTION AND PAINTING**
Theory and practice in construction, painting, and shifting of stage scenery. (3 cr, §74; limited to 20 students; prereq soph, 12; III MTWThF; WeH 306) Seay
- 54 STAGE-FENCING AND COMBAT**
History and execution; history of weapons through the ages; fighting and fencing with these weapons. Emphasis on their use in stage combat. (1 cr; limited to 12 students; prereq 12 or ¶12, §; I MWF; WeH 302) Dusek
- 90 COSTUMING**
Theory, design, and construction of costumes for stage and television. (3 cr; prereq 12, 34; V MTWThF; NH 304) Schulze
- 91 SCENE DESIGN**
Theory and practice of designing scenery as a functional environment for stage and television. (3 cr; prereq 12, 34; IV MTWThF; WeH 306) Josal
- 92 LIGHTING**
Theory and practice in applying methods and principles of lighting in theatre and television. (3 cr; prereq 12, 34; VI MTWThF; ScH 108) Scales

Note—Total accumulation of credits allowable in courses 101, 102, 103, 121, 122, 123, 174, 175, 176: M.A. (A plan), 6 credits; M.A. (B plan), 9 credits; Ph.D., 18 credits.

- 101, 102, 103 THEATRE PRACTICUM**
Individual creative projects meeting approval of a faculty committee in one or more of these areas: playwriting, directing, acting, design. Application forms in 102 Shevlin Hall. Approval of adviser and committee necessary before registration. (2-6 cr; prereq Δ and §; ar) Josal and staff
- 111 STAGE DIRECTION**
Theory of direction. Exercises in blocking and production of short scenes. (3 cr; prereq sr, 21, 6 cr from 90, 91, or 92 and §; II MTWThF; ScH 19) Balk
- 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 109) Graham
- 177 THEATRE BACKGROUNDS**
Selective examination of plays as part of the living theatre. Chronological, comparative study of development of theatrical elements in the drama from its origins. (3 cr; prereq jr, sr, grad, 11 or equiv plus 9 Upper Division cr in one of the following: speech-theatre, English, classics, or modern languages; IV MTWThF; 115 ShH) Ballet
- 180 AMERICAN THEATRE**
The theatre as an aspect of American culture from 1752 to the present. (3 cr; prereq 12 or grad; I MTWThF; NH 201) Woods
- 181, 182, 183 READINGS IN THEATRE ARTS**
Directed reading and preparation of reports on selected subjects. (Cr ar; prereq 9 cr in theatre arts and §; hrs ar) Staff
- 192 ADVANCED PROBLEMS IN STAGE LIGHTING**
Theory of stage lighting. Special projects and reports. (3 cr; prereq 111-112 or §; VI MTWThF; WeH 306) Josal
- 281, 282, 283 RESEARCH**
Open to graduate students engaged in research on special problems. (Cr ar) Staff

The following courses are offered by the Department of Music in the College of Liberal Arts:

- Mus 12A VOICE PRODUCTION FOR THE THEATRE**
(2 cr; for undergrad theatre majors, no previous singing or voice experience necessary; II MTThF; ShH 115) Corrigan

Mus 101 VOICE PRODUCTION FOR THE THEATRE

(2 cr; prereq grad in theatre arts; no previous singing or voice experience necessary; III MTThF; SHH 115) Corrigan

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 42 or 13 or #; I MTWThF; ForH 175) Ar

121 THEORY OF STATISTICS

(For nonmajors). Probability distributions, law of large numbers, sampling, likelihood function. (3 cr; prereq Math 10 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

Studio Arts (Art)

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; I-II MTWThF; J 2) Wilcox

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; prereq 10 or practical experience or #; limited to 15 students; III-IV MTWThF; J 2) Wilcox

20 BASIC DRAWING

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

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

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

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, Busa

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

32-33 ELEMENTS OF PRINTMAKING

(Sequence limited to 20 students) Bethke

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)

40-41 SCULPTURE

(Sequence limited to 20 students) Sauls

40 Beginning course. Intensive study of structure in nature with emphasis on accurate observation. Construction in metal and plaster. (3 cr; prereq 1 or #; I-II MTWThF; HolB 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; HolB 154)

51-54-55 DRAWING

From the model, still life, and nature. Principles of anatomy. (3 cr; limited to 25 students; prereq 23)

Sec 1, I-II MTWThF, ArtB 160, Busa
Sec 2, III-IV MTWThF, ArtB 151, Rowan

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; prereq 20, or equiv, with #; limited to 25 students; III-IV MTWThF; ArtB 141) Myers

70-71-72 OIL PAINTING

Introduction to medium of oil; individual projects and instruction. (3 cr; limited to 25 students; prereq 55 or #)

Sec 1, III-IV MTWThF, ArtB 161, Quirt
Sec 2, I-II MTWThF, ArtB 151, Rowan

80A,C-81A,C-82A,C SCULPTURE

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

- 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 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; III-IV MTWThF; J 2) Wilcox

90-91-92 PRINTMAKING, INTAGLIO PROCESSES

(3 cr; limited to 15 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 #; III-IV MTWThF; ArtB 161) Quirt

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) Sauls

- 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) Bethke

193-194-195 ADVANCED PROBLEMS IN STUDIO

Individual projects and guidance. (3 cr; prereq #; hrs and room ar) Quirt, Busa

200-201-202 ADVANCED PROBLEMS IN PAINTING

(3 cr; prereq #; hrs and room ar) Quirt, Busa

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)

REQUIRED COURSES

- 101 **PRINCIPLES OF ANESTHESIA**
(2 cr; prereq regis med) Van Bergen and staff

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**
(6 cr; limited to 6 students; hrs ar) Van Bergen and staff
- 182 **EXTERNSHIP IN ANESTHESIOLOGY AND RESPIRATORY PROBLEMS**
(6 cr; limited to 3 students; prereq 181) 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
- 269 **RESEARCH IN ANESTHESIA**
Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) Van Bergen and staff

Biochemistry (MdBc)

First
Term
Courses

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) Carr, Koerner, Bodley

Laboratory Medicine

- 181 **PROBLEMS IN CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Bradley, Strandjord, Sundberg, E Yunis, J Yunis
- 235 **ADVANCED CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Bradley, 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**
(2 cr per qtr for 4 qtrs; prereq 101. LMed 102; 1:00-1:50 alt 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. University, Murray; Veterans Administration, Hall; Hennepin County Gen-

†† Prior arrangements with departmental office.

eral Hospital, Schultz; St. Paul-Ramsey, Beckman; Mount Sinai, Lewis; and Northwestern, Watson. (6 cr per period; offered 3 elective periods; hrs ar)

181 RESEARCH IN MEDICINE

Research opportunities in the following areas are available at University and affiliated hospitals (as above): 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 above): 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

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; 9:00-9:50 Th; 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; 10:00-10:50 T; Todd Amph) Peterson, Ebert, and staff

210 SEMINAR: INFECTIOUS DISEASE

(1 cr; hrs ar) Spink

211 ELECTROCARDIOGRAPHIC CONFERENCE

(1 cr; 3:30-4:20 T; Todd Amph) 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; Todd Amph) Wang and staff

Division of Dermatology

REQUIRED COURSES

123 DERMATOLOGY, SYPHILOLOGY

(2 cr; prereq 101; 4:00-5:00 alt W; Hosp 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; Hosp 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; II-III W) McKelvey and staff
- 135 **CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY**
Includes clinics in obstetrics and gynecology. (12 cr; prereq regis med) McKelvey 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) McKelvey and staff

COURSES FOR GRADUATE STUDENTS

- 201 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART I**
(Cr ar) McKelvey and staff
- 202 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART II**
(Cr ar) McKelvey and staff
- 203 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART III**
(Cr ar) McKelvey and staff

- 204 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART IV**
(Cr ar) McKelvey and staff
- 205 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART V**
(Cr ar) McKelvey and staff
- 206 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VI**
(Cr ar) McKelvey and staff
- 207 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VII**
(Cr ar) McKelvey and staff
- 208 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VIII**
(Cr ar) McKelvey and staff
- 209 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART IX**
(Cr ar) McKelvey and staff
- 210 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART X**
(Cr ar) McKelvey and staff
- 211 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XI**
(Cr ar) McKelvey and staff
- 212 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XII**
(Cr ar) McKelvey and staff
- 216 **RESEARCH**
(Cr ar) Staff
- 301 **EXTERNSHIP**
(6 cr) Staff

Ophthalmology (Oph)

- 200 **CLINICAL OPHTHALMOLOGY**
(6 cr; 10:00-5:00 MTWThF; O-P Clin) Harris and staff
- 201 **PRACTICAL OCULAR SURGERY**
(3 cr; 7:30-10:00 TWTh; Oper Rm) Harris and staff
- 203 **BASIC AND APPLIED OPHTHALMOLOGY**
(2 cr; 9:00-12:00 S; O-P Clin) Harris and staff

Otolaryngology (Otol)

COURSES FOR GRADUATE STUDENTS

- 230 **CLINICAL OTOTOLOGY**
(3 cr; 1:00-4:00 MWThF; Outpatient Clinic) Paparella and staff
- 231 **CLINICAL RHINOLOGY AND LARYNGOLOGY**
(3 cr; 1:00-4:00 MWThF; Outpatient Clinic) Paparella and staff
- 232 **SURGERY OF EAR, NOSE AND THROAT**
(3 cr; 9:00-12:00 MTWThF; Oper Rm) Paparella and staff

Pathology (Path)

- 104 **AUTOPSIES**
(Cr ar; prereq 102; hrs ar) Dawson
- 106 **DISEASES OF THE HEART**
(1 cr; prereq 102; hrs ar) Edwards
- 111 **CONFERENCE ON AUTOPSIES**
(1 cr; prereq 102; 12:30-1:30 T; JacH 178) Dawson

- 112†† **DIAGNOSIS OF TUMORS**
(2½ cr; prereq 102; 8:00 MTThF; JacH 178) Hebbel
- 113†† **SURGICAL PATHOLOGY**
(Cr ar; prereq 102; hrs ar) Hebbel
- 120 **DISEASES OF THE LUNGS**
(1 cr; prereq 102; hrs ar) Dawson
- 150†† **PROBLEMS IN PATHOLOGY**
(Cr ar; prereq 102; hrs ar) Dawson
- 201 **RESEARCH**
Students with the necessary preliminary training may elect research either as a major or minor in pathology. (Cr ar; prereq #; hrs ar) 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 IN PEDIATRICS**
(1½ cr; VIII T; Mayo 1450) J Anderson and staff

†† Second Term 112, 113, and 150 are not repetitions of the First Term but rather continuations.

- 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 (Phcl)

- 109 **PHARMACOLOGICAL PROBLEMS**
(Cr and hrs ar) Cafruny and staff
- 203 **RESEARCH IN PHARMACOLOGY**
(Cr and hrs ar) Cafruny and staff

Physical Medicine and Rehabilitation (PMed)

- 103 **PHYSICAL THERAPY CLINIC**
(Cr and hrs ar) Gullickson
- 161 **CLINICAL MEDICINE IN REHABILITATION**
(5 cr) Kottke
- 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) Kottke, Kubicek
- 191 **SEMINAR: REHABILITATION LITERATURE**
(Cr ar; prereq regis med) Kottke
- 200 **PHYSICAL MEDICINE SERVICE**
(Cr and hrs ar) Staff
- 204 **CLINIC, PERIPHERAL VASCULAR DISEASE**
(Cr and hrs ar) Gullickson
- 205 **READINGS**
(1 cr; I M) Kottke
- 206 **CONFERENCE**
(Cr and hrs ar) Staff
- 210 **RESEARCH IN PHYSICAL MEDICINE**
(Cr and hrs ar) Kottke, Kubicek
- 212 **ELECTROMYOGRAPHY**
(Cr and hrs ar) Kottke

Occupational Therapy

First
Term
Courses

94-95-96 CLINICAL TRAINING IN OCCUPATIONAL THERAPY

A total of 9 months of supervised training in affiliated hospitals. (18 cr per qtr for senior O.T. students)

Physical Therapy

60A **THEORY AND TECHNIQUE OF THERMO-, PHOTO-, AND HYDROTHERAPY**
(6 cr; limited to physical therapy students in the professional program; lect I MTWThF, ChRC 208; lab II-IV MWF, 9:00-11:30 and 12:30-3:00 TTh, ChRC 220) Clayson, Nickolisen

88 CLINICAL EDUCATION

Five weeks of supervised practice at affiliating hospitals. (3 cr; limited to physical therapy students in the professional program; ar at affiliating hospitals) Clayson

Physiology (Phsl)

51 HUMAN PHYSIOLOGY

(5 cr; primarily for baccalaureate nursing students and physical therapy students; prereq zoology and 1 yr 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

(Cr and hrs ar) Visscher and staff

202 READINGS IN PHYSIOLOGY

(Cr and hrs ar) Visscher and staff

203 RESEARCH IN PHYSIOLOGY

(Cr and hrs ar) Visscher and 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 PhD 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
- 251 **CLINICAL INPATIENT PSYCHIATRY**
(Cr ar) Koutsky and 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) Koutsky and 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
- 264 **INTRODUCTION TO CLINICAL PSYCHOLOGY**
(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)
- 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) Feinberg, 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 M; Todd Amph) D'Angio
- 205 **RESEARCH: RADIATION THERAPY, NUCLEAR MEDICINE, RADIOBIOLOGY**
(Cr ar) D'Angio, Loken
- 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 work. (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) Jacobson
- 236 **RADIOISOTOPE SEMINAR**
Recent developments in nuclear medicine. (1 cr; 12:00-1:00 W) 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; 4:00-6:00 Th; Todd Amph) Lober, Peterson, and others

240 RADIATION THERAPY CONFERENCE

Recent advances in clinical radiotherapy. (1 cr; 4:00-5:00 M) D'Angio

Surgery (Surg)

Division of General Surgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

129 CLINICAL LECTURES IN GENERAL SURGERY

(1 cr per yr; prereq regis med) Staff

135 CLINICAL CLERKSHIP

(16 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

181 CARDIOVASCULAR SURGERY

Clinical problems and participation in surgery. For seniors only. (Cr and hrs ar) C W Lillehei, Varco

182 PROBLEMS IN CLINICAL INVESTIGATIONS AND PROBLEMS IN EXPERIMENTAL SURGERY

(Cr and hrs ar; University and affiliated hospitals) Staff

183 EXTERNSHIP IN AFFILIATED HOSPITALS

(Cr and hrs ar) Staff

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) Wangensteen and staff

202 APPLIED SURGICAL ANATOMY ON THE CADAVER

Surgical fellows prepare dissections with staff supervision. (1 cr; hrs ar) Wangensteen and staff

203 PROCTOSCOPY AND SIGMOIDOSCOPY

Diagnosis and treatment of lesions of the lower bowel. (1 cr; hrs ar) Wangensteen, W Bernstein, and staff

204 TUMOR CLINIC

Combined clinical-pathological consideration of tumors as seen by general surgeon. (1 cr; hrs ar) Wangensteen and 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) Wangensteen and staff

208 STUDY OF SURGICAL PROBLEMS

Surgical fellow acts as house surgeon at hospital. (1 cr; hrs ar) Wangensteen and staff

211 OPERATIVE SURGERY

Surgical fellow acts as the first assistant at operations in University Hospitals and later may be permitted to operate. (1 cr; hrs ar) Wangensteen and staff

- 214 **SURGICAL WARD CONFERENCE**
Presentation of interesting cases by the students. (1 cr; hrs ar) Surgical staff
- 215 **SURGICAL ROENTGENOLOGICAL CONFERENCE**
Weekly reviews of films of all surgical patients. (1 cr; hrs ar) Staffs of Departments of Radiology, Pathology, and Surgery
- 216 **SURGICAL RESEARCH**
Problems in experimental surgery. (1 cr; hrs ar) Surgical staff
- 217 **SURGICAL SEMINAR**
Conferences for review of surgical literature, for presentation of cases, and as research. (1 cr; hrs ar) Surgical staff
- 218 **SURGICAL CLINICS—PATHOLOGIC CONFERENCE**
Review of interesting cases by the medical, surgical, pediatrics, and pathology staffs. (1 cr; hrs ar) Surgical staff
- 219 **SURGERY-LITERATURE CONFERENCE**
Leading surgical journals are assigned to the fellows who read and report on important articles at weekly conference. (1 cr; hrs ar) Wangenstein and staff
- 220 **PERIPHERAL VASCULAR CONFERENCE**
Vascular clinic with conference following. (1 cr; hrs ar) Wangenstein and staff
- 221 **SURGERY-PHYSIOLOGY CONFERENCE**
Seminar discussing physiological aspects of surgery. (1 cr; VIII T) Wangenstein and staff

Division of Neurosurgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 127 **CLINICAL LECTURES IN NEUROSURGERY**
(1 cr per yr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 188 **NEUROSURGERY EXTERNSHIP, UNIVERSITY HOSPITALS**
(Cr ar; prereq regis med) Staff
- 189 **NEUROSURGERY EXTERNSHIP, VETERANS ADMINISTRATION HOSPITAL**
(Cr ar; prereq regis med) Staff
- 190 **NEUROSURGERY INVESTIGATION**
(Cr ar; prereq regis med) 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) French, Chou
- 308 **STUDY OF NEUROSURGERY PROBLEMS**
The neurosurgical fellow acts as house surgeon at University Hospitals. (4 cr) French, Chou
- 311 **OPERATIVE NEUROSURGERY**
The neurosurgical fellow acts as first assistant at operations in University Hospitals, and later may be permitted to operate. (4 cr) French, Chou
- 316 **NEUROSURGICAL RESEARCH**
Problems in experimental or clinical surgery. (3 cr) French, Chou
- 318 **NEUROSURGICAL CONFERENCE**
A review of X-rays and case histories on neurosurgical service. (1 cr) French, Chou

Division of Orthopedic Surgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 122 **PRINCIPLES OF DIAGNOSIS, TREATMENT, PROGNOSIS OF FRACTURES, DISLOCATIONS**
(1 cr; prereq regis med) Staff
- 140 **CLINICAL LECTURES IN ORTHOPEDIC SURGERY**
(1 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 185 **EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES**
(Cr ar; prereq regis med) Staff
- 186 **RESEARCH PROBLEMS**
(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) Peterson, Moe, Kane, and staff
- 403 **FRACTURES**
The orthopedic fellow acts as house surgeon on the fracture service at Hennepin County General Hospital. (5 cr) Nydahl 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, 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, and staff
- 410 **ORTHOPEDIC PATHOLOGY**
Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities. (2 cr) Moe 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, 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, and staff
- 416 **ORTHOPEDIC RESEARCH**
Problems in experimental or clinical surgery. University Hospitals. (5 cr) Moe, Kane, and staff

Division of Urology

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 173 **UROLOGY LECTURES**
(1 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 180 **EXTERNSHIP IN UROLOGY**
(Cr and hrs ar) Creevy and staff

First
Term
Courses

REQUIRED COURSES FOR GRADUATE STUDENTS

- 250 **UROLOGICAL SURGERY**
Urological fellow first assists at operations at the University Hospitals and later is permitted to operate under supervision of the staff. (4 cr; hrs ar) Creevy and staff
- 251 **CYSTOSCOPY AND UROLOGICAL DIAGNOSIS**
Urological fellow performs cystoscopies and other diagnostic procedures. (4 cr; hrs ar) Creevy and staff
- 252 **UROLOGICAL CONFERENCE**
Problems in diagnosis and treatment are discussed. (4 cr; hrs ar) Creevy and staff
- 253 **RESEARCH IN UROLOGY**
Problems in experimental and clinical surgery. (4 cr; hrs ar) Creevy and staff

SCHOOL OF NURSING

Nurs 82A³ **NURSING INTERVENTION**

Application, evaluation, and modification of nursing treatment. (4 cr; prereq Nurs 72) Staff

Sec 1, Lect III-IV TTh, Owre 112

Sec 4, Lect III-IV TTh, MH 118

Sec 2, Lect III-IV TTh, Owre 113

Sec 5, Lect III-IV TTh, PoH 2317

Sec 3, Lect III-IV TTh, Owre 117

Lab III-IV, VI-VII MWF

Nurs 185C **MEDICAL-SURGICAL NURSING**

Continuing analysis of health and disease; exploration of nursing role in man's movement to health goals. Selected community laboratory experiences. (4 cr; open only to students who will also be registered for 4 cr in this course Second Term; prereq Nurs 185B; hrs ar) Sarosi, Zatochill

Nurs 192C **PSYCHIATRIC NURSING SEMINAR AND FIELD PRACTICE IN THE COMMUNITY**

Study of the psychiatric nurse's role in present and future community mental health. (2 cr; open only to students who will also be registered for 2 cr in this course Second Term; prereq Nurs 192B; hrs ar) Hubbard, Cowlshaw

Nurs 195 **PROBLEMS IN NURSING**

Individual study of a problem in the field of nursing. (Cr ar; prereq regis in Master's programs or employed as nurse supervisor or instructor and Δ ; hrs ar) Staff

NuAd 173 **FUNDAMENTALS OF EDUCATION IN NURSING**

Identification of learning situations; selection and planning of learning experiences; methods of instruction for individuals and groups; evaluation. (3 cr; II-III MWF; MH 118) Dunning

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, §52, or §100A; III MTWThF; Bo B6) K Anderson

65†† **FIELD PRACTICE IN PUBLIC HEALTH NURSING**

Instruction and supervised experience in public health nursing in selected public health agencies. (Cr ar; prereq nurses) Leonard

†† The entire course includes both terms. No credit is given for First Term until satisfactory completion of Second Term.

- 95 HUMAN NUTRITION**
Particular reference to public health. Nutritional values of foods, food utilization and requirements, food management, nutrition education. (3 cr; prereq courses in chemistry and biology, or #; I MTWThF; MMA 100) Stief
- 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
- 169°° ADMINISTRATIVE RESIDENCY**
Field work of one calendar year's duration in an approved hospital; weighted rotation through departments, solution of special problems, and preparation of an acceptable formal report. (Cr ar) Stephan
- 172†† STUDIES IN PUBLIC HEALTH NURSING**
Orientation to research methodology; design and completion of a project. Continued second term. (3 cr for both terms; prereq 171) Kroska
- 176B†† CLINICAL SEMINAR: PUBLIC HEALTH NURSING**
Opportunity for increasing competence in public health nursing practice through experience with patients and families in a community agency under faculty guidance; analysis of behavioral and mental health concepts in concurrent seminar. (3 cr for both terms; prereq 176A) E Anderson, Fredlund, Sparrow, Downey, Leonard
- 178A†† THE PUBLIC HEALTH NURSING PRACTITIONER**
Selected experiences in the staff nurse role in a public health agency under faculty guidance; organization of patient care services; interpretive role of the public health nurse. Continued second term. (Cr ar; prereq 176, #) van Leeuwen
- 179B†† LONG-TERM PATIENT CARE AND REHABILITATION**
Independent study; exploration of a comprehensive multidiscipline approach in the continuity of care for long-term patients. Continued second term. (Cr ar; prereq 179A) E Anderson
- 189 FIELD WORK IN PUBLIC HEALTH NUTRITION**
Placement in an approved agency with opportunity for experience in various facets of public health nutrition programs. (Cr ar; prereq #) Stief, Reardon, and associates
- 190††°° FIELD PRACTICE IN PUBLIC HEALTH EDUCATION**
Two terms of supervised field experience. (Cr ar; prereq 183, 227) Craig
- 196 SEMINAR: PUBLIC HEALTH NUTRITION**
(Cr ar; prereq #) Stief
- 200 RESEARCH**
Opportunities will be offered by the School of Public Health and by various co-operating organizations for qualified students to pursue research work. (Cr ar) Staff
- 224†† SEMINAR: PUBLIC HEALTH NURSING WITHIN THE CURRICULUM**
Course objectives: organization; opportunity to explore problems in the development of plans for teaching public health nursing. Continued second term. (Cr ar; prereq #) Downey
- 226A†† CLINICAL SEMINAR: PUBLIC HEALTH NURSING—MENTAL HEALTH**
Opportunity for increasing competence in public health nursing practice including use of behavioral and mental health concepts and use of the nurse-patient relationship. Seminar analysis concurrent with experience with public health nursing patients. Continued second term. (Cr ar; prereq 175) Kohler

†† The entire course includes both terms. No credit is given for First Term until satisfactory completion of Second Term.

- 226B†† **CONCEPTS OF BEHAVIOR IN PSYCHIATRIC ILLNESS**
Etiology of mental illness, psychopathology involved, and current treatment. Opportunity for experience with patients in a state hospital and within the community after discharge. Continued second term. (Cr ar; prereq 226A) Williams
- 231°° **GROUND WATER DEVELOPMENT**
Development of ground water sources for public water supplies. Includes exploration through well design and construction. Special reference to public health problems involved. (Cr ar; prereq grad engineer and #) Bond, Singer, staff, visiting lecturers
- 233 **WATER QUALITY INVESTIGATION AND RESEARCH TECHNIQUES**
Field techniques and special research methods applicable to public health problems of water quality control. Procedures for establishing pollution baselines; appraisal and recognition of advancing eutrophication in surface and underground waters. (6 cr; prereq #) Olson, Odlaug, Ruschmeyer
- 234 **WATER QUALITY RESEARCH**
Design, logistical planning, and implementation of an independent short-term research activity basic to water quality evaluation. Literature review, statistical design and data processing. Field testing of sampling and laboratory operations. (6 cr; prereq #) Olson, Odlaug, Ruschmeyer
- 280†† **ORIENTATION TO SUPERVISION AND ADMINISTRATION IN PUBLIC HEALTH**
Application of principles; relationship of structure and philosophy of agency to supervisory role. Continued second term. (3 cr for both terms; prereq #) Sparrow

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 §111A, Math 10 or #; IV MTWThF; ForH 130) 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; III TThF and 7 hrs per wk ar during morning, afternoon hrs by special ar only; ForH 80) Jeffries
- 121A **QUANTITATIVE MAMMALIAN BIOLOGY**
Diffusion, surface tension, and mechanics of respiration, circulation, digestion, and locomotion. (3 cr; prereq 1-yr sequences in mathematics, physics, chemistry, and biology or #; II MTWThF; Mayo 1205) Evans
- 211 **SEMINAR: BIOMETRY**
(Cr ar) Boen

†† The entire course includes both terms. No credit is given for First Term until satisfactory completion of Second Term.

Mortuary Science (Mort)

For general information about the Department of Mortuary Science, see section on Schools, Colleges, and Special Programs.

8 ORIENTATION

An overview of funeral service; history, customs, development, personal qualifications, aptitudes. Field trips. (2 cr; II MTWTh; vH 113) Koschig

14 MORTUARY LAW

Probate proceedings, social security, life insurance benefits, public and personal liability, business law. Licensing; restrictions on mortuary sites; business organization; duties, rights, and liabilities for final disposition. (3 cr; I MTWThF; VH 113) Grayson

56 EMBALMING

Procedures and techniques of embalming. Embalming theory; consideration of special treatments. (3 cr; prereq Biol 2; III MTWThF; JacH 178) Stroud

76 EMBALMING LABORATORY

Laboratory procedure; practical experience in embalming; evaluations of theory. (2 cr; prereq 56 or §; hrs and room ar) Stroud

77 CLINICAL TRAINING

Practical experience in embalming; evaluations of theory. (2 cr; prereq 56 or §; hrs and room ar) Stroud

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; III-IV MWF, III TTh; Arch 20) Andrews

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; Aero 21) Hemp

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; I-II MWF, II TTh; Aero 21) Ar

Civil Engineering (CE)

61A SURVEY ENGINEERING

The planning, design, and execution of field control survey systems to determine the horizontal and vertical position of points on the earth for mapping, engineering projects, property boundaries and construction. Field problems in use of equipment. (3 cr; prereq Math 22A or equiv; lect I-II MWF, lab VI-IX TTh; Ex 265) G Johnson

63A ELEMENTS OF LAND DEVELOPMENT

Study of land ownership and title transfers, property rights, descriptions and location of property lines; land use and development procedures; study and analysis of maps, photographs, and photogrammetric equipment as data sources for land use studies and engineering design. (3 cr; prereq Math 15 or Math 21A or §; lect I-II TTh; Ex 265) G Johnson

141A INTERMEDIATE STRUCTURAL DESIGN

Structural steel design by plastic methods. Design of timber members, connections, and frames. The properties of reinforced concrete. Design of reinforced concrete by working stress method and ultimate strength method. Design of slabs, beams, and columns. Design diagrams and tables. (4 cr; prereq 83; I MTWThF and hrs ar; Ex 193) Andersen

264 SANITARY ENGINEERING UNIT OPERATIONS

Lectures, laboratory studies, and pilot plant-scale studies on screening, hydraulic separation, chemical coagulation, aeration, filtration, disinfection, drying, incineration, and digestion. (3-5 cr; prereq grad or §; hrs ar; Ex 250) W Johnson

Electrical Engineering (EE)

30 CIRCUIT ANALYSIS I

Steady-state and transient response of linear passive circuits under dc, step, and sinusoidal excitations. (3 cr; prereq Phys 14 or 23, Math 31; lect II MTWThF; Arch 50; plus computation hrs ar) Ar

30A ELECTRICAL ENGINEERING LABORATORY

Laboratory to accompany 30. (1 cr; prereq ¶30) Ar

Lab 1, III-IV MW, EE 121

Lab 2, VI-IX M, EE 121

Lab 3, III-IV TTh, EE 121

Lab 4, V-VIII T, EE 121

Lab 5, V-VIII W, EE 121

Lab 6, VI-IX Th, 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; lect I-II MWF, rec I-II TTh; ME 221) Ar

85 JUNIOR ELECTRICAL ENGINEERING LABORATORY

Experimental study of electronic circuits. (2 cr; prereq ¶(65) Ar

Lab 1, V-VIII MW, EE 218

Lab 2, V-VIII TTh, EE 218

Lab 3, V-VIII TTh, EE 205

107 LINEAR SYSTEM ANALYSIS I

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 MTWThF; Arch 55) Ar

Mechanical Engineering

Engineering Graphics (EG)

1 THE SLIDE RULE

Computation practice and theory. Design of special scales. (1 cr [0 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 co-ordinate 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 21 or §; lect V MTWThF, VI W, Arch 10; rec VI ME, Arch 10; lab open hrs, ME 308) Springer

Mechanical Engineering (ME)

21A ANALYSIS OF MECHANICAL ENGINEERING SYSTEMS

Determination of response of engineering systems utilizing transfer functions representation. Analogies between engineering systems based upon transfer function equivalence. (4 cr; prereq MM 36; lect II MTWThF, 1 hr ar, ME 321; lab VI-VII MW, ME 321) Frohrib

33 MEASUREMENTS LABORATORY I

Fundamental principles of measurement. Standards, accuracy, calibration. Treatment of experimental data. (2 cr; prereq ¶30A; lect VI TTh, ME 221; lab VII-IX TTh, ME 352) Tomisak

- 90†† INDUSTRIAL ASSIGNMENT, PART I**
Co-operative 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 ¶work-study program; hrs ar) Lund
- 91†† INDUSTRIAL ASSIGNMENT, PART I**
(See ME 90) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 92†† INDUSTRIAL ASSIGNMENT, PART I**
(See ME 90) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 93†† INDUSTRIAL ASSIGNMENT, PART I**
(See ME 90) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 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; lect II MTWThF, IV MWF; ME 302) Murphy
- 160A THERMAL ENVIRONMENTAL ENGINEERING**
Thermodynamic properties of moist air; h-W diagram for moist air; solar radiation; steady-state and periodic heat transmission in structures; water vapor transmission in structures; effects of thermal environment upon people, processes and materials; thermal loads; thermal environmental control systems. (4 cr; prereq 133; lect I MTWThF, III MWF; ME 321) Threlkeld
- 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 V MTWThF, 1 hr ar; ME 110) Holtby
- Lab 1, VI-VIII MW, ME 50 Lab 2, VI-VIII TTh, ME 50

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 contemporary architecture from its roots in the 19th century until the present time. (3 cr; prereq for all architecture history courses beginning Fall 1967; 9:15-10:00 a.m. MTWThF; Arch 130) Winterowd
- 51 HISTORY OF ARCHITECTURE**
The development of architecture up to the 15th century, part one—ancient architecture. (3 cr; prereq soph; 11:15-12:00 noon MTWThF; Arch 130) Winterowd
- 81-82-83††† ARCHITECTURAL DESIGN**
Basic exercises in composition of line, form, proportion, color, and texture. Elements of architectural design. Architectural drawing. Model making. (6 cr each for both terms; prereq 2nd yr for IT students, jr for CLA students and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers
- 91-92-93††† ARCHITECTURAL DESIGN**
Architectural problems with emphasis on development of structure as an integral part of design; site planning. (6 cr each for both terms; prereq 83 and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers
- 104 SEMINAR: EUROPEAN ARCHITECTURE**
Contemporary architecture from the beginning of the modern movement until the present time with specific emphasis upon the contributions of August Perret,

†† This course runs through both terms. The student must enter in the First Term and complete both terms in order to receive credit.

