

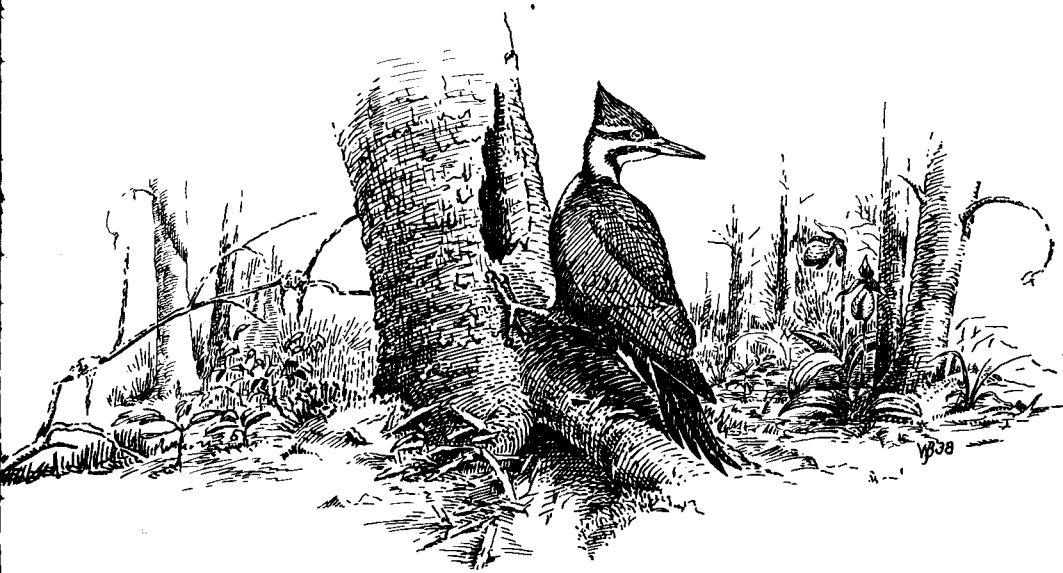
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Bulletin of the
UNIVERSITY OF MINNESOTA



Summer Session 1963

Lake Itasca Forestry and Biological Station

Biology Session

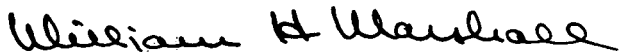
June 17 to August 3

FOREWORD

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

The 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.

This combination assures that students and research workers will have a most stimulating experience during the 7-week session.



William H. Marshall
Director of Biology Session

Volume LXVI

Number 1

January 1, 1963

BULLETIN OF THE UNIVERSITY OF MINNESOTA

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**GENERAL
INFORMATION**

Location

The 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, and Park Rapids.

Mail

Mail for students should be addressed to: Biological Station, Lake Itasca P. O., Minnesota.

Inquiries

Requests for bulletins and all information relating to the Biology Session should be addressed to:

Dean of the Summer Session
960 Johnston Hall
University of Minnesota
Minneapolis 14, Minnesota

Specific inquiries as to courses, accommodations, equipment, etc., will then be referred to the staff member concerned.

**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, algae, aquatic flowering plants, and 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 many examples of vegetation but also a singular variety of fungi, birds, mammals, and insects of southern, northern, and western origin. 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 animal problems for study.

**INDEPENDENT
INVESTIGATORS**

Qualified investigators may arrange with the director for research in various fields of terrestrial and fresh-water biology.

**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 of wildlife management have the opportunity for the study of life history



Ample dock and boat facilities are always available on the campus

Many specimens are available for laboratory studies



and ecology of vertebrates as well as basic courses in related fields. 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 field season should make prior arrangements with the director and the instructor involved.

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. Three complete sets of aerial photos of the park area made in 1938, 1951, and 1959 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, row boats, and launches, and the minor accessories for instruction and research.

A library-administration building provides room for quiet study. The Station library includes a set of *Biological Abstracts* and many books basic to field work. Other books and journals are available from the University Libraries.

Necessary supplies and textbooks can be bought at the store maintained by the University Bookstores at the Station.

**BOARD AND
LODGING**

Meals

Meals are served to both on-campus and off-campus students in an attractive dining hall located on the lake shore. The kitchen is operated by the director in consultation with a student representative. Meals are carefully planned, well balanced, and prepared by experienced cooks. Fresh meat, vegetables, and fruit are served daily.

Cabins

There are 7 cabins for men, each accommodating 8 students, and 6 cabins for women, each accommodating 6 students. Women's cabins are equipped with toilets and lavatories. A central bathhouse with laundry facilities is located near each of these groups.

**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 water, electricity, and firewood available. Students wishing to use this facility should make application well in advance of the session. There is a charge of \$21 for the use of this area.

**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 bed linen, towels, and blankets. Since the nights are often cool, it is suggested that you bring 2 or 3 wool blankets. Essential personal equipment includes suitable shoes or boots for field work, a field suit or dress, a warm jacket, a raincoat, heavy socks, a swimming suit, flashlight, notebooks, pocket field books, pencils, hand lenses, dissecting sets, pins, vials, and corks.

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.

If you bring a boat or canoe, a seasonal use permit (\$2.50) must be purchased at Park Headquarters.

Off campus and within park boundaries, the State Park regulations govern. The State Park entry sticker (\$2) must be bought at the park entrance if you bring your car.

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

Ecology and algae laboratory



HEALTH SERVICE A two-ward, well-equipped infirmary, with a registered nurse in attendance, is available for the care of minor ills and injuries. Medical attention, when necessary, can be secured at Park Rapids or Bemidji. The payment of the incidental fee covers the cost of this service and entitles the student to medical service not to exceed a cost of \$10. Special services, such as X-ray, infrared treatments, etc., and the cost of filling prescriptions must be paid by the student. If transportation to a hospital or doctor's office is needed, it must be provided by the student. Cost of dental work is not covered by the Health Service fee.

REGISTRATION INFORMATION Courses are open to all qualified graduate and undergraduate students who have had the usual preliminary courses in biological subjects. General rules for admission 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*.

Admission

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 at another recognized graduate school should complete the Transient Graduate Student form No. 218. Applications should be sent to the Dean of the Graduate School, University of Minnesota, Minneapolis 14.

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.

Library facilities are intensively used



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.

Requests for information and applications for the above fellowships should be made to the Graduate School, University of Minnesota, Minneapolis 14.

Research and Training Stipends

Stipends of three categories are available in the Biological Research and Training 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 grant-in-aid includes funds for tuition and fees.

Application forms for these stipends may be secured by writing the Dean of the Summer Session, 960 Johnston Hall, University of Minnesota, Minneapolis 14. They must be completed by March 1, 1963.

**Institute for
High School
Teachers**

An Institute for High School Teachers of Biology will be held at the Station again this year. A National Science Foundation grant provides for academic fees, stipends, travel, and dependency allowances for 22 teachers. The program is an intensive one stressing field biology and research projects. Write the Director of Itasca Biology Session, 300 Coffey Hall, University of Minnesota, St. Paul 1.

Registration

Whenever possible, students should complete their registration at the Office of Admissions and Records on either the St. Paul Campus or the Minneapolis Campus. Registration by out-of-town students can be completed at the Station.

Tallied Courses

All students must tally for courses given at the Station. IBM class reservation cards will be held for students who have filed the Request for Reservation blank from inside the back cover of this bulletin. The Request for Reservation may be brought or mailed to 300 Coffey Hall, St. Paul Campus, or 135 Johnston Hall, Minneapolis Campus.

The IBM class reservation cards may be picked up at 220 Coffey Hall, St. Paul Campus, after May 27. Cards for out-of-town students will be available at the Station when the student registers.

Normal Load

Two courses, totaling 12 quarter credits, are considered a normal load. Advanced students may take 2 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.

Reservations

The Station cabins accommodate 92 students. Reservations are required and should be received by the University by June 1. Cabin assignments will be made on Saturday, June 15, and Sunday, June 16. A reservation form is printed inside the back cover of this bulletin. Instructional facilities accommodate an additional number of off-campus students.

**Room and
Board Costs**

Fees for room and board include a \$19.25 service charge for dormitory and dining room facilities and, in addition, an initial payment of \$105 for board. The kitchen is run on an actual cost basis. These costs are payable to the director at the beginning of the term, and a refund or slight additional assessment may be made at the end of the session.

Academic Fees

The following fees are payable by each regular registrant on or before June 18:

Tuition fee	\$100.00
Incidental fees	15.40
Laboratory fee	10.00
	<hr/>
	\$125.40

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 \$43.40 tuition per term and the incidental fee.

Independent investigators will pay a Research Table fee of \$35.

Late Fees

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

June 19-21	\$3.00
June 24-28	5.00
Thereafter	10.00

No registration will be accepted after Thursday, June 20, without the approval of the director of the Biology Session and the payment of the late fee.

STAFF MEMBERS

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

Francis Drouet, research fellow, Academy of Natural Sciences of Philadelphia, is the author of extensive monographic studies on the blue-green algae.

David W. French, associate professor, University of Minnesota, has been working in field problems of forest pathology and has published on tree diseases and deterioration of wood.

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

Donald B. Lawrence, professor, University of Minnesota, has studied climatic change and vegetation development following glacier recession in western North and South America, has taught meteorology and ecology, and has directed ecosystem research in Minnesota.

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

Thomas Morley, associate professor, University of Minnesota, specializes in the classification of the flowering plants. He has published a monograph on the taxonomy of woody groups related to the myrtle family.

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.

William Schmid, assistant professor, University of North Dakota, is currently doing work in the field of comparative physiological ecology of anurans.

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

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

Dwain W. Warner, associate professor, University of Minnesota, is curator of ornithology at the Minnesota Museum of Natural History and is engaged in research on avian behavior, the relation of bird migration to distribution of fungi and viruses, and on radio telemetry.

COURSES OF INSTRUCTION

Other courses than those listed below and research problems may be arranged to suit individual needs.

An asterisk () indicates courses in which papers may be prepared by graduate students for independent work under Plan B. A sharp sign (#) indicates that consent of instructor must be obtained. A triangle (Δ) indicates that consent of department must be obtained.*

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. (6 cr; prereq 10 cr in botany or zoology, or #; WS) Ownbey
- 116. Summer Flora of Minnesota.** A survey of the summer flowering plants and ferns of the state with particular reference to the local flora. Collection and identification of species; distribution in Minnesota; literature and taxonomic methods. Text: *Gray's New Manual of Botany*; Tryon, *The Ferns and Fern Allies of Minnesota*. (6 cr; prereq 10 cr in botany or zoology, or #; TF) Morley
- 136.* Organisms, Microclimate, and Weather.** Relations of organisms including man to microclimate and to weather with special emphasis on heat and temperature, moisture and wind. Lectures, laboratory, field work, and discussion. Term paper required. (6 cr; prereq 10 cr in biology, botany, or zoology, a course in physics recommended; MTh) Lawrence

155. **Fresh-water Algae.** The morphology and taxonomy of fresh-water algae with particular attention to the collection and identification of local algae. Text: Smith, *Fresh-water Algae of the United States*. (6 cr; prereq 10 cr in botany, biology, or zoology, or #; TF) Drouet
159. **Lichens.** Taxonomy, ecology, and floristics of the lichens of northern Minnesota; identification, sampling methods, micro-chemistry as a taxonomic tool. (6 cr; prereq 10 cr in botany or zoology; WS) Hale
- 196.* **Problems in Ecology, Taxonomy, Bryology, or Algology.** Advanced studies based on individual field work and research. (Cr ar; prereq #) Staff
- 208.* **Research Problems in Taxonomy.** (Cr ar; prereq #) Ownbey, Morley
- 224.* **Research Problems in Ecology.** (Cr ar; prereq #) Lawrence
- 236.* **Research Problems in Cryptogams.** (Cr ar; prereq #) Drouet, Hale

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*. (6 cr; prereq Biol 2 or equiv; WS) 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*. (6 cr; prereq Biol 2 and Ent 52 or equiv or Δ ; WS) Cook

162.* Vertebrate Ecology. Field work on populations and their relationships to local environments; habitat analysis and ecological research methods. Text: Dice, *Natural Communities*. Individual and team research projects, field trips, and lectures. (6 cr; prereq Bot 50 and Zool 65 or equiv; MTh) Tester, 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 #) Cook, Marshall, Tester

PLANT
PATHOLOGY
AND BOTANY

56. Introduction to the Study of Fungi. The structure, development, and identification of fungi, especially those of economic importance. (6 cr; jr, sr; prereq 9 cr in botany, or #; MTh) French

156. Study of Fungi for Advanced Students. General characters of fungi; especially those used in identification; cultural and taxonomic procedures and practices. (6 cr; prereq 9 cr in botany, or #; MTh) French

210.* Special Problems in Mycology. Individual research work in taxonomy and biology of special groups of fungi. (Cr ar; prereq Myc 107) French

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*. (6 cr; prereq Biol 2 or equiv; MTh) Schmid

115. Advanced Natural History of Invertebrates and Fishes. Advanced taxonomic and ecological survey of the local fauna and independent ecological studies of several taxo-

onomic groups. Text: Eddy and Hodson, *Taxonomic Keys of the Common Animals of Minnesota*; Pennak, *Fresh-water Invertebrates of the United States*. (6 cr; prereq 15 cr in zoology; MTh) Schmid

119. Limnology. The conditions for life in the water and distribution of aquatic animals. Text: Reid, *Ecology of Inland Waters and Estuaries*. (6 cr; prereq 15 cr in general biology incl Biol 2, or equiv; WS) Underhill

135. Field Ornithology. Field and laboratory studies of ecology and life histories of the birds in the Itasca Park region. (6 cr; prereq 15 cr in zoology; TF) Warner

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 #) Underhill, Warner

**CONDENSED
COURSE
SCHEDULE**

<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
Bot 136	Bot 116	Bot 112	Bot 136	Bot 116	Bot 112
Ent 162	Bot 155	Bot 159	Ent 162	Bot 155	Bot 159
PIPa 56-156	Zool 135	Ent 59-124	PIPa 56-156	Zool 135	Ent 59-124
Zool 72-115		Zool 119	Zool 72-115		Zool 119

GRADUATE STUDENT THESES

- FREEMAN, R. S. The biology and life history of *Monoecocestus* Beddard, 1914. (Cestoda): Anoplocephalidae (from the porcupine), with notes on Minnesota Oribatordea (Acarina). Ph.D. Thesis. 1950.
- QUIMBY, D. C. The life history and ecology of the jumping mouse (*Zapus hudsonius*). Ph.D. Thesis. 1950.
- FASHINGBAUER, B. A. The effects of defoliation by the forest tent caterpillar, *Malacosoma disstria*, Hbn.: and spraying for the control of the forest tent caterpillar upon bird life; and the effect of spraying for the control of the forest tent caterpillar upon amphibians. M.S. Thesis. 1951.
- KRAFT, K. J. The ants of Itasca State Park, Minnesota. M.S. Thesis. University of North Dakota. 1952.
- LEISMAN, G. The rate of organic matter accumulation on the sedge mat zones of bogs in the Itasca State Park region of Minnesota. M.S. Thesis. 1952.