†† These courses run through both First and Second Terms. Students must enter at the beginning of First Term.

Peter Behrens, Walter Gropius and the Bauhaus, Le Corbusier, and the early work of Mies van der Rohe. (3 cr; prereq 56 or §; hrs ar) Winterowd

111-112-113††† 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 each for both terms; prereq 93, MM 93 and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

121-122††† 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 each for both terms; prereq 113, CE 41, and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

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 the wk, C 310) Staff

57A QUANTITATIVE ANALYSIS

A survey of modern quantitative methods of analysis. Lecture. (3 cr [no cr until 57B completed]; for nonchemistry majors; prereq GeCh 5; V-VI MWF; C 325) Staff

57B QUANTITATIVE ANALYSIS

A survey of modern quantitative methods of analysis including elementary physico-chemical procedures. Laboratory. (2 cr; for nonchemistry majors; prereq 57A or §57A; I-III MTWThF; C 310) Staff

201 SPECIAL TOPICS

Analytical topics not covered in regular courses are selected after discussion with instructor. (Cr ar; prereq §; hrs ar) Staff

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; for premedics, predentals, etc.; prereq predicted Math GPA 1.90 on ACT...Math Y or Z or college course in algebra; 4 yrs 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, and analyses of simple solids and alloys. (4 cr; prereq 5, 15 or 25; lect II MTWThF, SciCB 375; lab V-VIII MW, C ar) Staff

†† These courses run through both First and Second Terms. Students must enter at the beginning of First Term.

- 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; 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; for chemistry and chemical engineering majors; lect I MTWThF, SciCB 375; rec V MWF, lab VI-VIII MWF, C ar) Staff

Inorganic Chemistry (InCh)

- 103° **INORGANIC CHEMISTRY I**
Atomic structure, structure and bonding in covalent molecules and ionic crystals, thermochemistry of chemical bonding. Applications to the chemistry of the non-transition elements. (3 cr; prereq PCh 102A or #; lect III MTWThF, C 315; rec ar) Hugus
- 220 **ADVANCED INORGANIC CHEMISTRY LABORATORY METHODS**
(Cr and hrs ar) Hugus
- 301° **RESEARCH IN INORGANIC CHEMISTRY**
(Cr and hrs ar) Hugus and staff

Organic Chemistry (OrCh)

- 61 **ELEMENTARY ORGANIC CHEMISTRY**
(For all colleges) Important classes of organic compounds, both aliphatic and aromatic, together with some heterocyclic compounds. Laboratory work includes the preparation of typical substances. (5 cr; 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) Smith
- 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; 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**
(0 cr; prereq Δ) Staff

Physical Chemistry (PCh)

- 105, 106 **PHYSICAL CHEMISTRY LABORATORY**
(1 or 2 cr; prereq 101 or 102 or 108; VI-VIII MW; C 190) Humphries
- 107 **ELEMENTARY PHYSICAL CHEMISTRY**
(3 cr; prereq 1 yr college chemistry, Phys 9 or 6 with Δ, Math 25A or 32 or 44; I MTWThF; C 115) Humphries

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) 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 and by the plane table method. Preparation of geologic maps and cross-sections. Study of structural and geomorphic features and geologic setting of mineral deposits. (Cr ar by special or co-operative arrangement; prereq 120 or #)

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, A, Geo 1, 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 higher algebra, ¶10 allowed; II MTWThF; E 203) Ar

Z^{oo} (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; III-IV MTWThF; E 203) 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 elementary algebra and 1 yr high school geometry or equiv, and enrollment as elementary education student, or Δ ; III MTWThF; Arch 25) 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; prereq Z or high school higher algebra; III-IV MTWThF; E 229) 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, §15, §10, §21A; prereq high school higher algebra and T or high school trigonometry and satisfactory mathematics placement score; III-IV MTWThF; E 330) 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 and T or high school trigonometry; III-IV MTWThF; E 302) 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, the conic sections, translation of axes, polar co-ordinates, introduction to differentiation. (5 cr; prereq 4 yrs high school mathematics including trigonometry; I-II MTWThF; E 303) 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; prereq 21A; I-II MTWThF; E 330) 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 co-ordinates, application of integration to physical and geometrical problems in two and three dimensions. (5 cr; prereq 22A; III-IV MTWThF; E 303) 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. Standard topics of infinite series including tests for convergence and divergence, power series, and Taylor expansions. Partial differentiation including the chain rule, implicit functions, directional derivative, maxima and minima. (5 cr; prereq 23 or 23A; III-IV MTWThF; ForH 150) 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 217) Ar

40A 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, T or high school trigonometry; I-II MTWThF; E 215) 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 co-ordinates, 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 available for Upper Division credit to all except mathematics majors. Math 44 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 if grade in 40 is A or B; I-II MTWThF; E 227) Ar
- 43 (Arts) ANALYTIC GEOMETRY AND CALCULUS II**
 (See Math 42 for course description) (5 cr; prereq 42 or 40 with grade of B; III-IV MTWThF; E 227) Ar
- 44 (Arts) ANALYTIC GEOMETRY AND CALCULUS III**
 (See Math 42 for course description) (5 cr; prereq 43; III-IV MTWThF; E 340) Ar
- 65 (IT) INTRODUCTION TO PROGRAMMING MODERN DIGITAL COMPUTERS**
 Number systems. Computer organization. Elementary coding techniques. Scaling. Introduction to problem-oriented language. Program organization. Informal laboratory. (4 cr, §165A or §164-165-166; prereq 26A or 27 or §26A or §27 or §32 or §44 or §; IV MTWThF; Ex 193) Leavitt
- 110 TUTORIAL COURSE IN ADVANCED MATHEMATICS**
 Qualified students whose needs are not met by courses offered may make special arrangements for obtaining the content of other graduate courses regularly offered by the department. (3 cr; prereq membership in Academic Year Institute; V MTWThF; E 227) Schuster
- 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 25A or 26B or 32 or 44; IV MTWThF; E 215) Ar
- 117A (Arts) GEOMETRY**
 Selected chapters of geometry, such as convex bodies, projective geometry, geometry and imagination, elementary algebraic geometry, geometry of transformation groups, axiomatic geometry, geometrical constructions. (3 cr; prereq 25A or 26B or 32 or 44; III MTWThF; E 226) Ar
- 125A (Arts) CRITICAL REASONING IN MATHEMATICAL ANALYSIS**
 Notions of limit, sequence, series, function, derivatives, and integral. Gives more mature understanding of these concepts. Techniques of developing accurate proofs; intuition and logic in connection with these techniques. (3 cr; prereq 25A or 26B or 31 or 44; II MTWThF; E 226) Ar
- 131A (Arts) LINEAR ALGEBRA AND GROUP THEORY**
 Course description covers 131A and 131B. Finite dimensional vector spaces; linear transformations and matrices over the real or complex fields; linear equations; determinants; characteristic values; canonical forms; bilinear and quadratic forms; applications; introduction to abstract concepts of modern algebra; more detailed study of finite groups, including Jordan-Hölder theorem and basic theorem for Abelian groups. (3 cr, §149, §142-143, §180; prereq 31 or 44; V MTWThF; E 330) Harper
- 137C (IT) VECTOR ANALYSIS AND LINEAR ALGEBRA**
 Vector algebra, vector calculus, with emphasis on the generalizations to n dimensions, vector spaces, determinants, matrices, linear transformations, systems of linear equations, characteristic roots, and diagonalization of matrices. (5 cr; prereq admission to Summer Institute or permission of Institute Director; IV MTWThF plus 2 rec hrs ar; Ph 170) Wilde

- 147†† (IT) **VECTOR ANALYSIS**
 Scalar and vector products, derivatives, geometry of space curves, del operator, line and surface integrals, divergence and Stokes' theorem, transformation of co-ordinates, dyadics, applications. (3 cr; prereq 32 or 55; I MTWThF; E 217) Polansky
- 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 26A or 32 or 106; II MTWThF; E 217) Ar
- 151†† (IT) **ADVANCED CALCULUS I**
 Limits, properties of continuous functions of one and several variables, partial differentiation, implicit functions, maxima and minima, Taylor's theorem, transformations and mappings, integrals containing a parameter or variable limits, Stieltjes integral. (3 cr; prereq 26B or 31 or 55; III MTWThF; E 215) Ar
- 167 (IT) **FOURIER SERIES AND BOUNDARY VALUE PROBLEMS**
 Partial differential equations of theoretical physics, Fourier series, proof of convergence, orthogonal systems. Sturm-Liouville systems, solution of boundary value problems by separation of variables, applications. (3 cr, §173; prereq 32 or 106; IV MTWThF; E 320) 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 26A or 27, or 32 or 106; III MTWThF; Ex 193) Leavitt
- 188 (Arts) **TOPIC IN TOPOLOGY**
 This course is designed for the undergraduate and beginning graduate student who has not had a course in topology. It contains an axiomatic approach to topics from the fundamentals of general topology that are basic to modern analysis. Topics to be discussed are taken from the following: elementary set theory, topologies and topological spaces, mappings of topological spaces, connected spaces, compact spaces, homeomorphisms, metric spaces, convergence, and special types of topological spaces such as regular spaces and normal spaces. (3 cr; prereq 32 or 44; III MTWThF; E 320) 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) Toth
- 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) Toth
- 141-142-143*† **SPECIAL PROBLEMS IN METALLURGICAL ENGINEERING**
 Laboratory investigation of problems involved in metallurgical unit processes. (Cr ar; prereq sr status) Staff
- 201-202-203*† **RESEARCH IN METALLURGICAL ENGINEERING**
 (Cr ar) Staff

†† Note that Math 147 and 148 or 147 and 151 may be taken simultaneously in the First Term; Math 147, 148, 149 and 147, 151, 153 are 9-credit sequences regularly taught during the academic year.

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 170) 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 170) Kaufmanis

Physics (Phys)

1 INTRODUCTION TO PHYSICAL SCIENCE

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 PHYSICAL SCIENCE LABORATORY

Laboratory course given in conjunction with Phys 1. The combination of Phys 1 and 1A may be applied toward group requirements in the College of Liberal Arts. (1 cr; prereq 1 or ¶1) Ar

23 GENERAL PHYSICS, PART I

Electricity and magnetism. (2 cr; prereq 22, ¶23A, Math 23, or ¶Math 23 or Math 44 or ¶Math 44; II MTWThF; Ph 166) Ar

23A PHYSICS LABORATORY, PART I

Laboratory exercises in electricity and magnetism. ($\frac{1}{2}$ cr; prereq ¶23; 2 lab hrs per wk) Ar

50 INTERMEDIATE GENERAL PHYSICS, PART I

Special relativity. Atomic view of matter, electricity and radiation. Bohr model of atom. X-rays. Introduction to wave nature of matter and radioactivity. (2 cr; prereq 6 or 9 or 23, Math 31 or ¶Math 31 or Math 55 or ¶Math 55; III MTWThF; Ph 166) Ar

50A PHYSICS LABORATORY, PART I

Laboratory course given in conjunction with Phys 50. ($\frac{1}{2}$ cr; prereq ¶50; 2 lab hrs per wk) Ar

102C†† INTRODUCTION TO ELECTRIC AND MAGNETIC FIELDS

The classical theory of electric and magnetic fields, utilizing vector algebra and vector calculus. (5 cr for both terms; prereq Phys 100C and Math 148C and admission to the Summer Institute or permission of Institute Director; II MTWThF plus 1 lab per wk; Ph 131) Ar

109C†† MODERN PHYSICS II

Nuclear physics, particle physics, wave phenomena, and selected topics in solid state physics. (4 cr for both terms; prereq Phys 107C and Math 148C and admission to the Summer Institute or permission of Institute Director; I MTWThF; Ph 131) Ar

†† NSF Institute for High School Teachers of Physics. (See also section on Special Programs). This course runs through both terms. The student must enter the First Term and complete both terms in order to receive credit.

College of Veterinary Medicine††

All classes scheduled by arrangement.

Veterinary Anatomy (VAna)

- 191° **SPECIAL STUDIES IN VETERINARY ANATOMY**
Individual problems in gross anatomy, histology, embryology, neurology, hematology, and histological techniques. (1-5 cr; regis for more than 1 term permitted; prereq 151 or equiv, #) Weber
- 201, 202 **COMPARATIVE VETERINARY NEUROLOGY**
Correlated studies of the central nervous system of domestic animals. Special emphasis on relating neuroanatomy to neurophysiology. (4 cr per term; prereq 101, #) Fletcher

Veterinary Bacteriology and Public Health (VBac)

- 128° **PROBLEMS IN VETERINARY BACTERIOLOGY AND PUBLIC HEALTH**
(Cr ar; prereq 103 or equiv, #) Pomeroy, Anderson, Lindorfer, Loken, Diesch, Marquart, Klevan
- 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
- 221° **ADVANCED VETERINARY PUBLIC HEALTH**
Discussion of veterinary public health programs and selected diseases common to animals and man. (Cr ar; prereq 127, #) Anderson, Diesch

Veterinary Medicine (VM)

- 121A-B **CLINICS**
Application of medical, obstetrical, radiological, surgical and clinical pathological procedures in the diagnosis, treatment and prevention of animal diseases. (3 cr each; prereq 112, #) Low and others
- 202° **ADVANCED STUDIES IN DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES**
Detailed examination, discussion, treatment and prevention of animal disease problems. (Cr ar; prereq 104, 132, #) Sorensen, Low, Mather, D Johnson, Olson, L Johnson

Veterinary Obstetrics (VOBs)

- 204° **SPECIAL PROBLEMS IN ANIMAL REPRODUCTION**
(Cr ar; prereq #) Zemjanis

†† Tuition fees per term in College of Veterinary Medicine are \$76.50 for resident and \$190 for nonresident students, and incidental fee per term is \$13.50. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

Veterinary Pathology and Parasitology (VPaP)

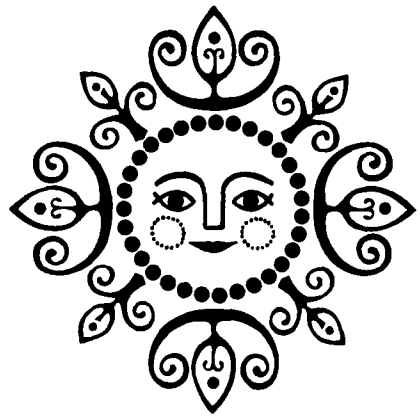
- 157 **VETERINARY NECROPSY**
Necropsies, techniques, examination of tissue sections, and preparation of records. (1-5 cr; prereq 153 or equiv, Δ) Kurtz and staff
- 158° **SURGICAL PATHOLOGY**
Preparation and interpretation of surgical and necropsy specimens. (3 cr; prereq 157, §, Δ) Bergeland and staff
- 160° **DIAGNOSTIC PATHOLOGY**
Interpretation of anamnesis, 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)

- 130° **PROBLEMS IN ANIMAL PHYSIOLOGY**
(Cr ar; prereq 109 or Phsl 106, 107, §) Good, Dziuk
- 171° **PROBLEMS IN VETERINARY PHARMACOLOGY**
(Cr ar; prereq 152 or equiv, §) Hammond, Stowe

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, §) Spurrell, 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, Courley
- 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, §) Gourley
- 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



**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).

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, of 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.

Courses in a variety of subject matter areas are offered in both terms of Summer Session.

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

Graduate, undergraduate, and special students as well as teachers interested in renewing certification will be able to choose from classes and workshops in the several areas of home economics and home economics education.

Workshops include Consumer Selection Guides in Household Equipment (June 13-29), Homes of the World (June 13-29), Construction and Refinishing of Home Furnishings (June 13-29), New Developments in Clothing Construction based on new fibers and finishes (June 30-July 15), and Purchasing Home Furnishings (June 30-July 15).

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 co-ordination 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 Zoology. The course offerings listed are available on the Twin Cities Campus to all eligible University students through the college or institute of their registration.

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 a separate section of this bulletin describing the Biology Session and to the special bulletin available upon request from the Dean of the Summer Session, 6790 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

BIOLOGY SESSION

LAKE ITASCA FORESTRY AND BIOLOGICAL STATION

During two 5-week terms of the Summer Session (June 12-August 19) an excellent opportunity for field work in terrestrial and freshwater biology in its most fundamental aspects is presented at Itasca State Park, approximately 220 miles northwest of the Twin Cities. These classes will be conducted co-operatively 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.

For a *Bulletin of Lake Itasca Biology Session* describing in detail the opportunities and facilities at the station, write to the Dean of the Summer Session, 6790 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 (see *Bulletin of Lake Itasca Biology Session*).

Admission and Registration††

The courses are open to all qualified graduate and undergraduate students who have had usual preliminary courses in biological subjects.

Graduate work taken at the Itasca Biology Session may be considered for resident requirement at the University of Wisconsin upon application to the Graduate School at Madison and 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 *Bulletin of Lake Itasca Biology Session*. This Request for Reservation form should be mailed to the Director of Field Biology, 112 Snyder Hall, University of Minnesota, St. Paul, Minnesota 55101 as early as possible. 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 16.

Fees and Expenses

Registrations will be accepted as long as class space is available.

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

Tuition fee	\$63.00
Incidental fee	13.50
Laboratory fee	8.50
	<hr/>
Total fees for each term	\$85.00

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, it is estimated, on the basis of the experience of other groups of students, that board which is on a cost basis will be approximately \$75 for the 5 weeks. A charge of \$15 is made for room in the cabins of the station 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.

The estimated cost of \$175 for each 5-week term does not include traveling expenses, clothing, laundry, and minor incidental personal expenses.

†† See section on Admission and Registration.

Tuition and fees are payable on or before June 13 or July 18. After June 13 or July 18, the late fee will be charged according to the following schedule:

June 14-16 or July 19-21	\$ 3.00
June 19-23 or July 24-28	5.00
Thereafter	10.00

No registration will be accepted after June 14 or July 19 without the approval of the director. Fee statements *dated* Tuesday, June 13, will carry the late fee described above. Fee statements dated Monday, June 12, may be paid on Tuesday, June 13, without penalty.

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 over-all grade average of at least "C." See *Bulletin of the School of Business Administration*.

Special Students

High school graduates who have reached the age of 24 and can furnish evidence that they have had business experience in an executive capacity may be admitted as special students. If later they decide to become candidates for a degree, they must complete the requirements for admission.

Students in Other Schools or Colleges of the University

Regularly enrolled students in other schools or colleges of the University may be admitted to such courses in this school as are authorized by the faculties of the School of Business Administration and the school or college concerned. Such students are urged to select their business subjects in accordance with a definite plan and, as far as possible, to complete a systematic course of business study.

Note—Special provision has been made for the direction of graduate students working on theses. For further information, inquire at the office of the director of graduate programs of the School of Business Administration.

Courses fulfilling the requirements of independent work and the preparation of written reports for the Master's degree, Plan B, shall be of graduate level and shall be made part of an approved program only upon recommendation of the candidate's adviser and the instructor for the course.

SCHOOL OF DENTISTRY

The School of Dentistry will not offer courses regularly scheduled in the dental curriculum unless the necessity arises to offer such instruction for students who may fail and will need to remove such failures before being promoted to the succeeding class. The clinic will remain open, however, for those who wish to receive instruction in clinical work or for those who may not have completed specified clinical or laboratory requirements for promotion.

The following instructors will be available both terms: D. L. Anderson, Goodkind, Gorlin, Grewe, Hall, Hampel, Holland, Holte, Isaacson, Jensen, LaBelle, Meskin, Meyer, Morstad, Olsen, Petersen, Rosenblum, Serr, Shapiro, Singer, Stallard, Vickers, Wakely, Yamane, Yock.

Dentistry fees during the summer quarter are: full-time tuition, resident \$155, nonresident \$330; 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 \$27.

COLLEGE OF EDUCATION

Under the division headings of Curriculum and Instruction (EdCI) and Educational Psychology (EPsy) in the course listings section of this bulletin, the courses are grouped for those interested in the elementary, secondary, and higher education offerings. Under each of these, courses of general interest are listed under *General Courses*; these are followed by offerings in *Elementary Education*, *Secondary Education*, and *Higher Education*.

Summer Session students who do not expect to become candidates for an undergraduate or graduate degree do not need to present credentials (see section on Admission and Registration). Those wishing to enter a graduate program should apply immediately for admission to the Graduate School (see Admission under 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, curriculums, and requirements for graduation, students should consult the *Bulletin of the College of Education*.

Courses listed in elementary and secondary education may be used for *renewal of teaching certificates*. Former teachers re-entering 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 re-enter 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. The chairman or his representative will be available in 206 Burton Hall during both terms.

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 program.

Physical Education

Physical Examination—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 ††.

Student Teaching

Student teaching during summer programs 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 or less credits 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 26 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.

Master's Degree Candidacy

Normally, only those students whose candidacy for the M.A. degree has been approved will be registered for research problems. All M.A. students majoring in any area of education must apply for candidacy for the Master's degree, through the College of Education, after having completed 9 to 12 credits of their programs. Candidacy approval requires (1) an average of 2.80 for graduate courses completed, (2) endorsement of the adviser, and (3) satisfactory standing on the examinations required of all entering graduate students in the fields of education. Dates for the battery of tests required under (3) above will be announced in graduate classes and in the Official Daily Bulletin. These should be taken only *after admission* to the Graduate School.

Detailed Description of Courses

For detailed description of courses and curriculums in education see the *Bulletin of the College of Education*.

Demonstration Facilities

Summer students are welcome to observe programs at Tuttle Demonstration Elementary School, the Institute of Child Development, the Psycho-Educational Clinic, and 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 co-operative 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)

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 sessions.

Nursery School—The Nursery School will be in session from 8:30 to 12 noon, beginning June 13 and closing July 14. Applications for the enrollment of children will be received at the office of the Nursery School. Tuition is \$35 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 terms for the purposes of training, research, and service. The clinic program will include remedial reading classes for children whose difficulties have been previously diagnosed and for whom special remedial work has been recommended. These children will attend school 2 hours daily, Monday through Friday, and the full 2-hour period will be used for individualized instruction. In addition, the Psycho-Educational Clinic will provide diagnosis and recommendation for school problem cases on the same basis as during the school year. The services of the clinic, including the remedial reading classes, will provide demonstrations for various College of Education classes, as well as clinical practice opportunities for advanced students registered under EPsy 150 and 257. Information may be obtained from the Director, Psycho-Educational Clinic, Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Summer Demonstration High School

A broadened summer program of enrichment, standard, and remedial courses will be offered at the University High School at Peik Hall during the First Term.

Course work in English, social studies, science, mathematics, art, business, and modern languages will be provided for grades 7 through 12. Interdisciplinary studies will also be available.

Students registered in student teaching will be assigned to observation and instruction in selected classes in University High School. The facilities are also available to college classes for demonstration purposes.

Admission to the Summer Session of University High School is open to any student of secondary school age. Children of teachers or other professional workers who are attending the Summer Session of the University are especially welcomed. For information regarding fees and registration procedure, address the Principal, University High School, Peik Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Workshops in Educational Administration

In response to the expressed needs of educational administrators, the summer offering includes three workshops, scheduled to meet 4 hours each

day for 2½ weeks. In the First Term, June 12 to 28, one workshop (EdAd 239) employs the technique of "simulation" and emphasizes the decision-making role of the administrator. The second workshop (EdAd 128), June 28 to July 15, considers the use of computers for processing, storing, and retrieving information in educational institutions and reviews the basic concepts in data processing.

The Second Term offers a workshop on collective bargaining in public schools (EdAd 128), meeting from July 17 to August 12. Participants focus on the analysis of the collective bargaining process in public education—its substance, procedures, determinants, and socio-political and economic impacts. The staff includes members of the Department of Educational Administration and the School of Business Administration plus resource persons from the Law School, the State Conciliation Division of Labor, general management, and labor groups.

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 them available this summer. An announcement describing these programs will be sent upon request to the Department of Educational Administration, 203 Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Secondary Curriculum and Instruction

Courses for secondary teachers listed under Curriculum and Instruction (EdCI) are concerned with materials and methods in English, social studies, mathematics, science, modern languages, business and distributive education. Also included are offerings in such special areas as reading and audio-visual 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 12 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.

Higher Education

For the first time in many years, regular graduate offerings in higher education will be available in both summer terms: First Term, Higher Education in the United States (EdCI 250), Effective College Teaching (EdCI 252), and Administration in Higher Education (EdAd 253). Listings in the Second Term include a repetition of the First Term offering of Higher Education in the United States (EdCI 250) and in addition The Junior College (EdAd 274). In the first 4 weeks of the Second Term (July 17 to August 12) the teacher education workshop planned with a committee from the North Central Association (EdCI 228) will continue the offering of previous summers.

In addition, course offerings for college student personnel workers will be included as indicated under "Graduate Programs for Counselors."

Special Education—Programs and Scholarships

Summer offerings in special education include speech correction and courses for teachers of the educable retarded, the deaf and hard-of-hearing, the blind, the crippled, the gifted, and the emotionally disturbed. Many State Departments of Education offer Summer Traineeships. The University may have traineeships for students interested in the areas of visual handicaps and trainable mentally retarded. Students interested in traineeships should contact their State Departments of Education or the Department of Special Education, Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Teaching Emotionally Disturbed Children

Education of Emotionally Disturbed and Socially Maladjusted Children (EPsy 186) is offered First and Second Terms, and an advanced course, Education of Emotionally Disturbed and Socially Maladjusted Children is offered First Term only. (See EPsy 286)

Teaching Culturally Disadvantaged Children

Education of the Culturally Disadvantaged Child (EPsy 188) is offered First Term.

Teaching the Deaf and Hard of Hearing

Courses for teachers of the deaf and hard-of-hearing are listed in schedules both through the Department of Speech, Communication, and Theatre Arts and the College of Education.

Workshop—Trainable Mentally Retarded

The University of Minnesota will be conducting a Second Term workshop for teachers of trainable mentally retarded children. Plans are being made jointly with several of the Minnesota State Colleges. Information about the workshop and possible traineeships may be obtained by writing Professor Dewey Force, 12 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455. (See EdCI 100)

Teaching the Mentally Retarded

In the First Term, courses for teachers of mentally retarded children include Introduction to Education of the Mentally Retarded (EPsy 184), Problems of Mental Deficiency (CPsy 143), and Education of Mentally Retarded Children in the Elementary School (EdCI 179). The first two of these courses will be available also in the Second Term.

Education of Blind and Partially Seeing Children

Three courses in the First Term will provide minimum preparation for an experienced regular class teacher to serve visually handicapped children. This work may be taken for graduate credit or for credit as a summer student with the permission of the instructor.

A course on orientation and mobility for blind children will be held during the First Term on the Minneapolis Campus. It provides teachers with basic techniques which help blind children gain skill in orientation and mobility. (See EdCI 126)

Those who wish may apply for scholarships for teachers of blind children by writing to the American Foundation for the Blind, 15 West 16th Street, New York, New York 10011. Other sources of scholarships may be available. For this information write Mrs. Glenda Martin, 101 Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Graduate Programs for Counselors

In both terms the regular graduate program in counselor education will be offered, except that the practicum in secondary counseling is listed only for the First Term. A course not always scheduled in summer will be available this year: EPsy 225-226, Counseling Theory and Procedure. In addition, two courses new to the counselor education curriculum will be offered: First Term, Group Counseling—Principles and Procedures (EPsy 236); and Second Term, Practicum in Group Counseling (EPsy 237). Enrollment for the latter will be limited.

Music Education

A new workshop in Preliminary Band Instrument Instruction will be offered First Term with emphasis on hearing and identifying tonal and rhythmic patterns, proceeding to beginning instrumental techniques. Included are demonstrations by fifth- and sixth-grade students.

The second in the 3-quarter sequence of music supervision courses (MuEd 152) will deal with instrumental, vocal, and general music in junior high schools. Guest instructor is Richard Papke of Brooklyn Center High School.