- BELLIS, E. D. An ecological study of the wood frog, *Rana sylvatica* Le Conte. Ph.D. Thesis. 1957.
- LARSON, O. R. Larval trematodes of fresh-water snails of Lake Itasca. M.S. Thesis. 1960.
- TESTER, J. R. A study of certain plant and animal interrelations on a native prairie in north-western Minnesota. Ph.D. Thesis. 1960.
- HARMS, C. E. The development and cultivation of the acanthocephalan *Octospinifer macilentis* Van Cleave, 1919. Ph.D. Thesis. 1962.
- PAULSEN, G. W. Preservation and stratigraphic distribution of pigments in Minnesota lake sediments. M.S. Thesis. 1962.
- SCHMID, W. D. Some aspects of the water economies of nine species of anuran amphibians. Ph.D. Thesis. 1962.

RECENT RESEARCH PUBLICATIONS

- ISAAC, D., W. H. MARSHALL and M. F. BUELL. A record of reverse plant succession in a tamarack bog. *Ecology*, 40:317-320. 1959.
- KROGSTAD, B. O. Some aspects of the ecology of *Axygnia furcata* McAtee (Diptera: Sylvicolidae). *Proc. Minn. Acad. Sci.*, 27:175-177. 1959.
- MARSHALL, W. H. Waterfowl brood studies. *Flicker*, 30:122-126. 1959.
- OLSON, W. A. A preliminary check-list of mosses of Itasca State Park, Minnesota. *Bryologist*, 62:259-262. 1959.
- SARGEANT, A. B. and W. H. MARSHALL. Mammals of Itasca State Park, Minnesota. *Flicker*, 31(4):116-123, 126-128. 1959.
- BESTE, V. An ecological study of the upland conifers of Itasca State Park. *Proc. Minn. Acad. Sci.*, 25:82-87. 1960.
- BOUDRYE, M. R. Notes on the Tardigrada of Minnesota. *Proc. Minn. Acad. Sci.*, 25:195-199. 1960.
- BUELL, M. F. and V. FACEY. Forest-prairie transition west of Itasca Park, Minnesota. *Bull. Torrey Bot. Club*, 87(1):46-58. 1960.
- COX, GEORGE W. A life history of the mourning warbler. *Wilson Bull.*, 72(1):5-28. 1960.
- LEFEBVRE, J. H. Preliminary ornithological survey of French Creek Bog. *Flicker*, 31(4):106-108. 1960.
- MONSON, P. H. Variation in *Nymphaea*, the white waterlily, in the Itasca State Park region. *Proc. Minn. Acad. Sci.*, 25:26-39. 1960.
- ORR, H. D. Orientation of the Franklin ground squirrel to environmental objects. *Proc. Minn. Acad. Sci.*, 25:225-232. 1960.
- ORR, H. D. and T. W. SUDIA. Flight distance in the great blue heron. *Wilson Bull.*, 72(2):198-199. 1960.
- PARTCH, M. L. Vegetation changes on the Waubun Prairie. *Proc. Minn. Acad. Sci.*, 25:60-70. 1960.
- STEIN, J. R. Preliminary survey of the algae of Hubbel Pond Game Refuge (Becker County). *Proc. Minn. Acad. Sci.*, 28:45-52. 1960.
- STROSNIDER, R. C. and J. GLEASON. Some factors related to the growth of redwinged black-birds. *Atlantic Naturalist*, April-June:107-110. 1960.

- SUDIA, T. W. Frequency calculations from several different forest ecological sampling methods. Ohio Jour. Sci., 60(2):100-105. 1960.
- SUTHERS, R. A. Measurement of some lakeshore territories of the song sparrow. Wilson Bull., 73(3):232-237. 1960.
- TESTER, J. R. and J. T. EMLEN, JR. Plastic tiles as dropping boards for population studies of small mammals. Jour. Mammalogy, 41:142. 1960.
- WOOD, F. A. and D. W. FRENCH. Growth of cankers caused by *Hypoxylon pruinaum* on aspen and sporulation of the fungus. Proc. Minn. Acad. Sci., 28:3-5. 1960.
- BRECKENRIDGE, W. J. and J. R. TESTER. Growth, local movements, and hibernation of the Manitoba toad, *Bufo hemiophrys*. Ecology, 42(4):637-646. 1961.
- CAMARA, JOSEPH and BENTON W. BUTTREY. Intestinal protozoa from tadpoles and adults of the mink frog, *Rana septentrionalis* Baird. Proc. S. D. Acad. Sci., XL:59-66. 1961.
- DENNIS, C. J. An observation of the behavior of *Telamoria compacta* Ball preceding and during oviposition (Homoptera, Membracidae). Ent. News, 72(6):152-154. 1961.
- PETERSON, A. Some types of eggs deposited by moths, Heteroscera-Lepidoptera. The Florida Entomologist, 44:107-114. 1961.
- STERN, K. R. Chromosome numbers in nine taxa of *Potamogeton*. Bull. Torrey Bot. Club, 88(6):411-414. 1961.
- STERN, K. R. Revision of *Dicentra* (Fumariaceae). Brittonia, 13:1-57. 1961
- TESTER, J. R. and W. H. MARSHALL. A study of certain plant and animal relations on a native prairie in northwestern Minnesota. Minn. Mus. of Nat. Hist. Occ. Papers, 8:1-51. 1961.
- BRAY, J. R. Use of non-area analytic data to determine species dispersion. Ecology, 43:328-333. 1962.
- CHRIST, JOHN CONRAD. Activity at a phoebe nest. Flicker, 34:102. 1962.
- TESTER, J. R. and W. H. MARSHALL. Minnesota prairie management techniques and their wildlife implications. Trans. N. A. Wildlife Conf., 27:267-287. 1962.

ITASCA BIOLOGY SESSION

Request for Reservation

Name _____ Date _____

Address _____

Status: Grad.; Special; Research; Freshman; Soph.; Junior; Senior (circle one)

College _____

Reserve a place in the following two courses for me:

Dept. _____ No. _____ and Dept. _____ No. _____

(see condensed course schedule to avoid conflicts)

I wish a single reservation, campground reservation, or resort list (circle one).

Date of arrival _____ Car or bus? _____

Meal service begins June 15. Buses will be met at Douglas Lodge.

Please mail this form to Director, Itasca Biology Session, 300 Coffey Hall,
University of Minnesota, St. Paul 1, Minnesota



BULLETIN

DESK COPY

Delivery 4-5-63

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**University
of
Minnesota**

summer session

**preliminary
announcement**

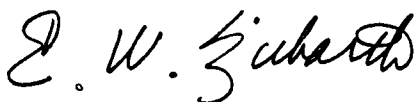
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Foreword

It is our hope that the program of carefully planned study and recreation outlined in the pages of this bulletin will serve your needs and interests. This is our invitation to you to make full use of the extensive facilities which will be available to you at the University of Minnesota during the summer of 1963.

The Summer Session is not impersonal even though it is large, and the program has been designed with the special interests of the summer student in mind.

Welcome to the 1963 Summer Session!



E. W. ZIEBARTH
Dean, Summer Session

Volume LXVI

No. 2

January 15, 1963

BULLETIN OF THE UNIVERSITY OF MINNESOTA

Published semimonthly January 1 to December 15 inclusive. Second-class postage paid at Minneapolis, Minnesota. Send change of address notices and other communications to Office of Admissions and Records, University of Minnesota, Minneapolis 14, Minnesota.

1963

UNIVERSITY OF MINNESOTA

Minneapolis, Minnesota



SUMMER SESSION

First Term

June 17 - July 20

Second Term

July 22 - August 24

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- ★ SCHOOLS AND COLLEGES

Special Programs

The programs listed in this section are new or outstanding projects of special interest. For further information about any of these programs, for copies of the complete Summer Session bulletin, or for additional copies of this bulletin write to the Dean of Summer Session, 950 Johnston Hall, University of Minnesota, Minneapolis 14.

During the first term of the Summer Session, the Modern Language Institute 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.

Modern Language Institute

The directors of the residence houses will be Professor Arnold Mendel for the Deutsches Haus; and Professor James F. Burks for the Maison Française. In each house there will be native assistants.

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 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 institute has 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 and Scholarships

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. Several scholarships will be available.

Language Institute

A summer institute under the National Defense Education Act will be offered for 30 elementary school teachers of German and 30 elementary school teachers of Spanish. For further information write to Professor Gerhard H. Weiss, 216 Folwell Hall, University of Minnesota, Minneapolis 14.

Scandinavian Area Studies

The Scandinavian Studies program, held alternate summers at the University of Minnesota and the University of Wisconsin, is scheduled for the summer of 1963 at the University of Wisconsin. For detailed information write Professor Harald S. Naess, 67 Bascom Hall, University of Wisconsin, Madison, Wisconsin.

During the summer of 1963, 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.

American Studies

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.

To help scientists and students of science become acquainted with the research of their Russian counterparts, the Summer Session will offer a course in Scientific Russian. Students with no prior knowledge of the Russian language may register for Russ 24, Scientific Russian, and devote 10 class hours weekly to the mastery of this important language.

Courses in Russian

The major goal of this course will be the acquisition of a reading skill in the most direct fashion possible. Students will also be acquainted with the standard Soviet journals in the various fields.

Starting with the 1963 Summer Session, the Department of Slavic and Oriental Languages will offer an intensive beginning course in Russian (Russ A and B) which covers the same ground covered by the regular 3-quarter sequence during the academic year. Students completing the intensive summer course will be prepared to join students at the second-year level in the fall.

Journalism and Communi- cations

The School of Journalism program contains courses for both undergraduate and graduate students interested in professional training. 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 publications editors who lack formal journalism training. Students may fit regular Summer Session courses around the 2-week workshop period.

The school also offers courses on the Upper Division-Graduate level in the area of mass communications. These include *History of Journalism*, *Mass Media in a Dynamic Society*, *Contemporary Problems in Freedom of Speech and Press*, *Public Opinion and Propaganda*, *Communications Analysis*, *International Communications and Foreign Affairs*, and *History of American Broadcasting*.

Murphy Hall, the School of Journalism 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.

Summer Travel Course in European Art

The summer travel course in European art will be conducted by the Department of Art 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 cities to be visited are Lisbon, Madrid, Athens, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Frankfurt, Copenhagen, Paris, and London. Five credits will be given in Art 59 to students successfully completing the course. The total cost is \$1,383 including University fees.

Members of the group will depart from New York by air on June 29, spend approximately 6 weeks in Europe, and return to New York on August 12.

The Humanities Proseminar will be offered during the second term of Summer Session. Professor Roy Swanson of the Departments of Classics and Humanities has chosen the theme "Irrationalism." Ancient, medieval, and modern attitudes toward essential irrationalism: tragic, romantic, and amoral irrationalism; Nazism; gratuitousness; the existential "absurd"; "belief" without faith; schools and cults of irrationalism.

Humanities Proseminar

During the second term of the Summer Session the Department of Speech and Theater Arts offers a Theater Symposium, an intensive study of the art of the theater. Particular emphasis is placed on the productions and production methods of the Tyrone Guthrie Theatre, taking advantage of the unique opportunity to study *Hamlet*, *The Miser*, *The Three Sisters*, and *The Death of a Salesman* as presented by the Guthrie Theatre. The symposium will be conducted by professional directors, critics, actors, and designers, as well as University faculty members, providing a wide range of scholarly and professional opinion. This symposium carries a special tuition fee of \$85.

Theater Arts

An intensive institute at the graduate level intended primarily for government employees who serve in responsible administrative positions with local, state, or national governments will be offered during the first 2 weeks of the second summer term, July 22 - August 2. The institute will feature lectures, seminars, and workshops designed to bring participants up to date on current trends in public administration. The sessions during the first week will focus on recent developments in organization theory relating to planning, decision-making, authority, and communication. The sessions during the second week will deal with administrative analysis and operations research, computers and management systems, politics and the budgetary process, and personnel administration. Faculty will include the staff of the University's Public Administration Center and visiting professors invited because of their recent and current research and publications on the several topics.

Public Administration Institute

**Archaeological
Field Session**

Students enrolled in the archaeological field techniques course, Anth 140, will headquarter at Carlos State Park located 10 miles north of Alexandria, Minnesota. The 6-credit course will contain instruction in field survey techniques, excavation procedures, and preliminary laboratory analysis. Students will participate in the excavation of Middle Woodland habitation and burial mound sites within the state park and in the adjacent areas. Field survey problems will be met in surveying the right-of-way of Interstate Highway 94 in Douglas County.

**Geographical
Field Session**

Two intensive field research seminars, Geog 251-252 and Geog 276-277, will be given August 29-September 18 (1 week will be on the University campus and 2 weeks in San Luis Valley, Colorado, with headquarters at Alamosa). Research will be focused upon related problems in physical and agricultural geography. Open only to graduate students with consent of instructor. For detailed information, contact Department of Geography, University of Minnesota, Minneapolis 14.

**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.

**Home
Economics**

The School of Home Economics offers courses at both graduate and undergraduate levels during Summer Session. In some areas students may earn an advanced degree through summer offerings. Home economists returning to the teaching field or those wishing to prepare themselves for teaching should seek an early conference with Professor Roxana Ford, 117 McNeal Hall, University of Minnesota, St. Paul.

Home economists in teaching (college, adult, or secondary school), agricultural extension, or business will be especially interested in a concentrated course to be offered July 22-August 7 dealing with consumer selection guides for household equipment.

Extension clothing specialists and teachers of clothing in colleges will find the new offering in Experimental Methods of Clothing Construction useful.

During the Summer Session, the Department of Speech and Theater Arts offers an expanded program in speech pathology and rehabilitation at both the graduate and undergraduate level. Students interested in continuing their training or working toward graduate degrees may do so through summer offerings. Professor Paul Moore, head of the Department of Speech, University of Florida, will be visiting lecturer in speech pathology during the first summer term, offering courses in the anatomy and physiology of voice production and the diagnosis of and therapy for voice disorders.

Speech Pathology

Students who wish to plan their summer work in relation to securing a degree in speech pathology should seek an early conference with Professor Ernest Henrikson or Professor Clark Starr, Speech Clinic, Shevlin Hall, University of Minnesota, Minneapolis 14.

Courses in audiology will be available during both terms. During the first term, J. Donald Harris, director of the U.S. Navy Auditory Research Laboratory, New London, Conn., will teach courses in Basic Hearing Science, and Theories of Hearing. In the second term, Professor Rollie Houchins will offer courses for prospective teachers of the deaf, including Language for the Hearing Impaired, and Speech for the Hearing Impaired. The Audiology Clinic and a special demonstration class of hearing-impaired children will be among several special facilities and arrangements for supervised experience.

Audiology (Hearing)

Students wishing to plan a degree program or a special unit of study in audiology should arrange an early conference with Professor Frank Lassman, Audiology Clinic, Room D-311, University of Minnesota Hospitals, Minneapolis 14.

Driver Education

The course in driver education (EdCI 101) will provide the special background required for high school instructors in driver training. Those involved in either classroom or behind-the-wheel teaching in the driver training program are urged to enroll. It will be given first term on the Minneapolis Campus, and second term on the Duluth Campus. Because registration is limited, interested summer students must apply in advance for this work.

Higher Education Workshops

The outstanding higher education workshops (EdCI 228), planned with committees from the North Central Association, will be available again. The first-term workshop is planned for representatives from the liberal arts colleges, and the second-term group will emphasize the problems of the teacher-education institutions.

Graduate Programs for Counselors

An advanced level NDEA Institute will be offered this summer. The basic purpose is to upgrade and develop the professional competencies of secondary school counselors who are in need of specialized or refresher training. Information may be obtained from the Department of Educational Psychology in the College of Education. Completed applications must be received no later than April 19, 1963.

In both terms the regular graduate program in counselor education will be offered, including the practicum in secondary counseling.

Industrial Education Workshops

Two workshops (listed under Ind 136) have been planned for the first term. The first of these, conducted by Professor William Kavanaugh, will deal with teaching of electricity and electronics as outlined in the new State Department Curriculum Bulletin, No. 13. The second, conducted by Professor Jerome Moss during the first 2½ weeks of the term (June 17 to July 3), will concentrate on a program of Leadership Development for Industrial Educators. Participants will be potential co-ordinators and directors of area vocational-technical schools.



The Department of History and the College of Education have planned a 6-credit offering for the first term for high school teachers of American history. Included will be 3 credits in American history and 3 in curriculum and instruction, the latter concerned with materials and procedures for high school classes in the subject (see EdCI 168A and Hist 152).

American History Teaching

Special courses will be available for high school teachers of modern languages, science, mathematics, and English, listed under Curriculum and Instruction. Two of the offerings for English teachers (EdCI 195 and 195A) will be limited to those co-operating in the research under Project English. All others are open to qualified summer registrants.

Secondary School Instruction

Contemporary Crafts (ArEd 80), a course much in demand by teachers last summer, will be offered in the first term this year, with two sections available. Mr. Donald Bujnowski of the School for American Craftsmen, Division of Rochester Institute of Technology, Rochester, New York, will be the visiting instructor.

Teaching of Crafts

The Tuttle Demonstration Elementary School will operate during the first term. All school staff members will be welcome to observe these programs at Tuttle. Special attention is called to the teaching demonstrations in physical education, of particular value to many students in this field.

Demonstration Facilities

The Institute of Child Development conducts a nursery school in which students may observe children of preschool ages.

The Psycho-Educational Clinic will be available for summer students who wish to observe its individual and group remedial projects in both terms.

The University High School will be in operation during the first term with regular classes, remedial instruction, and a special workshop in speech and theater. Any Summer Session student is welcome to observe the work of University High School.

**Introduction
to Teaching:
Elementary
and Secondary**

The basic course sequence for persons preparing to teach in the elementary schools is Ed 75A (first term) and Ed 75B (second term). The basic sequence for secondary teachers is Ed 55A (first term) and Ed 55B (second term).

These sequence courses are available 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 to the College should be made to the director of admissions of the University by May 15 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.

**General Music
Education
Workshop**

In the second summer term, Professor Arnold F. Caswell will offer the General Music Education Workshop (MuEd 110), dealing with a cappella and accompanied choral and vocal ensemble work in the senior high school. A demonstration group of high school age students will be used to perform choral and ensemble materials and demonstrate rehearsal techniques. These high school students will also receive individual instruction by graduate students under the direction of Professor Roy A. Schuessler, through his course on History of Vocal Arts (Mus 114).

**Master of
Education
Program for
Mathematics
Teachers**

Summer courses will be available for high school teachers of mathematics whose applications are accepted for the master of education program under the College of Education, with a major in mathematics and related courses on teaching problems. An announcement about this program may be obtained through the Department of Mathematics in the College of Science, Literature, and the Arts, or through the College of Education.

Advanced graduate programs (1 year beyond the Master's degree) leading to the certification of Specialist in Education (School Administration) have been developed for elementary principals, high 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 the specialist in education programs for school administrators at all school levels will be sent on request.

**Educational
Administration
Two-Year
Programs**

During the first term a special workshop for elementary and secondary school principals will be offered (EdAd 239). Using the technique of "simulation," participants will assume the role of the principal of a specific school, making decisions about its operation and evaluating them in the light of recent research and theory in educational administration. The workshop is designed for students in preparation for administrative posts as well as for administrators now in the schools.

**Workshop in
Educational
Administration**

Two courses in educational psychology for advanced students previously not offered during summer will be available in the first term: Statistical Methods and Laboratory (EPsy 218 and 218A); and Theories of Learning (EPsy 294). Also included in first-term offerings is the course on programmed learning with registration limited to those having recent background in the psychology of learning.

**Advanced
Educational
Psychology**

Agricultural education students in the Graduate School who register for Field Problems (AgEd 221) in the first term, may include as part of their study, 2 weeks' participation in the institute on the business analysis method in teaching farm management scheduled as an agricultural short course. The institute will include information about the present status, purposes, organization, and procedures of instruction in this area. Attention will be given to relationships with the intermediate level regional analysis centers, the area vocational schools, experiment stations, and various other local and state educational agencies. Interested

**Institute on
Teaching Farm
Management**

graduate students should consult faculty advisers in the Department of Agricultural Education. Noncredit participants in the institute may secure information through the Director of Agricultural Short Courses, 205 Coffey Hall, University of Minnesota, St. Paul 1.

**Economic
Education**

In the second term, two workshops will assist selected groups of teachers to develop economic education materials and syllabi. The first workshop (July 22-August 3) is planned for teachers of world history; and the second (July 22-August 3) is offered for teachers of occupational relations (see EdCI 164A and 164B).

**Teaching the
Mentally
Retarded**

Courses for teachers of mentally retarded children will be available both terms. Problems of Mental Deficiency (CD 143) is scheduled first term. A course on the mentally retarded in secondary schools (EPsy 191) will be offered first term on the Minneapolis Campus and second term on the Duluth Campus. Elementary teachers may take the comparable course for their level of instruction (EPsy 184) on the Minneapolis Campus first term.

**Education of
Gifted Children**

Education of Gifted Children (EPsy 183) is offered both terms, and Arithmetic for Gifted Children (EdCI 165A) is available first term only.

**Teaching
Emotionally
Disturbed
Children**

Courses in the newly developed program for educating teachers of children with behavioral disorders will be scheduled both terms. One course, Education of Emotionally Disturbed and Socially Maladjusted Children (EPsy 186), will be open to any qualified summer student; the Practicum (EPsy 288) is restricted to advanced students. Students wishing to enter the year-long training program and apply for stipends should write as soon as possible to Professor Bruce Balow, 106 Pattee Hall, University of Minnesota, Minneapolis 14.

In the first term, 3 courses will provide minimum preparation for an experienced regular class teacher to serve partially seeing children, and 3 will provide minimum preparation to serve blind children. This work may be taken for graduate credit or for credit as a summer student with the permission of the instructor.

A demonstration resource room for blind and partially seeing children will be in operation at the Tuttle Laboratory School; observation will be required of all students in EdCI 118 and 182. Those who wish may apply for scholarships on the education of blind children by writing the American Foundation for the Blind, 15 West 16th Street, New York 11, New York.

The course on orientation and mobility for blind children will be held during the second 4 weeks of the first term (June 24-July 19) on the Minneapolis Campus. It provides teachers with basic techniques which help blind children gain skill in orientation and mobility. Films, demonstrations, observation, and travel practice will be included (see EdCI 126). Some scholarships of \$150 will be available. Application for admission and/or a scholarship may be made by writing Miss Jeanne R. Kenmore, 15A Pattee Hall, University of Minnesota, Minneapolis 14. This course has been made possible through a grant from a special reserve trust of Seeing Eye, Inc., Morristown, New Jersey.

Courses for teachers of the deaf will be offered both terms. Introduction to the Education of Hearing Impaired Children (EdCI 128) and Methods of Teaching School Subjects to the Hearing Impaired (EdCI 127) are scheduled for first term, with Language for the Hearing Impaired (Spch 125) and Speech for the Hearing Impaired (Spch 127) available second term. There will be related courses both terms in speech and theater arts, child development, and educational psychology. A demonstration class for deaf children will be conducted second term. Students interested in a year-long training program and stipends should write to Professor Rollie Houchins, 12 Pattee Hall, University of Minnesota, Minneapolis 14.

Education of Blind and Partially Seeing Children



Orientation and Mobility for Blind Children

Teaching the Deaf and Hard-of- Hearing

**Institutes
for High
School
Teachers
of Science**

Chemistry and Physics

An Institute for High School Teachers of Chemistry and Physics, supported by the National Science Foundation, will be held on the Minneapolis Campus from June 17 to August 23 (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.

Biology

For information on the Institute for High School Teachers of Biology at the Lake Itasca Forestry and Biological Station, see section on Biology Session.

Radiation Biology

An Institute in Radiation Biology, sponsored jointly by the Atomic Energy Commission, the National Science Foundation, and the University of Minnesota, will be conducted on the St. Paul Campus from June 17 to July 27 for high school teachers of biology. Stipends for the participants, dependency and travel allowances are available.

Teaching personnel are associated with the Department of Agronomy and Plant Genetics, the Department of Zoology, Division of Radiation Therapy, and the Department of Veterinary Surgery and Radiology (see College of Veterinary Medicine).

**Research and
Training Sti-
pends—Biology**

For information regarding stipends in this field for work at the Lake Itasca Forestry and Biological Station, see section on Biology Session.

The Department of Physiology is offering a new course which is specially designed to serve the interests of high school and college teachers of biology and others who feel the need of an introduction to the modern developments in general physiology. The course (Phs1 100) will deal primarily with basic processes, such as transport phenomena, energetic processes, excitation and conduction, and mechanical movement. It will serve as an introduction to biophysical phenomena in living systems.

**Physiology
for High
School
Teachers**

The 1963 3M visiting lecturer will be Professor D. H. R. Barton of the Imperial College of Science and Technology (University of London). Professor Barton, who is one of England's most eminent organic chemists, will give a series of lectures on selected topics in natural product chemistry. The series will begin July 22 and continue to August 24.

**3M
Distinguished
Lectures in
Chemistry**

The Department of Statistics plans to offer courses ranging from elementary (Stat 41) through intermediate (Stat 111 and 181) to advanced (Stat 281) statistics during both terms of the Summer Session. These courses are not directed toward any particular area of application, but should be of value to users of statistical techniques in many fields, as well as to those interested in the basic logic and conceptual structure of statistical inference.

Statistics

Two Social Work Institutes	June 17-21
Two Social Work Institutes	June 24-28
Organ Institute	July 1-6
Fourth Annual Choral Art Institute	July 1-12
Techniques of Infrared Spectroscopy	July 29-August 3
Infrared Spectra	August 5-9
Institute for Parents of Deaf Children	August 15-17
Institute for Credit Union Leaders	August 16-17
Steelworkers Institute	August 26-31

**Center for
Continuation
Study
Program**



General Information



A more complete Summer Session bulletin is issued later in the spring. Copies of that bulletin or additional copies of this preliminary bulletin may be obtained by addressing your request to the Dean of Summer Session, 950 Johnston Hall, University of Minnesota, Minneapolis 14.

The University of Minnesota is on the quarter system, and the Summer Session is so organized that the 2 terms make it possible for the student to complete a full quarter's academic work.

The listing of courses which follows each college's descriptive text may be somewhat revised and amplified in the complete bulletin to meet the changing trend in enrollment.

In these course listings following the title of the course the number of credits is shown in parentheses. Courses 1 to 49 carry credit for freshmen and sophomores; courses 50 to 99 carry credit for juniors, seniors, and fifth-year students; courses 100 to 199 carry credit for juniors, seniors, and fifth-year students, and graduate credit for those registered in the Graduate School; courses 200 and above are open only to those registered in the Graduate School.

Dates of Summer Session

The Summer Session consists of 2 terms of 5 weeks each: June 17 to July 20 and July 22 to August 24. Students may register for subjects of their choice in either or both terms. Registration and payment of fees for the first term close at 4 p.m. on Tuesday, June 18. First term classes on the Minneapolis East Bank Campus will begin Tuesday, June 18, at 8:30 a.m.; classes

on the West Bank will begin at 8 a.m.; and classes on the St. Paul Campus will begin at 8 a.m.

Registration and payment of fees for the second term close at 4 p.m. on Monday, July 22. Classes for this term will open Tuesday, July 23.

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

Twenty-three student religious organizations, representing various faiths and denominations, function on the Minneapolis Campus. There are nine religious foundation buildings on the University Avenue side of the campus which maintain programs of fellowship and recreation. Information may be secured from the Office of the Co-ordinator of Students' Religious Activities, 211 Eddy Hall.

Religious Activities

Full library privileges are available to the summer student. Among the finest university libraries in existence, the University of Minnesota Libraries contain more than 2,000,000 volumes and a wide variety of periodicals and pamphlets. Large, comfortable reading rooms provide an excellent atmosphere for study.

Libraries

Departmental libraries on all campuses contain special subject collections. There will be a branch library on the West Bank Campus in which course reserve materials will be available.

Other available library facilities in the Twin Cities area include the Minneapolis Public Library, the St. Paul Public Library, the Minnesota Historical Society, and the James Jerome Hill Reference Library of St. Paul.



Students with speech or hearing problems may use the facilities of the University Speech and Hearing Clinic during the summer. These offices are located at 205 Shevlin Hall.

Speech and Hearing Clinic

**University
Health Service**

The University Health Service, in quarters across from the Church Street entrance of the University Hospitals, maintains a dispensary and hospital exclusively for students. The students' hospital provides hospitalization whenever necessary.