Elementary Music Education Workshop

The fifth annual Elementary Music Education Workshop at the University of Minnesota will be held on Monday and Tuesday, June 19-20. Special attention will be given to discussion and demonstration of "music reading and listening—contemporary music" for elementary grades. The clinician will be Professor Eunice Boardman, head, Department of Elementary Music Education, Wichita State University, Wichita, Kansas, and author of the new Holt, Rinehart, and Winston series entitled "Exploring Music."

Industrial Education Workshop

A research workshop (Ind 136) has been planned for the First Term to be conducted by Professor Jerome Moss. Instruction will include basic information about research procedures and individual assistance in developing specific proposals. Class meetings will be held 3 hours daily for the first 2 weeks of the term, and the remaining 3 weeks will be devoted to individual consultations, with a few general sessions near the close of the term.

NDEA Institute for Advanced Study for Industrial Arts Teachers of Electronics, Graphic Arts, and Drafting

The Industrial Education Department in the College of Education will offer an 8-week National Defense Education Act special summer institute from June 19 to August 11. The total of 30 participants (10 each from electronics, graphic arts, and drafting) will be selected from applicants presently teaching in these areas of Industrial Arts, grades 10 through 12. At least 3 years' experience in such instruction and a baccalaureate degree are required. Applicants must certify, with endorsement by an appropriate school official, that they will be teaching electronics, graphic arts, or drafting, grades 10 through 12, in the 1967-68 school year. For further information, write to Professor William A. Kavanaugh, Industrial Education Department, 103 TNCD, University of Minnesota, Minneapolis, Minnesota 55455.

Workshops in Home Economics Education

By special request of teachers and administrators, three workshops will be conducted during the First Term. These include Home Economics Curriculum (secondary level) from June 12-28; Child Development and Human Relations from June 12-28; and Methods in Teaching Home Economics from June 29-July 15. (See HEEed 160A, 196B, and 161)

NDEA Language Institute for Teacher Trainers

A 7-week institute under the National Defense Education Act will be offered for 27 college and university methods teachers and student teacher supervisors in the area of foreign languages. Basic courses include the teaching of beginning foreign languages; applied linguistics, materials, and techniques for advanced foreign language courses; conducting and interpreting research in second language learning. Other activities include a film series, an integrating seminar, curriculum and language laboratory workshops, special lectures, small group discussions and individual conferences. For information write to Professor Emma Birkmaier, 224 Peik Hall, University of Minnesota, Minneapolis, Minnesota 55455.

GENERAL COLLEGE

Depending upon availability of space, 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. Its program is intended to give students opportunities to explore a variety of subject-matter fields, to test themselves in college-level academic work, and to build the foundation of a general education. Its 2-year curriculum culminates in the associate in arts degree.

Students may supplement the more general courses with studies preparing them for work in certain occupations requiring less than 4 years of training, such as marketing, dental assisting, general office work, and recreation activity leadership.

All students entering the General College for the first time, either as new freshmen or as transfer students, are required to take a comprehensive examination, the results of which will be useful to the individual and to the faculty adviser in planning a course of study.

Students who, by the quality of their General College work, demonstrate ability to do the level of work required by another college of the University usually may transfer without undue loss of time or academic credits.

The *Bulletin of the General College*, which may be obtained upon request from the Office of Admissions and Records, indicates in detail the requirements for the associate in arts degree, complete course descriptions, transfer information, and general regulations.

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, and doctor of philosophy, and the specialist in education certificate.

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 as such 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 15, 1967 for First Term and Monday, June 19, 1967 for Second Term). Applications should be sent to Dean of the Graduate School, 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 petition to transfer *only their first term's work as an adult special student or Summer-Session-only student* to their graduate record. 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 Summer 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 *Bulletin of the Graduate School*, 1966-68, pages 10-26.

Deadline Dates for Summer Session Graduation

Theses of Summer Session students must be complete and registered in the Graduate School office at least 8 weeks before the end of the term in which they take the degree (First Term—Friday, May 19, 1967; Second Term—Friday, June 23, 1967). Oral examinations must be completed at least 5 weeks prior to the commencement date (First Term—Friday, June 9, 1967; Second Term—Friday, July 14, 1967).

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 1967 Summer Session are for the most part selected from the regular Arts College curriculum. The complete curriculum is described in the *Bulletin of the College of Liberal Arts* which may be obtained from the Office of Admissions and Records.

Courses announced in the bulletin 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 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 Summer Session bulletin; cost, housing, and other information is provided in this bulletin as well as in the separate *Bulletin of General Information*.

Students are urged to bring questions or problems to the college offices, 214 Johnston Hall (Lower Division) and 223 Johnston Hall (Upper Division), or (on Monday, June 12) 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 a series of special programs are available; these are described in the following paragraphs.

Scandinavian Area Studies

The Department of Scandinavian, with support from the Center for Northwest European Language and Area Studies, will offer an intensive course in Swedish intended for undergraduate and graduate students without previous knowledge of the language. For detailed information consult Professor Nils Hasselmo, Department of Scandinavian, 210 Folwell Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Modern Language Residence Houses

During the First Term the Romance Language 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 Friedrichsmeyer for the Deutsches Haus; and Professor Mireille Rydell for the Maison Française. In each house there will be native assistants. See course listings under Department of German and Department of Romance Languages.

Programs—The program consists 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 not to exceed 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.

Fees—A special fee of \$40, in addition to regular Summer Session fees, is charged for the program offered in a language residence house. Room and board are additional.

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 German. Careful planning should enable a student to satisfy the requirement for an M.A. degree in about three summers. The policy of an expanded German program will be continued in the future.

Courses in Russian

To help scientists and students of science become acquainted with the research of their Russian counterparts, the Summer Session will offer two courses in scientific Russian in the Department of Slavic and East European Languages. Students with no prior knowledge of the Russian language may register for Russ 24, Scientific Russian I. The major goal of this course will be the acquisition of the basic principles of grammar essential to a reading skill. Russ 25, Scientific Russian II, introduces reading and translation of scientific texts in various fields.

In addition, the department is offering two intensive courses in Russian, a beginning course in spoken and written Russian (Russ A-B) 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.

American Studies

During the summer of 1967, visiting professors will offer courses in various aspects of American culture, as will members of the University of

Minnesota staff in the Departments of Anthropology, History, English, Sociology, Economics, Education, Geography, Art, 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 candidates.

Journalism and Communications

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 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 University of Minnesota will be one of five institutions in the country offering special 4-week seminars (one each term) sponsored by the Newspaper Fund, Inc. Enrollment is open only to those awarded fellowships by the Newspaper Fund, but high school publications advisers enrolled in regular Summer Session courses will be afforded an unusual opportunity to exchange views and experiences with Newspaper Fund fellows from many parts of the United States.

The school also offers courses at the Upper Division-Graduate level in the area of mass communications. These include Contemporary Problems in Freedom of Speech and Press; International Communications and Foreign Affairs; Mass Communications and the News; History of Journalism; Mass Media in a Dynamic Society; Public Relations Methods; Graphic Arts: Processes; and Seminar in the History of Communications. 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 Associated Collegiate Press. Students are welcome to visit these organizations and to obtain counsel on publication problems from the staffs of NSPA and ACP.

Lectures in Behavioral Engineering

In collaboration with the Center for Research in Human Learning, the Psychology Department is offering a special program in the control of behavior or behavioral engineering. Five different lecturers, each of whom is a

distinguished visiting research worker and teacher in one aspect of behavior control, will teach the course for 1 week. One lecturer will be concerned with general applications of behavioral techniques to educational problems. A second expert will describe experimental techniques for the modification of the behavior of severely disturbed children. A third will deal with the need for, and the methods of, training parents and teachers as behavioral engineers. The fourth lecturer will discuss the role of classical conditioning techniques in behavior modification. Finally, the fifth lecturer will approach the problems of environmental control of specific learning behaviors.

The course (Psy 215, Seminar: Behavioral Engineering) is scheduled to meet for 2 hours per day, with lectures, films, demonstrations, and tapes as instructional media. (See First Term course descriptions.)

Permission to enroll may be secured through the Human Learning Center, 400 Ford Hall, University of Minnesota, Minneapolis, Minnesota 55455. (Telephone 373-5302.)

Metropolitan Problems Workshop

The Workshop on Minnesota Government and Politics will be offered during the Second Term for persons interested in Minnesota public affairs. The 1967 Workshop will focus upon the special problems of the Twin Cities Metropolitan Area. Topics will include the uniqueness of the Twin Cities environment, modernizing local government, fiscal aspects, control of pollution, and the role of the experimental city. One week will be devoted to each topic. On Wednesday afternoons, after an introductory lecture, a panel of public officials, civic leaders, and educators will discuss the topic of the week. On Thursday afternoons, the topic will be discussed in a seminar session. Persons not desiring academic credit may participate in the Wednesday sessions through the Department of Conferences and Institutes, Nolte Center for Continuing Education. Persons desiring academic credit should register for PA 214A. For further information, write to the Director, Public Administration Center, University of Minnesota, Minneapolis, Minnesota 55455.

Audiology (Hearing)

Courses in audiology will be available during both summer terms. During First Term, Professor W. Dixon Ward will offer a course on Industrial Audiology and Occupational Hearing Loss, and Professor Joseph Chaiklin will offer a course on Galvanic Skin Response. In addition, courses will be offered in the areas of hearing science, hearing disorders, audiometry, hearing aids, lip reading, and language for the hearing impaired. Seminars and clinical practice will be arranged through the facilities of the Audiology Clinic.

Interested students should arrange an early conference with Professor Frank Lassman, Audiology Clinic, D-311 Mayo, University of Minnesota.

Speech Pathology

During the First Term the Division of Speech Science, Pathology and Audiology of the Department of Speech, Communication, and Theatre Arts will offer an expanded program at the graduate and undergraduate levels. Professor Richard McDermott will offer a special symposium (SSPA 249) on Current Issues in Speech Pathology, with four distinguished guest professors: Frank Klefner, Ronald Sommers, Frank Wilson.

Associate Professor Ronald Wendahl of the University of Minnesota Voice Science Laboratory will offer a course on the application of laboratory techniques to the study of the larynx and Professor Richard Martin will offer a course on Behavior Modification and Speech Pathology. During the First Term courses will be offered in articulation, stuttering, aphasia and speech retardation. Students interested in summer work toward a graduate or undergraduate degree should contact Professor Clark D. Starr, Speech and Hearing Clinic, 110 Shevlin Hall, University of Minnesota, Minneapolis, Minnesota 55455.

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 see Professor Bernard Brock (404 Folwell Hall). EdCI 177 is available for students desiring instruction in teaching speech at the high school level (see the Education or Speech, Communication, and Theatre Arts section of First Term course descriptions in this bulletin).

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.

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); and Morris Carnovsky (1966). Our 1967 guest, professional commitments permitting, will be Dame Sybil Thorndike.

Archaeological Field Session

The archaeological field techniques course will be offered during the First Term. Students enrolled in the course will participate in the excavation of a pre-ceramic habitation site near Pine City, Minnesota and will work under the direction of Professor Leland R. Cooper of Hamline University.

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 lectures, 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, Olympia, 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 \$1,475 including University fees. An examination will be required.

Members of the group will depart from New York by air on June 28, 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 a later date than that of group return.

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 1967, SPAN will have 51 students studying in Czechoslovakia, Israel, Uganda and Venezuela. The SPAN program can be divided into three distinct phases: preparation, study abroad, and 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 161-162 and the faculty directors of the group are considered members of the University's Summer Session faculty. For further information, contact Professor Theofanis Stavrou, History Department, University of Minnesota, Minneapolis, Minnesota 55455.

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 Nolte Center for Continuing Education. 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, St. Paul, 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 \$400 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 \$27. Students in certain courses are required to furnish microscopes.

Medical Students or Physicians Registering for Externships—A tuition fee of \$63 per term is charged for the externships listed under the various clinical departments. This is the same for residents and nonresidents 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. Each registrant for an externship will pay the incidental fee of \$13.50 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—Several of the courses in the 1967 School of Nursing Summer Session are restricted to those students who are currently enrolled in the school's regular programs. However, a limited number of courses has been planned to meet the needs of registered nurses. Registered nurses planning to enroll in *Summer-Session-courses-only* register in the School of Nursing and pay Summer Session fees. 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 *Bulletin of the School of Nursing*.

Programs Leading to a Master's Degree—Elective courses and undergraduate courses required prior to enrollment in the programs leading to the degrees of master of science in psychiatric nursing, master of science in medical-surgical nursing, or master of education in nursing education are available during the Summer Session. Students in education register in the College of Education. Students in psychiatric nursing and medical-surgical nursing register in the Graduate School. Students pay Summer Session fees.

Programs Leading to the Degree of Bachelor of Science—Graduates of associate degree or diploma programs in nursing who are enrolled in the baccalaureate nursing program may register in the School of Nursing for general education courses and pay Summer Session fees. For further information, see the *Bulletin of the School of Nursing*.

High school graduates and transfer students from colleges or universities may register for elective courses in the College of Liberal Arts and pay Summer Session fees. For further information, see the *Bulletin of the School of Nursing*.

Students already enrolled in the baccalaureate programs in the School of Nursing who attend Summer Session pay Summer Session fees.

Program in Practical Nursing—Fourth-quarter students in practical nursing register in the School of Nursing and pay regular School of Nursing fees. This program will not be offered after this year.

SCHOOL OF PUBLIC HEALTH

Summer courses at the graduate level are designed both for completion of Master's degree programs and, in the fields of environmental health, veterinary public health, and public health nutrition, for students beginning such programs. It is expected that all students in these latter three 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 eighth 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 12 to August 19. For further information, write the 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 the First and Second Terms to specialists who have an interest in water quality control. It 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 a fully equipped 30-foot research vessel is available for the scheduled field studies. The courses will be limited in registration, and will run from June 12 to July 15 and from July 17 to August 19. For detailed information write the 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 offered by the department are primarily for those students who will be matriculating fall quarter 1967 for their final year in either the Plan A or Plan B program for the associate in mortuary science degree. The inclusion of these courses in the final year of either program makes an extremely heavy class schedule and it is recommended that in every possible instance they be completed prior to the last year's matriculation. The offerings are those courses not obtainable in other colleges of the University or at other institutions of higher learning.

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

The Institute of Technology includes the College of Engineering, the School of Architecture, the School of Chemistry (chemical engineering and chemistry), the School of Earth Sciences (geology and geophysics), the School of Mathematics, the School of Mineral and Metallurgical Engineering, and the School of Physics and Astronomy.

A few courses are offered in architecture; astronomy; aeronautics and engineering mechanics; civil, electrical, and mechanical engineering; engineering graphics; geology; mathematics; and physics. The School of Mineral and Metallurgical Engineering offers summer field trips in alternate years, as well as two courses in physical metallurgy and a few problems and research courses.

In the Department of Chemistry, analytical, general, inorganic, 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 12 to August 19 (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.

3M Distinguished Lectures in Chemistry

The 3M Visiting Lecturer for 1967 will be the noted theoretical chemist, Professor J. W. Linnett, of Cambridge University. The title for the lectures will be "Atoms, Molecules, and Electrons." The lectures will be presented in the period July 3-July 28.

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 effort to satisfy the increasing demand for earth sciences in high school curriculums.

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.

Structural and Inorganic Chemistry

The Division of Inorganic Chemistry will have a National Science Foundation institute for college teachers from June 12 through July 14. The major objective of the institute will be to contribute to the improvement of teaching advanced inorganic chemistry by the participants through broadening their understanding of and background in the structural aspects of modern inorganic chemistry. This is to be accomplished by presenting an intensive, rigorous 5-week course dealing with modern approaches to this field.

In addition to the regular faculty, nine outstanding chemists have accepted invitations to participate as outside lecturers in this institute. These men are recognized for their original contributions to the field of structural and inorganic chemistry both as teachers and as active research workers.

The institute is not offered for credit and is open to participants by invitation only. For further information contact Professor Doyle Britton, Department of Chemistry, Minneapolis, Minnesota 55455.

GENERAL EXTENSION DIVISION

Department of Conferences and Institutes Program

NOLTE CENTER FOR CONTINUING EDUCATION

The following institutes and short courses will be offered during the Summer Session:

June 22-23—Seminar for Clerks of District Courts

June 26-30—Creative Writing for Children and by Children

July 10-14—Dynamic Communication in Middle Management

July 17-22—Techniques of Infrared Spectroscopy

July 24-28—Chemical Interpretation of Infrared Spectra

Summer Technology Seminars

For further information, please write to the Director, Department of Conferences and Institutes, Nolte Center for Continuing Education, University of Minnesota, Minneapolis, Minnesota 55455.

UNIQUE PROGRAMS AT CIC INSTITUTIONS

The Committee on Institutional Cooperation (CIC) is an organization established in 1958 to provide for voluntary co-operative 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.

In addition to the two rotating institutes (Far Eastern Languages at the University of Michigan, and Slavic Language and Area at Indiana University) sponsored annually by CIC, the following courses were considered by the CIC Summer Session Committee to be unique offerings of the co-operating institutions. This list is only descriptive and is provided to assist students in selecting a summer program in an area which otherwise may be limited in the summer. Interested persons are advised to write the dean or director of the respective institution for complete official information.

Courses designated "graduate" are open only to graduate students. Those not so restricted are open to both undergraduates and graduate students.

University of Illinois • Urbana, Illinois

Library Science 450. Advanced Study in Librarianship. Graduate level, prerequisites. Course deals with new Anglo-American Code of Cataloging. July 17-August 12.

Inter-University Rotating Summer Program in South Asian Studies (in co-operation with CIC institutions). Courses in area studies and in eight Indian languages. Brochures available at CIC institutions. June 20-August 25.

Indiana University • Bloomington, Indiana

Folklore Institute. Several courses dealing with American, French and Celtic folklore. June 21-August 10.

Information Systems Design L744. Systems analysis applied to libraries and information systems; conversion design; evaluation of results. Graduate. June 21-August 10.

Geometric Optics I. Optics of lenses, prisms, and mirrors. Emphasis on application in visual science. Trigonometry essential. Undergraduate. June 21-August 10.

Elementary Mongolian (intensive), 12 credits; **Advanced Mongolian**, 9 credits; **Introduction to Uzbek**, 6 credits, intensive study of languages of Central Asia. June 21-August 10.

University of Iowa • Iowa City, Iowa

Translation Workshop 8:488. A course for those interested in the translation of foreign texts into English of high literary merit. Graduate. June 14-August 9.

Great Books of China and India 39:163. Advanced course for serious students of religion and philosophy. Book reports and term paper. No prerequisite. June 14-August 9.

The Genius of American Religious Institutions. A delineation of outstanding characteristics of contemporary religious scene in the United States. June 14-August 9.

Iowa Summer Pastoral Care Institute 32:255. Emphasis on pastoral relationships with patients to help clergymen gain insights and skills which will make their ministry more meaningful. June 5-July 14.

Iowa Lakeside Laboratory. Course offerings in field biology, helminthology, morphology of algae, aquatic ecology, field entomology, etc. June 14-July 14; July 17-August 9.

Michigan State University • East Lansing, Michigan

Summer Institute of Glaciological Sciences (Juneau Icefield, Alaska). Intensive study in arctic sciences; geomorphology, glaciology, snow physics, geological mapping, arctic botany. Graduate and advanced undergraduates. July 15-September 1.

W. K. Kellogg Biological Station (Gull Lake, Michigan). Instruction in microbiology, botany, entomology, parasitology. June 17-August 26.

Northwestern University • Evanston, Illinois

Summer Institute in Transportation. Designed to provide insights into social, economic and technological forces affecting transportation in modern society. Courses in transportation, development, engineering, economic theory, location and regional analysis, and geography. June 26-August 19.

University of Wisconsin • Madison, Wisconsin

Anthropology 690. Ethnological Fields: Mexico. A study of the religious-pilgrimage network which links native communities of Central Mexico with sacred religious shrines. Meets field training needs in Latin America for graduate students regardless of their discipline. Graduate. June 5-September 5.

Tri-State Field Seminar in Geography (jointly sponsored by Departments of Geography at Iowa, Minnesota, and Wisconsin). Provides guided experi-

ence in the formulation and study of individual field problems in one or two branches of geography. Graduate. August 14-31.

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: Music 60 (Introduction to Orchestral Repertoire); the Lake Itasca Biology Session; Public Health 138 (Hospital Engineering Problems); and Public Health 231-232 (Ground Water Development). A description of these programs will appear in the summer bulletins of all CIC member institutions. The programs are described in this bulletin in the appropriate college or departmental section.



This special section reports on "Summer Music at Minnesota," an exciting concept in music and music education in which the Minneapolis Symphony Orchestra serves as a teaching instrument during the first term of the 1967 Summer Session.

As in the 1966 Summer Session, the Symphony will be in residence, sharing in a comprehensive program of courses and workshops throughout the 5 weeks of the first term—June 12 to July 15.

Among the special features, described in detail in the following pages, will be:

Music 60, "An Introduction to Orchestral Repertoire"
Contemporary Music Workshop
High School Musicians Project
Elementary and Secondary Music Education Workshops in Creative
and Contemporary Music
High School Music Teachers Workshop
Opera Workshop

In addition, the Symphony will present a series of concerts open to the public.

Teachers enrolled in Music Education for this first term of the Summer Session will have access to most of these programs, including open rehearsal of the Symphony and many phases of the instructional program for high school musicians.

"Summer Music at Minnesota" is a first step in providing the people of Minnesota and the Upper Midwest with a comprehensive summer program in the performing arts; a program designed for the serious artist, educator, student, listener, and viewer.





“introduction to orchestral repertoire” (music 60)

Summer Music at Minnesota this year again presents Music 60, An Introduction to Orchestral Repertoire. The 5-week course, designed with the nonspecialist in mind, provides students an opportunity to familiarize themselves with the meanings in music.

Live demonstrations will be conducted twice a week by the full Minneapolis Symphony Orchestra and smaller instrumental and vocal ensembles on the Northrop Auditorium stage. They will be joined by distinguished composers, conductors, and other music specialists in a series of listening classes carefully planned to promote a better understanding of the music frequently heard in concert and recital halls.

George Trautwein, Associate Conductor of the Minneapolis Symphony, will conduct the first and final sessions. His lectures will deal with the way Richard Strauss, Claude Debussy, and Gustave Mahler utilized the large orchestra to invent new ways to vary the language of music. Other sessions will feature the distinguished conductor, Stanislaw Skrowaczewski, Musical Director of the Minneapolis Symphony Orchestra, in a demonstration designed to acquaint the concert-goer with recent innovations in contemporary music for orchestra. Lecturers also include Professors Paul Fetler and Arnold Caswell of the University music faculty.

A chorus comprised of gifted high school students, on campus for the High School Musicians Project, will be the highlight of another session. Small ensembles consisting of members from the Minneapolis Symphony Orchestra will perform string quartet, woodwind, brass, and percussion chamber music, with emphasis on the characteristic orchestral passages of each instrument.

One special session will demonstrate the vitality of "early music" from the Middle Ages, the Renaissance, and Baroque eras by utilizing the solo voice, harpsichord, recorders, string, and double reed instruments. A professional dance group will join the orchestra to demonstrate the ways in which dance movement has shaped the abstract symphonic music of Beethoven, Haydn, and Mozart.

Music specialists are also urged to attend and may take Music 60 for credit. Grades will be assigned on the basis of separate examinations which will cover reading assignments not required of the nonmusic majors.

Fee for the course for those not attending summer school is \$22. Dates are Tuesday, June 13, to Thursday, July 14. The class will meet in the evening for greater convenience of persons interested in music.



For additional information concerning Music 60, write or call: Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2925.





high school musicians project

A unique approach to music education, the second annual High School Musicians Project, will be held on the University of Minnesota campus this summer.

The 4-week program will be offered to 141 high school sophomores and juniors judged to be among the state's most musically and academically gifted students. Dates for the project are June 12 to July 9.

The creative music program, a combined effort of the University and the Minnesota Orchestral Association, offers students the opportunity to play alongside Minneapolis Symphony Orchestra members. Designed to orient talented young musicians to music as literature and as a vocation, the project attempts to present an overview of music's related disciplines as well as music as a performing art. It also assists music teachers throughout the state in their efforts at broadening approaches to music study and instruction.

Statewide auditions were held to select the students, who are divided evenly among wind and percussion concert band musicians; string, wind, and percussion orchestral musicians; and vocalists. Participants receive full scholarships for all classes, lessons, and practice sessions. A small fee for board and room in University residence halls will be charged.

In addition to playing with the Minneapolis Symphony in rehearsal sessions, the musicians will also attend college level classes in theory, creativity, and music literature. Faculty will be drawn from the University Music Department, members of the Minneapolis Symphony, and nationally selected music teachers.

One of the literature courses the students will attend, Music 60, An Introduction to Orchestral Repertoire, uses the entire orchestra to demonstrate the meanings found in music. This class will be held in Northrop Auditorium and is open to the general public.

Other features of the project include the following: private applied lessons for vocalists and vocal classes in diction and repertoire; group lessons conducted by members of the Minneapolis Symphony and faculty of the Music Department; chamber music rehearsals; student solo recitals and chamber concerts; and intensive band, orchestra, and chorus rehearsals culminating in a concert at the end of the project.

A staff of trained recreation leaders, who will be able to assist the musicians with their studies and practice sessions, will be in charge of all social and recreational activities.



For information concerning the High School Musicians Project, write or call: Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2925.





high school music teachers workshop

This program, offered for the first time in the summer of 1967, provides an opportunity for intensive study of music literature recommended for use in secondary schools.

Workshop dates are the same as those for the first term of Summer Session, June 12 to July 15. Participants may receive college credit for some of the work planned for the workshop. It is designed to be equally meaningful for teachers who instruct in vocal, wind, or woodwind music.

The program will center on performance and observation. Included will be a 3-credit workshop seminar, daily ensemble rehearsal coached by members of the Minneapolis Symphony Orchestra and the University faculty, along with graduate courses in music and related areas. The observation activities will focus on different parts of the High School Musicians Project, which will be held on the University campus at the same time.



For additional information concerning the High School Music Teachers Workshop, write or call: Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2925.

music education workshop

The 1967 Elementary and Secondary Music Education Workshop is scheduled to be held for its fifth successive year, on Monday and Tuesday, June 19 and 20, 1967.

Its major concern will be to deal with "Music Reading and Listening—Contemporary Music." It is planned to focus its major emphasis upon the elementary grades with some attention also directed toward the junior high school class level.

The 1967 guest clinician will be Eunice Boardman, Professor of Music Education, Wichita State University, Wichita, Kansas. She will be joined by members of the University of Minnesota Music Education faculty.



The workshop is offered on a no-credit basis. There will be a \$10 fee for the 2-day event. Applications for enrollment in the workshop and requests for information should be mailed to Robert L. Borg, 214 Scott Hall, University of Minnesota, Minneapolis, Minnesota 55455.



contemporary music workshop

The increased existence of musical literature written for the symphony orchestra by master composers using twelve note, serial, or modal techniques and the ever widening acceptance of these forms by both the performing artist and audiences makes it necessary for the music educator, musician, or critic to be provided with added resources for their study of such music.

The noted American composer Elliott Carter and Stanislaw Skrowaczewski, musical director of the Minneapolis Symphony Orchestra, will be co-directors of a workshop to be held as a part of "Summer Music at Minnesota" from Monday, July 3 through Friday, July 7, with its complete attention turned to examining major trends in contemporary music. The workshop is designed to take place in both a seminar setting and full orchestral demonstration.

Mr. Carter studied at Harvard under Walter Piston and E. B. Hill before studying in France for several years.

He has twice been awarded Guggenheim fellowships for study abroad and has again recently demonstrated his capacity for creative inventiveness with his concerto for piano and orchestra. His frequently heard compositions encompass many forms of musical expression and continue, over a lengthening period, to constitute evidence of his capacity for highly original musical creativity.

Mr. Carter's lectures will be carefully planned to be illustrated by the rehearsal sessions of the Minneapolis Symphony Orchestra. Maestro Skrowaczewski will also provide added dimensions in the exploration of the compositions to be heard.



For additional information concerning the Contemporary Music Workshop, write or call: Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2925.





opera workshop

A joint offering of the Center Opera Company and the Summer Session becomes part of "Summer Music at Minnesota" in 1967 to provide training for Upper Midwest residents involved in the production and presentation of opera. The workshop will meet at the MacPhail Center for the Performing Arts.

Offered at both beginning and advanced levels, the workshop will meet in 2-hour sessions three times a week for a 6-week period from Monday, June 12 through Friday, July 21.

The workshop will be under the general direction of H. Wesley Balk, Assistant Professor of Speech, Communication, and Theatre Arts, who is the artistic director of the highly successful operas produced by the Center Opera Company.

Training in body movement, stage direction, and individual and group ensemble work will be featured. Participants will be thoroughly coached in specific roles. Each will be committed by intensive study to two scenes from different operas.

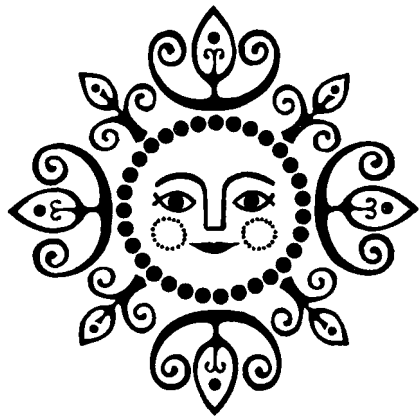
At the discretion of the director, selected scenes will be presented by the workshop members in public performance.

Private voice lessons correlated with the workshop study plan will be presented by George Kroenlein, vocal instructor in the Department of Music at the University of Minnesota.

Opera Workshop admission is by audition only. The tuition is \$90 with full or partial scholarships, awarded by the Center Opera Association, granted at the option of the workshop director.



For information concerning the Opera Workshop write or call: Summer Session, 135 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455; telephone 373-2925.



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 room ar) Staff

Agronomy and Plant Genetics (Agro)

Agronomy

201° RESEARCH IN FARM CROPS

Problems in physiology, production, and classification of crop plants. (Cr and hrs ar; prereq 121, 127) 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 for both terms; prereq 132 or #) Lambert

Animal Husbandry (AnHu)

213 RESEARCH IN ANIMAL HUSBANDRY

Special problems assigned to students to be worked out under the supervision of a faculty member. (3-5 cr; prereq #; hrs ar) Hanson, Jordan, Meade, Rempel, Boylan, Meiske, Goodrich, Melliere

Dairy Husbandry (DyHu)

202° RESEARCH IN DAIRY PRODUCTION

Special problems assigned to fit student needs. (Cr ar; prereq prelim grad work; hrs ar) Cole, Donker, Graham, Williams, Young, Otterby

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.

- 243° RESEARCH IN ENTOMOLOGY
(Cr ar) Hodson, Chiang, Cook, Peterson, Brooks, Kulman, Price, Radcliffe
- 267° RESEARCH IN FISHERY BIOLOGY
(Cr ar) Smith, Waters
- 280° RESEARCH IN WILDLIFE BIOLOGY
(Cr ar) Marshall, Beer, Tester, 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) Coulter, Morr, Morris, Thomas
- 180° SPECIAL PROBLEMS IN DAIRY AND FOOD MICROBIOLOGY
Laboratory or library research on problems related to the microbiology of dairy products. (1-3 cr; prereq sr or ‡; hrs ar) Jezeski, Olson

Forestry (For)

OFFERED ON THE TWIN CITIES CAMPUS (ST. PAUL)

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

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

OFFERED AT LAKE ITASCA FORESTRY AND BIOLOGICAL STATION

Second
Term
Courses

Special Term for Forestry Students

(August 21 to September 22)

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 5 days per week. Largely field or laboratory work. In addition to the regular field work in For 54 and 56, special field trips to federal, state, and private forestry operations are 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, §2) Mohn

54 FOREST ECOLOGY

Ecological principles. Silvical characteristics of tree and shrub species. Forest communities and environmental factors. (3 cr, §5) Hansen, Sucoff

56 FIELD FOREST MEASUREMENTS

Woods surveying, tree measurements, and timber estimating. (1 cr, §6) Hallgren

57 INTRODUCTION TO FOREST RECREATION

An introduction to recreational use of the forest based upon the planning, management, and interpretation at Itasca State Park. (2 cr, §14) Frissell

Soil 3A FIELD FOREST SOILS

Soil texture, structure, consistence, reaction, and color. Field study and description of soil profiles. Use of soil maps in forestry. (1 cr) Armeman

Home Economics (HE)

21 COLOR

Study of color theory and its application to problems in dress and interiors; experiments with paint mixing; color in light; color illusion. Emphasis on development of sensitivity and awareness. (3 cr; I-II MTWThF; McNH 342) Nagle

24B HOME PLANNING AND FURNISHINGS EXPERIENCES I

Problems in designing for living space needs. Experiences in evaluation of design quality of furnishing elements. Selection and co-ordination of fabrics, furniture, accessories in a studio room. Field trips (3 cr; prereq 21, 24A; III-IV MTWThF; McNH 360, 425) Forsyth

86 HOME MANAGEMENT LABORATORY

(Students should not register for a first period class)

Residence for 5 weeks in one of the two home management houses, 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...41 recommended; deposit of \$10 required) Ar

120 ART HISTORY

Art from the Egyptian period to the present. Painting, sculpture, and architecture of the past studied for influence on contemporary period. Field trips. (3 cr; II MTWThF; McNH 358) Forsyth

121 TEXTILE DESIGN

Designing textiles. Printing and dyeing techniques such as silk screen, batik, block printing, tie dye. (3 cr; prereq 21, 23 or #...19 recommended; III-IV MTWThF; McNH 433) Abell

- 179 **READINGS IN NUTRITION**
Survey of literature in the field; oral and written reports. (2 cr; prereq 170; ar) Simy
- 221 **SPECIAL PROBLEMS IN TEXTILE DESIGN**
Advanced study in textile design such as silk screen, block printing, or batik. (1-3 cr; prereq 121 or §; III-IV MTWThF; McNH 433) Abell
- 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; prereq §) 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
- 251x* **ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING**
Written report based on library, laboratory, or field research. (3-9 cr; prereq §) Staff
- 252x* **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 NEMATODOLOGY**
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, Anderson, Kennedy, Mirocha, Rowell, Bantari, Calpouzos, MacDonald, Moore
- 207* **PROBLEMS IN MYCOLOGY**
Research along such lines as taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; investigation of fungi involved in industrial or natural processes; morphology or physiology of special forms. (Cr ar; prereq 105, 106, 107) Christensen, Anderson

Poultry Science (Poul)

- 214* **RESEARCH IN POULTRY SCIENCE**
Research problems assigned to meet the needs of the student. (Cr ar; prereq §; hrs ar) Staff
- 215* **RESEARCH IN POULTRY NUTRITION**
(Cr ar; prereq §; hrs ar) Waibel, Snetsinger
- 216* **RESEARCH IN POULTRY BREEDING**
(Cr ar; prereq §; hrs ar) Shoffner
- 219* **RESEARCH IN AVIAN PHYSIOLOGY**
(Cr ar; prereq §; hrs ar) Phillips

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

Rhetoric (Rhet)

Second
Term
Courses

2 COMMUNICATION II

Expository communication. Note-taking, outlining. Short themes, library research, term paper, documentation. (3 cr; limited to 25 students; prereq 1; I MTWThF; AgEng 307) Nelson

22 PUBLIC SPEAKING

A practical course in the fundamentals of speech making. 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) Marchand, Horberg

Sec 1, I MTWThF, ForH 115

Sec 3, III MTWThF, ForH 115

Sec 2, II 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) Nelson

251 SEMINAR: LISTENING COMPREHENSION

Research problems and methods in this field. Evaluation of published research. (2 cr, §Spch 251; III MTWThF; AgEng 221) Nichols

Soil Science (Soil)

3A FIELD FOREST SOILS

Soil texture, structure, consistence, reaction, and color. Field study and description of soil profiles. Use of soil maps in forestry. (1 cr; given at Itasca) Arneman, Farnham

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

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

College of Biological Sciences

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

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 \S ; hrs ar) Briggs, Dagley, Henderson, Jenness, Kirkwood, Liener, Schultze, Gander, Glass, Lovrien, Warner

Biology (Biol)

- 2†† **GENERAL BIOLOGY**
(See Biol 1, First Term) (5 cr; limited to 168 students; prereq 1 or equiv; lect V MTWTh, V-VI F, Aero 313, 317, 319, 321; lab VI-VIII MTWTh, Z 101ABCD) Ar

Botany (Bot)††

- 299 **RESEARCH PROBLEMS**
(Cr ar; prereq \S) Staff

Zoology (Zool)††

- 99 **INDIVIDUAL WORK IN SOME SPECIAL DISCIPLINE**
(Cr ar; prereq Biol 2 or 50 and \S) Staff
- 101 **BASIC ZOOLOGY**
(Cr ar; prereq grad only; hrs ar) Staff
- 299 **RESEARCH**
(Ar cr)

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

†† The entire course in elementary biology includes both Biol 1 and 2. No credit is given for Biol 1 until the satisfactory completion of Biol 2.

Biology Session

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, 6790 Johnston Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Botany (Bot)

- 112 **AQUATIC FLOWERING PLANTS**
(5 cr; limited to 20 students; prereq 52 or equiv or #; MTh) Beal
- 116 **SUMMER FLORA OF MINNESOTA**
(5 cr; limited to 20 students; prereq 52 or equiv or #; WS) Thieret
- 152 **ECOLOGY OF FRESHWATER ALGAE**
(5 cr; limited to 20 students; prereq 150 or 155 or #; MTh) Brook
- 155 **FRESHWATER ALGAE**
(5 cr; limited to 20 students; prereq 10 cr in botany, biology, or zoology, or #; TF) Meyer
- 158 **THEORY AND PRACTICE IN ENVIRONMENTAL MEASUREMENT**
(See For 158)
- 99 **RESEARCH PROBLEMS**
(5 cr; prereq major in biological sciences, #) Staff
- 299° **RESEARCH PROBLEMS**
(Cr ar; prereq grad) Staff

Entomology, Fisheries, and Wildlife (Ent)

- 129 **AQUATIC ENTOMOLOGY**
(5 cr; limited to 15 students; prereq 59, 74 or equiv or #; MTh) Cook
- 162° **VERTEBRATE ECOLOGY**
(5 cr; limited to 20 students; prereq Biol 80 or equiv; WS) Rongstad
- 196° **SPECIAL PROBLEMS IN ENTOMOLOGY, FISHERIES AND WILDLIFE**
(Cr ar; prereq #) Staff

Forestry (For)

- 158 **THEORY AND PRACTICE IN ENVIRONMENTAL MEASUREMENT**
(Same as Bot 158) (5 cr; limited to 20 students; prereq college physics, ecology, or physiology; MTh) Miller
- 215° **RESEARCH PROBLEMS IN FOREST-TREE PHYSIOLOGY**
(Cr ar; prereq #) Miller

Plant Pathology and Physiology (PIP_a)

- 56 **INTRODUCTION TO THE STUDY OF FUNGI**
(5 cr; limited to 7 students; prereq 9 cr in botany, or #; WS) French

- 156 **STUDY OF FUNGI FOR ADVANCED STUDENTS**
(5 cr; limited to 8 students; prereq 9 cr in botany, or #; WS) French
- 160 **AQUATIC FUNGI**
(5 cr; limited to 20 students; prereq 9 cr in botany, or #; TF) Johnson
- 210° **SPECIAL PROBLEMS IN MYCOLOGY**
(Cr ar; prereq grad, Myc 107) French, Johnson

Zoology (Zool)

- 72 **NATURAL HISTORY OF INVERTEBRATES AND FISHES**
(5 cr; limited to 10 students; prereq Biol 2 or #; TF) Dineen
- 115 **ADVANCED NATURAL HISTORY OF INVERTEBRATES AND FISHES**
(5 cr; limited to 10 students; prereq 15 cr in zoology or #; TF) Dineen
- 119 **LIMNOLOGY**
(5 cr; limited to 20 students; prereq 15 cr in biology or #; WS) Underhill
- 195° **PROBLEMS IN ECOLOGY AND LIMNOLOGY**
(Cr ar; prereq Biol 2 or equiv, and #) Staff

School of Business Administration

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

Accounting (Acct)

- 25 PRINCIPLES OF ACCOUNTING**
(Continuation of Acct 24) (3 cr, §55B; prereq 24)
Sec 1, II MTWThF, CB 230, Ar Sec 2, IV MTWThF, CB 125, Ar
- 26 PRINCIPLES OF ACCOUNTING**
(Third quarter—see Acct 24) (3 cr, §55B; prereq 25)
Sec 1, I MTWThF, CB 125, Gray Sec 2, III MTWThF, CB 115, Gray
- 55B ELEMENTARY ACCOUNTING**
(Continuation of Acct 55A) (4 cr, §24, 25, 26; counts as Lower Division course when transferred to CLA; prereq 55A [summer only]; 7:30-8:50 MTWThF; CB 115) Zimmer
- 75A†† ACCOUNTING LABORATORY I**
(See First Term) (1 cr for both terms; prereq 26 or equiv, ¶105A; VI-VII W; CB 110) Ar
- 105A†† INTERMEDIATE ACCOUNTING I**
(See First Term) (3 cr for both terms; prereq 26 or equiv; IV MWF; CB 430) Smith
- 115B†† COST ACCOUNTING**
(See First Term) (3 cr for both terms, §55C; prereq 115A; II MWF; CB 430) Smith
- 125†† AUDITING PRINCIPLES AND PROCEDURES**
(See First Term) (4 cr for both terms; prereq 105C or ¶105C and 105B; 7:30-8:50 MWF; CB 430) Smith
- 175B DATA PROCESSING SYSTEMS**
Analysis of business information systems. Includes application of manual, tabulating, and electronic data-processing systems. (3 cr; prereq 115B; III MTWThF; CB 430) Zimmer

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; CB 140) Ar
- 76 CAPITAL MARKETS AND INSTITUTIONS**
(Formerly 72) Study of the characteristics and institutional structure of the money and capital markets and their interrelationship through interest rates and prices.

†† The course runs for two terms. No credit is given for First Term until satisfactory completion of Second Term.

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; CB 105) Ar

156 BUSINESS FINANCE FUNDAMENTALS

Study of the financial management of firms. Principles governing the planning, raising, and control of short- and long-term funds. Attention directed to capital structures, valuation situations, capital budgeting, dividend policy. Presented through text, problem, and case material. (3 cr, §56; prereq grad, Acct 26 or Acct 155B; I MTWThF; CB 140) Ar

Industrial Relations (IR)

52 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

Introduction to current employment relationships; an 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 association, industrial unrest and conflict, employment and unemployment, wage problems. (3 cr, §152; prereq Econ 2 or equiv; III MTWThF; CB 230) Simler

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; CB 110) Smythe

152 SYSTEMS OF INDUSTRIAL RELATIONS: LABOR MARKETING

(See IR 52) (3 cr, §52; prereq Econ 2 or equiv; III MTWThF; CB 230) Simler

172 SYSTEMS OF INDUSTRIAL RELATIONS: MANPOWER MANAGEMENT

(See IR 72) (3 cr, §72; prereq Econ 2; II MTWThF; CB 110) Smythe

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; II MTWThF; CB 105) Weitzel

232 COLLECTIVE BARGAINING: THE PROCESS

Examines the collective bargaining process in terms of its functions, variants, determinants, practices, and impacts. (3 cr; prereq 152; IV-V MWF; CB 105) Smythe

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; prereq sr and completion of business core or ¶ final core course; 7:30-8:50 MTThF; CB 425) Juralewicz

70 FUNDAMENTALS OF MANAGEMENT

The principal functional areas of management: planning, organizing, staffing, directing, and controlling. Examines attributes of good organization; establishment of goals, policies, and procedures; control systems and techniques; providing necessary factors and relationships to achieve organizational objectives. (3 cr; 7:30-8:50 MTThF; CB 435) Mauriel

150A FUNDAMENTALS OF MANAGEMENT

A first course in management at the graduate level covering functions of the manager; planning, organization, staffing, direction, and control. Activities,

problems, and common remedies under each of these functional headings. Case analysis designed to bring out specific points and develop insights into management problems. (3 cr, §70, §old 180, §old 170; prereq grad or §; 9:05-10:20 MTThF; CB 435) Mauriel

Second
Term
Courses

Marketing (Mktg)

57 PRINCIPLES OF MARKETING

Marketing functions and institutions. Channels of distribution. Retail and wholesale trade. Pricing policies and practices. Marketing policies and methods for consumers' goods, producers' goods, and raw materials. (3 cr, §157; prereq Econ 2 or equiv; I MTWThF; CB 250) Mittelstaedt

77 ADVERTISING

A survey of economics and functions of advertising, budgets, agencies, media, copy, layout, printing processes, and research. (3 cr, §207; prereq 57...Psy 156 recommended; IV MTWThF; CB 240) Lewis

97 MARKET ANALYSIS AND RESEARCH I

Techniques used in marketing research. Emphasis on marketing information which can aid in the solution of marketing problems. Selected nonsurvey and survey research techniques. (3 cr, §217; prereq QA 51, 57; I MTWThF; CB 240) Russick

117 SALES MANAGEMENT I

Sales policies and planning, sales organization, election, training, and compensation of salesmen, control of sales performance, sales budgets, and cost control. Case materials. (3 cr, §237; prereq 57; II MTWThF; CB 205) Lewis

157 MARKETING FUNDAMENTALS

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 grad or §, Econ 2 or equiv; IV MTWThF; CB 115) Mittelstaedt

807 ADVERTISING AND SALES PROMOTION

(See Mktg 77) (3 cr, §77; prereq 57 or 157; IV MTWThF; CB 240) Lewis

217 MARKET ANALYSIS AND RESEARCH

(See Mktg 97) (3 cr, §97; prereq QA 51 or QA 151 and 57 or 157; I MTWThF; CB 240) Russick

237 SALES MANAGEMENT

(See Mktg 117) (3 cr, §117; prereq 57 or 157; II MTWThF; CB 205) Lewis

Quantitative Analysis (QA)

5 ELEMENTS OF STATISTICS

Sources and collection of data, tabular and graphic presentation; frequency distribution; probability; sampling; introduction of statistical estimation and decision-making. (3 cr, §151, §Soc 45, §Psy 70; prereq Math 10 or equiv; I MTWThF; CB 255) Kozelka

51 BUSINESS STATISTICS

Basic concepts of regression and correlation; statistical estimation and decision-making, applications to survey sampling, acceptance sampling and statistical quality control; time series analysis and index numbers. (3 cr, §161; prereq soph with §, 5 or equiv; II MTWThF; CB 140) Ar

61†† INTRODUCTION TO ELECTRONIC COMPUTERS

(See First Term) (2 cr for both terms; prereq 5, Math 10 or equiv; lect II TTh; CB 430) R Johnson

Sec 1, hrs ar, CB 93

Sec 2, hrs ar, CB 93

†† The course runs for 2 terms. No credit is given for First Term until satisfactory completion of Second Term.

College of Education

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

Agricultural Education (AgEd)

- 221 **FIELD PROBLEMS**
The development and study of special problems in the field of the individual student's choice. (3 cr; hrs ar) Peterson, Nelson, Persons, McMillion
- 232° **RESEARCH IN AGRICULTURAL EDUCATION**
Selecting research problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts. (Cr ar; prereq 15 cr in education) Peterson, Nelson, Persons, McMillion

Art Education (ArEd)

- 10 **ELEMENTARY SURVEY**
Introduction to pictorial expression, design, and the function of art in the social environment as a foundation for elementary teachers. (2 cr; each section limited to 30 students) Mitra
Sec 1, I MTWThF, WuH 240, 2 hrs ar
Sec 2, III MTWThF, WuH 240, 2 hrs ar
- 18 **DESIGN ACTIVITIES FOR ELEMENTARY EDUCATION**
Projects in invention arrangement and decoration; color, lettering, posters, bulletin board displays. (3 cr; limited to 30 students; III-IV MTWThF; WuH 120) Bradley
- 80 **CONTEMPORARY CRAFTS**
Materials, equipment, design criteria and techniques for textile, wood, metal, and ceramics; application to educational programs in elementary and secondary schools, adult education, special education, recreation, and occupational therapy. (3 cr; limited to 30 students; I-II MTWThF; WuH 120) Bradley
- 184 **IMPROVING ART PROGRAMS IN THE ELEMENTARY SCHOOL**
Evaluating research findings and introducing new materials; developing cooperation between classroom teachers and education specialists. (3 cr; II MTWThF; WuH 220) Olson
- 295° **PROBLEMS: ART EDUCATION**
Independent projects under staff guidance; may include advanced studio practice or technical problems requiring experimental or library research. (Cr ar; prereq §) Olson

Institute of Child Development

Child Psychology (CPsy)

- 80 **CHILD PSYCHOLOGY**
(3 cr; prereq Psy 2; II MTWThF; Ph 170) Karmel
- 132 **ADOLESCENT DEVELOPMENT**
(3 cr, §81; prereq sr, 12 cr in psychology, child psychology, or educational psychology; I MTWThF; CD 218) Goldin

- 140 **BEHAVIOR PROBLEMS**
(3 cr; prereq 80 or equiv; III MTWThF; Ph 131) Linker
- 142 **PSYCHOLOGY OF HANDICAPPED CHILDREN**
Research related to sensory, speech, language, physical disabilities of children. (3 cr; prereq CPsy 80 or equiv; III MTWThF; CD 218) Jarmon
- 143 **PROBLEMS OF MENTAL DEFICIENCY**
(3 cr; prereq 80 or equiv; IV MTWThF; CD 218) Turnure
- 144 **PSYCHOLOGY OF THE GIFTED CHILD**
Psychology and development of high intellectual ability and of special talents. (3 cr; prereq CPsy 80 or equiv; II MTWThF; CD 218) Phillips
- 181 **SOCIAL DEVELOPMENT**
Family and peer influences; social interaction and social relations; developmental changes. (3 cr; prereq 80 or equiv; IV MTWThF; AH 9) Gliner
- 190 **TOPICS: CHILD PSYCHOLOGY**
(Cr and hrs ar; prereq #) Staff
- 295 **SEMINAR: PROJECTIVE METHODS WITH CHILDREN AND ADOLESCENTS**
Demonstrations, critical analysis and discussion of research tools and clinical devices. (3 cr; prereq #; VI MTWThF; Pt 214) Jarmon

Educational Administration (EdAd)

- 118 **THE COMMUNITY SCHOOL**
Philosophy, purposes, organization, and functioning of the community school; its relationship with the area it serves. (3 cr; II MTWThF; Ph 236A) Pierce
- 128†† **WORKSHOP: EDUCATIONAL ADMINISTRATION (Collective Bargaining)**
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 30 students; IV-VII MTWThF; July 17-August 12; Bu 120) Davis, Mueller
- 167 **JUNIOR HIGH SCHOOL**
Sources of the movement; purposes, functions, and limitations; fundamental problems, types, and curricular implications of reorganization. (3 cr; prereq 9 cr in education; II MTWThF; AH 9) Popper
- 201 **FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
(3 cr; I MTWThF; Pt 111) Pierce
- 202 **FOUNDATIONS OF EDUCATIONAL ADMINISTRATION**
(3 cr; II MTWThF; Arch 45) Ar
- 218 **SEMINAR: SECONDARY SCHOOL ADMINISTRATION**
Problems in school units treated in a tri-dimensional 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 #; IV MTWThF; VH 205) Popper
- 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; II MTWThF; FraH B20) Davis
- 228* **PROBLEMS: EDUCATIONAL ADMINISTRATION**
(1-3 cr; hrs ar) Davis, Domian, Hooker, Mueller, Popper
- 236 **FIELD STUDY**
(0-10 cr; prereq #; hrs ar) Curtin, Davis, Domian, Firth, Hooker, Lambert, Mueller, Pierce, 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 program.

- 241 **SEMINAR: INTERNSHIP IN EDUCATIONAL ADMINISTRATION**
(1 cr; IV MTWThF; FraH B20) Ammentorp
- 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; I MTWThF; Ph 143) Ar
- 270A° **PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION**
(Cr ar; prereq ‡; hrs ar) Curtin, Lambert
- 270B° **PROBLEMS: SECONDARY SCHOOL ADMINISTRATION**
(Cr ar; prereq ‡; hrs ar) Ammentorp, Davis, Domian, Firth, Hooker, Mueller, Pierce, Popper
- 274 **THE JUNIOR COLLEGE**
Present status, development, functions, organization, curriculum, and trends. (3 cr; V-VIII TTh; Bu 105) Hendrix

Educational Psychology (EPsy)

GENERAL COURSES

- 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, Bu 125 Sec 2, IV MTWThF, Bu 125
- 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 45 students) Ar
Sec 1, III MTWThF, C 111 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; I MTWThF; Bu 125) A Anderson
- 148 **CLINICAL DIAGNOSIS OF READING DIFFICULTIES**
Relationship to psychological factors and clinical remedial correction. (3 cr; each section limited to 20 students; prereq EdCI 145) Ar
Sec 1, II MTWThF, CD 105 Sec 2, IV MTWThF, AH 101
- 150 **CLINICAL PRACTICE IN REMEDIAL TEACHING**
Remedial tutoring of individual children who have difficulty in school learning. (3 cr; each section limited to 35 students; prereq EdCI 145 or 151 and ‡) Ar
Sec 1, I MTWThF, Pt 214 Sec 2, II MTWThF, Pt 111
- 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) Kaul
Sec 1, I MTWThF, FraH 20 Sec 2, IV MTWThF, FraH B1
- 182 **EDUCATION OF EXCEPTIONAL CHILDREN**
Overview of field of special education for classroom teachers, counselors, supervisors, and administrators; the initial course for students working on special class certificates. (3 cr; prereq Ed 55B or 75B; VI MTWThF; Pt 111) Ar

- 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; Pt 214) Reynolds
- 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; FraH B1) Crismer
- 186 EDUCATION OF EMOTIONALLY DISTURBED AND SOCIALLY MALADJUSTED CHILDREN**
Discussion and evaluation of curriculum, 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; Bu 125) Ar
- 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, §old 193, 196-197; each section limited to 40 students) Ar
Sec 1, II MTWThF, WuH 230 Sec 2, IV MTWThF, WuH 230
- 208* METHODS IN EDUCATIONAL RESEARCH**
Methods and techniques employed in investigation and report of education problems. (3 cr; limited to 10 students; I MTWThF; CD 105) Hoyt
- 211 ADVANCED INDIVIDUAL MENTAL TESTING**
Familiarizes student with a variety of individual assessment devices, supplementing the Binet and Wechsler scales. Exploration of theoretical aspects of intelligence; administration and interpretation of specific tests; limited practicum involved. (3 cr, §143; limited to 15 students; prereq 210 and #; II MTWThF; WuH 130) Duker
- 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) Ar
- 217A STATISTICAL METHODS LABORATORY**
For students who wish more experience in solutions of problems and the use of machines than is obtained in 217. (2 cr; limited to 22 students; prereq §217; III-IV TWTh; WuH 330) Ar
- 218 STATISTICAL METHODS (Part II)**
(See EPsy 218, First Term) (3 cr total for combined course, †Parts I-II; IV MWF; WuH 130) Ar
- 218A STATISTICAL METHODS LABORATORY (Part II)**
(See EPsy 218A, First Term) (2 cr total for combined course, †Parts I-II; limited to 22 students; prereq §218; II-III MF; WuH 330) Ar
- 233* PROBLEMS: GUIDANCE AND PERSONNEL WORK**
Independent study. (1-9 cr; VI-VII MW; Bu 123) Parker, A Anderson
- 237 PRACTICUM IN GROUP COUNSELING**
Supervised practice in counseling several groups preferably in the setting in which student intends to work; participation in a counseling group as a member with emphasis on systematic evaluation of progress and on developing skill in interpersonal perception, communication, and research. (3 cr; limited to 10 students; VI-VIII MTWThF; Bu 125) A Anderson
- 253* RESEARCH PROBLEMS**
(Cr and hrs ar; prereq #) Wilk, Reynolds, Duker, Force, Turnure, Wood
- 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 6 students; prereq 210 or equiv, EdCI 145, #; 1:00-4:00 MTWThF; rm ar) Wesenberg and clinical staff
- 268 SEMINAR: THE CULTURALLY DISADVANTAGED**
Psychological theory and research with implications for educational planning and procedures. (3 cr; limited to 20 students; prereq #; VII-VIII TTh; Pt 111) Wood

ELEMENTARY EDUCATION

- 60 TEACHING READING IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; I MTWThF; Bu 123) Chang
- 61 TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; II MTWThF; Pt 214) Ar
- 62 TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A, Math 5A-B; I MTWThF; FraH B1, Jackson)
- 63 CHILDREN'S LITERATURE**
(3 cr; limited to 50 students; II MTWThF; Bu 120) Johansen
- 64 TEACHING ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq Ed 75A; IV MTWThF; Ph 166) Dykstra
- 65 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 48 students; prereq Ed 75A; 10 cr in natural science; III MTWThF; Pt 111) Boeck
- 102 TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL**
(3 cr; prereq Ed 75B or equiv; IV MTWThF; Pt 214) Keach
- 103 TEACHING SCIENCE IN THE ELEMENTARY SCHOOL**
(3 cr; prereq sr, Ed 75B or tchg exper; IV MTWThF; Pt 111) Goossen
- 119 ELEMENTARY SCHOOL CURRICULUM**
(3 cr; prereq Ed 75B or equiv; II MTWThF; FraH 120) Goossen
- 121 LITERATURE FOR THE ELEMENTARY SCHOOL**
(3 cr; III MTWThF; Bu 120) Johansen
- 143A TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOL**
(3 cr; limited to 50 students; prereq 9 cr in education; I MTWThF; Bu 120) E Woestehoff
- 149A TEACHING AND SUPERVISION OF MATHEMATICS IN THE ELEMENTARY SCHOOL**
(3 cr, §149; prereq 62 or §; II MTWThF; FraH 20) Jackson
- 150 SUPERVISION AND IMPROVEMENT OF INSTRUCTION**
(3 cr; prereq 9 cr in education; III MTWThF; Bu 123) Curtin
- 153 TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOL**
(3 cr; prereq 64 or elementary school tchg exper; I MTWThF; Ph 145) Dykstra
- 170 EDUCATION OF MENTALLY RETARDED CHILDREN IN THE ELEMENTARY SCHOOL**
(3 cr; prereq EPsy 184; IV MTWThF; CD 105) Ar
- 261* PROBLEMS: IMPROVEMENT OF INSTRUCTION**
(Cr and hrs ar; prereq §) Boeck, Bormuth, Curtin, Dykstra, Goossen, Jackson, Lambert, Odland

SECONDARY EDUCATION

- 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; Arch 135) Gebhard
- 101B†† DRIVER EDUCATION II**
(4 cr; limited to 32 students; prereq 101 or 101A and Δ; 2:30-3:50 MTWThF; Arch 135) Gebhard
- 113 PRINCIPLES OF SECONDARY SCHOOL CURRICULUM**
(3 cr; prereq Ed 55B or equiv; IV MTWThF; Arch 145) Firth, Kimpston

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

- 122 **LITERATURE FOR ADOLESCENTS**
(3 cr; prereq Ed 55B or jr-sr high school tchg exper; II MTWThF; PeikH 275) Kemp
- 132 **TEACHING THE BASIC BUSINESS SUBJECTS**
Recent trends and developments in teaching general business, economic geography, marketing, business law, and consumer education. (3 cr; III MTWThF; Bu 105) Price
- 135 **GROUP PROCEDURES IN GUIDANCE**
Content and materials for home room groups, occupations units, and other guidance courses in junior and senior high school. (3 cr; limited to 25 students; prereq 9 cr in education, EPsy 133 or #; II MTWThF; Bu 123) Ar
- 139 **CO-ORDINATION TECHNIQUES**
Problems of co-ordinators in the co-operative part-time program. Guidance and selection; placing students in work stations, assisting job adjustments, developing the training program. (3 cr; I MTWThF; Bu 105) Ashmun
- 141 **CO-OPERATIVE PART-TIME WORK EXPERIENCE PROGRAMS**
Planning, organizing, curriculum building, plant and equipment, promoting and evaluating co-operative part-time distributive, office, miscellaneous trades and diversified occupations programs. (3 cr; II MTWThF; Bu 105) Meyer
- 144 **TEACHING READING IN SECONDARY SCHOOLS**
(3 cr; prereq 9 cr in education; III MTWThF; PeikH 275) Kemp
- 155 **MATERIALS LABORATORY FOR SOCIAL STUDIES TEACHERS**
Printed and audio-visual materials useful in social studies classes. (3 cr; prereq #; II MTWThF; C 111) Gardner
- 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 U.S. (3 cr, \$200; prereq #; IV MTWThF; Bu 105) Price
- 190 **CURRENT DEVELOPMENTS IN SECONDARY SCHOOL SCIENCE TEACHING**
(3 cr; prereq EdT 68B-C or 68M, equiv undergrad courses or exper in science teaching; II MTWThF; PeikH 385) Gennaro
- 199E **INTERNSHIP: RECREATION LEADERSHIP**
(Cr and hrs ar; available for master of education students in recreation) Ostrander, Scott
- 225° **PROBLEMS: SECONDARY SCHOOL SUPERVISION**
(Cr and hrs ar; prereq #) Firth
- 237 **SEMINAR: RESEARCH IN BUSINESS, DISTRIBUTIVE, AND ECONOMIC EDUCATION**
(0 cr; prereq #; hrs ar) Meyer, Price
- 238° **PROBLEMS: DISTRIBUTIVE EDUCATION**
(Cr and hrs ar; prereq #) Ashmun, Meyer
- 239° **PROBLEMS: BUSINESS EDUCATION**
(Cr and hrs ar; prereq #) Price
- 295 **READINGS IN ENGLISH AND MODERN LANGUAGE EDUCATION**
(1-3 cr; hrs ar) Piche