The staff of physicians, dentists, and nurses is on duty throughout the year.

Housing and Food Service

Minneapolis Campus

Ada Comstock Hall for women and *Centennial Hall* for men are modern residence halls reserved for the use of Summer Session students. Each hall will offer comfortable living in large double and single rooms with well-planned and healthful meals prepared and served under the direction of a trained dietitian. Meals will be served in Comstock Hall every day of the week while Centennial Hall will offer meals Monday through Friday. 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.

St. Paul Campus

Bailey Hall is a new and attractive residence hall with comfortable accommodations in large double rooms. It has one wing for men and a separate wing for women joined by a common lounge. Rooms will be available during first term only. Food may be obtained in a University cafeteria or the Student Center adjacent to the building.

For application forms and additional information, write to the Director of University Housing, 108A Wesbrook Hall, University of Minnesota, Minneapolis 14.

Residence Halls



Private Residences

For single students, rooms in private homes, rooming houses, fraternities, and sororities are available. These facilities are University-inspected and approved, and are listed with the Student Housing Bureau where a staff of counselors is available to assist in finding suitable housing. Students find it unsatisfactory to reserve accommodations by mail. Therefore, vacancy listings, as a general policy, are not distributed by mail.

The Housing Bureau also helps married students obtain housekeeping facilities. In addition to regular listings of vacancies, lists of Summer Session sublets of apartments and houses are available beginning in May upon request.

For further information, write to Student Housing Bureau, 209 Eddy Hall on the Minneapolis Campus, or 101 Coffey Hall on the St. Paul Campus.

Food Service

In addition to the dining facilities in the residence halls, Coffman Memorial Union offers a variety of accommodations.

Well-prepared food at moderate prices and quick, efficient service are featured in the Cafeteria and Fountain Grille. The Commuters' Lunchroom is open with vending machine service. Service in these units is provided Monday through Friday of each week.

Party and banquet dining facilities will be available for both lunch and dinner to all campus organizations and groups except during the month of July.

On the St. Paul Campus the new Student Center (St. Paul Campus Union) will provide lunchroom and soda fountain facilities during both terms.



Admission and Registration

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.

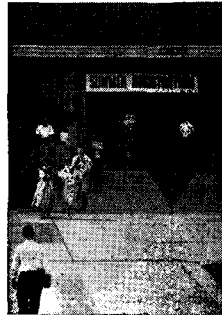
Admission

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. Such students will be classified as "special" for the Summer Session only.

Special Students

Persons about 24 years of age or older who have not had previous college work and who are not candidates for a degree but wish to complete certain specific college subjects will also be considered for admission as special students for Summer Session only.

Attendance during the Summer Session in no way guarantees special students admission to the regular academic year. Special students who wish to be considered for admission to a subsequent term must file regular admission applications early in the summer.



The procedure for admission of graduate students is discussed in the section on the Graduate School (see index).

Graduate Students

**Degree
Candidates**

Those who expect to become candidates for a degree at the University during the Summer Session must have filed an application for admission and have been regularly admitted to a college of the University.

All students should consult the *Bulletin of General Information* for detailed requirements governing admission and the granting of degrees. The *Bulletin of General Information* and specific college bulletins may be obtained by writing to Office of Admissions and Records, University of Minnesota, Minneapolis 14.

**Registration
Dates**

In order that short Summer Session terms may prove of maximum value and that work of courses may not be interfered with by late entrants, students are urged to complete their registration on the following dates:

First Term

Registration: Monday, June 17, 8 a.m. to 4 p.m.

Fee payment, last day without penalty: Tuesday, June 18

Second Term

Registration and fee payment: Monday, July 22, 8 a.m. to 4 p.m.

**Place of
Registration**

First Term

June 17: Main Ballroom, Coffman Memorial Union (Minneapolis Campus students)

220 Coffey Hall (St. Paul Campus students)

Students registering in the College of Agriculture, Forestry, and Home Economics or the College of Veterinary Medicine should report to 220 Coffey Hall, St. Paul Campus, for registration materials.

Other students should report to the Main Ballroom, Coffman Memorial Union.

Students registering before or after the regular registration day, June 17, should begin registration at the Office of Admissions and Records, Minneapolis or St. Paul Campus as appropriate.

Second Term

July 22: Information Booth, Morrill Hall (Minneapolis Campus students)

220 Coffey Hall (St. Paul Campus students)

Students registering in the College of Agriculture, Forestry, and Home Economics or the College of Veterinary Medicine should report to 220 Coffey Hall, St. Paul Campus, for registration materials.

Other students should report to the Office of Admissions and Records Information Booth, first floor, Morrill Hall, Minneapolis Campus, for registration materials and instructions.

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

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

Changes in Registration

**Late
Registration**

Late fees are charged for the first term as follows for payment of fees on:

June 19-21	\$ 3.00
June 24-28	5.00
Thereafter	10.00

No registrations are allowed for the first term after Thursday, June 20, without special permission of the dean of the school or college concerned.

Late fees for the second term are as follows for payment of fees on:

July 23-26	\$ 3.00
July 29-August 2	5.00
Thereafter	10.00

No registrations will be accepted for the second term later than Thursday, July 25, without special permission of the dean of the school or college concerned.

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

Fees

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

Tuition fee (per term)	\$59.50
Incidental fee (per term)	11.00
	<hr/>
Total fee (per term)	\$70.50

The following fees are payable each term at time of registration by each student taking 4 credits or less (whether resident or nonresident) and must be paid before registration is complete:

Part-time Fees

Part-time tuition fee (4 credits or less)	
(per term)	\$46.50
Incidental fee (per term)	11.00
	<hr/>
Total fee (per term)	\$57.50

The incidental fee of \$11 per term entitles each student to the privileges of Coffman Memorial Union, Health Service, Library, the St. Paul Student Center, and the recreation program including the *Minnesota Daily*.

Incidental Fee

Regular tuition fees as provided during the academic year will be charged all students in Medicine and Nursing, In Dentistry, Law, and Veterinary Medicine, 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.

Special Fees

In addition, course fees are charged for Civil Engineering Camp, Modern Language Institute, Music, Physical Education, Public Health, and the Biology Session as indicated in the section on course fees in the regular *Bulletin of the Summer Session*.

Graduate students who have completed all of their graduate work with the exception of their thesis may register for *thesis work* only upon payment of \$31 tuition per term and the incidental fee.

Summer Session staff members are entitled to the same fee privileges in the summer as during the academic year. Eligible staff members pay at the resident rate in the Graduate School as follows: more than 3 credits, \$43 per term; 3 credits or less or thesis only, \$21.50 per term; plus incidental fee.

Auditors

Fees for auditors are the same as for students registered for credit.

Amount of Work

A maximum of 9 quarter 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.

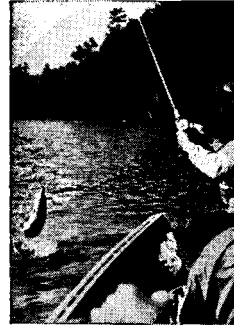
Summer Recreation

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.

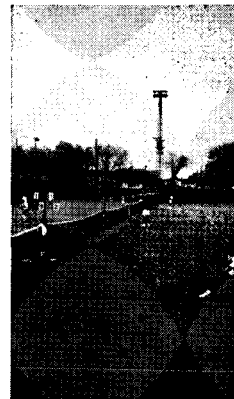
The location of the University makes possible the use of the many cultural and recreational facilities of a large metropolitan area. Lakes and lagoons on which to canoe, swimming beaches, picnic grounds in parks and along roadsides, evening concerts on lake shores and in parks, art centers, museums, 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 week ends.

Tournaments in tennis, bowling, softball, golf, and horseshoes are arranged each summer. Tournament play and free practice for women including such activities as badminton, golf, archery, tennis, and table tennis are planned at Norris Gymnasium. Swimming pools with attendants and instructors in charge are open at scheduled hours. Men swim at Cooke Hall and women in Norris Gymnasium. Most of these activities involve no extra charge except for towel service.

Tennis and golf tickets will be issued to regularly enrolled Summer Session students upon presentation of their fee statements and payment of a small fee. A greens fee is also charged for use of the University golf course which can be reached by car or by intercampus bus. Without tickets a slightly higher charge is made for the use of the tennis courts.



Sports Program





Sports Facilities

Facilities for healthful exercise are offered by the University's physical education plants. These include recreation fields . . . an 18-hole golf course and a 9-hole short course . . . gymnasiums and swimming pools for men in Cooke Hall, and in Norris Gymnasium for women . . . Delta Field offers facilities for baseball and softball . . . 21 tennis courts . . . space for other sports such as track, badminton, horseshoes, handball, squash, table tennis, and archery.

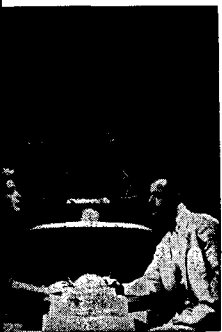
Excursions

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 featured in this program. Addresses are by outstanding scientists, literary figures, artists, and observers of national and international affairs.

University Theater



The University Theater has won world-wide acclaim with its presentation of exceptionally fine plays on campus, its International Touring Companies, and the Minnesota Centennial Showboat. Two plays will be presented in repertory on the showboat which again will be operated on the Mississippi River by the University Theater, a high point of the Summer Session activities.

In addition, during the first summer term, the annual High School Theater Workshop will present in Shevlin Hall Arena Theater a production of a modern classic drama. Each term a play will also be presented at Scott Hall Auditorium.

Attention is also called to professional performances in the new Tyrone Guthrie Theatre of plays by Shakespeare, Molière, Chekhov, and Arthur Miller in repertory. University of Minnesota theater students who have been awarded McKnight Foundation Scholarships are working on these productions.

A weekly feature is the Newsreel Theater which shows motion pictures of current events, travel pictures, and various educational films. A program of educational films of a type which can be used in the classroom is of special interest to teachers. These film programs are shown with the co-operation of the Department of Audio-Visual Education.

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.

Facilities

Facilities include billiards, table tennis, and a co-educational game room for recreation . . . modern bowling lanes with automatic pin-spotters . . . an Art Craft Workshop for general hobby craft—woodworking, leather work, ceramics, weaving, photography . . . the large cafeteria and fountain grille 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 modern 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 classes in square and modern dancing,

Films

Coffman Memorial Union



in bowling, and in bridge, in addition to social hours, parties, musical programs, and art exhibits. Many of these instruction classes and activities are open to students without charge. Some of the dancing and social hour programs are conducted on the outdoor terrace.

Student Center

On the St. Paul Campus the Student Center will be open throughout the Summer Session. Complete information about the Student Center and the St. Paul Campus 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.

Museum of Natural History

The Minnesota Museum of Natural History, located on the campus 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 1:30 to 4:30 p.m. on Sundays and most holidays during both summer terms.

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



The University Gallery, located on the third and fourth floors of Northrop Memorial Auditorium, stresses a program of frequently changing major art exhibitions which include paintings, sculpture, drawings, prints, and other arts from the contemporary scene as well as from past centuries. The University Gallery also maintains a seminar gallery for showing selected examples of contemporary art and for small didactic exhibitions.

University Gallery

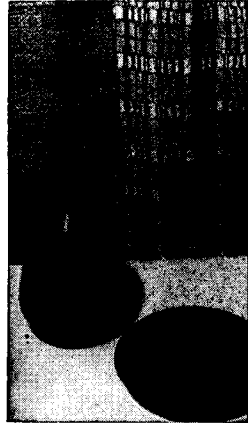
The permanent collection of the University Gallery, which emphasizes twentieth-century American artists, includes works by Hartley, Maurer, and Nordfeldt, on extended loan from Ione and Hudson Walker and Mrs. B. J. O. Nordfeldt, as well as paintings by Feininger, Dove, Marin, and O'Keeffe. A sculpture collection of major works by noted contemporary artists is being formed through the John Rood Sculpture Collection. Selections from these permanent collections are regularly on view in the Third Floor West exhibition area.

There are also lending programs. The Student Rental Collection includes framed original prints as well as reproductions of well-known paintings; pictures may be borrowed during the first week of each term (thereafter at certain hours) and are to be returned at the close of that term. A nominal fee is charged. The Pictorial Reference Files provide mounted photographs and color reproductions for individual study as well as for study exhibitions. Materials may be borrowed without charge.

For further information please inquire at the offices of the Gallery, 316 and 310 Northrop Memorial Auditorium.

The Art Library, located in Jones Hall, maintains a collection of 6,000 books and several periodicals. In addition to "Y" books and reference material of limited circulation, many books are in open stacks and may be taken out on 1-month loans. The facilities of the Library are available to all faculty members and students of the University. The summer hours are 7:45 a.m. to 4:30 p.m., Monday through Friday.

Art Library



Schools and Colleges

Graduate School

To obtain graduate credit for a course or courses to be taken during the summer, the student must be registered in the Graduate School. Applications for admission to the Graduate School must be submitted and completed at least 4 weeks prior to the opening of the term in which a student expects to enter in order to avoid delay, last-minute disappointment, and possible penalty for late registration. Applications for admission must be accompanied by official transcripts in duplicate of all undergraduate and graduate work completed. Certain colleges and departments require the student to complete the Miller Analogies Test, graduate level, as part of the application (see the *Bulletin of the Graduate School*). Before applications for admission to fields requiring this test can be reviewed, a report of the test performance is necessary. University of Minnesota graduates must submit certified copies of their scholastic records. Application forms may be secured by writing to the Dean of the Graduate School, 316 Johnston Hall, University of Minnesota, Minneapolis 14.



Before their arrival at the University, students should have assurance from the Graduate School that they are adequately prepared and will be accepted as *majors in their chosen field*. Admission to the Graduate School does not imply admission to candidacy for an advanced degree. After a student has studied in this Graduate School for one or more terms, the faculty will determine whether or not he should be encouraged to work for a degree.

The *Bulletin of the Graduate School* contains detailed information on requirements and work in the Graduate School. A copy may be obtained by writing to the Office of Admissions and Records, University of Minnesota, Minneapolis 14.

Courses numbered 100 or above which are listed in the *Bulletin of the Graduate School* carry graduate credit for students formally enrolled in the Graduate School.

**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.

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 summer sessions 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.