HIGHER EDUCATION

- 228°‡‡ **WORKSHOP: PROBLEMS OF TEACHER EDUCATION**
(6 cr; hrs and rm ar MTWThF July 17 to August 12) Mork, McCune, Woesthoff 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;

‡‡ 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.

evaluation of outcomes. (3 cr; prereq a year of grad study in any field or 18 cr in education; VI-VII MW, VI F; Bu 105) Corcoran

**Second
Term
Courses**

Education (Ed)

55B INTRODUCTION TO SECONDARY SCHOOL TEACHING

Open only to students accepted for a regular degree program in the College of Education who have completed Ed 55A. (5 cr; each section limited to 30 students; prereq 55A, #; lect I MTWThF; Ph 150) Williams

Sec 1, II MTWThF, Ph 143, Williams	Sec 4, III MTWThF, Ph 236A, Ar
Sec 2, II MTWThF, Ph 145, Ar	Sec 5, IV MTWThF, Ph 143, Ar
Sec 3, III MTWThF, Ph 143, Ar	Sec 6, IV MTWThF, Ph 236A, 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, Arch 40, Bennett
Sec 2, II MTWThF, Arch 40, Bagley

131 COMPARATIVE EDUCATION

European, Asiatic, and American systems and philosophies of education. Explores possibilities of international education. (3 cr; IV MTWThF; VH 2) Corcoran

156 HISTORY OF IDEAS IN AMERICAN EDUCATION

Readings in American political, economic, and social development; reference to the emerging system of public education. Recommended as background for 170. (3 cr; IV MTWThF; Ph 131) Bagley

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, and others. (3 cr; prereq 90; III MTWThF; FraH 120) Bennett

241° PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION

For graduate students interested in research in these areas. (Cr and hrs ar; prereq #) Bagley, Bennett

Home Economics Education (HEEd)

49 INTRODUCTION TO HOME ECONOMICS EDUCATION

Nature of the home economics teacher's work; means for developing necessary competencies. (2 cr; prereq soph, Psy 2; III MTWThF; McNH 103) Wantoch

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) Wantoch

190 READINGS IN HOME ECONOMICS EDUCATION

Independent study under tutorial guidance. (1-3 cr; prereq #; hrs ar) Brown, Ford

201 PROBLEMS: HOME ECONOMICS EDUCATION

Independent study of current educational problems. (1-9 cr, §293; prereq 200A and #; hrs ar) Brown, Ford

Industrial Education (Ind)

109 CONFERENCE LEADING FOR INDUSTRY

Purposes, advantages, and limitations of conference method; techniques of conference procedure; experience in planning, leading, and evaluating conferences and in writing summaries. (3 cr; prereq #; I MTWThF; TNCD 116) Miletich

- 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; TNCD 113) Nelson
- 115 **SUPERVISION OF INDUSTRIAL EDUCATION**
Principles of creative supervision; duties, organization for supervision. (3 cr; prereq 35 or 105; III MTWThF; TNCD 113) 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; TNCD 103) Nelson

Music Education (MuEd)

- 51 **TEACHING MUSIC**
Kindergarten-Primary grades. For nonmusic majors. Appreciation; methods. (2 cr; each section limited to 25 students; prereq Mus 4) Coleman
Sec 1, I MTWThF, ScH 104 Sec 2, II MTWThF, ScH 3
- 52 **TEACHING MUSIC**
Intermediate grades. For nonmusic majors. Appreciation, methods, materials. (2 cr; each section limited to 25 students; prereq 51, Mus 4 or *) Sieber
Sec 1, I MTWThF, ScH 3 Sec 3, IV MTWThF, ScH 3
Sec 2, III MTWThF, ScH 3
- 101 **PHILOSOPHIES OF MUSIC EDUCATION**
Analysis and interpretation of philosophies in music and education; objectives, trends, curriculum, evaluation. (3 cr; III MTWThF; ScH 104) Borg
- 103 **PSYCHOLOGICAL FOUNDATIONS**
Implications of developmental and objective psychological data in music theory and acoustics. (3 cr; prereq *; I MTWThF; ScH 103) Ar
- 125 **SELECTION, INSTRUMENTAL MUSIC MATERIALS**
Sources and criteria; orchestra, band, ensemble music, and choral accompaniments; class teaching methods books; individual projects; group activities. (3 cr; prereq sr; V MTWThF; ScH 103) Ar
- 224* **RESEARCH PROBLEMS**
(3-9 cr; prereq knowledge of elementary statistics) Borg

Physical Education

Physical Education for Men (PEM)

- 1A†† **BEGINNING ARCHERY**
(1 cr; limited to 20 students; IV MTWTh; CH 215; co-ed, see PEW 3) Torpey
- 1B†† **BEGINNING GOLF**
(1 cr each; each section limited to 20 students) Bolstad
Sec 1, VI-VII MW, Golf Course
Sec 2, VI-VII TTh, Golf Course
- 1C†† **BEGINNING SWIMMING**
(1 cr; limited to 20 students; VII MTWTh; CH Pool) Donnelly
- 2B†† **INTERMEDIATE SWIMMING**
(1 cr; limited to 25 students; prereq swim 100 yds; VI MTWTh; CH Pool; co-ed, see PEW 32) Torpey

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

- 2C†† BEGINNING TENNIS**
(1 cr each; each section limited to 20 students)
Sec 1, V MTWTh, CH 214, Walker
Sec 2, VI MTWTh, CH 214, Mowerson
- 67 FOOTBALL COACHING**
Theory, strategy, generalship, styles of offense and defense, methods of organizing practices, and handling of players. (2 cr; prereq 4A or 1 yr exper on squad; V MTWThF; CH 215) Crawford
- 106 CURRICULUM DEVELOPMENT**
Trends, issues and problems at selected levels of interest; elementary, secondary, junior college. For experienced teachers. (3 cr; prereq 102 or equiv; I MTWThF; CH 214) Torpey
- 118E PROBLEMS**
Focus on teaching of physical education. (Cr ar; prereq MEd candidate, §) Donnelly
- 135 TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION**
(See PEW)
- 137 READINGS: PHYSICAL EDUCATION**
Independent study under tutorial guidance. (1-3 cr; prereq grad, §; ar) Donnelly
- 224B° RESEARCH PROBLEMS**
Individual problems. (Cr ar; prereq 224A or §; ar) Donnelly
- 236 LABORATORY RESEARCH TECHNIQUES**
(See PEW)

Physical Education for Women (PEW)

For Special Fees, see page 24.

ACTIVITY COURSES

- 3†† ARCHERY FOR BEGINNERS**
Instruction will include shooting skills and techniques, proper handling of equipment, rules and etiquette of the sport. Individual coaching will be stressed. Equipment provided. (1 cr; limited to 22 students; co-ed, see PEM 1A; IV MTWTh; CH 215) Torpey
- 7†† TENNIS FOR BEGINNERS**
(1 cr; section limited to 20 students; V MTWTh; NGW 151) Lampe
- 8†† GOLF FOR BEGINNERS**
(1 cr; section limited to 20 students; I MTWTh; NGW 60) Lampe
- 32†† INTERMEDIATE SWIMMING**
(1 cr; limited to 25 students; prereq swim 100 yards; co-ed, see PEM 2B; VI MTWTh; CH Pool) Torpey

PROFESSIONAL COURSES OPEN TO MEN AND WOMEN (PE)

- 45†† INTRODUCTION TO PHYSICAL EDUCATION ACTIVITIES FOR THE ELEMENTARY SCHOOL**
Laboratory course for PEW 70. Experience with graded activities for the elementary school child; problems of organization and teaching progressions considered. (2 cr; limited to 45 students; prereq elem ed majors only; III MTWThF; NGW 153) Lampe
- 106 CURRICULUM DEVELOPMENT**
(See PEM)

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

- 135 **TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION**
Study of construction and interpretation of evaluative procedures; place and limitations of measurement. (3 cr; prereq #: II MTWThF; NGW 3) Stoner
- 236 **LABORATORY RESEARCH TECHNIQUES**
Demonstration and student participation in laboratory procedures involving assessment of exercise parameters. (1-3 cr; prereq 136 or ¶136; V MTWThF; CH 206) Stoner

Recreation and Park Administration (Rec)††

Courses for the summer terms in the field of recreation and park administration include subjects in programming, school recreation, therapeutic recreation, and supervised field work.

- 84 **FIELD WORK IN RECREATION**
(Cr and hrs ar; prereq jr, recreation major) Ostrander, Scott
- 85 **FIELD WORK IN RECREATION**
(Cr and hrs ar; prereq sr, recreation majors or minors) Ostrander, Scott
- 116 **COMMUNITY RECREATION RESOURCES AND ORGANIZATION**
Agencies and their interrelationships. (3 cr; prereq 110-111-112; I MTWThF; CH 215) Schultz
- 118E **PROBLEMS**
Focus on conduct of recreation programs. (Cr and hrs ar; prereq M.Ed. candidate, #) Schultz
- 137 **READINGS: RECREATION**
Independent study under tutorial guidance. (1-3 cr; prereq sr honor, grad, #: hrs ar) Donnelly, Schultz
- 224B **RESEARCH PROBLEMS**
Individual problems. (Cr ar; prereq 224A or #) Donnelly

School Health Education (Hlth)

- 59 **INSTRUCTOR'S COURSE IN FIRST AID**
Preparation to teach the standard course in first aid. (3 cr; prereq American Red Cross Standard Certificate, age 20; I MTWThF; CH 206) Osell

†† Students in M.Ed. programs may elect EdCI 199E, Internship: Recreation Leadership. See EdCI for listing.

General College (GC)

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

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

5C PROBLEMS OF ETHICS

The student is given an opportunity to discover and analyze the presuppositions, principles, and standards which he employs in his attempts to do what is right and avoid doing what is wrong. He is asked to consider the nature and justification of moral judgments, extent of individual moral responsibility, and ethical foundations of democratic society. (3 cr; II MTWThF; NH 207) Zanoni

9A STATISTICS

Emphasis on understanding problem-solving through statistical decision-making. Topics include organization and presentation of data; summary statistics; sampling; probability; distributions; simple estimation; and tests of hypotheses. Attention is drawn to limitations of methods of presentation. (3 cr; I 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 to body function, what can go wrong with it, what is known about keeping it on the job. (5 cr; III-IV MTWThF; SciCB 125) Jefferson

19A PROBLEMS OF BUSINESS TRANSACTIONS

Using only arithmetic skills, practical methods are developed for solving many basic money problems connected with taxes, commissions, prices, discounts, loans, and notes. Student acquires useful skills and a basis for sound judgment to apply to financial problems. (5 cr; I-II MTWThF; ME 110) Roger Larson

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) Sheldon

30B FUNDAMENTALS OF USAGE AND STYLE

Intensive drill in usage and punctuation; emphasis on such matters of style as subordination, parallel construction, tense consistency, and placement of modifiers. (3 cr; III MTWThF; NH 207) Kivits

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 material 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, III-IV MTWTh, FolH 102, Draxten

Sec 2, III-IV MTWTh, NH 201, Kirchner

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; open to all; IV MTWThF; NH 107) Benson

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. (3 cr; I MTWThF; NH 213) Steinhauser

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. 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; II MTWThF; ME 302) T Harris

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

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

American Studies (AmSt)

Hum 21 AMERICAN LIFE I

Individualism in American life and thought. (3 cr; I MTWThF; VH 6) Newell

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

A survey of the prehistoric archaeology of North America north of Mexico. Emphasis will be placed on analysis of the techniques, methods, and goals of prehistoric archaeology. (3 cr; prereq 1A or 100; III MTWThF; ForH 155) Adams

151 APPLIED ANTHROPOLOGY

Application of methods and techniques of anthropology to current problems of government, industry, education, and social welfare planning. Role of anthropology in such administrative activities as technical aid, public health. (3 cr; prereq 2A or 100 or Δ; II MTWThF; ForH 285) Kiste

161 ANTHROPOLOGY OF RELIGION

The varieties and range of religious beliefs and practices. The relation of religion to other aspects of culture. (3 cr; prereq 2A or 100; IV MTWThF; ForH 285) Kiste

190, 191, 192 DIRECTED RESEARCH

(Cr and hrs ar; prereq sr, Δ) Staff

Art History (Arth)

2 SURVEY: HISTORY OF ART

Expression of Western civilization in architecture, sculpture, and painting; from pre-history including Egypt, Mesopotamia, Crete, Iran, and Greece, to Rome. (3 cr, §56; IV MTWThF; Arch 25) Staff

5 SURVEY: HISTORY OF ART

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

56 SURVEY: HISTORY OF ART

Similar to Arth 2 in organization and basic content. Expanded program of reading and contact with works of art. (3 cr, §2; IV MTWThF; Arch 25) Staff

60 SURVEY: HISTORY OF ART

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

- 116 **BAROQUE ART AND ITALY AND SPAIN**
 Protobaroque and early baroque painting; Barocci, the Carracci, Caravaggio. Early baroque architecture in Rome. Bernini and high baroque fusion of architecture, sculpture, and painting. Illusionistic ceiling painting. Classical tendencies in later 17th century Roman art. Sculpture and painting in Naples, Bologna; architecture and painting in Venice. Piedmontese baroque architecture: Guarini, Juvara. Baroque painting in Spain: El Greco, Velasquez, Zurbaran, Murillo. (3 cr; II MTWThF; J 207B) Staff
- 157 **NINETEENTH-CENTURY FRENCH PAINTING, 1860-1900**
 Realism of Manet and Degas, impressionist idea and its evolution, multiple styles of postimpressionists, and aestheticism, symbolism, and mysticism of 1890's. (3 cr; IV MTWThF; J 207B) Waldfoegel

For studio courses in art, see Studio Arts, page 223.

Classics

Classics (Clas)††

- 45 **GREEK AND ROMAN MYTHOLOGY**
 Classical myths which acquaint the student with the stories of gods, demi-gods, 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; II MTWThF; FolH 308) Schork
- 82 **ARISTOPHANES AND ROMAN DRAMA IN TRANSLATION (ARISTOPHANES, MENANDER, PLAUTUS, TERENCE, SENECA)**
 Introductory material organized as in Clas 81, first term, but with emphasis on the tradition of comedy. Reading of about a dozen comedies and three Senecan tragedies. (3 cr, §182; open to qualified Lower Division students; prereq 9 cr in English literature, English beyond C, or foreign literature, or Δ; I MTWThF; FolH 308) Ar
- 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, §45; II MTWThF; FolH 308) Schork
- 182 **ARISTOPHANES AND ROMAN DRAMA IN TRANSLATION**
 Meets with Clas 82 but students do additional work for advanced credit. (3 cr, §82; prereq grad; I MTWThF; FolH 308) Ar

Greek (Grk)

- 178B **GREEK LITERATURE: LYRIC**
 (3 cr; prereq Δ; III MTWThF; A 12) Schork

Latin (Lat)

- 176C **LATIN LITERATURE: DRAMA**
 (3 cr; prereq Δ; IV MTWThF; A 12) Ar

Modern Greek (MdGk)

- 2 **INTRODUCTION TO MODERN GREEK**
 Provides initial experience in speaking and reading demotic Greek. Pattern-practice drill, simple readings, some grammar. (3 cr; does not provide sufficient

†† No knowledge of Latin or Greek is required.

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, §IT, §C, §50A; prereq 3rd qtr fr)

Sec 1, II MTWThF, CB 120, Staff Sec 2, III MTWThF, CB 120, Smith

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, CB 415, Staff Sec 3, III MTWThF, CB 415, Staff
Sec 2, II MTWThF, CB 415, Staff Sec 4, IV MTWThF, CB 415, 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 †; II MTWThF; CB 130) Coen

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 †)

Sec 1, II MTWThF, CB 240, Green
Sec 2, III MTWThF, CB 130, Teubal

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; IV MTWThF; CB 425) Green

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; III MTWThF; CB 145) Foster

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 †; II MTWThF; CB 145) Staff

102 CONTEMPORARY LABOR ISSUES

Analysis of important labor problem areas. Current issues will be examined in light of their broader economic, legal, political, and social implications. (3 cr; prereq 62 or equiv or †; IV MTWThF; CB 220) Simler

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; I MTWThF; CB 155) Coen

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 †; I MTWThF; CB 155) Coen

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; II MTWThF; CB 155) Smith

- 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 §; II MTWThF; CB 155) Smith
- 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; CB 130) Coen
- 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 §; II MTWThF; CB 240) Green
- 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 §; IV MTWThF; CB 255) Teubal
- 185B ADVANCED MICROECONOMICS**
Price and output policies under conditions of imperfect competition. Problems of choice under conditions of uncertainty. (3 cr; prereq 185A or §; II MTWThF; CB 115) Foster
- 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

English §§

Composition (Comp)

- 1 FRESHMAN COMPOSITION**
(3 cr, §Engl A or 1A or 1B or 10H or Comm 1; each section limited to 28 students; prereq classific card 1 or 1A or 2 or 3)
Sec 1, I MTWThF, VH 205 Sec 2, II MTWThF, VH 205
- 2 FRESHMAN COMPOSITION**
(3 cr, §Engl B or 2A or 2B or 11H or Comm 2; each section limited to 28 students; prereq 1)
Sec 1, I MTWThF, VH 306 Sec 3, II MTWThF, VH 6
Sec 2, I MTWThF, VH 309

Literature (Engl)

- 21 INTRODUCTION TO LITERATURE**
Chaucer, Spenser, Milton, and others. (6 cr; prereq ††; I-II MTWThF; VH 301) Durham
- 37 MODERN LITERATURE**
Readings in modern poetry, British and American. (3 cr; prereq ††; IV MTWThF; VH 207) R Foster

†† 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.

- 55 SHAKESPEARE**
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 selected by the instructor. (3 cr; limited to 35 students; prereq ††; III MTWThF; VH 306) Roth
- 56 SHAKESPEARE**
Plays from Shakespeare's middle and later 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, VH 113, Scoggins
Sec 2, III MTWThF, VH 205, Reed
- 74 AMERICAN LITERATURE**
Crane to the present. (3 cr; prereq 72 except for education minors or ‡; I MTWThF; VH 207) Roth
- 78 TWENTIETH-CENTURY BRITISH AND AMERICAN LITERATURE**
A critical survey of major figures, with emphasis on basic trends and the inter-relations of the two literatures. (3 cr; prereq ††; II MTWThF; VH 207) Reed
- 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)
- 100 OLD ENGLISH**
Introduction to sounds and grammar with some prose reading. Relation to modern English stressed. (6 cr; prereq ††; I-II MTWThF; VH 307) Kirchner
- 108 ROMANTIC POETRY AND PROSE**
Blake, Wordsworth, Coleridge, and others. (3 cr; prereq ††; IV MTWThF; VH 113) Scoggins
- 136 ADVANCED SHAKESPEARE**
Special attention to two or three of his later plays; survey of some earlier ones. (3 cr; prereq 56; III MTWThF; VH 6) Clayton
- 154 AMERICAN NOVEL**
A history of the American novel from the beginnings to Howells. (3 cr; prereq ††; II MTWThF; VH 1) Griffin
- 157 AMERICAN POETRY**
Critical survey of American poetry from Anne Bradstreet to Emily Dickinson. (3 cr; prereq ††; IV MTWThF; VH 1) Griffin
- 191 TWENTIETH-CENTURY WRITERS**
Lawrence, Joyce. (3 cr; prereq ††; III MTWThF; VH 1) R Foster
- 198 SEVENTEENTH-CENTURY LITERATURE**
Prose and nondramatic poetry of the mid-century. (3 cr; prereq ††; IV MTWThF; VH 6) Clayton
- 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; I MTWThF; C 111) Kokosh

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

Foreign Study (FS)

162 SEMINAR FOR FOREIGN STUDY II

Continuation of FS 161 (see First Term). (12 cr for both terms; prereq approval before December 1966 by a faculty selection committee [grad students must also have approval of adviser]) Stavrou, administrative official; White, Youngblood, Johnson, Norton

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; CB 10) Skaggs

134 EASTERN UNITED STATES

Regional analysis of physical and human resources east of the Great Plains. (3 cr, §113; II MTWThF; CB 235) Ar

137 CANADA AND ALASKA

Regional analysis of physical and human geography; examination of both internal and external areal relationships. (3 cr, §111; prereq 10 cr or §; I MTWThF; CB 235) Mather

143 SOUTH AMERICA

Regional survey of physical resources, population, agriculture, manufacturing, and transportation in countries of South America. (3 cr, §110; III MTWThF; CB 235) Mather

190 DIRECTED READINGS

(1-3 cr; prereq sr) Skaggs

German (Ger)

2A BEGINNING GERMAN

(5 cr; prereq 1A or 1 yr high school German; I-II MTWThF; FolH 109) Staff

4 INTERMEDIATE GERMAN

Selected readings from literature. (3 cr; prereq 3A or 3B or 3 yrs high school German...§5 recommended; I-II MWF; FolH 110) Staff

5 INTERMEDIATE GERMAN

Elementary composition and conversation. (2 cr; prereq 3A or 3B or 3 yrs high school German...§4 recommended; I-II TTh; FolH 110) 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 high school German; III MTWThF; FolH 109) Staff

72 TWENTIETH-CENTURY LYRIC POETRY

(3 cr; prereq 56 or 4 and Δ; III MTWThF; A 201) Taraba

75 MODERN DRAMA

(3 cr; prereq 56 or 4 and Δ; I MTWThF; FolH 102) Menze

80 HISTORY OF THE GERMAN LANGUAGE

Required of all German majors in the College of Education. (3 cr; prereq 6 cr in courses 70 or above; IV MTWThF; FolH 302) C Wood

123†† HISTORY OF THE GERMAN LANGUAGE

(See 122, First Term) (6 cr for both terms; prereq 122; VI-VII MW; Arch 45) C Wood

†† To receive credit for this course a student must complete both Ger 122 and 123.

133 BIBLIOGRAPHY AND RESEARCH METHODS

Required of all graduate majors. (3 cr; prereq 11 cr above 69; VI-VII TTh; Library 4A) Taraba

**Second
Term
Courses**

History (Hist)**1 CIVILIZATION OF THE MODERN WORLD, PART I**

Rise of Western European civilization. (3 cr; II MTWThF; CB 5) Noonan

3 CIVILIZATION OF THE MODERN WORLD, PART III

Impact of industrialism upon Western and world civilization in the 20th century. (3 cr; III MTWThF; CB 5) Rudolph

15 ANCIENT CIVILIZATION, PART II

Greek civilization, 750-323 B.C. (3 cr; I MTWThF; CB 150) Muhly

17 HISTORY OF ASIA, PART I

History and culture of China, Japan, and India to A.D. 1200. (3 cr; III MTWThF; CB 410) Taylor

24 AMERICAN HISTORY, PART II

Modern America. (4 cr; 11:10-12:15 MTWThF; SciCB 175) Berkhofer

51 ANCIENT CIVILIZATION, PART II

Greek civilization, 750-323 B.C. (3 cr; I MTWThF; CB 150) Muhly

59 HISTORY OF ASIA, PART I

History and culture of China, Japan, and India to A.D. 1200. (3 cr; III MTWThF; CB 410) Taylor

98 MINNESOTA AND THE NORTHWEST

(3 cr; II MTWThF; CB 425) Jordan

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

103B GREECE TO 200 B.C., PART I

(3 cr; II MTWThF; CB 450) Muhly

116B FRENCH REVOLUTION AND NAPOLEON, PART II

The Revolution and revolutionary wars. (3 cr; III MTWThF; CB 440) Bamford

120E HISTORY OF EARLY RUSSIA, PART III

Ivan IV, time of troubles, early Romanov period to Peter the Great. (3 cr; I MTWThF; CB 440) Noonan

122A ECONOMIC HISTORY OF EUROPE, PART II

The 18th and early 19th centuries. (3 cr; IV MTWThF; CB 235) Rudolph

135E AMERICAN HISTORY, 1850-1900, PART III

From 1880 to 1900. (3 cr; II MTWThF; CB 215) Loehr

139A CURRENT INTERPRETATION AND THE PROBLEM OF SYNTHESIS IN AMERICAN HISTORY

The course is designed to acquaint students with current scholarship in the field and its implications for the general interpretation of American history. (3 cr; 1:00-3:30 MTh; CB 215) Berkhofer

148D CHINESE HISTORY TO A.D. 1279, PART I

Chinese history to 221 B.C. (3 cr; IV MTWThF; CB 215) Taylor

163A PROSEMINAR: MEDIEVAL HISTORY, PART I

(3 cr; VI MTWThF; SocSci 628) Hoyt

172A PROSEMINAR: SEVENTEENTH-CENTURY FRANCE, PART I

(3 cr; IV MTWThF; SocSci 633) Bamford

181D PROSEMINAR: NINETEENTH-CENTURY AMERICAN HISTORY

(3 cr; IV-V MW; SocSci 628) Jordan

181F PROSEMINAR: AMERICAN HISTORY, 1850-1900, PART I

(3 cr; III MTWThF; SocSci 633) Loehr

Humanities (Hum)

- 1 **HUMANITIES IN THE MODERN WORLD I**
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, §1A or §51; I MTWThF; Ph 170) Penn
- 2 **HUMANITIES IN THE MODERN WORLD II**
The Industrial Revolution, liberalism, and socialism. Period from about 1776 to 1890. Authors: the classical economists, Marx, Mill, Ibsen, Dostoevski. (3 cr, §2A or §52; I MTWThF; Ph 166) White
- 3 **HUMANITIES IN THE MODERN WORLD III**
From about 1840 to about 1914. Authors: Darwin, Nietzsche, Kierkegaard, and Mann. (3 cr, §3A or §53; II MTWThF; SciCB 125) Tembeck
- 4 **HUMANITIES IN THE MODERN WORLD IV**
The humanities since World War I. 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; II MTWThF; Ph 210) Atkin
- 21 **AMERICAN LIFE I**
Individualism in American life and thought. (3 cr; I MTWThF; VH 6) Newell
- 54 **HUMANITIES IN THE MODERN WORLD**
(See Hum 4) (3 cr, §4)
 Sec 1, IV MTWThF, AH 150, Tembeck
 Sec 2, III MTWThF, ME 110, Bryan
- 63 **RENAISSANCE AND REFORMATION**
The 15th to 17th centuries. The Age of Lorenzo the Magnificent in Florence; ideal of beauty in art, politics, and morals; universal man. The High Renaissance and the Reformation. Authors: Pico della Mirandola, Machiavelli, Luther, Montaigne, Pascal. Renaissance and baroque art and architecture. (3 cr, §13; III MTWThF; VH 301) Ar
- 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; SciCB 325) Penn
- 133 **HUMANITIES PROSEMINAR**
Mass culture. Studies relating to the current state of the arts and intellectual life in America; examination of several theories about the relationship of culture to the technology of mass production, to mass communication, and to social mobility. (3 cr; prereq sr; IV MTWThF; SciCB 527) Bryan

Journalism and Mass Communication (Jour)

- 11 **JOURNALISTIC WRITING FOR NONMAJORS**
(For journalism minors or students in the College of Agriculture, Forestry, and Home Economics, College of Education, Institute of Technology, and the School of Business Administration) Newspaper and broadcast fact-gathering and news writing; specialized reporting; fundamentals of press law. (3 cr; prereq soph, C avg, Engl C, 3A, 3B, or Comm 3 or Rhet 3, or exemption from Engl requirement; I MTWThF; MurH 311) Sim
- 78 **PUBLIC RELATIONS METHODS**
Publicity, external and internal communication, including use of company publications, institutional advertising, and trade journals. Projects and campaigns. (3 cr; prereq 51 or 56 and 73...or 41, 57, and 71...or §; III MTWThF; MurH 302) Lindsay

- 90 MASS COMMUNICATIONS AND THE NEWS**
How the news gets to and affects the public, in print, on the air, by film. Evaluation of news gathering and presentation methods. Contemporary influences on communications media. Individual news media and news commentators. (3 cr; not open to jour maj; III MTWThF; MurH 311) Sim
- 109 HISTORY OF JOURNALISM**
Development of American newspapers and periodicals, from early beginnings in Europe to the present day; the rise of radio and television; the relation of communication developments to political, economic, and social trends in America. (3 cr; IV MTWThF; MurH 308) Emery
- 124 INTERNATIONAL COMMUNICATIONS AND FOREIGN AFFAIRS**
Channels of international communication and news gathering agencies. Factors affecting flow of news throughout the world. Role of foreign correspondent. Relation of communications to foreign affairs and international understanding. (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; I MTWThF; MurH 302) Lindsay
- 177 CONTEMPORARY PROBLEMS IN FREEDOM OF SPEECH AND PRESS**
Anglo-American concept of freedom and responsibility, constitutional development in the United States, areas of present tension. The Bill of Rights and journalism today. (3 cr; prereq 15 cr in social sciences; VI MTWThF; MurH 302) Gerald
- 209 SEMINAR: HISTORY OF COMMUNICATION**
Research in history and development of mass media. Historical bibliography and criticism in the field of journalism. (3 cr; prereq 110 or #; ar) Emery

Library School (Lib) ††

- 101 LIBRARY ADMINISTRATION**
Introduction to principles of library administration and management. (3 cr; II MTWThF; Lib 4A) Berninghausen
- 103 CATALOGUING AND CLASSIFICATION**
Basic principles of descriptive cataloging, rules of entry, subject headings and classification in libraries. (3 cr; IV MTWThF; Lib 4A) Samanisky
- 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; III MTWThF; Ph 145) Smith
- 105 HISTORY OF LIBRARIES AND LIBRARIANSHIP**
A survey of library development from ancient times to the present with emphasis on library service in the United States in the 19th and 20th centuries. The characteristics and functions of libraries as social agencies. (3 cr; I MTWThF; Lib 4A) Shove
- 231 PUBLIC LIBRARY EXTENSION AND DEVELOPMENT**
Larger units of service based upon county and multi-county patterns. Operation of federal and state aid programs. The legal basis for the larger unit of service.

†† 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 student in the College of Liberal Arts or the College of Education. Students who do not fall in one of these 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.

Consideration of the financial, administrative, materials selection, and personnel problems involved. (3 cr; prereq 101; V MTWThF; Lib 4B) Smith

- 242 INTRODUCTION TO INFORMATION RETRIEVAL**
Theory of various methods of subject analysis; methods of data representation, including coding; search strategies. (3 cr; prereq 103 or ♯; IV MTWThF; Lib 4B) Brekhus
- 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) Simonds
- 268 RESEARCH METHODS IN LIBRARIANSHIP**
Evaluation of research reported in library literature. (3 cr; limited to 25 students; prereq ♯; II MTWThF; Lib 4B) McDiarmid
- 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 book-sellers, special publishing, censorship, etc. Book production and book distribution. (3 cr; III MTWThF; Lib 4B) Shove
- 283 ADVANCED CATALOGUING AND CLASSIFICATION**
Advanced study of rules of entry, descriptive cataloguing and subject analysis of library materials, administrative problems in cataloguing. (3 cr; prereq 103; III MTWThF; Lib 4A) Simonton

Middle Eastern Languages

Arabic (*Arab*)

B BEGINNING INTENSIVE ARABIC

(Continuation of Arab A) Covers the equivalent of the second 1½ quarters of the regular first-year sequence, Arab 1-2-3. (7½ cr; prereq A; I-III MTWThF; FolH 302) Chejne, Koury

Hebrew (*Heb*)

B BEGINNING INTENSIVE HEBREW

(Continuation of Heb A) Covers the equivalent of the second 1½ quarters of the regular first-year sequence, Heb 1-2-3. (7½ cr; prereq A; I-III MTWThF; FolH 303) Paradise, Toledano

Music (*Mus*)

4 FUNDAMENTALS OF MUSIC

(2 cr; for nonmusic majors—primarily child development students and elementary teachers)

Sec 1, II MTWThF, NMA 4, Lauritzen

Sec 2, IV MTWThF, NMA 4, Lauritzen

7B EAR TRAINING

Résumé of aural work included in Mus 4T-6T, with concentration on their application. (3 cr; prereq ♯; II MTWThF; ScH 103) Fetler

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 ♯; III MTWThF; ScH 103) Fetler

Note—Applied music courses 11 through 30 and 61 through 80 are offered as electives for nonmusic majors and as part of degree programs for Lower Division and Upper Division music majors. For elective credit, place an E after course number. When taken for no credit, place the letter V after the appropriate number.

**Second
Term
Courses**

- 11°° **PIANO**
(2 cr; prereq entr exam; hrs ar; ScH 107) Freed, McNab, Ivory
- 12°° **VOICE**
(2 cr; prereq entr exam; hrs ar; ScH 107) Schuessler, Knowles
- 13°° **VIOLIN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Sambuco
- 14°° **VIOLA**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 15°° **CELLO**
(2 cr; prereq entr exam; hrs ar; ScH 107) Jamieson
- 16°° **BASS**
(2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 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, Tetzlaff
- 22°° **FRENCH HORN**
(2 cr; prereq entr exam; hrs ar; ScH 107) Binstock
- 23°° **TROMBONE**
(2 cr; prereq entr exam; hrs ar; ScH 107) Weinman
- 24°° **TUBA**
(2 cr; prereq entr exam; hrs ar; ScH 107) Walton
- 25°° **PERCUSSION**
(2 cr; prereq entr exam; hrs ar; ScH 107) 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) Van
- 30°° **CLASSICAL ACCORDION**
(2 cr; prereq entr exam; hrs ar; ScH 107) Liane, Malmberg
- 61°° **PIANO**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Freed, McNab, Ivory
- 62°° **VOICE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Schuessler, Knowles
- 63°° **VIOLIN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Sambuco

- 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) Jamieson
- 66** BASS**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Ar
- 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, Tetzlaff
- 72** FRENCH HORN**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Binstock
- 73** TROMBONE**
(2 cr; prereq entr exam or placement test; hrs ar; ScH 107) Weinman
- 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) 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) Van
- 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
- 111 GENERALIZED STYLE ANALYSIS**
Thorough and detailed examination of the organizational and structural principles of style, synthesizing a unified approach to music of all periods. The student should be familiar with the basic techniques of harmonic analysis, the common forms of music, and score reading, and have experience in at least some areas of medieval, Renaissance, and baroque music. (3 cr; IV MTWThF; ScH 104) Godt
- 114 HISTORY OF VOCAL ART**
Significant schools of singing from 1600 to the present. (2 cr; prereq 18 cr in 12 and 62, or ‡; IV MTWTh; ScH 103) Schuessler
- 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 a reflection of intellectual, political, and artistic currents of the Napoleonic era. (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; ScH 104) Godt

- 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 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 7, VI MTh |
| Lab 2, I TF | Lab 8, VI TF |
| Lab 3, II MTh | Lab 9, VII MTh |
| Lab 4, II TF | Lab 10, VII TF |
| Lab 5, V MTh | Lab 11, VIII MTh |
| Lab 6, V TF | 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; II MTWThF; ForH 155) Raab
- 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, Ph 210, Mason Sec 2, IV MTWThF, Ph 210, Lewis
- 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; IV MTWThF; VH 301) Raab
- 52A HISTORY OF WESTERN PHILOSOPHY**
Early modern philosophy from Descartes through Hume; impact of science; backgrounds of contemporary philosophical problems. (3 cr; II MTWThF; ForH 130) Lewis
- 53A HISTORY OF WESTERN PHILOSOPHY**
Later modern philosophy from Kant through the 19th century. (3 cr; III MTWThF; ForH 130) Murphy
- 150 ETHICAL THEORY**
Distinguishing characteristics of a moral judgment; application of moral judgments to motives, acts, and persons; moral freedom and responsibility; moral relativity, skepticism, and the justification of moral standards; examination of representative systems. (3 cr; prereq 3 or #; IV MTWThF; Ph 145) Mason
- 151 PRINCIPLES OF AESTHETICS**
Sample topics: standards of evaluation; aesthetic experience; representation, meaning. (3 cr; prereq 3 cr in philosophy or #; I MTWThF; ForH 130) Murphy

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

Political Science (Pol)

- B THE STATE IN THE MODERN WORLD**
(Part B of A-B) The development, principles, and operation of the modern nation state. (3 cr; III MTWThF; CB 150) Noonan
- 2 AMERICAN GOVERNMENT AND POLITICS**
(Part 2 of 1-2†) Organization of national, state, and local government: legislative, executive, and judicial branches and their procedures. (3 cr; II MTWThF; CB 410) Penikis
- 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; CB 150) Klein
- 108 LEGISLATIVE ORGANIZATION AND PROCEDURE**
Congress and the state legislatures at work. (3 cr; prereq 2 or ‡; III MTWThF; CB 155) Shaw
- 109 THE JUDICIAL PROCESS**
Structure of the American judiciary; selection of judges; process of litigation; influences on judicial decisions; impact of and compliance with decisions; role of Supreme Court in the American political system. (3 cr; prereq 2 or ‡; IV MTWThF; CB 250) Sorauf
- 143 GOVERNMENT AND POLITICS OF THE SOVIET UNION**
Analysis that seeks to explain rise of Bolshevism; sources and nature of its ideology; history of communist regime; institutional character; organization of power; role of the party; foreign, economic, and cultural policies; significance for Western civilization. (3 cr; prereq B or 12 cr in social science or ‡; IV MTWThF; CB 110) Noonan
- 155 LATIN-AMERICAN GOVERNMENT AND POLITICS I**
Analysis of factors such as colonial institutions, the economy, the social structure, which condition constitutional and political organization. (3 cr; prereq 2 or ‡; III MTWThF; CB 110) Klein
- 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; CB 130) Shaw
- 175 DIPLOMACY**
Nature and functions, historical development of diplomacy; its relation to forms of government and power systems. Traditional diplomacy, diplomacy by conference and in international organizations, personal diplomacy, open and secret diplomacy. Essentials of diplomatic usage. Diplomatic agents. (3 cr; IV MTWThF; CB 440) Penikis

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; II-III MTWThF; NH 45) Katzenmeyer
- 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; I-III MTWThF; WeH 101)
- 216 SEMINAR: SPECIAL AREAS OF PSYCHOLOGY—FUNCTIONS OF FANTASY**
Critical review and integration of theory and empirical results concerning the determinants and role of fantasy in human behavior. (3 cr; prereq ‡; hrs and room ar) Klinger

Personal Orientation (PO)

Second
Term
Courses

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; Ph 236A) Crews

Public Administration (PA)

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 # of Public Administration Center; hrs ar) Likins

214A CURRENT ISSUES OF PUBLIC ADMINISTRATION AND POLICY DEVELOPMENT IN MINNESOTA

Background study through lectures, panel discussions, and seminar sessions of vital issues of public policy and administration which currently confront Minnesota's governmental units. For 1967 the focus will be upon the Twin Cities Metropolitan Area. Topics will include the uniqueness of the Twin Cities environment, modernizing local government, fiscal aspects, control of pollution, and the experimental city. Some 40 legislators, government officials, civic leaders, and university professors will serve as faculty for the course. (3 cr; prereq grad; VI-VIII W, Mayo Aud; VI-VII Th, SocSci 1383) 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; VIII-IX TTh; SocSci 1383) Rosenthal

247 URBAN DEVELOPMENT

Role and methods of the urban administrator in effecting change and in mobilizing both public and private community resources for urban development. (3 cr; prereq #; I-II TTh; SocSci 1383)

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; III-IV TTh; SocSci 1383) Rosenthal

282B ADMINISTRATIVE INTERNSHIP

Supervised field work in an approved local, state, or federal government agency; preparation of an acceptable formal report. (Cr ar; prereq Δ; hrs ar) Steen

Romance Languages

French (Fren)

2 BEGINNING FRENCH

(5 cr; prereq 1, or 1 yr high school French; I-II MTWThF; A 201) Jones

25 INTERMEDIATE FRENCH

(5 cr; prereq 3, or 3 yrs high school French; I-II MTWThF; NH 201) Mantini

54 FRENCH COMPOSITION

(3 cr; prereq 25 or equiv; I MTWThF; Aero 327) Fadell

- 58 **ADVANCED FRENCH CONVERSATION**
(3 cr; prereq 55 or ‡; IV MTWThF; FolH 110) Zeoli
- 67 **SURVEY OF FRENCH LITERATURE; ROMANTICISM TO SURREALISM**
(3 cr; prereq 30; III MTWThF; FolH 308) Rydell
- 70 **FRENCH DICTION**
(3 cr; prereq 56, ‡; II MTWThF; Aero 327) Sinval
- 87 **NINETEENTH- AND TWENTIETH-CENTURY FRENCH LITERATURE**
(2 cr; prereq 30 or ‡, †67 for majors; V MTWTh; FolH 109) Rydell
- 108 **STRUCTURE OF MODERN FRENCH**
(3 cr; prereq 57 or †57 or ‡; IV MTWThF; FolH 109) Mantini
- 125 **RENAISSANCE AND BAROQUE DRAMA: CORNELLE AND THE ORIGINS OF THE CLASSICAL DRAMA**
(3 cr; II MTWThF; NH 209A) Francis
- 172 **THE NOVEL OF L'ENTRE-DEUX GUERRES**
(3 cr; IV MTWThF; NH 209A) Francis
- 191 **DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq ‡; hrs ar) Mantini
- 260 **DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq ‡; hrs ar) Francis

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 high school Italian; III-IV MTWThF; Aero 327) Erasmi

Portuguese (Port)

- 1-2-3†† **BEGINNING PORTUGUESE**
(See First Term) (15 cr for both terms; I-II MTWThF; FolH 108) Hamilton
- 191 **DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq ‡; hrs ar) Hamilton
- 260 **DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq ‡; hrs ar) Hamilton

Spanish (Span)

- 2 **BEGINNING SPANISH**
(5 cr; prereq 1, or 1 yr high school Spanish; III-IV MTWThF; FolH 108) Collins
- 25 **INTERMEDIATE SPANISH**
(5 cr; prereq 3 or 3A, or 3 yrs high school Spanish; III-IV MTWThF; Arch 60) Cooke

†† Student must enter the course in the First Term and complete both terms of the course to receive any credit.

- 54 SPANISH COMPOSITION**
(3 cr; prereq 25 or equiv; II MTWThF; Arch 60) Howey
- 55 SPANISH CONVERSATION**
(3 cr; prereq 25 or equiv; III MTWThF; FolH 110) Sullivan
- 58 ADVANCED SPANISH CONVERSATION**
(3 cr; prereq 55; III MTWThF; NH 209A) Narváez
- 108 STRUCTURE OF MODERN SPANISH**
(3 cr; prereq 57 or # or ¶57; IV MTWThF; FolH 303) Narváez
- 110 SPANISH LITERATURE: NINETEENTH CENTURY**
(3 cr; prereq 65, 66, 67; II MTWThF; FolH 102) Rundorff
- 135 DEVELOPMENT AND METAMORPHOSIS OF "DON JUAN" THEME**
(3 cr; prereq 1 Upper Division literature course or #; IV MTWThF; NH 207) Rundorff
- 183 THE SPANISH NOVEL SINCE 1945**
(3 cr; prereq 65, 66, 67; V MTWThF; NH 209A) Sullivan
- 191 DIRECTED READINGS FOR UNDERGRADUATES**
(1-3 cr; prereq #; hrs ar) Sullivan
- 260 DIRECTED READINGS FOR GRADUATE STUDENTS**
(1-3 cr; prereq #; hrs ar) Rundorff

Note—The General Extension Division will offer Spanish for graduate students (Span 17A). Please address all inquiries to the General Extension Division.

Scandinavian Languages

Swedish (Swed)

- 1-2-3†† INTENSIVE BEGINNING SWEDISH**
(15 qtr cr for both terms [10 semester cr]; I-III MTWThF; A 205)

Slavic and East European Languages

Russian (Russ)

- A-B†† 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; A 11A) Donchenko
- 4-5-6†† INTENSIVE INTERMEDIATE RUSSIAN**
(See section on Special Programs) (9 cr for both terms; I-II MTWTh, I F; A 12) Prokopov
- 25 SCIENTIFIC RUSSIAN II**
(See section on Special Programs) Concentration on the development of reading skill for students of science who have a knowledge of the structure of Russian. (5 cr; II-III MTWThF; A 105) Hudgins

†† This course runs through both terms. The student must enter in the First Term and complete both terms in order to receive credit.

Social Science (SSci)

1 PERSONALITY

An investigation of the factors that influence individual human action. Among the topics studied are personality in nature, culture, and society; personality as a shaper of society; the American character; the validation of theories of personality. (3 cr; II MTWThF; CB 220) Utlaut

3 COMMUNITY

The web of human relations in traditional and modern societies. Types of group behavior. Caste and class in the United States. The government of societies: Democracy and totalitarianism. (3 cr; prereq 1 or 2; III MTWThF; CB 220) Utlaut

Social Work (SW)

Soc 90 AMERICAN SOCIAL WELFARE
(See Sociology) Wiebler

Soc 91 INTRODUCTION TO SOCIAL WORK PROCESS
(See Sociology) Wiebler

104 SPECIAL TOPIC: WORKING WITH GROUPS

Basic considerations for working successfully with groups including principles of programming. Designed for persons who in one capacity or another work with committees, recreation groups, or community groups. (3 cr; VI MTWThF; CB 450) Goldman

106 SPECIAL TOPIC: COPING PATTERNS

The role of professionals, especially teachers, social workers, public health nurses, in understanding adequate coping methods in various client groups with focus on the culturally deprived. (3 cr; III MTWThF; CB 450) Hess

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; CB 450) France

287 SPECIAL STUDIES IN SOCIAL WORK

Selected projects previously approved by instructor. Open only to social work students in their second graduate year. (Cr ar; VII MTWThF; SocSci 860) Hess

Sociology (Soc)

1 INTRODUCTION TO SOCIOLOGY: 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; I MTWThF; CB 10) Ar

3 SOCIAL PROBLEMS

Survey; contemporary social problems; special emphasis on personal demoralization and social disorganization. (3 cr; V MTWThF; CB 5) Johnson

53 ELEMENTS OF CRIMINOLOGY

General survey of field of criminology. (3 cr; prereq 1 or 1A or 1H or #; IV MTWThF; CB 5) Ward

90 AMERICAN SOCIAL WELFARE

Analysis of American social welfare as a basic social institution. (3 cr; prereq 3; IV MTWThF; CB 150) Wiebler

91 INTRODUCTION TO SOCIAL WORK PROCESS

Analysis of the nature of social work helping process through a study of development of social work theory and its implementation in field of practice. (3 cr; prereq 90 or consent of major adviser; VI MTWThF; CB 150) Wiebler

- 100 CONTEMPORARY PENOLOGY**
Prisons as social organizations; description and evaluation of current treatment programs for adult offenders. (3 cr; prereq 1, 53, or 8; II MTWThF; CB 135) Ward
- 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 8; IV MTWThF; CB 10) Johnson
- 152 SOCIOLOGY OF MEDICINE AND MEDICAL INSTITUTIONS**
Social factors associated with incidence of physical and mental illness and its treatment. Social organization of medical institutions. Public needs and medical services. Sociology of aging, and social problems of the aged. (3 cr; prereq 1 or 8; I MTWThF; CB 220) Ar
- 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; II MTWThF; CB 250) Tallman
- 180 METHODS OF SOCIAL RESEARCH**
Survey, including advantages of major methods and limitations when applied to specific types of problems. (3 cr; prereq 45 or equiv; IV MTWThF; CB 230) Tallman

**Second
Term
Courses**

Speech, Communication, and Theatre Arts

Speech (Spch)

- 5X FUNDAMENTALS OF SPEECH**
Development of basic skills in meeting a variety of speech situations; extemporaneous speaking, oral reading, discussion. Development of basic understanding of speech processes and forms. (3 cr; limited to 25 students; I MTWThF; FolH 306) Shapiro and staff
- 6 FUNDAMENTALS OF SPEECH**
(Second quarter of Spch 5-6) (3 cr; limited to 25 students; prereq 5; II MTWThF; FolH 306) Shapiro and staff
- 51 ADVANCED PUBLIC SPEAKING**
Preparation and delivery of speeches on current public issues. (3 cr; prereq 5; I MTWThF; FolH 307)
- 65 RADIO AND TELEVISION SPEECH**
Fundamentals of practice and theory in speaking for radio and television. Emphasis on projects and exercises in radio and television performance and scripting; introduction to studio equipment and procedures. (3 cr; limited to 18 students; prereq 5; IV MTWThF; 302 MurH, Aero 309) Bart
- 69 RADIO AND TELEVISION PRODUCTION**
An introduction to the problems of radio and television production. Equipment and staff organization; interrelationships with program design. Exercises in production. (3 cr; limited to 16 students; prereq 65; V MTWThF; Aero 309) Bart
- 81 INTERPRETATIVE READING**
Aesthetic theory of literature and of oral reading. Practice in reading for interpretation and mastery of technique (fiction). (3 cr; limited to 25 students; prereq 5; III MTWThF; FolH 305) Fredricks
- 102 ARGUMENTATION AND PERSUASION**
Theories of modern motivational rhetoric. Analysis of persuasive speaking; practice in preparation and delivery of oral argument. (3 cr; prereq 5, Psy 2, 10 cr in social science; III MTWThF; FolH 306) Howell
- 107 PLATFORM READING**
Advanced course in oral interpretation of selected poems and plays. Speech melody, rhythm, platform techniques. Problems in aesthetic analysis. Lecture recitals. (3 cr; prereq 83; II MTWThF; FolH 305) Fredricks

- 126C **HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS, 1925-1966**
Study of representative speakers in relation to the contemporary American socio-economic, educational and cultural, legal, and political issues and movements. (3 cr; prereq 5; III MTWThF; FolH 307) Rieke
- 169 **SPEECH AND LANGUAGE IN HUMAN BEHAVIOR**
Basic orientation on the place of speech and language in human behavior. Individual projects and collateral reading. (3 cr; IV MTWThF; FolH 406) Shapiro
- 181, 182, 183 **READINGS IN SPEECH**
Directed reading and preparation of reports on selected subject. (Cr ar; prereq Spch 5, and 6 addtl cr and §; hrs ar) Staff
- 210 **SEMINAR: FACE-TO-FACE INTERCULTURAL COMMUNICATION**
The seminar defines and investigates factors influencing face-to-face communication in varied cultures, concentrating upon task-oriented communications 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 if U.S. citizen, Anth 100 or similar course in cultural anthropology or §; hrs ar) Howell
- 231 **SEMINAR: ADVANCED SPEECH PROBLEMS**
Evaluation of research methods in speech and communication. (3 cr; prereq undergraduate major in speech, or equiv, §; V-VI TF; FolH 307) Rieke
- 251 **SEMINAR: LISTENING COMPREHENSION**
Research problems and methods. Evaluation of published research. (2 cr; prereq undergrad spch major; §; III MTWThF; AgEng 221) Nichols
- 291, 292, 293 **RESEARCH**
Open to graduate students engaged in research on special problems. (Cr and hrs ar) Staff

Speech Science, Pathology and Audiology (SSPA)††

- 101, 102, 103 **READINGS**
Directed readings and preparation of reports. (Cr ar; prereq §) Chaiklin, Henrikson, Lassman, Starr
- 201 **SEMINAR: ADVANCED PROBLEMS**
(3 cr, can be repeated; prereq §; II MTWThF; FolH 307) Henrikson
- 204, 205, 206 **RESEARCH**
Open to graduate students engaged in research. (Cr ar; prereq §) Chaiklin, Henrikson, Lassman, Starr
- 246 **SEMINAR: CLEFT PALATE**
Critical review of research on communication problems of persons with cleft palates. (3 cr; prereq 146 or §; III MTWThF; FolH 406) Starr
- 280, 281, 282 **SEMINAR: HEARING**
Major experimental research in psychophysiological and psychoacoustical nature of hearing. Critical analysis of theory, experimental method, and treatment of data. (Cr ar; prereq §; hr ar) Chaiklin, Lassman

Theatre Arts (Th)

- 12 **LABORATORY SECTION: INTRODUCTION TO THE THEATRE**
A laboratory in the practice of the arts and crafts of the theatre; scenery and particularly construction and painting, stage operation, theatre lighting, cos-

†† 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 Professor Clark Starr, director of the Speech and Hearing Clinic, 110 Shevlin Hall.

- tuning, or make-up. (1 cr; prereq 11 or ¶11; meet II hr first day, ScH 108, then hrs and room ar) Seay
- 23 BEGINNING ACTING: TECHNIQUE**
Fundamentals of body movement, rhythms, and acting technique; individual and group performances. (3 cr; limited to 20 students; prereq 21 or #; III MTWThF; WeH 302) Moulton
- 24 STAGE MAKE-UP**
Theory and practice in the art of stage make-up. (1 cr; limited to 15 students; prereq 12; VI-VII TTh; ScH 23) Sloane
- 34 STAGECRAFT: CONSTRUCTION AND PAINTING**
Theory and practice in construction, painting, and shifting of stage scenery. (3 cr, §74; limited to 20 students; prereq soph, 12; IV MTWThF; WeH 306) Seay
- 101, 102, 103 THEATRE PRACTICUM**
Individual creative projects meeting approval of a faculty committee in one or more of these areas: playwriting, directing, acting, and design. Application forms in 102 Shevlin Hall. Approval of adviser and committee necessary before registration. (2-6 cr; prereq Δ and #; ar) Moulton and staff
- 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; VI MTWThF; ScH 108) Loppnow
- 121 PROBLEMS IN ACTING**
Acting problems stemming from differences in genres and style of dramatic production from the Greeks to the present. Emphasis on intensive scene and character analysis and on skill in communicating character and concept to an audience in individual and group performance. (3 cr; limited to 18 students; prereq 61, 62, or #; V MTWThF; WeH 302) Herstand
- 132 CHILDREN'S THEATRE**
Selection, direction, and production of plays for children's audiences. (3 cr; limited to 30 students; prereq 12 or ¶12 or #; IV MTWThF; FoH 307) Graham
- 174 HISTORY AND TECHNIQUE OF STAGE MOVEMENT**
Application of historical research in the area of manners, games, and dances to techniques of body movement for the stage. (3 cr; limited to 18 students; prereq 171, 172, 173 and #; IV MTWThF; WeH 302) Moulton
- 181, 182, 183 READINGS IN THEATRE ARTS**
Directed reading and preparation of reports on selected subjects. (Cr ar; prereq 9 cr in theatre arts and #; hrs ar) Staff
- 281, 282, 283 RESEARCH**
Open to graduate students engaged in research on special problems. (Cr ar) Staff

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; I MTWThF; ForH 175) 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

Studio Arts (Art)

- 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; I-II MTWThF; J 2) Liebling
- 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; prereq 10 or practical experience and #; limited to 15 students; III-IV MTWThF; J 2) Liebling
- 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, III-IV MTWThF, ArtB 150, Priede
Sec 2, I-II 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) Volpe
- 32-33 ELEMENTS OF PRINTMAKING**
(Sequence limited to 20 students) Priede
- 32 Foundation course. Familiarizes the student with the media of print-making 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)
- 51-54-55 DRAWING**
From the model, still life, and nature. Principles of anatomy. (3 cr; limited to 25 students; prereq 23)
Sec 1, I-II MTWThF, ArtB 151, Routon
Sec 2, III-IV MTWThF, ArtB 140, Chaffey
- 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 #; I-II MTWThF; ArtB 141) Chaffey
- 70-71-72 OIL PAINTING**
Introduction to medium of oil; individual projects and instruction. (3 cr; limited to 15 students; prereq 55 or #; III-IV MTWThF; ArtB 161) Rowan
- 150-151-152 PROBLEMS IN PAINTING**
(3 cr; limited to 10 students; prereq 72 or #; III-IV MTWThF; ArtB 161) Routon
- 200-201-202 ADVANCED PROBLEMS IN PAINTING**
(3 cr; prereq #; hrs ar) Rowan
- 203-204-205 ADVANCED PROBLEMS IN PAINTING**
(3 cr; prereq #; hrs ar) Routon

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)

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**
(6 cr; limited to 6 students; hrs ar) Van Bergen and staff
- 182 **EXTERNSHIP IN ANESTHESIOLOGY AND RESPIRATORY PROBLEMS**
(6 cr; limited to 3 students; prereq 181) 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
- 268 **RESEARCH IN ANESTHESIA**
Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) Van Bergen and staff

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) Ungar, Van Pilsum, Edstrom

Laboratory Medicine (LMed)

- 181 **PROBLEMS IN CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Bradley, Strandjord, Sundberg, E Yunis, J Yunis
- 235 **ADVANCED CLINICAL LABORATORY MEDICINE**
(Cr and hrs ar; prereq #) Benson, Bradley, Strandjord, Sundberg, E Yunis, J Yunis
- 236 **RESEARCH: CLINICAL LABORATORY PROBLEMS**
(Cr and hrs ar; prereq #) Benson and others
- 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**
(2 cr per qtr for 4 qtrs; prereq 101, LMed 102; 1:00-1:50 alt 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. University, Murray; Veterans Administration, Hall; Hennepin County

†† Prior arrangements with departmental office.

General Hospital, Schultz; St. Paul-Ramsey, Beckman; Mount Sinai, Lewis; and Northwestern, Watson. (6 cr per period; offered 3 elective periods; hrs ar)

181 RESEARCH IN MEDICINE

Research opportunities in the following areas are available at University and affiliated hospitals (as above): 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 interest are available at University or affiliated hospitals (as above): 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

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; 9:00-9:50 Th; 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; 10:00-10:50 T; Todd Amph) Peterson, Ebert, and staff

210 SEMINAR: INFECTIOUS DISEASE

(1 cr; hrs ar) Spink

211 ELECTROCARDIOGRAPHIC CONFERENCE

(1 cr; 3:30-4:20 T; Todd Amph) 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; Todd Amph) Wang and staff

Division of Dermatology

REQUIRED COURSES

123 DERMATOLOGY, SYPHILOLOGY

(2 cr; prereq 101; 4:00-5:00 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

Obstetrics and Gynecology (Obst)

REQUIRED COURSES

- 120 OBSTETRICS AND GYNECOLOGY
Physiology of pregnancy, labor and puerperium. (4 cr; prereq 124; 2:00-3:00 W)
McKelvey and staff
- 135 CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY
Includes clinics in obstetrics and gynecology. (12 cr; prereq regis med) McKelvey
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) McKelvey and staff

COURSES FOR GRADUATE STUDENTS

- 201 ADVANCED OBSTETRICS AND GYNECOLOGY, PART I
(Cr ar) McKelvey and staff
- 202 ADVANCED OBSTETRICS AND GYNECOLOGY, PART II
(Cr ar) McKelvey and staff
- 203 ADVANCED OBSTETRICS AND GYNECOLOGY, PART III
(Cr ar) McKelvey and staff
- 204 ADVANCED OBSTETRICS AND GYNECOLOGY, PART IV
(Cr ar) McKelvey and staff
- 205 ADVANCED OBSTETRICS AND GYNECOLOGY, PART V
(Cr ar) McKelvey and staff

- 206 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VI**
(Cr ar) McKelvey and staff
- 207 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VII**
(Cr ar) McKelvey and staff
- 208 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART VIII**
(Cr ar) McKelvey and staff
- 209 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART IX**
(Cr ar) McKelvey and staff
- 210 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART X**
(Cr ar) McKelvey and staff
- 211 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XI**
(Cr ar) McKelvey and staff
- 212 **ADVANCED OBSTETRICS AND GYNECOLOGY, PART XII**
(Cr ar) McKelvey and staff
- 219 **RESEARCH**
(Cr ar) Staff
- 302 **EXTERNSHIP**
(6 cr) Prem and staff
- 303 **OBSTETRIC AND GYNECOLOGIC HISTORY**
(6 cr; hrs ar) Prem and staff

Ophthalmology (Oph)

- 200 **CLINICAL OPHTHALMOLOGY**
(6 cr; 10:00-5:00 MTWThF; O-P Clin) Harris and staff
- 201 **PRACTICAL OCULAR SURGERY**
(3 cr; 7:30-10:00 TWTh; Oper Room) Harris and staff

Otolaryngology (Otol)

COURSES FOR GRADUATE STUDENTS

- 230 **CLINICAL OTOTOLOGY**
(3 cr; 1:00-4:00 MWThF; O-P Clin) Paparella and staff
- 231 **CLINICAL RHINOLOGY AND LARYNGOLOGY**
(3 cr; 1:00-4:00 MWThF; O-P Clin) Paparella and staff
- 232 **SURGERY OF EAR, NOSE AND THROAT**
(3 cr; 9:00-12:00 MTWThF; O-P Clin and Oper Room) Paparella and staff

Pathology (Path)

- 104 **AUTOPSIES**
(Cr and hrs ar; prereq 102) Dawson, Hebbel
- 106 **DISEASES OF THE HEART**
(1 cr; prereq 102; hrs ar) Edwards
- 111 **CONFERENCE ON AUTOPSIES**
(1 cr; prereq 102; 12:30-1:30 T; JacH 178) Dawson
- 112†† **DIAGNOSIS OF TUMORS**
(2½ cr; prereq 102; 8:00 MTThF; JacH 178) Hebbel
- 113†† **SURGICAL PATHOLOGY**
(Cr and hrs ar; prereq 102) Hebbel

†† Path 112 and 113 are not repetitions of the First Term but rather continuations.