Agricultural Biochemistry

First Term or Second Term

203 Research Problems (2-5)Staff

Agricultural Economics

First Term

105 Advanced Farm Management (3)Nodland
 200 General Seminar in Agricultural Economics (3).....Staff

Second Term

201 General Seminar in Agricultural Economics (3) Staff

Agricultural Education

See courses listed under the College of Education

Agricultural Engineering

First Term

131 Problems and Field Studies in Advanced
 Farm Mechanics (3)Taylor, Marvin

Agronomy and Plant Genetics

First Term or Second Term

201 Research in Farm Crops (3-9)Staff
 241 Research in Plant Genetics (3-9)Staff
 244 Laboratory Methods in Plant Breeding (1½)Staff

Animal Husbandry

First Term

165 Beef Cattle Production (3)Harvey

First Term or Second Term

213 Research in Animal Husbandry (3-5)Staff

Dairy Husbandry

First Term or Second Term

202 Research in Dairy Production (ar)Cole, Donker, Graham,
Williams, Young

Dairy Industries

First Term or Second Term

210 Research in Dairy Products (2-5)Coulter, Morris, Thomas

212 Research in Dairy Bacteriology (2-5)Olson, Jezeski

Entomology, Fisheries, and Wildlife

First Term or Second Term**

243 Research in Entomology (ar)Staff

267 Research in Fishery Biology (ar)Staff

280 Research in Wildlife Biology (ar)Staff

Forestry

First Term or Second Term

200 Research Problems in Silviculture (ar)Staff

203 Research Problems in Forest Management (ar)Staff

205 Research Problems in Forest Economics (ar)Staff

207 Research Problems in Forest Products Engineering (ar)Staff

213 Research Problems in Forest Utilization (ar)Staff

215 Research Problems in Forest-Tree Physiology (ar)Staff

218 Research Problems in Forest Measurements and
Photogrammetry (ar)Staff

220 Research Problems in Forest-Tree Genetics (ar)Staff

221 Research Problems in Forest Influences (ar)Staff

222 Research Problems in Forest Policy (ar)Staff

** For entomology, fisheries, and wildlife courses given during the Biology Session at the Lake Itasca Forestry and Biological Station, see index.

Second Term

Offered at the Lake Itasca Forestry and Biological Station at Itasca State Park. Open to students registered in the Forest Resources Management curriculum at the University, or who have had 1 year in a junior or other college and plan to register in forestry at the University and have at least 1 course in botany.

2	Important Forest Plants (2)	Ar.
5	Forest Ecology (4)	Hansen
6	Field Forest Measurements (2)	Brown
Soil 3A	Field Forest Soils (1)	Armenian

Home Economics

First Term

FamS 15	The Home and Its Furnishings (3)	Ludwig
21	Color and Design (3)	Abell
25	Design Applied to Crafts (3)	Abell
28	Construction and Refinishing of Home Furnishings (3)	Myren
49	Household Equipment (3)	Hocraffer
69	Administrative Food Service Experience (5)	Hitchcock
76	Nutrition of the Family (4)	Morse
86	Home Management Laboratory (4)	Jeary, McCandless
86A	Home Management Laboratory (4) (at home)	Jeary
116	Family Clothing Problems (3)	Williams
126	Special Problems in Crafts (2-3)	Abell
127	Purchasing Home Furnishings (3)	Ludwig
131	Laboratory Problems in Household Equipment (3)	Ehrenkranz
134	Consumer Selection Guides for Household Equipment (3)	Ar.
137	Modern Food Preparation Principles and Practices (3)	Trammell
144	Topics in Experimental Foods (2-3)	Noble
155	Experimental Studies in Clothing Construction (3)	Williams
166	Developments in Quantity Food Production (3)	Hitchcock
172	Current Developments in Nutrition (3)	Sirny, Morse
179	Readings in Nutrition (2)	Sirny, Morse
184	Home Management Principles (3)	McCandless
295-296	Home Economics Problems (1-5)	Davison, Ehrenkranz, Esteros, Morse, Noble, Sirny, Straus, Burk

Second Term

49	Household Equipment (3)	McCandless
86	Home Management Laboratory (4)	McCandless, Ar.
120	Art History (3)	Esteros
134	Consumer Selection Guides for Household Equipment (July 22-August 7) (3)	Ehrenkranz
152	Problems in Consumer Textiles (3)	Davison
172	Current Developments in Nutrition (3)	Sirny
179	Readings in Nutrition (2)	Sirny
185	Family Relationships (3)	Straus
187	Readings in Family Relationships (1-3)	Straus

220	Readings in Related Art (1-3)	Esteros
295-296	Home Economics Problems (1-5)	Davison, Ehrenkranz, Esteros, Morse, Noble, Sirny, Straus, Burk

Home Economics Education

See courses listed under College of Education.

Horticulture

First Term or Second Term

190-191-192	Special Problems in Horticulture (2-4)	Staff
247	Report on Special Horticultural Topics (9 or less)	Staff
249	Research in Horticultural Crop Breeding (9 or less)	Currence, Hutchins, Wilcox

Plant Pathology and Botany**

First Term or Second Term

206	Research in Plant Pathology (ar)	Kernkamp, N. Anderson, C. M. Christensen, Eide, French, Hart, King, Kommedahl, Moore, Rowell, Wilcoxson
210	Problems in Mycology (ar)	N. Anderson, C. M. Christensen
254	Research Problems in Plant Physiology (ar)	Linck, Rowell, Sudia

Poultry Science

First Term or Second Term

214	Research in Poultry Science (ar)	Staff
215	Research in Poultry Nutrition (ar)	Waibel, Snetsinger, Johnson
216	Research in Poultry Breeding (ar)	Shoffner
218	Research in Poultry Products (ar)	Swanson

Rhetoric

First Term

22	Public Speaking (3)	Cashman
44	Humanities: The American Experience (3)	Carr
47	Efficient Reading (5 secs) (3; 1 for SLA students)	Brown, Seymour, Horberg
51	Exposition (2 secs) (3)	Carr, Horberg

** For plant pathology and botany courses given during the Biology Session at the Lake Itasca Forestry and Biological Station, see index.

Second Term

22	Public Speaking (3)	Nichols
47	Efficient Reading (4 secs) (3)	Wright, Marchand, Price
Spch 251	Seminar: Listening Comprehension (2)	Nichols

Soils

First Term or Second Term

202	Research Problems in Soils (2-5)	Martin, Burson, Caldwell, MacGregor, Arneman, Blake, Schmidt, Rust, Grava, Farnham, VanDoren, Holt
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Second Term**

3A	Field Forest Soils (1)	Arneman
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Biology Session

The Biology Session at the Lake Itasca Forestry and Biological Station will extend over 7 weeks (June 17-August 3). The station is located in Itasca State Park with its wide variety of natural habitats. Courses in botany, entomology, and zoology are based in well-equipped laboratories and conducted so as to include field studies of natural history and ecology as well as identification and taxonomy.

Institute for High School Teachers of Biology

An Institute for High School Teachers of Biology under the auspices of the National Science Foundation will be held at the station. It is designed for teachers interested in spending a summer in the field laboratory with other high school biology teachers.

** Offered only at Lake Itasca Forestry and Biological Station. See Forestry, second term.

Research and Training Stipends

Stipends for three categories of applicants are available in a Biology Research and Training Program sponsored by the National Science Foundation at the station: (a) predoctoral graduate students, (b) postdoctoral research workers, and (c) independent investigators.

For special bulletin regarding the Biology Session or for information regarding any of these programs, write to Dean of Summer Session, 950 Johnston Hall, University of Minnesota, Minneapolis 14.



First Term (7 Weeks)

Botany

112	Aquatic Flowering Plants (6)	Ownbey
116	Summer Flora of Minnesota (6)	Morley
136	Organisms, Microclimate, and Weather (6)	Lawrence
155	Fresh-water Algae (6)	Drouet
159	Lichens (6)	Hale
196	Problems in Ecology, Taxonomy, Bryology, or Algology (ar)	Staff
208	Research Problems in Taxonomy (ar)	Ownbey, Morley
224	Research Problems in Ecology (ar)	Lawrence
236	Research Problems in Cryptogams (ar)	Drouet, Hale

Entomology, Fisheries, and Wildlife

59	Field Entomology (6)	Cook
124	The Biology of Immature Insects (6)	Cook
162	Vertebrate Ecology (6)	Tester, Marshall
196	Special Problems in Entomology, Fisheries, and Wildlife (ar)	Cook, Tester, Marshall

Plant Pathology and Botany

56	Introduction to the Study of Fungi (6)	French
156	Study of Fungi for Advanced Students (6)	French
210	Special Problems in Mycology (ar)	French

Zoology

72	Natural History of Invertebrates and Fishes (6)	Schmid
115	Advanced Natural History of Invertebrates and Fishes (6)	Schmid
119	Limnology (6)	Underhill
135	Field Ornithology (6)	Warner
195	Problems in Ornithology, Ecology, and Limnology (ar)	Underhill, Warner

**School of
Business
Administration
(including
Economics and
Industrial
Relations)**

The Twin Cities are the business nerve center of a vast four-state area. As such, they present an unusual background for preparation for a business career. The School of Business Administration offers courses in the functions of business and in the management of a business enterprise. For those interested in the economic structure of society, the school offers courses in fundamental analysis and in the examination of current economic problems.

Admission to this school ordinarily follows completion of a 2-year prebusiness program in a liberal arts or technical school. The core group of courses, as well as several specialized courses, is available for the degree candidate. Mature students who have special objectives in business but do not technically meet the formal admission requirements may be admitted to take selected courses consistent with individual objectives.

Graduate work in business administration, economics, and industrial relations is planned to meet the needs of high school and college teachers and others whose graduate work is limited to summer sessions, and graduate students who wish to accelerate their progress toward advanced degrees at Minnesota or elsewhere. Admission to graduate work should be arranged through the Graduate School.



Accounting

First Term

24	Principles of Accounting (3)	Lund
25	Principles of Accounting (3)	Davis
55A	Elementary Accounting (4)	Davis
85	Introduction to Accounting (2½)	Berryman
105A	Intermediate Accounting I (3)	Lund
155A	Introduction to Managerial Accounting (3)	Davis
185A	Advanced Accounting (3)	Lund
295A	Readings in Accounting (ar)	Ar.

Second Term

25	Principles of Accounting (3)	Ar.
26	Principles of Accounting (3)	Ar.
55B	Elementary Accounting (4)	Bentley
55C	Managerial Costs (3)	Bentley
85	Introduction to Accounting (2½)	Berryman
105B	Intermediate Accounting II (3)	Berryman
155B	Introduction to Managerial Accounting (3)	Bentley
265A	Managerial Cost Accounting (3)	Bentley
295A	Readings in Accounting (ar)	Ar.

Business Finance

First Term

56	Corporation Finance (3)	Stevenson
116	Investments (3)	Stevenson
156	Corporation Finance (3)	Stevenson

Second Term

56	Corporation Finance (3)	J. R. Nelson
76	Financial Management (3)	J. R. Nelson
156	Corporation Finance (3)	J. R. Nelson
276	Financial Management (3)	J. R. Nelson

Business Law

First Term

58	Business Law: Contracts (3)	Wright
158	Business Law: Contracts (3)	Wright

Economics

First Term

1	Principles of Economics (3)	Ar.
2	Principles of Economics (3)	Ar.
65	Intermediate Economic Analysis I: The Firm and Industry (3)	Ar.
66	Intermediate Economic Analysis II: Income and Employment (3)	Hause
67	Money and Banking (3)	Smith
68	Elements of Public Finance (3)	Borak
104	International Economics (3)	Foster
111	Introduction to the Theory of Statistics (Econ 121A) (3)	Ar.
160	Comparative Economic Systems (3)	Smith
165	Elements of Economic Analysis: Firm and Household (3)	Ar.
166	Elements of Economic Analysis: Income and Employment (3)	Hause

185A	Price Theory (3)	Ar.
200	Advanced Topics in Economics (3)	Ar.

Second Term

1	Principles of Economics (3)	Ar.
2	Principles of Economics (3)	Ar.
65	Intermediate Economic Analysis I: The Firm and Industry (3)	Galloway
66	Intermediate Analysis II: Income and Employment (3)	Ar.
69	Government Regulation of Business (3)	Mohring
102	Contemporary Labor Issues (3)	Callaway
165	Elements of Economic Analysis: Firm and Household (3)	Galloway
166	Elements of Economic Analysis: Income and Employment (3)	Ar.
176A	Theory of Employment, National Income, and the Price Level I (3)	Ar.
184	Economic Problems of the Far East (3)	Krueger
190	Readings in Economics (ar)	Buttrick
290	Graduate Research (ar)	Buttrick

Industrial Relations

First Term

52	Systems of Industrial Relations: Labor Marketing (3)	Smythe
72	Systems of Industrial Relations: Manpower Management (3)	Smythe
152	Principles of Industrial Relations: Labor Marketing (3)	Smythe
172	Principles of Industrial Relations: Manpower Management (3)	Smythe
182A	Intermediate Labor Marketing (3)	Mahoney
222	Wage and Salary Administration (3)	Mahoney

Second Term

52	Systems of Industrial Relations: Labor Marketing (3)	Smythe
152	Principles of Industrial Relations: Labor Marketing (3)	Smythe
202	Organization and Staffing (3)	England
362	Seminar in Manpower Management (3)	Staff

Insurance

First Term

53	Risk Management and Insurance (3)	Williams
93	Property and Liability Insurance I (3)	Williams
153	Risk Management and Insurance (3)	Williams
223	Property and Liability Insurance I (3)	Williams

Management

First Term

60	Business Policy and Management Control (3)	Doty
150A	Fundamentals of Management (3)	Glaskowsky

Second Term

60	Business Policy and Management Control (3)	Ar.
70	Fundamentals of Management (3)	Ar.
260	Policy Formulation and Administration (3)	Ar.

Marketing

First Term

57	Principles of Marketing (3)	Rudelius
97	Market Analysis and Research I (3)	Rudelius
157	Marketing Fundamentals (3)	Harper
187	Price Policy (3)	Harper
217	Market Analysis and Research (3)	Rudelius

Second Term

57	Principles of Marketing (3)	Lewis
117	Sales Management I (3)	Lewis
237	Sales Management (3)	Lewis

Production

First Term

50	Production Management (3)	Glaskowsky
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Second Term

50	Production Management (3)	Ar.
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Quantitative Analysis

First Term

5	Elements of Statistics (4)	Willis
51	Business Statistics (3)	Willis
61	Introduction to Electronic Computers (2)	Davis

Second Term

5	Elements of Statistics (4)	Kozelka
51	Business Statistics (3)	Kozelka

Transportation

First Term

54	Transportation I: Principles (3)	Nightingale
154	Transportation I: Principles (3)	Nightingale
184B	International Transportation: Water and Air (3)	Nightingale

School of Dentistry

Clinical instruction is open to eligible students in crown and bridge, operative dentistry, oral diagnosis, oral surgery, pedodontics, periodontics, and prosthodontics.