- 121 DISEASES OF THE ALIMENTARY TRACT**
(1 cr; prereq 102; hrs ar) Hebbel
- 150†† PROBLEMS IN PATHOLOGY**
(Cr and hrs ar; prereq 102) Dawson, Hebbel
- 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 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 IN 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

†† Path 113 and 150 are not repetitions of the First Term but rather continuations.

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) Cafruny and staff

203 RESEARCH IN PHARMACOLOGY

(Cr and hrs ar) Cafruny and staff

Physical Medicine and Rehabilitation (PMed)

103 PHYSICAL THERAPY CLINIC

(Cr and hrs ar) Gullickson

161 CLINICAL MEDICINE IN REHABILITATION

(5 cr) Kottke

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) Kottke

200 PHYSICAL MEDICINE SERVICE

(Cr and hrs ar) Staff

204 CLINIC, PERIPHERAL VASCULAR DISEASE

(Cr and hrs ar) Gullickson

205 READINGS

(1 cr; I M) Kottke

206 CONFERENCE

(Cr and hrs ar) Staff

210 RESEARCH IN PHYSICAL MEDICINE

(Cr and hrs ar) Kottke, Kubicek

212 ELECTROMYOGRAPHY

(Cr and hrs ar) Kottke

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

83 THEORY AND TECHNIQUE OF MUSCLE FUNCTION

(5 cr; lect II MTWTh, ChRC 208; lab III-IV MTWTh, II-IV F, ChRC 220)
Pohtilla, Allison

88 CLINICAL EDUCATION

Five weeks of supervised practice at affiliating hospitals. (3 cr; limited to physical therapy students in the professional program; ar at affiliating hospitals) Clayson

Physiology (Phsl)

- 113 PROBLEMS IN PHYSIOLOGY
(Cr and hrs ar) Visscher and staff
- 202 READINGS IN PHYSIOLOGY
(Cr and hrs ar) Visscher and staff
- 203 RESEARCH IN PHYSIOLOGY
(Cr and hrs ar) Visscher and 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 neurology 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
- 251 **CLINICAL INPATIENT PSYCHIATRY**
(Cr ar) Koutsky and 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) Koutsky and 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
- 264 **INTRODUCTION TO CLINICAL PSYCHOLOGY**
(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)
- 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) Feinberg, 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 neuro-surgical 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 M; Todd Amph) D'Angio
- 205 RESEARCH: RADIATION THERAPY, NUCLEAR MEDICINE, RADIOBIOLOGY**
(Cr ar) D'Angio, Loken
- 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 work. (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) Jacobson
- 236 RADIOISOTOPE SEMINAR**
Recent developments in nuclear medicine. (1 cr; 12:00-1:00 W) 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; 4:00-6:00 Th; Todd Amph) Lober, Peterson, and others
- 240 RADIATION THERAPY CONFERENCE**
Recent advances in clinical radiotherapy. (1 cr; 4:00-5:00 M) D'Angio

Surgery (Surg)

Division of General Surgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 129 CLINICAL LECTURES IN GENERAL SURGERY**
(1 cr per yr; prereq regis med) Staff
- 135 CLINICAL CLERKSHIP**
(16 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 181 CARDIOVASCULAR SURGERY**
Clinical problems and participation in surgery. For seniors only. (Cr and hrs ar)
C W Lillehei, Varco
- 182 PROBLEMS IN CLINICAL INVESTIGATIONS AND PROBLEMS IN EXPERIMENTAL SURGERY**
(Cr and hrs ar; University and affiliated hospitals) Staff
- 183 EXTERNSHIP IN AFFILIATED HOSPITALS**
(Cr and hrs ar) Staff

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) Wangenstein and staff
- 202 APPLIED SURGICAL ANATOMY ON THE CADAVER**
Surgical fellows prepare dissections with staff supervision. (1 cr; hrs ar) Wangenstein and staff
- 203 PROCTOSCOPY AND SIGMOIDOSCOPY**
Diagnosis and treatment of lesions of the lower bowel. (1 cr; hrs ar) Wangenstein, W Bernstein and staff
- 204 TUMOR CLINIC**
Combined clinical-pathological consideration of tumors as seen by general surgeon. (1 cr; hrs ar) Wangenstein and 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) Wangenstein and staff
- 208 STUDY OF SURGICAL PROBLEMS**
Surgical fellow acts as house surgeon at hospital. (1 cr; hrs ar) Wangenstein and staff
- 211 OPERATIVE SURGERY**
Surgical fellow acts as the first assistant at operations in University Hospitals and later may be permitted to operate. (1 cr; hrs ar) Wangenstein and staff
- 214 SURGICAL WARD CONFERENCE**
Presentation of interesting cases by the students. (1 cr; hrs ar) Surgical staff
- 215 SURGICAL ROENTGENOLOGICAL CONFERENCE**
Weekly reviews of films of all surgical patients. (1 cr; hrs ar) Staffs of Departments of Radiology, Pathology, and Surgery
- 216 SURGICAL RESEARCH**
Problems in experimental surgery. (1 cr; hrs ar) Surgical staff
- 217 SURGICAL SEMINAR**
Conferences for review of surgical literature, for presentation of cases and as research. (1 cr; hrs ar) Surgical staff
- 218 SURGICAL CLINICS—PATHOLOGIC CONFERENCE**
Review of interesting cases by the medical, surgical, pediatrics, and pathology staffs. (1 cr; hrs ar) Surgical staff
- 219 SURGERY-LITERATURE CONFERENCE**
Leading surgical journals are assigned to the fellows who read and report on important articles at weekly conference. (1 cr; hrs ar) Wangenstein and staff
- 220 PERIPHERAL VASCULAR CONFERENCE**
Vascular clinic with conference following. (1 cr; hrs ar) Wangenstein and staff
- 221 SURGERY-PHYSIOLOGY CONFERENCE**
Seminar discussing physiological aspects of surgery. (1 cr; VIII T) Wangenstein and staff

Division of Neurosurgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 127 CLINICAL LECTURES IN NEUROSURGERY
(1 cr per yr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 188 NEUROSURGERY EXTERNSHIP, UNIVERSITY HOSPITALS
(Cr ar; prereq regis med) Staff
- 189 NEUROSURGERY EXTERNSHIP, VETERANS ADMINISTRATION HOSPITAL
(Cr ar; prereq regis med) Staff
- 190 NEUROSURGERY INVESTIGATION
(Cr ar; prereq regis med) 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) French, Chou
- 308 STUDY OF NEUROSURGERY PROBLEMS
The neurosurgical fellow acts as house surgeon at University Hospitals. (4 cr) French, Chou
- 311 OPERATIVE NEUROSURGERY
The neurosurgical fellow acts as first assistant at operations in University Hospitals, and later may be permitted to operate. (4 cr) French, Chou
- 316 NEUROSURGICAL RESEARCH
Problems in experimental or clinical surgery. (3 cr) French, Chou
- 318 NEUROSURGICAL CONFERENCE
A review of X-rays and case histories on neurosurgical service. (1 cr) French, Chou

Division of Orthopedic Surgery

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 122 PRINCIPLES OF DIAGNOSIS, TREATMENT, PROGNOSIS OF FRACTURES, DISLOCATIONS
(1 cr; prereq regis med) Staff
- 140 CLINICAL LECTURES IN ORTHOPEDIC SURGERY
(1 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 185 EXTERNSHIP IN ORTHOPEDIC SURGERY AND FRACTURES
(Cr ar; prereq regis med) Staff
- 186 RESEARCH PROBLEMS
(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) Peterson, Moe, Kane, and staff

- 403 **FRACTURES**
The orthopedic fellow acts as house surgeon on the fracture service at Hennepin County General Hospital. (5 cr) Nydahl 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, 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, and staff
- 410 **ORTHOPEDIC PATHOLOGY**
Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities. (2 cr) Moe 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, 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, and staff
- 416 **ORTHOPEDIC RESEARCH**
Problems in experimental or clinical surgery. University Hospitals. (5 cr) Moe, Kane, and staff

Division of Urology

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

- 173 **UROLOGY LECTURES**
(1 cr; prereq regis med) Staff

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 180 **EXTERNSHIP IN UROLOGY**
(Cr and hrs ar) Creevy and staff

REQUIRED COURSES FOR GRADUATE STUDENTS

- 250 **UROLOGICAL SURGERY**
Urological fellow first assists at operations at the University Hospitals and later is permitted to operate under supervision of the staff. (4 cr; hrs ar) Creevy and staff
- 251 **CYSTOSCOPY AND UROLOGICAL DIAGNOSIS**
Urological fellow performs cystoscopies and other diagnostic procedures. (4 cr; hrs ar) Creevy and staff
- 252 **UROLOGICAL CONFERENCE**
Problems in diagnosis and treatment are discussed. (4 cr; hrs ar) Creevy and staff
- 253 **RESEARCH IN UROLOGY**
Problems in experimental and clinical surgery. (4 cr; hrs ar) Creevy and staff

SCHOOL OF NURSING (Nurs)

82B NURSING INTERVENTION

Application, evaluation, and modification of nursing treatment. (4 cr; prereq 82A) Staff

Sec 1, Lect II-III TTh, Owre 112

Sec 4, Lect II-III TTh, MH 118

Sec 2, Lect II-III TTh, Owre 113

Sec 5, Lect II-III TTh, PoH 2317

Sec 3, Lect II-III TTh, Owre 117

Lab II-IV, VI-VIII MW

185C MEDICAL-SURGICAL NURSING

Continuing analysis of health and disease; exploration of nursing role in man's movement to health goals. Selected community laboratory experiences. (4 cr; open only to students who were registered for 4 cr in this course First Term; hrs ar) Sarosi, Zatochill

192C PSYCHIATRIC NURSING SEMINAR AND FIELD PRACTICE IN THE COMMUNITY

Study of the psychiatric nurse's role in present and future community mental health. (2 cr; open only to students who were registered for 2 cr in this course First Term; hrs ar) Hubbard, Cowlshaw

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 first term. (Cr ar; prereq nurses) Leonard

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

The application of environmental engineering, sanitation and maintenance principles and techniques, with particular reference to effective planning, administration and operation of hospitals. (Cr ar; prereq #) Michaelsen, Nyquist and others

172 STUDIES IN PUBLIC HEALTH NURSING

See first term. (3 cr for both terms; prereq 171) Kroska

176B CLINICAL SEMINAR: PUBLIC HEALTH NURSING

See first term. (3 cr for both terms; prereq 176A) E Anderson, Fredlund, Sparrow, Downey, Leonard

178A THE PUBLIC HEALTH NURSING PRACTITIONER

See first term. (Cr ar; prereq 176, #) van Leeuwen

179B LONG-TERM PATIENT CARE AND REHABILITATION

See first term. (Cr ar; prereq 179A) E Anderson

189 FIELD WORK IN PUBLIC HEALTH NUTRITION

Placement in an approved agency with opportunity for experience in various facets of public health nutrition programs. (Cr ar; prereq #) Stief, Reardon, and associates

- 190** **FIELD PRACTICE IN PUBLIC HEALTH EDUCATION**
See first term. (Cr ar; prereq 183, 227) Craig
- 196 **SEMINAR: PUBLIC HEALTH NUTRITION**
(Cr ar; prereq #) Stief
- 200 **RESEARCH**
Opportunities will be offered by the School of Public Health and by various co-operating organizations for qualified students to pursue research work. (Cr ar) Staff
- 224 **SEMINAR: PUBLIC HEALTH NURSING WITHIN THE CURRICULUM**
See first term. (Cr ar; prereq #) Downey
- 226A **CLINICAL SEMINAR: PUBLIC HEALTH NURSING—MENTAL HEALTH**
See first term. (Cr ar; prereq 175) Kohler
- 226B **CONCEPTS OF BEHAVIOR IN PSYCHIATRIC ILLNESS**
See first term. (Cr ar; prereq 226A) Williams
- 230** **FIELD PRACTICE IN ENVIRONMENTAL HEALTH**
(Cr ar; prereq #) Bond, Paulus, Greene, DeRoos
- 232** **FIELD WORK IN GROUND WATER DEVELOPMENT**
Development of ground water sources with special reference to construction of wells, field tests, and public health problems involved. (Cr ar; prereq grad engineer, 231) Bond, Singer, staff visiting lecturers
- 233 **WATER QUALITY INVESTIGATION AND RESEARCH TECHNIQUES**
Field techniques and special research methods applicable to public health problems of water quality control. Procedures for establishing pollution baselines; appraisal and recognition of advancing eutrophication in surface and underground waters. (6 cr; prereq #) Olson, Odlaug, Ruschmeyer
- 234 **WATER QUALITY RESEARCH**
Design, logistical planning, and implementation of an independent short-term research activity basic to water quality evaluation. Literature review, statistical design and data processing. Field testing of sampling and laboratory operations. (6 cr; prereq #) Olson, Odlaug, Ruschmeyer
- 280†† **ORIENTATION TO SUPERVISION AND ADMINISTRATION IN PUBLIC HEALTH**
See first term. (3 cr for both terms; prereq #) Sparrow

Biometry (PubH)

- 110B **BIOMETRY II**
Further consideration of testing statistical hypothesis and interval estimation; regression analysis; correlation; use of ratios; analysis of variance; contrasts and multiple comparison techniques. (3 cr; prereq 110A, 111B; IV MTWThF; ForH 130) McHugh
- 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
- 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) Boen
- 211 **SEMINAR: BIOMETRY**
(Cr ar) Brown

†† The entire course includes both terms. No credit is given for First Term until satisfactory completion of Second Term.

Mortuary Science (Mort)

For general information on the Department of Mortuary Science, see section on Schools, Colleges, and Special Programs.

13 MORTUARY LAW

Probate proceedings, social security, life insurance benefits, public and personal liability, business law. Licensing; restrictions on mortuary sites; business organization; duties, rights, and liabilities for final disposition. (3 cr; I MTWThF; VH 113) Grayson

76 EMBALMING LABORATORY

Laboratory procedure; practical experience in embalming; evaluations of theory. (2 cr; prereq 56 or #; hrs and room ar) Stroud

77 CLINICAL TRAINING

Practical experience in embalming; evaluations of theory. (2 cr; prereq 56 or #; hrs and room ar) Stroud

Institute of Technology

For general information on 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) Andrews

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) Hemp

Civil Engineering

64A ENGINEERING GEOMETRICS

The geometric design of engineering projects; horizontal and vertical curves; grades; fitting of structural elements to the topography; earthwork and drainage analysis; detailed site plans for construction; computations for construction layout; layout. (3 cr; prereq 61A; lect I-II MWF, lab VI-IX MW; Ex 265) J Fant

147 FOUNDATIONS

Earth pressure theories by Rankine, Coulomb, and Poncelet. Flexible bulkheads. Soil bearing power. Footings. Piles of steel, timber, and concrete. Pile driving formulas. Driving and handling stresses. Cellular cofferdams, single-wall cofferdams. Caissons. Bridge piers. Port structures and installations. (3 cr; prereq 81; I MTWThF; Ex 193) Andersen

194 ADVANCED DESIGN AND ANALYSIS IN CIVIL ENGINEERING

Special studies in planning, design, or analysis of complex civil engineering systems. Individual laboratory research problems, literature studies and reports supervised by senior staff. (1-3 cr; prereq approval of faculty sponsor; hrs ar) J Fant

Electrical Engineering (EE)

31 CIRCUIT ANALYSIS II

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 II MTWThF, Arch 50; plus computation hrs ar) Ar

31A ELECTRICAL ENGINEERING LABORATORY

Laboratory to accompany 31. (1 cr; prereq ¶31) Ar

Lab 1, III-IV MW, EE 118

Lab 2, VI-IX M, EE 118

Lab 3, III-IV TTh, EE 118

Lab 4, V-VIII T, EE118

Lab 5, V-VIII W, EE 118

Lab 6, VI-IX Th, EE 118

- 76 **ELECTROMAGNETIC FIELDS III**
Applications of electrostatic, magnetostatic and electromagnetic field theory. (4 cr; prereq 75; lect I-II MWF, rec I-II TTh; ME 221) Ar
- 86 **JUNIOR ELECTRICAL ENGINEERING LABORATORY**
Experimental study of electromagnetic fields and linear systems. (2 cr; prereq 76 or ¶76, 107) Ar
Lab 1, V-VIII MW, EE 218
Lab 2, V-VIII TTh, EE 218
Lab 3, V-VIII TTh, EE 205
- 108 **LINEAR SYSTEM ANALYSIS II**
Introduction to feedback systems. Analog computer simulation. Spectral analysis, correlation, noise, and sampling. (3 cr; prereq 107; III MTWThF; Arch 55) Ar

Mechanical Engineering

Mechanical Engineering (ME)

- 22A **ANALYSIS AND SYNTHESIS 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 21A; I MTWThF, 1 hr ar; lab V-VI W, VI-VII F; ME 321) Frohrib
- 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 MM 37; lect V-VI TTh, ME 321; lab VII-IX TTh, ME 321) 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; lect I MTWThF, III MWF; Arch 145) Ibele
- 34 **MEASUREMENTS LABORATORY II**
Static and dynamic characteristics of generalized measurement systems. Electro-mechanical transducers. Measurement of temperature, pressure, vacuum, humidity, density, viscosity, heating valves, speed, power, force, stress, strain, and radio-activity. (2 cr; prereq ¶30A; lect VI TTh, ME 221; lab VII-IX TTh, ME 370) Liu
- 35 **MEASUREMENTS LABORATORY III**
(See ME 34) (2 cr; prereq 34; lect V MF, ME 321; lab VII-IX MW, ME 370) Liu
- 90†† **INDUSTRIAL ASSIGNMENT, PART II**
(See First Term) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 91†† **INDUSTRIAL ASSIGNMENT, PART II**
(See First Term) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 92†† **INDUSTRIAL ASSIGNMENT, PART II**
(See First Term) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 93†† **INDUSTRIAL ASSIGNMENT, PART II**
(See First Term) (2 cr for both terms; prereq ¶work-study program; hrs ar) Lund
- 197 **SYSTEM ANALYSIS AND CONTROL**
Study of basic theory of linear feedback control systems. The transfer function representation of solid body, fluid, pneumatic, and electro-mechanical components. On-off, proportional, floating, and rate response in control systems, including industrial instrumentation. (3 cr; prereq 21A; lect III-IV MWF, ME 106) Ogata

†† This course runs through both terms. The student must enter in the First Term and complete both terms in order to receive credit.

Industrial Engineering (IE)

Second
Term
Courses

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 II MTWThF, 1 hr ar; ME 106) Johnson

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 contemporary architecture from its roots in the 19th century until the present time. (3 cr; prereq for all architecture history courses beginning Fall 1967; 9:15-10:00 a.m. MTWThF; Arch 130) Winterowd

56 HISTORY OF ARCHITECTURE

The development of architecture from the 15th century—part three, modern architecture. (3 cr; prereq soph; 11:15-12:00 noon MTWThF; Arch 130) Winterowd

81-82-83††† ARCHITECTURAL DESIGN

(See First Term) (6 cr each for both terms; prereq 2nd yr for IT students, jr for CLA students and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

91-92-93††† ARCHITECTURAL DESIGN

(See First Term) (6 cr each for both terms; prereq 83 and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

106 SEMINAR: AMERICAN ARCHITECTURE

Contemporary architecture in the United States from the period of Henry Hobson Richardson until the present time and including the specific contributions of Louis H. Sullivan, Frank Lloyd Wright and his "Prairie School," Eliel and Eero Saarinen, and later work of Walter Gropius and Mies van der Rohe. Field trip. (3 cr; prereq 56 or §; hrs ar) Winterowd

111-112-113††† ARCHITECTURAL DESIGN

(See First Term) (7 cr each for both terms; prereq 93, MM 93 and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

121-122††† ARCHITECTURAL DESIGN

(See First Term) (9 cr each for both terms; prereq 113, CE 41, and Δ; 1:00-5:00 p.m. MTWThF; Arch 210) Myers

SCHOOL OF 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 225) Staff

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) Staff

211 PHYSICOCHEMICAL METHODS OF ANALYSIS

Optical and electrochemical methods and methods of separation. Lecture. (3 cr; prereq 111 or §; V-VI MWF plus 2 hrs ar; C 325) Staff

†† These courses run through both First and Second Terms. Students must enter at the beginning of First Term.

- 212 PHYSICOCHEMICAL METHODS OF ANALYSIS**
Quantitative application of electrochemical, optical, and other physical techniques. Laboratory. (4 cr; prereq 211 or ¶211; I-III MTWThF; C 310) Staff
- 202 SPECIAL TOPICS**
Analytical topics not covered in regular courses are selected after discussion with instructor. (Cr ar; prereq #; hrs ar) Staff
- 301 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; 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; limited to College of Engineering students; prereq 14; lect I MTWThF, SciCB 375; 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. (5 cr; for chemistry and chemical engineering majors; prereq 24; lect I MTWThF, SciCB 375; rec V MWF, lab VI-VIII MWF, C ar) Staff

Inorganic Chemistry (InCh)

- 104° INORGANIC CHEMISTRY II**
Chemistry of the transition metal and rare earth compounds: nomenclature and stereochemistry; thermodynamics and kinetics of complex ion reactions; crystal field, ligand field, molecular orbital, and valence bond descriptions of bonding; solution chemistry of the transition elements. (3 cr; prereq 103 or #; lect III MTWThF, C 315; rec ar) Hugus
- 302° RESEARCH IN INORGANIC CHEMISTRY**
(Cr and hrs ar) Hugus and staff

Organic Chemistry (OrCh)

- 62 ELEMENTARY ORGANIC CHEMISTRY**
(For all colleges) Important classes of organic compounds, both aliphatic and aromatic, together with some heterocyclic compounds. Laboratory work includes the preparation of typical substances. (5 cr; 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) Smith
- 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)

- 105, 106 **PHYSICAL CHEMISTRY LABORATORY**
(1 or 2 cr; prereq 101 or 102; VI-VIII MW; C 190) Humphries
- 108 **ELEMENTARY PHYSICAL CHEMISTRY**
(3 cr; prereq 107; I MTWThF; C 115) Humphries

Second
Term
Courses

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 72 students; prereq 1 or 11; lect II MTWThF; P 110) Swain
Lab 1, III-IV MWF, ForH 85 Lab 2, VI-VII MWF, ForH 85
- 62 **MINERALOGY AND LITHOLOGY**
Introduction to crystallography, crystal chemistry, and mineralogy. Descriptive and determinative mineralogy. Classification of rocks. Textural, structural, and mineralogical variations of rocks and some ores. (5 cr, §old Geol 23-24; prereq 1 or 11 or §, 1 term college chemistry; lect III MTWThF, P 110; lab VI-VIII MTWTh, P 100) Bartels
- 103 **GEOLOGIC PROBLEMS**
(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, §old Geol 2, B, Geo 2, 22; limited to 18 students; only for students holding degrees in education; prereq 1 or 11 or 109C or §; lect II MTWThF, seminar V TTh; P 110) Swain
Lab 1, III-IV MWF, ForH 85 Lab 2, VI-VII MWF, ForH 85
- 182 **MINERALOGY**
Introduction to crystallography, crystal chemistry, and mineralogy. Descriptive and determinative mineralogy. Classification of rocks. Textural, structural, and mineralogical variations of rocks and some ores. Term paper. (4 cr; not open to geology, mining and metallurgy majors; prereq 1 or 11 or 109C, a term of college chemistry; lect III MTWThF, seminar V TTh, P 110; lab VI-VIII MTWTh, P 100) Zoltai, 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; E 303) 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 320) 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 elementary algebra and 1 yr high school geometry or equiv, and enrollment as elementary education student, or Δ ; III MTWThF; E 330) 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, §15, §10, §21A; prereq high school higher algebra and T or high school trigonometry and satisfactory mathematics placement score; III-IV MTWThF; E 340) 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 and T or high school trigonometry; III-IV MTWThF; E 320) 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; prereq 21A; I-II MTWThF; E 340) 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 co-ordinates, application of integration to physical and geometrical problems in two and three dimensions. (5 cr; prereq 22A; III-IV MTWThF; E 315) 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. Standard topics of infinite series including tests for convergence and divergence, power series, and Taylor expansions. Partial differentiation including the chain rule, implicit functions, directional derivative, maxima and minima. (5 cr; prereq 23 or 23A; III-IV MTWThF; E 303) 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 229) 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; I-II MTWThF; E 229) Ar

40A 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, T or high school trigonometry; III-IV MTWThF; E 227) 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 co-ordinates, 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 available for Upper Division credit to all except mathematics majors. Math 44 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 if grade in 40 is A or B; III-IV MTWThF; E 215) Ar
- 43 (Arts) ANALYTIC GEOMETRY AND CALCULUS II**
 (See Math 42 for course description) (5 cr; prereq 42 or 40 with grade of B; I-II MTWThF; E 215) 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 25A or 26B or 44; III MTWThF; E 302) 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 25A or 26B or 32 or 44; IV MTWThF; E 302) Ar
- 110 TUTORIAL COURSE IN ADVANCED MATHEMATICS**
 Qualified students whose needs are not met by courses offered may make special arrangements of obtaining the content of other graduate courses regularly offered by the department. (3 cr; prereq membership in Academic Year Institute; V MTWThF; E 203) Schuster
- 117B (IT) GEOMETRY**
 Selected chapters of geometry, such as convex bodies, projective geometry, geometry and imagination, elementary algebraic geometry, geometry of transformation groups, axiomatic geometry, geometrical constructions. (3 cr; prereq 25A or 26B or 32 or 44; III MTWThF; E 203) Ar
- 125B (Arts) CRITICAL REASONING IN MATHEMATICAL ANALYSIS**
 Notions of limit, sequence, series, function, derivatives, and integral. Gives more mature understanding of these concepts. Techniques of developing accurate proofs; intuition and logic in connection with these techniques. (3 cr; prereq 26B or 31 or 44; II MTWThF; E 203) Ar
- 131B (Arts) LINEAR ALGEBRA AND GROUP THEORY**
 Course description covers 131A and 131B. Finite dimensional vector spaces; linear transformations and matrices over the real or complex fields; linear equations; determinants; characteristic values; canonical forms; bilinear and quadratic forms; applications; introduction to abstract concepts of modern algebra; more detailed study of finite groups, including Jordan-Hölder theorem and basic theorem for Abelian groups. (3 cr, \$149, \$142-143, \$180; prereq 131A; V MTWThF; E 215) Harper
- 135 (Arts) 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 26A or 27 or 32 or 106; II MTWThF; E 217) Ar

137C (IT) VECTOR ANALYSIS AND LINEAR ALGEBRA

Vector algebra, vector calculus, with emphasis on the generalizations to n dimensions, vector spaces, determinants, matrices, linear transformations, systems of linear equations, characteristic roots, and diagonalization of matrices. (5 cr; prereq admission to Summer Institute or permission of Institute Director; II MTWThF, plus 2 rec hrs ar; Ph 133) Wilde

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; prereq 26B or 31 or 44; I MTWThF; E 217) Ar

153 (IT) ADVANCED CALCULUS II

Infinite series, computation with series, series with variable terms, uniform convergence, power series. Improper integrals. Fourier series and orthogonal functions. Fourier integrals. Special functions. (3 cr; prereq 151 or 108; III MTWThF; E 217) Polansky

168A (IT) ELEMENTARY THEORY OF COMPLEX VARIABLES

Derivative and integral of a function of a complex variable. Cauchy's integral theorem and formula, residues. Application to evaluation of integrals, conformal mapping. (3 cr; prereq 151, 153 or 147, 148, 149 or 108 or §; IV MTWThF; E 217) Ar

185-186 (IT) NUMERICAL ANALYSIS IN ENGINEERING

Will be given together as a continuous sequence, meeting 2 hours per day. 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) Leavitt

Note that Math 147 and 148 or 147 and 151 may be taken simultaneously in the First Term; Math 147, 148, 149 and 147, 151, 153 are 9-credit sequences regularly taught during the academic year.

SCHOOL OF PHYSICS AND ASTRONOMY

Physics (Phys)

2 INTRODUCTION TO PHYSICAL SCIENCE

Introduction 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 PHYSICAL SCIENCE LABORATORY

Laboratory course in conjunction with Phys 2. The combination of Phys 2 and 2A may be applied toward group requirements in the College of Liberal Arts. (1 cr; prereq 2 or ¶2) Ar

23 GENERAL PHYSICS, PART II

Electricity and magnetism. (2 cr; prereq 23 [Part I]; II MTWThF; Ph 166) Ar

23A PHYSICS LABORATORY, PART II

Laboratory exercises in electricity and magnetism. (½ cr; prereq ¶23; 2 lab hrs per wk) Ar

50 INTERMEDIATE GENERAL PHYSICS, PART II

Special relativity. Atomic view of matter, electricity and radiation. Bohr model of atom. X-rays. Introduction to wave nature of matter and radioactivity. (2 cr; prereq 50 [Part I]; III MTWThF; Ph 166) Ar

50A PHYSICS LABORATORY, PART II

Laboratory course given in conjunction with Phys 50. (½ cr; prereq ¶50; 2 lab hrs per wk) Ar

102C†† INTRODUCTION TO ELECTRIC AND MAGNETIC FIELDS

The classical theory of electric and magnetic fields, utilizing vector algebra and vector calculus. (5 cr for both terms; prereq Phys 100C and Math 148C and admission to the Summer Institute or permission of Institute Director; II MTWThF plus 1 lab per wk; Ph 131) Ar

**Second
Term
Courses**

109C†† MODERN PHYSICS II

Nuclear physics, particle physics, wave phenomena, and selected topics in solid state physics. (4 cr for both terms; prereq Phys 107C and Math 148C and admission to the Summer Institute or permission of Institute Director; I MTWThF; Ph 131) Ar

†† NSF Institute for High School Teachers of Physics. (See also section on Special Programs.) This course runs through both terms. The student must enter the First Term and complete both terms in order to receive credit.