College of Education



The College of Education summer offerings include several special projects described earlier in this announcement and also other professional courses at the graduate level for teachers, school administrators, counselors, and other educators. In addition to courses in curriculum and instruction, philosophy of education, educational psychology, and administration for both elementary and secondary school staff members, there are offerings in the vocational fields of business and distributive education, economic education, agricultural education, industrial education, and home economics education. Advanced work is available for music and art educators, for teachers of health and physical education, and for recreation workers, as well as for teachers of all high school subjects and of elementary grades.

Master's degree programs for teachers of academic subjects in the secondary schools should include advanced work in the teaching subject. Students may apply for admission to the Graduate School for a major in the teaching subject; or if they wish to complete their graduate research on a classroom problem, they may apply for a major in curriculum and instruction. In the

latter case, the student will complete several courses in the teaching subject under "related fields." For example, a science teacher who wishes to major in curriculum and instruction might complete his research on a problem of learning in science; but approximately half of his Master's degree program would consist of science courses or the special institutes offered under National Science Foundation grants. A teacher of social studies might wish to major in history or political science for the Master's degree; or he might wish to have a major in education emphasizing materials and teaching problems in secondary school social sciences. His "related fields" for the M.A. degree then would include courses in history and other social sciences. Graduate advisers in the College of Education may be consulted about the most appropriate program for a particular applicant.

Beginning and advanced courses for counselors, school psychological workers, reading specialists, and teachers of special classes for exceptional children are strongly emphasized. A 2-year graduate program in school psychological services has been planned, and the full resources of several related departments are available for the instruction and graduate advising.

In elementary education, a wide selection of courses on improvement of instruction in the elementary schools is offered in both terms. Prospective elementary school principals will be interested in courses presenting current materials on all phases of elementary instruction, supervision, and administration.

The departments of physical education for men and for women offer work toward the bachelor of science degree with either a major or a minor in physical education. Advanced courses also are available for majors in physical education under the master of education and master of arts programs. Doctoral students major in education with an emphasis on school health and physical education. In addition, courses in the recreation field, open to both men and women and leading to the bachelor of science or master of education degree, are listed under the men's department.

Courses in the Institute of Child Development are planned not only for graduate and undergraduate students but also to



meet the needs of experienced teachers and professional workers who wish to increase their knowledge and skill in working with children.

There are courses in child and adolescent psychology, personality and social development, learning and cognitive development, and behavior problems. Other courses dealing with retarded children and clinical procedures with children are offered. The preschool will provide facilities for observation and participation, and the Child Development Clinic offers an opportunity for qualified students to work with children with adjustment problems.

Agricultural Education

First Term

121	Enterprise Analysis (June 17-July 5) (3)	.....	Teske
171	Procedures in Teaching Agriculture (June 17-July 5) (3)	.....	Taylor
221	Field Problems (3)	.....	Peterson, Swanson, Marvin
232	Research in Agricultural Education (ar)	.....	Peterson, Swanson, Marvin

Second Term

221	Field Problems (3)	.....	Peterson, Swanson, Marvin
232	Research in Agricultural Education (ar)	.....	Peterson, Swanson, Marvin

Art Education

First Term

18	Design Activities for Elementary Education (3)	.....	Olson
19	Functional Arts and Crafts in Elementary Education (3)	.....	Olson
53	Introduction to Weaving (3)	.....	Smits
80	Contemporary Crafts (2 secs) (3)	.....	Bujnowski
151	Curriculum Building in Art Education (3)	.....	Hastie
156	Intercultural Education Through Art (3)	.....	Gayne
184	Improving Art Programs in the Elementary School (3)	.....	Gayne
185	Improving Art Programs in the Secondary School (3)	.....	Hastie
295	Problems: Art Education (ar)	.....	Gayne, Hastie
296	Seminar: Art Education (1)	.....	Gayne, Hastie

Second Term

17	Pictorial Expression for Elementary Education (3)	Ragouzis
18	Design Activities for Elementary Education (3)	Ragouzis
84	Teaching Art in the Elementary School (3)	Hegg

Institute of Child Development

First Term

80	Child Psychology (3)	Odom
132	Adolescent Development (3)	Harper
140	Behavior Problems (3)	Harper
143	Problems of Mental Deficiency (3)	Barnard
179	Clinical Procedures with Children (3)	Duker
180	Personality Development (3)	Wright
181	Social Development (3)	Moore
250	Practicum in Clinical Child Psychology (ar)	Ruebush
270	Readings and Research in Child Development (ar)	Staff

Second Term

80	Child Psychology (3)	Charlesworth
132	Adolescent Development (3)	Hickman
140	Behavior Problems (3)	Hoving
179	Clinical Procedures with Children (3)	Barnard
180	Personality Development (3)	Wright
186	Cognitive Development (3)	Charlesworth
270	Readings and Research in Child Development (ar)	Staff

Curriculum and Instruction

First Term

General Courses

105	Audio-Visual Materials in Education (3)	Pearson
107	Radio and Television in Education (3)	Pearson
115	Introduction to Education of Visually Handicapped Children (3)	Davis
116	Braille I (3)	Jenkins
117	Braille II (3)	Martin
126	Orientation and Mobility for Blind Children (6)	Kenmore
127	Methods of Teaching School Subjects to the Hearing Impaired (3)	Houchins
128	Introduction to the Education of Hearing Impaired Children (3)	Houchins
145	Reading Difficulties (3)	Bond
151	Diagnosis and Treatment of Learning Difficulties (3)	Wesenberg
174-175-176	Clinical Methods and Practice in Speech Pathology (3 each)	Starr
178	Structure and Function of the Eye—Educational Implications (3)	Kantar, Kenmore



182	Education of Partially Seeing Children (3)	Kenmore
201	Problems: Teaching Social Studies (ar)	Rogers, Gardner
205	Problems: Audio-Visual Education (ar)	Pearson
271	Problems: Curriculum Construction (ar)	Birkmaier, Boeck, Bond, Goossen, Chase, Curtin, Kegler, Odland, Rogers, Woods, Gardner, Ziebarth
273	Problems: Reading (ar)	Bond, Balow, Chase, Odland

Elementary Education

60	Teaching Reading in the Elementary School (3)	Odland
61	Teaching Social Studies in the Elementary School (3)	Rogers
62	Teaching Mathematics in the Elementary School (3)	Jackson
63	Children's Literature (3)	Peltola
64	Teaching English in the Elementary School (3)	Dykstra
65	Teaching Science in the Elementary School (3)	Jackson
102	Teaching Social Studies in the Elementary School (3)	Rogers
103	Teaching Science in the Elementary School (3)	Goossen
118	Education of Blind Children in the Elementary Grades (3)	Martin
119	Elementary School Curriculum (3)	Goossen
121	Literature for the Elementary School (3)	Odland
143	Teaching and Supervision of Reading in the Elementary School (3)	Bond
149	Teaching and Supervision of Mathematics in the Elementary School (3)	Stochl
150	Supervision and Improvement of Instruction (3)	Curtin
153	Teaching and Supervision of English in the Elementary Schools (3)	Chase
163	Plastic Materials, Story Telling, and Social Studies for Young Children (3)	Headley
165A	Arithmetic for Gifted Children (3)	Stochl
166	Current Trends, Kindergarten Education (3)	Headley
186	Laboratory in Elementary Instructional Practices (2)	Arthur Jensen
261	Problems: Improvement of Instruction (ar)	Bond, Goossen Curtin, Rogers, Stochl

Secondary Education

101	Driver Education (3)	Gebhard
113	High School Curriculum (3)	Woods
120	Education of Blind Students in Secondary Schools (3)	Davis
122	Literature for Adolescents (3)	Kegler, Kemp
124	Foundations of Career Development (3)	Rank
132	Teaching the Basic Business Subjects (3)	Price
136	Organization and Administration of Distributive Education (3)	Meyer
139	Co-ordination Techniques (3)	Meyer
142	Business and Distributive Programs for Adults (3)	Ar.
144	Teaching Reading in Secondary Schools (3)	Chase
158	Materials and Methods in Office and Clerical Practice (3)	Ar.

168A	Methods and Materials for Teaching American History (3)	Gardner
177	Directing Secondary School Speech Activities (3)	Scott
185	Advanced Course in the Teaching of Modern Languages (3)	Birkmaier
190	Current Developments in Secondary School Science Teaching (3)	Boeck
191	Advanced Teaching and Supervision of Secondary Mathematics (3)	Ziebarth
195	Current Developments and Curriculum Construction in English (3)	Kegler
195A	Current Developments and Curriculum Construction in English—Project English (3)	Kegler, D. Smith
199E	Internship—Recreation Leadership (ar)	Fitzgerald
225	Problems: Secondary School Supervision (ar)	Keller, Woods
237	Seminar: Business and Distributive Education (0)	Price, Meyer, Warmke
238	Problems: Distributive Education (ar)	Meyer
239	Problems: Business Education (ar)	Price, Warmke
266	Supervision of High School Instruction (3)	Woods
287	Research Foundations of Secondary School Teaching (3)	Boeck
296	Problems: Teaching English (ar)	Kegler

Higher Education

228	Workshop: Problems of Higher Education and Teacher Education (June 17-July 12) (6)	Jenson, Eckert, and consultants
250	Higher Education in the United States (3)	Eckert

Second Term

General Courses

105	Audio-Visual Materials in Education (3)	Pearson
106	Co-ordinating an Audio-Visual Education Program (3)	Pearson
108	Nonprojected Audio-Visual Materials and Equipment Laboratory (3)	Alton Jensen
145	Reading Difficulties (3)	Wesenberg
201	Problems: Teaching Social Studies (ar)	Rogers, Gardner
205	Problems: Audio-Visual Education (ar)	Pearson
271	Problems: Curriculum Construction (ar)	Clymer, Goossen, Curtin, Rogers, Woods, Cardner, Ziebarth
273	Problems: Reading (ar)	Clymer, Balow, Odland

Elementary Education

61	Teaching Social Studies in the Elementary School (3)	Rogers
62	Teaching Mathematics in the Elementary School (3)	Jackson
63	Children's Literature (3)	Peltola
102	Teaching Social Studies in the Elementary School (3)	Rogers

103	Teaching Science in the Elementary School (3)	Goossen
119	Elementary School Curriculum (3)	Goossen
143	Teaching and Supervision of Reading in the Elementary School (3)	Clymer
149	Teaching and Supervision of Mathematics in the Elementary School (3)	Stochl
150	Supervision and Improvement of Instruction (3)	Curtin
153	Teaching and Supervision of English in the Elementary Schools (3)	Dykstra
261	Problems: Improvement of Instruction (ar)	Clymer, Goossen, Curtin, Rogers, Stochl
263	Research in Mathematics Instruction in the Elementary School (3)	Stochl

Secondary Education

113	High School Curriculum (3)	Woods
122	Literature for Adolescents (3)	Kegler, Kemp
125	Occupational Information Laboratory (3)	Borow
131	Advanced Teaching of Technical Business Subjects (3)	Price
144	Teaching Reading in Secondary Schools (3)	Kegler
155	Materials Laboratory for Social Studies Teachers (3)	Gardner
156	Trends in Business Education (3)	Price
164A	Workshop: Economic Education (for teachers of world history) (July 22-August 3) (3)	Warmke
164B	Workshop: Economic Education (for teachers of occupational relations) (July 22-August 3) (3)	Warmke
168	Current Developments in the Social Studies (3)	Gardner
199E	Internship—Recreation Leadership (ar)	Fitzgerald
225	Problems: Secondary School Supervision (ar)	Woods
237	Seminar: Business and Distributive Education (0)	Price, Warmke
239	Problems: Business Education (ar)	Price, Warmke
266	Supervision of High School Instruction (3)	Woods
296	Problems: Teaching English (ar)	Kegler

Higher Education

228	Workshop: Problems of Higher Education and Teacher Education (July 29-August 23) (6)	Mork, Troyer, Woestehoff, and consultants
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Educational Administration

First Term

General Courses

201	Foundations in Educational Administration (3)	Hooker
202	Foundations in Educational Administration (3)	Hooker
211	School Business Management (3)	Domian
227	Teacher and Employee Administration (3)	Cunningham
228	Problems: Educational Administration (1-3)	Cunningham, Domian, Hooker, Popper

- 236 Field Study (0-10)Cunningham, Domian, Goossen,
Hooker, Keller, Curtin, Popper, Woods
239 School Principal's Workshop (3)Cunningham, Popper

Elementary Education

- 200 Seminar: Elementary School Administration (3) Curtin
270A Problems: Elementary Education (ar)Bond, Goossen, Curtin

Secondary Education

- 167 The Junior High School (3) Popper
218 Seminar: Secondary Education (3)Keller
264 The Secondary School Principalship (3) Ar.
265 Administering the High School Program (3)Ar.
270B Problems: Secondary Education (ar)Cunningham, Domian,
Goossen, Hooker, Keller,
Curtin, Popper, Woods

Second Term

General Courses

- 201 Foundations in Educational Administration (3)Cunningham
202 Foundations in Educational Administration (3)Cunningham
210 Public School Finances (3) Hooker
224 Legal Aspects of Public School Administration (3)Hooker
226 School Plant Planning and Management (3) Ar.
228 Problems: Educational Administration (1-3)Cunningham,
Domian, Hooker, Popper
230 School Community Relations (3) Popper
235 Seminar: Educational Administration (3) Domian
236 Field Study (0-10)Cunningham, Domian,
Goossen, Hooker, Curtin, Popper, Woods

Elementary Education

- 215 Elementary School Principalship (3)Curtin
270A Problems: Elementary Education (ar)Clymer, Goossen,
Curtin

Secondary Education

- 264 The Secondary School Principalship (3) Popper
270B Problems: Secondary Education (ar)Clymer, Cunningham,
Domian, Goossen, Hooker,
Curtin, Popper, Woods

Educational Psychology

First Term

General Courses

- 110 Educational Measurement in the Classroom
(2 secs) (3) Hoyt
116 Introduction to Statistical Methods (2 secs) (3)Collier, Giese

116A	Introduction to Statistical Methods—Laboratory (2)	
	Sec 1	MacEachern
	Sec 2	Mandeville
117	Basic Principles of Measurement (3)	Lathrop
140	Instruments and Techniques of Measurement (3)	Edson
148	Clinical Diagnosis of Reading Difficulties (3)	Karlsen
150	Clinical Practice in Remedial Teaching (2 secs) (3)	Balow and staff
151	Clinical Practice in Education Diagnosis (3)	Balow and staff
152	Introduction to School Psychological Services (3)	Duker
159	Personality Development and Mental Hygiene (2 secs) (3)	Borow
182	Education of Exceptional Children (3)	Force
183	Education of Gifted Children (3)	Reynolds
184	Education of Mentally Retarded Children in Elementary Schools (3)	Force
186	Education of Emotionally Disturbed and Socially Maladjusted Children (3)	Wilderson, Wood
191	Education of the Mentally Retarded in Secondary Schools (3)	Karlsen
193	Psychology of Human Learning (3)	Neale
195	Automated and Programmed Learning (3)	Orlando
195A	Automated and Programmed Learning— Laboratory (2)	Orlando
200	Seminar: Institute in Guidance (1)	Blocher, Hogan
201	Seminar: Counseling Needs of Able Students (3)	Tennyson and staff
216	Statistical Methods in Education (3)	MacEachern
216A	Statistical Methods in Education—Laboratory (2 secs) (2)	Giese
218	Statistical Methods in Education (3)	Collier
218A	Statistical Methods in Education—Laboratory (2)	MacEachern
233	Problems: Guidance and Personnel Work (ar)	Dugan, Edson, Blocher, Hogan
234	Seminar: Counseling Theory and Research (3)	Tennyson and staff
243	Problems: Statistics for Students in Education and Psychology (3)	Collier
253	Research Problems (ar)	Bond, Collier, Edson, Hoyt, Reynolds, Torrance, Balow, Force, Duker, Houchins, Karlsen, Neale, Orlando, Wilderson
288	Practicum in Special Education (ar)	Wilderson, Anderson, Kenmore, Wood
290	Advanced Counseling Practicum (3)	Tennyson and staff
294	Recent Theory and Research in Human Learning (3)	Neale

Secondary Education

133	Basic Procedures in Student Personnel Work (3)	Dugan
134	School Counseling Procedures (3)	Hogan
282A-B	Supervised Practicum in Counseling (6)	Benson, Burks

Second Term

General Courses

60	Introduction to Measurement and Statistics (3)	Hoyt
110	Educational Measurement in the Classroom (2 secs) (3)	C. Smith
116	Introduction to Statistical Methods (3)	MacEachern
116A	Introduction to Statistical Methods—Laboratory (2)	Giese
117	Basic Principles of Measurement (3)	Hoyt
150	Clinical Practice in Remedial Teaching (2 secs) (3)	Balow and staff
151	Clinical Practice in Educational Diagnosis (3)	Balow and staff
152	Introduction to School Psychological Services (3)	Duker
159	Personality Development and Mental Hygiene (3)	Torrance
182	Education of Exceptional Children (3)	Force
183	Education of Gifted Children (3)	Reynolds
186	Education of Emotionally Disturbed and Socially Maladjusted Children (3)	Wilderson, Wood
193	Psychology of Human Learning (3)	Neale
200	Seminar: Institute in Guidance (1)	Blocher, Hogan
217	Statistical Methods in Education (3)	MacEachern
217A	Statistical Methods in Education—Laboratory (2 secs) (2)	Giese
233	Problems: Guidance and Personnel Work (ar)	Blocher, Hogan, Tennyson
253	Research Problems (ar)	Clymer, Hoyt, Mork, Reynolds, Torrance, Ba'ow, Force, Duker, Neale, Wilderson
288	Practicum in Special Education (ar)	Wilderson, Wood, and visitor
293	Psychology of Learning (3)	Neale

Secondary Education

133	Basic Procedures in Student Personnel Work (3)	Rank
134	School Counseling Procedures (3)	Blocher
282A-B	Supervised Practicum in Counseling (6)	Hogan, Summers

General Education

First Term

55A	Introduction to Secondary School Teaching (5)	Gardner, Randleman
	Sec 1	Randleman
	Sec 2	Olstad
	Sec 3	Olstad
	Sec 4	Ziebarth
75A	Introduction to Elementary School Teaching (5)	Dykstra, R. Johnson, Mitchell

Second Term

55B	Introduction to Secondary School Teaching (5)	Randleman, Olstad
	Sec 1	Olstad
	Sec 2	Ziebarth
	Sec 3	Randleman
	Sec 4	Ziebarth
75B	Introduction to Elementary School Teaching (5)	Dykstra, R. Johnson, Mitchell

History and Philosophy of Education

First Term

141	Critical Issues in Contemporary Education (3)	Neff
180	The School and Society (2 secs) (3)	Bagley
182	Comparative Philosophies of Education (3)	Neff
241	Problems: History and Philosophy of Education (ar)	Bagley

Second Term

131	Comparative Education (3)	Beck
156	History of Ideas in American Education (3)	Bagley
180	The School and Society (3)	
	Sec 1	Bagley
	Sec 2	Beck
241	Problems: History and Philosophy of Education (ar)	Beck, Bagley

Home Economics Education

First Term

91	Observation, Materials, Teaching in Home Economics (5)	Ar.
190	Readings: Home Economics Education (1-3)	Ford
194A	Adult Education in Home Economics (3)	Ford
293	Problems: Home Economics Education (1-9)	Brown
294	Research Methods (3)	Brown

Second Term

190	Readings: Home Economics Education (1-3)	Ford
293	Problems: Home Economics Education (1-9)	Brown

Industrial Education

First Term

90	Independent Study (3)	Nelson
91	Independent Study (3)	Nelson
101	Tests in Industrial Subjects (3)	Kavanaugh

115	Supervision of Industrial Education (3)	Widdowson
125	Philosophy and Practice of Industrial Education (3)	Widdowson
136	Instructional Materials Laboratory (3)	
	Sec 1	Kavanaugh
	Sec 2 (June 17-July 3)	Moss
200	Research Problems (3, 6, 9)	Nelson, Moss, Kavanaugh
250	Literature in Industrial Education (3)	Nelson

Second Term

100	Industrial Instruction (3)	Moss
105	Administration of Industrial Education (3)	Nelson
150	Vocational Education Surveys (3)	Moss
200	Research Problems (3, 6, 9)	Nelson, Moss

Methods and Student Teaching

First Term

50	Junior Practicum in Special Education (ar)	Kenmore, Anderson
52**	Student Teaching (ar)	Mork
53A	Teaching Handicapped Children (6)	Kenmore, Anderson
69**	Student Teaching in the Social Studies (1)	Kyle
77	Student Teaching in the Nursery School (3)	Moore
84A-B-C	Practice and Field Work in Recreation Leadership (2)	Fitzgerald
85A-B-C	Practice and Field Work in Recreation (2)	Fitzgerald

Second Term

50	Junior Practicum in Special Education (ar)	Ar.
84A-B-C	Practice and Field Work in Recreation Leadership (2)	Fitzgerald
85A-B-C	Practice and Field Work in Recreation (3)	Fitzgerald

Music Education††

First Term

51	Teaching Music (Kindergarten-Primary grades) (2)	Borg
52	Teaching Music (Intermediate grades) (2 secs) (2)	Borg
60-61	Student Teaching and Supervision of Music (2-12)	Ivory
124	Selection, Conducting of Choral Materials (3)	Caswell
150	Organization, Supervision of Vocal-Instrumental Music in Elementary Schools (3)	Caswell, Ivory

** Student teaching open only to students in College of Education regular degree programs. Application must be made prior to May 28. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

†† See also Department of Music in the College of Science, Literature, and the Arts.

170	Recent Research and Literature (3)	Ivory
194	Advanced Selection, Conducting of Choral Materials (3)	Caswell
224	Research Problems (3-9)	Caswell, Ivory

Second Term

51	Teaching Music (Kindergarten-Primary grades) (2)	Abelson
52	Teaching Music (Intermediate grades) (2)	Abelson
110	Workshop: Music Education (3)	Caswell
224	Research Problems (3-9)	Caswell

Physical Education for Men

First Term

1A	Beginning and Intermediate Swimming (1)	Mowerson
1B	Beginning Golf (1)	Bolstad
1C	Beginning Golf (1)	Bolstad
2A	Beginning and Intermediate Tennis (1)	Mowerson
5B	Gymnastics (1)	Anderson
7A	Games and Relays (1)	Anderson
7C	Recreational Games (1)	Anderson
51	Mechanics of Movement (3)	Osell
68	Basketball Coaching (2)	Kundla
73-74-75**	Student Teaching (3)	Mowerson
135	Tests and Measurements in Physical Education (3)	McAdam
224	Research Problems: School Health Education, Physical Education, and Recreation (ar)	Donnelly, Fitzgerald, McAdam
236	Introduction to Research in Physical Education and Recreation (3)	McAdam
238	Administration of Physical Education in Colleges and Universities (3)	Donnelly
241	Administration of Public Recreation (3)	Fitzgerald

Second Term

1A	Beginning and Intermediate Swimming (1)	Mowerson
1B	Beginning Golf (1)	Bolstad
1C	Beginning Golf (1)	Bolstad
2A	Beginning and Intermediate Tennis (1)	Mowerson
65	Adapted Physical Education (3)	Osell
67	Football Coaching (2)	Nash, Crawford
101	Principles of Physical Education (3)	McAdam
110	Recreation Surveys (3)	Fitzgerald
224	Research Problems: School Health Education, Physical Education, and Recreation (ar)	Donnelly, Fitzgerald, McAdam
233	Administration of the Physical Education Program in Secondary Schools (3)	McAdam

** Student teaching open only to students in College of Education regular degree program. Application must be made prior to May 28. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

Physical Education for Women

First Term

3	Archery (1)	Tenney
7	Tennis (4 secs) (1)	Eibner, Tenney
8	Golf (4 secs) (1)	Plack
10	Modern Dance (1)	Morrison
18	Teaching of Dance (2)	Morrison
25	American Red Cross First Aid: Standard, Advanced (2)	Hauptfuehrer, Morrison
32	Beginning Swimming (2 secs) (1)	Eibner
37	Teaching of Individual and Dual Sports (2)	Tenney
70	Teaching Health, Physical Education in the Elementary School (3)	Hauptfuehrer
102	Physical Education Program for the Elementary and Secondary School (3)	Jaeger
117B	Advanced Instruction in School Health for Secondary Schools (3)	Slocum
118E	Problems: Teacher Education in Health, Physical Education, and Recreation (ar)	Staff
124	Supervision of Physical Education (3)	Slocum
224	Research Problems (ar)	Staff

Second Term*

7	Tennis (2 secs) (1)	Lampe
8	Golf (2 secs) (1)	Lampe
118E	Problems: Teacher Education in Health, Physical Education, and Recreation (ar)	Staff
130	Contributions of Basic Sciences to Physical Education (3)	Wilson
224	Research Problems (ar)	Staff

**General
College**

The General College 2-year program leads to the degree of associate in arts. The aim of this program is to give the student a general education which will prepare him for the personal, vocational, civic, and cultural problems of his life in the community.

Courses are planned to be as complete as possible in themselves and to give an understanding of basic principles. They are not merely introductions to more specialized courses in the same field.



Courses successfully completed in the Summer Session may be applied toward fulfilling the requirements leading to the degree. For general information about the college program, requirements for the associate in arts degree, and requirements for transfer to other colleges, students should consult one of the administrative or counseling officials, or the *Bulletin of the General College*.

First Term

3A	Home Life: Marriage and Family Living (3)	W. Anderson
7D	Physical Science: Geology (3)	M. Harris
8A	Applied Mathematics (3)	Schwabacher
10A	Human Biology: Fundamental Similarities in the Living World (3)	Dearden
23A	Art Laboratory (3)	Safer
29A	World Literature I (3)	Burrows
30A	Reading and Vocabulary Development (3)	Draxten
31A	Writing Laboratory: Personal Writing (3)	Finnberg
32A	Oral Communication: Basic Principles (3)	Kurak
41A	Man in Society: His Personal Role (3)	F. Johnson
44B	Current History (3)	F. Harris

Second Term

5B	Functions and Problems of Logic (3)	Benson
10B	Human Biology: Living Machinery in Man (3)	Jefferson
19A	Problems of Business Transactions (3)	McCutcheon
30B	Fundamentals of Usage and Style (3)	Wyvell
31D	Writing Laboratory: Business Writing (3)	Kivits
32A	Oral Communication: Basic Principles (3)	Hagen
38A	General Geography (3)	Steinhauser
46D	Problems of International Relations (3)	Jones

Law School

Courses in the Law School Summer Session are open only to students who have completed at least 1 year of work in this Law School or in another accredited law school. All Law School courses run through both the first and second terms. For further information, write to Law School, University of Minnesota, Minneapolis 14.

First and Second Terms

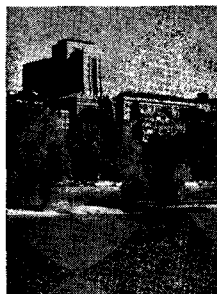
122	Business Associations (3)	Choper
125	Remedies (6)	Miller
128	Taxation 1 (6)	Ar.
129	Evidence (6)	Ar.
142	Conflicts (6)	Cound
175	International Law (3)	Christie
185	Jurisprudence (3)	Christie
194	Civil Liberties (3)	Choper

College of Medical Sciences

The University of Minnesota Medical School is known as one of the leading centers for medical instruction and training in the United States. Its newly expanded University Hospitals facilities as well as affiliation with the Minneapolis Veterans Hospital, Minneapolis General Hospital, and Ancker Hospital in St. Paul, provide the Summer Session student of medicine with unusual opportunities for study.