College of Veterinary Medicine^{††}

All classes scheduled by arrangement

Veterinary Anatomy (VAn)

- 191° **SPECIAL STUDIES IN VETERINARY ANATOMY**
Individual problems in gross anatomy, histology, embryology, neurology, hematology, and histological techniques. (1-5 cr; regis for more than 1 term permitted; prereq 151 or equiv, §) Weber
- 201, 202 **COMPARATIVE VETERINARY NEUROLOGY**
Correlated studies of the central nervous system of domestic animals. Special emphasis on relating neuroanatomy to neurophysiology. (4 cr per term; prereq 101, §) Fletcher

Veterinary Bacteriology and Public Health (VBac)

- 128° **PROBLEMS IN VETERINARY BACTERIOLOGY AND PUBLIC HEALTH**
(Cr ar; prereq 103 or equiv, §) Pomeroy, Anderson, Lindorfer, Loken, Diesch, Marquart, Kleven
- 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
- 221° **ADVANCED VETERINARY PUBLIC HEALTH**
Discussion of veterinary public health programs and selected diseases common to animals and man. (Cr ar; prereq 127, §) Anderson, Diesch

Veterinary Medicine (VM)

- 121A-B **CLINICS**
Application of medical, obstetrical, radiological, surgical and clinical pathological procedures in the diagnosis, treatment and prevention of animal diseases. (3 cr each; prereq 112, §) Low and others
- 202° **ADVANCED STUDIES IN DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES**
Detailed examination, discussion, treatment and prevention of animal disease problems. (Cr ar; prereq 104, 132, §) Sorensen, Low, Mather, D Johnson, Olson, L Johnson

Veterinary Obstetrics (VObs)

- 204° **SPECIAL PROBLEMS IN ANIMAL REPRODUCTION**
(Cr ar; prereq §) Zemjanis

†† Tuition fees per term in College of Veterinary Medicine are \$76.50 for resident and \$190 for nonresident students, and incidental fee per term is \$13.50. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

Veterinary Pathology and Parasitology (VPaP)

Second
Term
Courses

- 157 **VETERINARY NECROPSY**
Necropsies, techniques, examination of tissue sections, and preparation of records. (1-5 cr; prereq 153 or equiv, Δ) Kurtz and staff
- 158° **SURGICAL PATHOLOGY**
Preparation and interpretation of surgical and necropsy specimens. (3 cr; prereq 157, §, Δ) Bergeland and staff
- 160° **DIAGNOSTIC PATHOLOGY**
Interpretation of anamnesis, 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

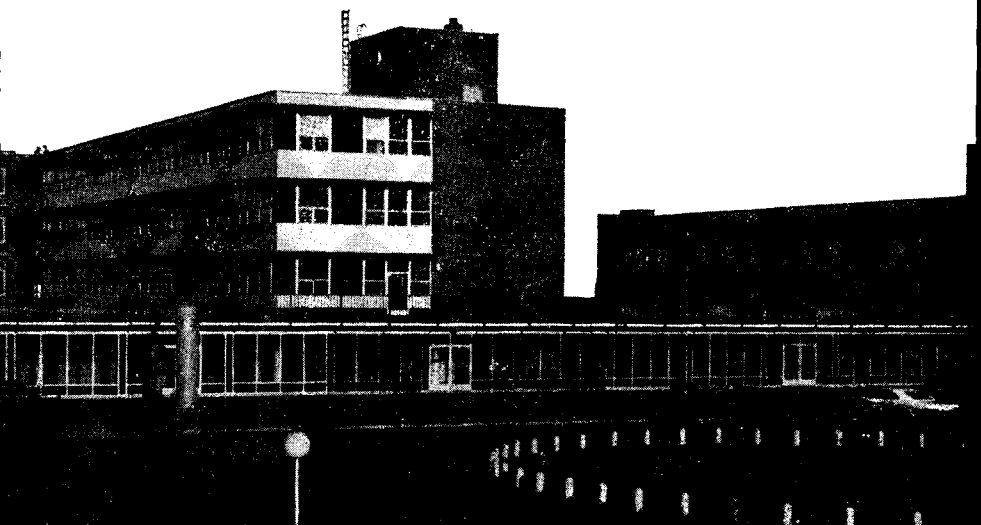
Veterinary Physiology and Pharmacology (VPP)

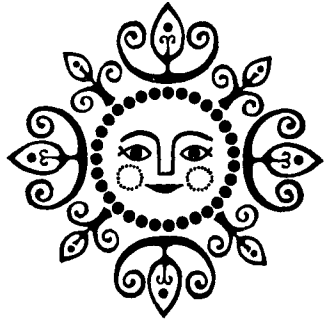
- 130° **PROBLEMS IN ANIMAL PHYSIOLOGY**
(Cr ar; prereq 109 or Phsl 106, 107, §) Good, Dziuk
- 171° **PROBLEMS IN VETERINARY PHARMACOLOGY**
(Cr ar; prereq 152 or equiv, §) Hammond, Stowe

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, §) Spurrell, 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, Gourley
- 225° **ADVANCED SMALL ANIMAL SURGERY**
Surgery of the various systems in small animals with preoperative and postoperative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Gourley
- 230° **ADVANCED LARGE ANIMAL SURGERY**
Surgery of the various systems in large animals with preoperative and postoperative evaluation and treatment. (Cr ar; prereq 103 or equiv, §) Arnold, Usenik

Duluth Campus





Duluth Campus

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 is but a short drive from metropolitan Duluth and its harbor bustling with foreign and domestic traffic, parks, golf courses, swimming beaches, and the famous Skyline Drive.

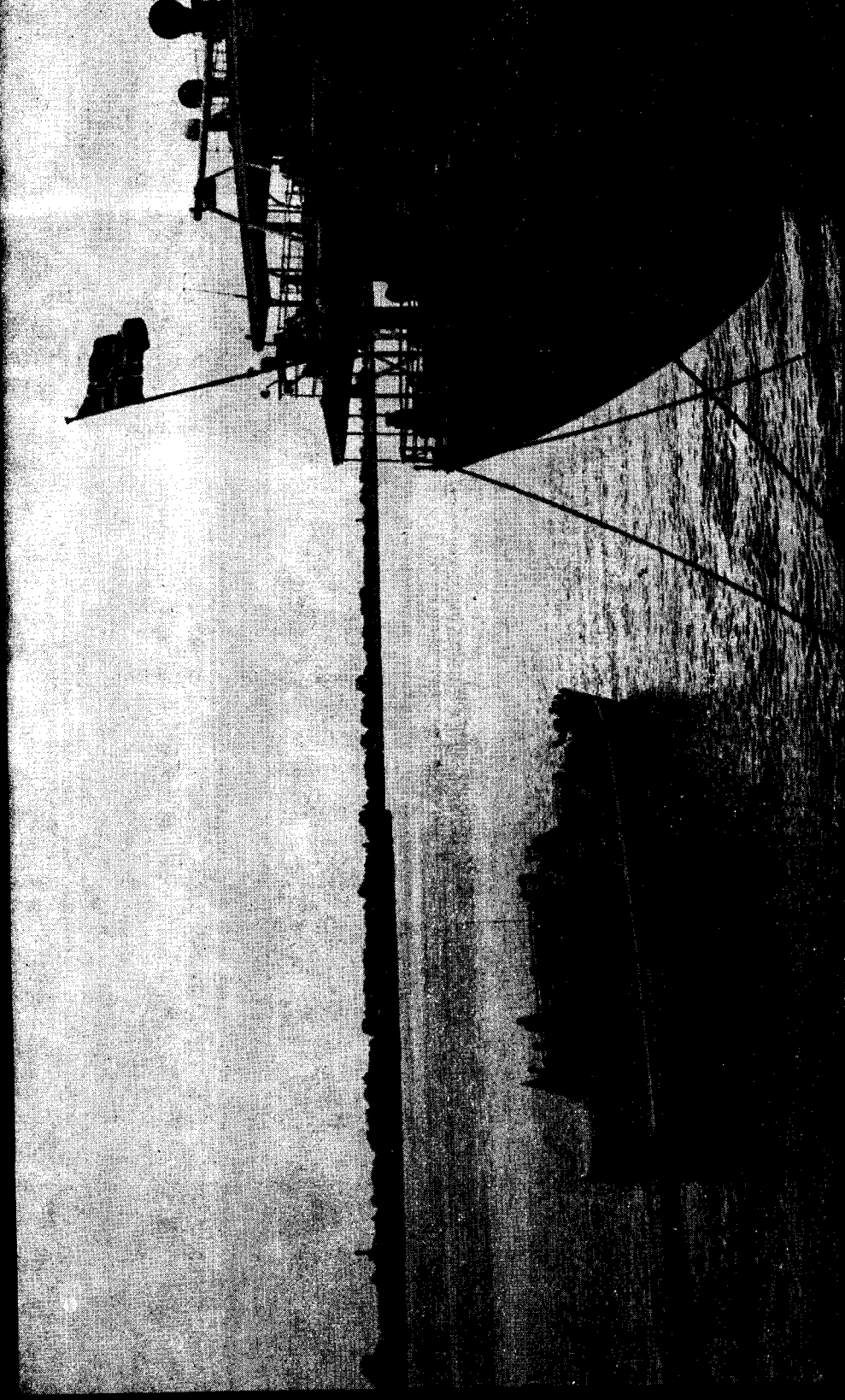
The many lakes in the deeply forested Arrowhead region and the North Shore and Circle Route drives are popular for overnight or weekend camping and fishing trips.

The UMD Summer Session social calendar is planned to fit the recreational needs of the individual student or his entire family. Bridge and golf lessons, family swimming, free coffee breaks, lemonade parties, dances, tours, films, concerts, lectures, an all-school picnic, a steak cook-out, and a wilderness canoe trip are a few of the regularly scheduled activities.

Since 1947 when UMD was established, more than \$18 million has been expended on the complex of 13 buildings which serve departments within four academic divisions. Outstanding structures include Kirby Student Center, Tweed Art Gallery, and the Marshall W. Alworth Planetarium.

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 10 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, in education, in curriculum and instruction, in educational psychology (counseling), in English, and in American history. These studies are designed to serve elementary school teachers, secondary school teachers, counselors, and persons interested in the field of rural education. Students may complete all course work at Duluth. The Graduate School also provides all the course work necessary for the completion of a master of science degree in analytical, inorganic, organic, or physical chemistry. 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 latest *Duluth General Bulletin*, available at the News Service office, Communications Center, and in the *Bulletin of the Graduate School*.

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 Office of the Academic Dean, University of Minnesota, Duluth, Duluth, Minnesota 55812. This office also may be consulted for information concerning selection of courses and other degree requirements.

Application must be submitted *complete in every detail*—two official transcripts of all college work and, if required, test results, references, or other information—at least 4 weeks prior to the opening of the quarter or summer term in which the student 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 English

A graduate major is offered, leading to a Master's degree in English. This program, designed primarily for secondary school English teachers, will em-

phasize a comprehensive coverage of the entire field of English literature. A program of courses is planned for the Summer Session so that a candidate may complete the requirements 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 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. Summer work at the Duluth Campus during both terms will involve the research phase of the M.S. degree.

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 of the University of Minnesota.

Educational Administration

The Duluth Campus summer courses in educational administration have been expanding in recent years but do not yet constitute a complete program for the Superintendent's or Secondary School Principal's Certificates. Graduate students wishing to major in this field may do so by being admitted at the Twin Cities Campus, and may then take certain Duluth courses with the consent of their graduate adviser. For further information write to Department of Educational Administration, 203E Burton Hall, University of Minnesota, Minneapolis, Minnesota 55455.

Persons applying for the Elementary School Principal's Certificate prior to September 1, 1967, in Minnesota, as well as in most other states, may meet their requirements with courses taken entirely on the Duluth Campus. Inquiries may be addressed to Department of Elementary Education, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Counselor Education

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 Counselor Training, Department of Psychology, University of Minnesota, Duluth, Duluth, Minnesota 55812.

Economic Education for Teachers

Scholarships in economic education will be available to present or prospective elementary or secondary school teachers during the first summer term. Teachers will take two graduate courses in economics from the following group: Econ 150C, Current Economic Issues; Econ 150D, Current Economic Issues; Econ 165, Economic Analysis; and Econ 180A, History of Economic Thought. A special introductory economics seminar will be available concurrently for those who need basic background in economics. Information on scholarships may be obtained from the 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 co-ordinators 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.

Programmed Instruction

Classroom teachers and other school personnel who are interested in developing or using programmed teaching materials should note the offering of EdCI 112, Programmed Instruction in the Classroom, during the First Term. Principles and techniques will be discussed and there will be opportunities for construction of programmed materials for classroom use.

Special Education

Teaching Mentally Retarded Children—Teachers wishing endorsement for a special certificate to teach the mentally retarded will find the following

courses pertinent: EdCI 145, Reading Difficulties; EPsy 110, Educational Measurement in the Classroom; EPsy 159, Personality Development and Mental Hygiene; EPsy 182, Education of Exceptional Children; Spch 119, Speech Improvement and Management of the Speech Handicapped in the Classroom. 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 12 to July 21. 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 French and Spanish

Ten-week courses will be offered to provide the student with basic proficiency in French or Spanish 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 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.

Geology

Physical Geology (Geol 1 and Geol A) will be taught First Term, and Historical Geology (Geol 2 and Geol B) Second Term. Both theory and laboratory phases will be considered—and the Duluth area is admirably suited for field applications.

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 First Term. Math 15 will be offered Second Term for those wishing to start their engineering studies in the Fall with advanced standing in mathematics.

Workshop in Advanced Painting

The 19th annual summer painting workshop on the Duluth Campus will again be conducted by a nationally known artist. Some of the past artists who have directed the workshop include Morris Kantor, Max Weber, Yasuo Kuniyoshi, Ralston Crawford, Fletcher Martin, Will Barnet, Philip Evergood, and Henry Pearson. It is a Second Term offering.

NDEA English Institute

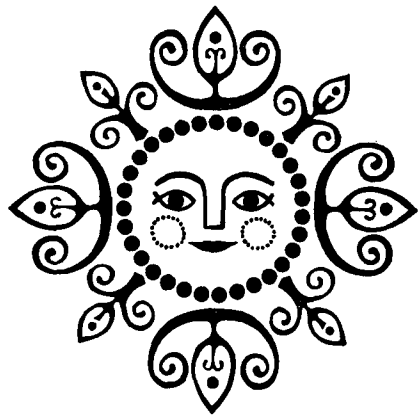
An NDEA Institute for Advanced Study in English: Children's Literature, will be offered on the Duluth Campus during the Second Term for 44 elementary teachers, 22 from grades K through 3 and 22 from grades 4 through 6. The program, supported by the National Defense Education Act, is planned to introduce teachers to a wide range of children's books and to help them to develop principles of criticism so that they can select books with discrimination. The courses will include Literature for Children, Critical Approaches to Literature, and Storytelling. A workshop and demonstration classes will assist teachers to incorporate the materials into their own teaching. Participation in the institute is limited to teachers from Minnesota and Wisconsin. Inquiries may be addressed to Anna L. Stensland, Director, NDEA Institute in English, University of Minnesota, Duluth, Duluth, Minnesota 55812.

NDEA Institute for Secondary School Teachers of Geography

A 6-week institute, supported by the National Defense Education Act, will be offered on the Duluth Campus June 15 to July 26 for junior and senior high school geography teachers. The program is planned mainly for teachers of geography, or social studies which is primarily geography. It is directed toward teachers having limited college preparation in geography, normally not greater than 9 semester (12 quarter) hours. This program is designed to emphasize the kind of training that will provide greater understanding of the basic concepts and principles of geography using the concept of the geographic landscape as the central theme. Participation in the institute is not limited to teachers of the Upper Lakes region but it is assumed that many of the participants will come from this region. For information, write to Director, NDEA Geography Institute, University of Minnesota, Duluth, Duluth, Minnesota 55812.

NDEA Institute in Reading

An 8-week NDEA Institute in Reading will be held on the Duluth Campus, June 19 to August 11. The program will focus upon the early identification and prevention of potential cases of reading disability, and the diagnosis and remediation of reading disability. Enrollment will be limited by competitive application to 28 experienced elementary teachers who wish to begin securing the necessary requirements as a remedial reading teacher, and to 8 experienced remedial reading teachers who wish to begin securing the requirements for certification as a reading consultant or supervisor. Elementary teachers from Minnesota, North Dakota, South Dakota, Wisconsin, and Michigan are invited to make application. Applications must be postmarked no later than March 20, 1967. For information, write to Vernon L. Simula, Director, NDEA Institute in Reading, University of Minnesota, Duluth, Duluth, Minnesota 55812.



Morris Campus

Morris Campus

FIRST TERM

Division of Humanities

Engl 51 SHAKESPEARE I

Introduction to the works of Shakespeare. The plays from the first half of Shakespeare's career. (3 cr; III MTWThF; Hum 105) Spring

Engl 76 HAWTHORNE AND MELVILLE

A study of the important works with an emphasis upon the literary technique. (3 cr; II MTWThF; Hum 105) Gremmels

Engl 80 EURASIAN HEROIC LITERATURE

A study of the heroic tradition in such works as the *Iliad*, the *Aeneid*, the French romance, *Morte d'Arthur*, *Don Quixote*, *Shahnamá* (Persian), *Alf-Lailá* (Arabic), *Mahá-Bharat* (Sanskrit), and others from oriental literature. The works are studied in English translations, and the course is intended to introduce the student interested in liberal education to the important heroic tradition outside English literature. (3 cr; I MTWThF; Hum 111) Khan

Ger A BEGINNING GERMAN

Basic principles of grammar and syntax; reading and writing of simple German prose; correct pronunciation and rudimentary conversation (7½ cr; 10:30-12:00, and 1:00-2:30 MTWThF; Hum 205) Wood

Mus 10A INTRODUCTION TO MUSIC

A general survey to develop an intelligent understanding and appreciation of music. Designed for students not majoring in music. (3 cr; III MTWThF; MuH 109) Johnson

Phil 61A HISTORY OF PHILOSOPHY FROM AUGUSTINE TO HUME

A survey of the main developments in Western philosophic thought from about 400 to 1778. Medieval philosophy. The philosophy of Italian and French Renaissance. Particular attention is given to the systems of continental rationalism (Descartes, Spinoza, and Leibnitz) and British empirical philosophy (Locke, Berkeley, and Hume). (3 cr; IV MTWThF; Hum 11) Uehling

Spch 5A FUNDAMENTALS OF SPEECH

An introductory theory-performance course dealing with the basic principles of oral discourse as found in a variety of speech situations: extemporaneous speaking, oral reading, and discussion. (3 cr; I MTWThF; Hum 105) Fosgate

Spch 76 CREATIVE DRAMATICS

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; II MTWThF; MuH 109) Lammers

Division of Social Sciences

Anth 2A INTRODUCTION TO ANTHROPOLOGY: CULTURAL ANTHROPOLOGY

The varieties and range of human behavior as revealed through the study of "primitive" societies in all parts of the world. A scientific analysis of the ways in which primitive man organized his life, directed toward a deeper and broader understanding of human capacities and purposes. Included will be discussions

of language; social, economic, and political organizations; personality in culture; cultural areas; theories of cultural change; the analysis of law; the arts and religious beliefs in "primitive" societies; and the applications of the study of cultural anthropology. (3 cr; II MTWThF; Hum 11) Nord

Hist 79 AMERICAN PEACE MOVEMENTS: 1815-1914

The individual and organizations devoted to peace in the United States from the War of 1812 to the outbreak of World War I. The relationship of Peace Movement to other 19th-century reform movements. Proposed solutions for elimination of war and for the attainment of perpetual peace. Problems faced in gaining recognition and acceptance from Americans, and internal problems within the movement. The international aspect of American Peace Movements. (3 cr; I MTWThF; Hum 11) Imholte

Soc 53 THEORIES OF CRIMINAL AND DELINQUENT BEHAVIOR

Critical analysis of theories accounting for criminal and delinquent behavior. There will be an attempt to elaborate the family and community backgrounds of these behaviors. Types of deviant behavior such as "professional" or organized crime, white collar crime, etc., will be examined. An approach to prevention will be attempted insofar as the validation of the above theories is achieved. Included will be discussions of statistics on crime and delinquency, penal systems and punishment, psychological and sociological explanations, homicide and suicide, the criminality of women, "abnormal sex crimes," and criticisms of our approaches to reform of criminals. (3 cr; III MTWThF; Hum 11) Seidl

Division of Science and Math

Phys 1 INTRODUCTORY PHYSICS

A study of the basic physical laws and principles relative to mechanics and molecular physics. Topics—measurement, force, motion, work, energy, momentum, and others of interest. A liberal amount of problem solving will be done to enhance the understanding of the various laws. (5 cr; limited to 20 students; IV-V MTWThF; Hum 111) Agarwal

Division of Education

Ed 58 HUMAN LEARNING AND THE CLASSROOM

Application to school situations; motivations; rate of learning and forgetting; teaching of skills, meanings, attitudes; reasoning and problem solving; transfer of learning. (3 cr; V MTWThF; Hum 105) Henjum

SECOND TERM

Division of Humanities

Ger B BEGINNING GERMAN

Continuation of Ger A. First Term. (7½ cr; 10:30-12:00, and 1:00-2:00 MTWThF; Hum 205) Sibul

Division of Education

Ed 57 CURRENT TRENDS IN TEACHING

Consideration of new developments in teaching including team teaching, departmentalization in the elementary grades, programmed instruction, ungraded classrooms and use of lay readers, etc. Of particular interest to teachers in service. (3 cr; III MTWThF; 2-wk period beginning July 17 and ending July 29; Hum 105) Henjum

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INSTRUCTIONS

1. Who should file a Statement of Intent to Register?

Summer Session students as defined on page 13.

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, 105 Morrill Hall.
3. If you are in doubt about your status, see Admissions and Registration section of this bulletin.
4. Do not write in boxes with bold outline.
5. Please print all 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 by May 15. Additional copies of this form may be obtained upon request.

Appl. No. _____

Statement of Intent to Register
UNIVERSITY OF MINNESOTA
 A-82 SUMMER SESSION—1967

Name ↓	LAST	FIRST	MAIDEN	MIDDLE	File No.
---------------	-------------	--------------	---------------	---------------	-----------------

Current Mailing Address ↓	STREET	CITY
----------------------------------	---------------	-------------

COUNTY	STATE	ZIP	S	C	Date	MO	DAY	YEAR
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Last School Attended:	High School or College	NAME	CITY	STATE
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C	Plan on Summer Term	1 _____	2 _____	Minnesota Resident	1 _____	2 _____	Sex: Female _____	Male _____
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NH	NA	PR	O	If previously registered in University of Minnesota indicate:	Last College _____	When _____
1	2	3	3			

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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Minneapolis, Minn.

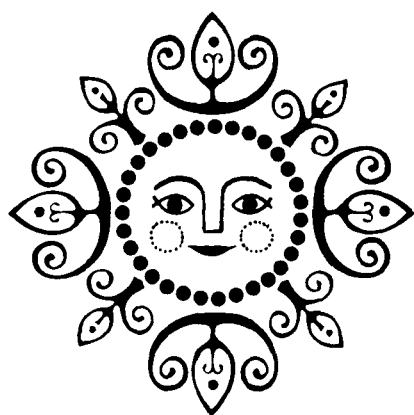
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University of Minnesota Bulletin Summer Session 1967

CHANGES AND ADDITIONS

FIRST TERM

(Shown only is the changed portion of the course description. The remainder of the course description in the bulletin is up to date.)

lect 115B	III-IV MWF, CB 120. Course is completed in First Term.	IR 262	canceled
lect 175B	(added) See description in Second Term. New hour is 7:30-9 a.m. MWF, CB 440.	IR 272	(added) Graduate Topics. Selected topics in industrial relations. (3 cr; prereq 152 or 172) Averch
gEc 109	I-II hour, HH 210	Jour 156	prereq Psy 2 (not Jour 2)
rt 25	(added) 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; III-IV MTWThF; ArtB 140) Routon	Lib 102	Sec 1, II MTWThF, Lib 4A Sec 2, III MTWThF, Lib 4A (Reserved Course--JohH 205)
rt 40-41	canceled	Lib 103	canceled
rt 73-74-75	(added) Presentation Techniques. Visual means of communicating ideas in fields of exhibition techniques, illustration, and advertising. Investigating characteristics and creative use of various mediums. (3 cr; prereq 23; I-II MTWThF; ArtB 140) Routon	Math 137C	Ph 131
rt 80A, C-81A, C-82A, C	canceled	Mus 60	6:30-9:00 p.m. TTh
E 141A	Course number is CE 141.	Nurs 82A	Sec 1, PoH 1326 Sec 2, PoH 1413 Sec 4, PoH 2309
con 160 160A	moved to Second Term.	Nurs 92B	(added) Nursing Synthesis in the Community. Study and application of principles underlying public health nursing designed to meet nursing needs of individuals and families in the community; emphasis on health and prevention of illness and disability. (3 cr; open only to students who will also be registered for 3 cr in this course Second Term; prereq 82B or 85; lect V-VI TTh; 1413 PoH; lab hrs ar) Cano
dCI 124	Arch 50	Phys 1 (see below)	
dCI 158	Arch 50	PubH 50	Arch 35
Psy 286	canceled	PubH 120A	(added) Biomedical Computing. Introduction to biomedical computing and FORTRAN programming. (3 cr; prereq Math 10; 11:15-12:00 MTWThF; PoH Am) Briese, Pogue
er 122	FolH 302	PubH 231	8:30-4:30 MTWThF, JacH 74
er 151	3 credits, FolH 302	SSPA 166F	canceled
er 166	3 credits, Arch 30	Th 177	Reserved Course---JohH 205
st 23	11:10-12:15 MTWThF	QA 258	I hour, CB 145
st 144C	canceled	Phys 1	Reserved Course---CofH 225 for AFHE, E 136 for IT, JohH 205 all others.
st 189F	canceled		

First Term

For Second Term see other side . . .

University of Minnesota Bulletin Summer Session 1967

CHANGES AND ADDITIONS

SECOND TERM

(Shown only is the changed portion of the course description. The remainder of the course description in the bulletin is up to date.)

Acct 115B	See First Term on reverse side.	Math 137C	IV MTWThF, Ph 131
Acct 175B	Moved to First Term. See reverse side.	Mort 2	(added) Introduction to Restorative Art. Basic drawing, anatomical drawing and modeling. (4 cr; II-IV MTWTh; JacH 393) Burger
Anes 268	Research in Anesthesia should be Anes 269.	Nurs 92B	See First Term on reverse side.
Arth 116	canceled	Nurs 199	(added) Special Topics in Nursing. (4 cr; prereq req in Master's programs or employed as nurse supervisor instructor and Δ; hrs ar) Elwood
Arth 176	(added) Twentieth-Century Painting. L'art nouveau, Fauvism, Cubism, Futurism, Orphism. Matisse, Picasso, Braque, Gris, Léger, Boccioni, Rousseau, de Chirico, Duchamp, etc. (3 cr; II MTWThF, J 207B) Nickels	Phys 2 (see below)	
CE 147	prereq 81, 53 or #	Psy 128-129†	(added) 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 for each; prereq 75 except for students in Sequence A and grads; II-III MTWThF; SciCB 175) Trapold
CPsy 140	Arch 25	PubH 138	8:30-4:30 MTWThF; July 17-21, Owre 12 July 24-August 18, JacH 7
Econ 160 & 160A	(added) See bulletin description in First Term.	PubH 232	8:30-4:30 MTWThF, July 17-21, JacH 74
Ed 55B	NH 45	Soc 152	canceled
EdAd 128	July 17-August 2	SW 106	Reserved Course---JohH
EdCI 105	NH 211	Phys 2	Reserved Course---CofH 2 for AFHE, E 136 for IT, JohH 205 all others.
EdCI 179	I hour, AH 101		
EPsy 182	III hour, FraH B1		
Ger 72	Arch 30		
Ger 123	FolH 302		
HEd 156	Arch 50		
Hist 98	canceled		
Hist 181D	canceled		
Lib 103	Sec 1, III MTWThF, Lib 4A Sec 2, IV MTWThF, Lib 4A (Reserved Course---JohH 205)		
Lib 104	C 225		
Lib 283	canceled		

Supplement to the University of Minnesota Bulletin Summer Session Issue of February 1, 1967

CHANGES AND ADDITIONS

(Shown only is the changed portion of the course description. The remainder of the course description in the bulletin is up to date.)

FIRST TERM

AgEc 109
Art 25

I-II hour, HH 210

(added) **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; III-IV MTWThF; ArtB 140) Routon canceled

Art 40-41
Art 73-74-75

(added) **Presentation Techniques.** Visual means of communicating ideas in fields of exhibition techniques, illustration, and advertising. Investigating characteristics and creative use of various mediums. (3 cr; prereq 23; I-II MTWThF; ArtB 140) Routon canceled

Art 80A, C-
81A, C-82A, C
Econ 160 and 160A

moved to Second Term

EPsy 286
Hist 144C
Hist 189F
Jour 156
Lib 102

canceled

canceled

canceled

prereq Psy 2 (not Jour 2)

Sec 1, II MTWThF, Lib 4A (Reserved Course—JohH 205)
Sec 2, III MTWThF, Lib 4A (Reserved Course—JohH 205)

Lib 103
Mus 60
QA 258

canceled

6:30-9:00 p.m.

I hour, CB 145

SECOND TERM

Econ 160 and 160A

(added) See bulletin description in First Term

EdAd 128

July 17-August 2

EdCI 179

I hour, AH 101

EPsy 182

III hour, FraH B1

Hist 96

canceled

Hist 181D

canceled

Lib 103

Sec 1, III MTWThF, Lib 4A (Reserved Course—JohH 205)

Sec 2, IV MTWThF, Lib 4A (Reserved Course—JohH 205)

Lib 283

canceled

Psy 128-129†

(added) **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 for each; prereq 75 except for students in Sequence A and grads; II-III MTWThF; rm ar) Trapold

Reserved Course—JohH 205

SW 106

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