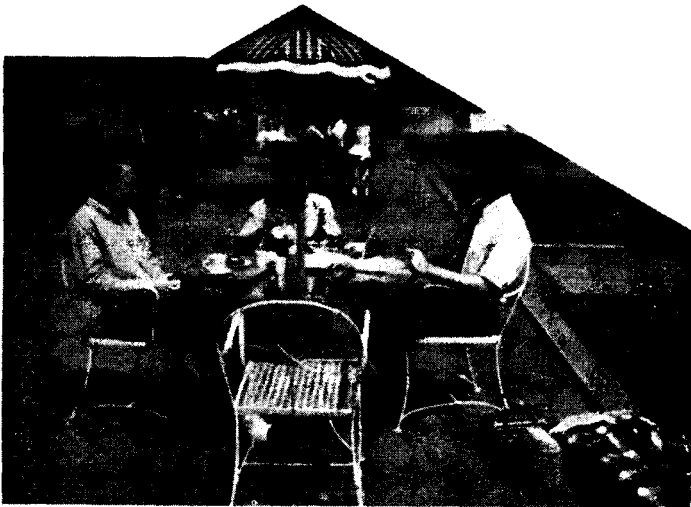
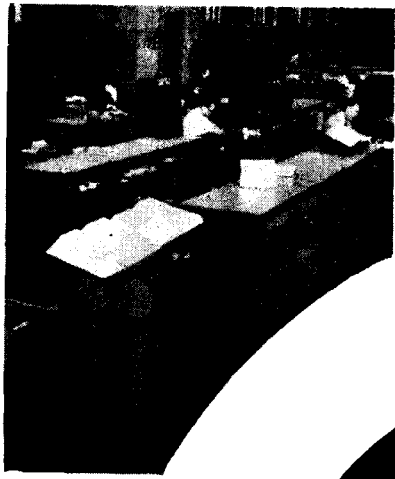
MEDICAL SCHOOL

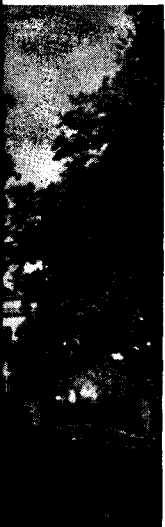
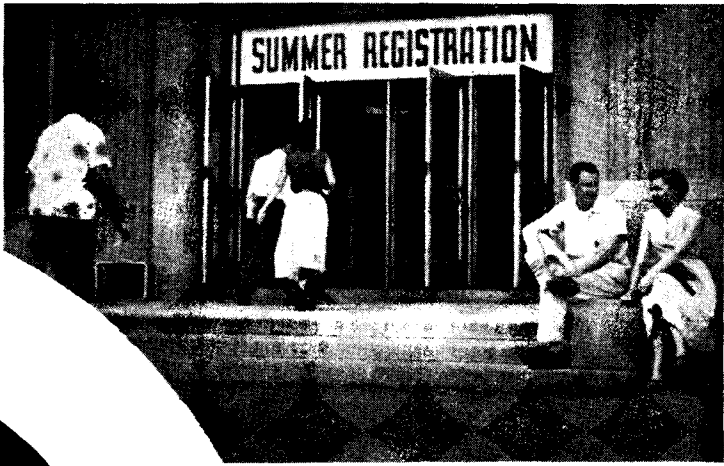
Required courses for freshman and sophomore medical students are not offered during the Summer Session. A wide range of elective and advanced study courses, however, is offered for medical students at the University of Minnesota, accredited students from other medical schools, and graduate physicians. Additional courses are also offered which lead to training programs for nurses, physical therapists, occupational therapists, medical and x-ray technologists, medical officers of public health, public health nurses, public health engineers, and health educators.



Externships

The clinical Departments of Medicine, Surgery, Obstetrics, Ophthalmology, Otolaryngology, Pediatrics, Physical Medicine, Anesthesiology, Radiology, Psychiatry and Neurology, and Divisions of Orthopedics, Urology, Neurosurgery, and Dermatology offer elective externships at the University Hospitals and affiliated hospitals. These externships are open to junior and senior medical students at the University of Minnesota and to qualified





medical students from other institutions. For information concerning these clinical opportunities write to the department head of the service in which you are interested, Medical School, University of Minnesota, Minneapolis 14.

Registration and Graduate Credit

A student applying to register in preclinical subjects or externships must present, at the time of application for such registration, a letter from the dean of his medical school approving the purpose of the registration. 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 Summer Session 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.

Students who wish to earn graduate credit must register through the Graduate School office.

Anatomy

First Term or Second Term

156	Advanced Anatomy (ar)	Graduate staff
204	Research in Anatomy (ar)	Graduate staff

Anesthesiology

First and Second Terms

101	Principles of Anesthesia (2)	Van Bergen and staff
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First Term or Second Term

265	General Anesthesia (12)	Van Bergen and staff
266	Regional Anesthesia (4)	Van Bergen and staff
267	Pre- and Postanesthetic Evaluation (2)	Van Bergen and staff
268	Seminar in Anesthesiology (2)	Van Bergen and staff
269	Research in Anesthesia (ar)	Van Bergen and staff

ELECTIVE COURSES

169	Research in Anesthesia (ar)	Van Bergen and staff
181	Externship in Anesthesiology (4)	Van Bergen and staff

182	Externship in Anesthesiology and Respiratory Problems (4)	Van Bergen and staff
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Biochemistry

First Term

100	Physiological Chemistry (7)	Barnum, Carr, Van Pilsum
153	Problems in Physiological Chemistry (ar)	Barnum, Carr, Van Pilsum
205	Research in Physiological Chemistry (ar)	Barnum, Carr, Van Pilsum

Second Term

101	Physiological Chemistry (7)	Armstrong, Ungar, Koerner
153	Problems in Physiological Chemistry (ar)	Armstrong, Ungar, Koerner
205	Research in Physiological Chemistry (ar)	Armstrong, Ungar, Koerner

Medicine

First and Second Terms

104	Introduction to Internal Medicine (2)	Watson and staff
112	Clerkship: Internal Medicine (16)	Goetz and staff
124	Senior Clerkship: Dermatology (2; prereq regis Med) 1:00-3:00 MTW, 9:00-11:00 Th, 1:30-3:00 F, Hosp EustisAmph	Lynch, others
201	Clinical Medicine (ar)	Watson and staff
202	Diseases of the Cardiovascular Apparatus (ar)	Frantz
203	Research in Medicine (ar)	Watson and staff
205	Diseases of Chest (ar)	Hall, MacDonald
206	Clinical Conference (1)	Watson and staff
207	Clinical Pathological Conference (1)	Dawson
208	Clinical Radiological Conference (1)	Peterson, Watson, and staff
210	Seminar: Infectious Disease (1)	Spink
214	Cardiovascular Conference (1)	Wang and staff
225	Clinical Dermatology (ar)	Lynch, others
226	Dermatology (ar)	Lynch, others
227	Histopathology of the Skin (ar; prereq 225)	Lynch, others
228	Research: Dermatology (ar)	Lynch, others
229	Experimental Methods in Dermatology (ar; prereq 225)	Lynch, others
230	Functional Biology of the Skin (ar)	Lynch, others

ELECTIVE COURSES

180	Externship in Medicine: University, Minneapolis General, Ancker, Mt. Sinai, Veterans Hospitals (18)	Watson and staff
181	Research in Medicine (18)	Watson and staff
182	Externship in Dermatology (4)	Lynch
183	Problems in Dermatology (8)	Lynch
184	Clinical Medicine (18)	Watson and staff

Microbiology

First Term

122 Physiology of Bacteria Laboratory (3)Bernlohr, Rogers

First Term or Second Term

201 Research (ar)Staff

Obstetrics and Gynecology

First Term or Second Term

ELECTIVE COURSE

184 Externship in Obstetrics and Gynecology (ar) McKelvey and staff

First Term

COURSES FOR GRADUATE STUDENTS

201 Advanced Obstetrics and Gynecology, Part I
(ar)McKelvey, Prem, Makowski, and staff

205 Advanced Obstetrics and Gynecology, Part II
(ar)McKelvey, Prem, Makowski, and staff

209 Advanced Obstetrics and Gynecology, Part III
(ar)McKelvey, Prem, Makowski, and staff

216 Research (ar)McKelvey, Prem, Makowski, and staff

301 Externship (6)McKelvey, Prem, Makowski, and staff

Second Term

COURSES FOR GRADUATE STUDENTS

204 Advanced Obstetrics and Gynecology, Part I
(ar)Prem, Makowski, and staff

208 Advanced Obstetrics and Gynecology, Part II
(ar)Prem, Makowski, and staff

212 Advanced Obstetrics and Gynecology, Part III
(ar)Prem, Makowski, and staff

219 Research (ar)Prem, Makowski, and staff

302 Externship (6)Prem, Makowski, and staff

303 Obstetric and Gynecologic Histology (6)Prem and staff

Ophthalmology

First and Second Terms

200 Clinical Ophthalmology (6)Harris and staff

201 Practical Ocular Surgery (3)Harris and staff

203 Basic and Applied Ophthalmology (2)Harris and staff

Otolaryngology

First and Second Terms

COURSES FOR GRADUATE STUDENTS

230	Clinical Otology (3)	Boies and staff
231	Clinical Rhinology and Laryngology (3)	Boies and staff
232	Surgery of the Ear, Nose, and Throat (3)	Boies and staff

Pathology

First Term

104	Autopsies (ar)	Dawson
106	Diseases of the Heart (1)	Edwards
111	Conference on Autopsies (1)	Dawson
112	Diagnosis of Tumors (2½)	Hebbel
113	Surgical Pathology (ar)	Hebbel
120	Diseases of the Lungs (1)	Dawson
201	Research (ar)	Dawson

Second Term

104	Autopsies (ar)	Dawson, Hebbel
106	Diseases of the Heart (1)	Edwards
111	Conference on Autopsies (1)	Dawson
112	Diagnosis of Tumors (2½)	Hebbel
113	Surgical Pathology (ar)	Hebbel
121	Diseases of the Alimentary Tract (1)	Hebbel
201	Research (ar)	Dawson, Hebbel

Pediatrics

First and Second Terms

120	Clinical Lecture (2)	Anderson and staff
135	Clerkship (16)	Anderson and staff
181	Externship (ar)	Anderson and staff
182	Special Clinical Problems (ar)	Anderson and staff
183	Research in Pediatrics (ar)	Anderson and staff
200	Seminar (1½)	Anderson and staff
202	Clinic (ar)	Anderson and staff
204	Residency (ar)	Anderson and staff
206	Pediatric Special Interest (ar)	Anderson and staff
208	Pediatric Research (ar)	Anderson and staff

Pharmacology

First and Second Terms

10	Pharmacology for Nursing Students (2)	Shideman and staff
109	Pharmacological Problems (ar)	Shideman and staff
203	Research in Pharmacology (ar)	Shideman and staff

Physical Medicine and Rehabilitation

First Term or Second Term

103	Physical Therapy Clinic (ar)	Gullickson
122	Physical Medicine and Rehabilitation Lectures: Junior and Senior Students (1)	Staff
200	Physical Medicine Service (ar)	Staff
204	Clinic, Peripheral Vascular Disease (ar)	Gullickson
205	Readings (1)	Kottke
206	Conference (ar)	Staff
210	Research in Physical Medicine (ar)	Kottke, Kubicek
212	Electromyography (ar)	Kottke

Occupational Therapy

Consult Occupational Therapy office, 860 Mayo Memorial, University of Minnesota, Minneapolis 14.

Physiology

First Term

4	Human Physiology (4)	King
100	General Physiology (4)	Walker
203	Research in Physiology (ar)	Visscher and staff

Second Term

51	Human Physiology (6)	King, Lester
203	Research in Physiology (ar)	Visscher and staff

Psychiatry and Neurology

First Term or Second Term

101	Clinical Neurology (1)	Baker
103	Junior Clinical Clerkship (12)	Staff
145	Readings in Psychiatry (ar)	Staff
145X	Readings in Neurology (ar)	Staff
151	Survey of Neuropathology (ar)	Staff
181	Externship in Neurology (ar)	Staff
182	Problems in Basic and Clinical Neurology (ar)	Staff
191	Externship in Adult Psychiatry (ar)	Staff
192	Externship in Child Psychiatry (ar)	Jensen
193	Problems in Psychiatry (ar)	Staff
202	Case Conference (1)	Schofield and staff
203	Psychometric Clerkship (ar)	Schofield and staff
208	Clinical Neurology (ar)	Baker and staff
209	Research in Neurology (ar)	Baker and staff
212	Survey of Neuropathology (1)	Baker and staff
226	Neurological-Neurosurgical Conference (1)	Baker and staff
228	Research in Neuropathology (ar)	Baker and staff

231	Applied Electroencephalography, Myography (ar)	Baker and staff
233	Applied Neuropathology (ar)	Baker and staff
251	Clinical Inpatient Psychiatry (ar)	Koutsky and staff
252	Clinical Outpatient Psychiatry (ar)	Anderson and staff
253	Clinical Child Psychiatry (ar)	Jensen and staff
254	Advanced Clinical Inpatient Psychiatry (ar)	Koutsky and staff
255	Advanced Clinical Outpatient Psychiatry (ar)	Anderson and staff
256	Advanced Clinical Child Psychiatry (ar)	Jensen and staff
257	Special Assignments (1)	Staff
258	Research in Psychiatry (ar)	Staff
260	Orientation to Clinical Psychiatry (1)	Staff
264	Descriptive Psychopathology (1)	Staff
265	Personality Development and Psychodynamics (1)	Anderson
291	Seminar in Current Literature (1)	Simon
292	Specialized Supervised Psychotherapy (1)	Hastings and staff

Radiology

First Term or Second Term

111	Medical Roentgenologic Conference (1)	Peterson and staff
124	Pediatric Roentgenologic Conference (1)	Fineberg and staff
135C	Surgery Roentgenologic Conference (1)	Amplatz and staff
163A	Neurosurgical Roentgenologic Conference (1)	Peterson and staff
180	Externship (4; prereq regis Med)	Peterson and staff
181	Externship: Diagnostic Radiology (4; prereq regis Med)	Peterson and staff
182	Externship: Radiation Therapy (4; prereq regis Med)	Mosser and staff
183	Problems: Radiation Biology, Radioactive Isotope Methods (12; prereq regis Med)	Mosser and staff
184	Problems: Diagnostic Radiology (12; prereq regis Med)	Peterson and staff
200	Research in Roentgenology (ar)	Peterson and staff
205	Research Related to Radiation Therapy (ar)	Mosser and staff
206	Roentgenoscopy (3)	Peterson and staff
207	Roentgen and Radium Therapy (ar)	Mosser and staff
209	Roentgen Diagnosis (3)	Peterson and staff
210	Roentgen Technique (2)	Peterson and staff
238	Roentgen-Surgical Pathology Conference (1)	Peterson, Lober
240	Conference in Radiation Therapy (1)	Mosser and staff

Surgery

General Surgery

First and Second Terms

121	Principles of Surgery (3)	Wangensteen and staff
129	Surgical Clinics for Juniors (3)	Wangensteen and staff
135	Junior Clinical Clerkship (16)	Wangensteen and staff
181	Cardiovascular Surgery (ar)	C. W. Lillehei

182	Problems in Clinical Investigation and/or Problems in Experimental Surgery (ar)	Wangensteen and staff
183	Externship in Affiliated Hospitals	
200	Outpatient Clinic in Surgery (1)	Wangensteen and staff
203	Proctoscopy and Sigmoidoscopy (1)	Wangensteen and staff
204	Tumor Clinic (1)	Wangensteen and staff
205	Surgical Diagnosis (1)	Wangensteen and staff
208	Surgical Service (1)	Wangensteen and staff
211	Operative Surgery (1)	Wangensteen and staff
214	Surgical Ward Conference (1)	Wangensteen and staff
215	Roentgenological-Surgery Conference (1)	Wangensteen and staff
216	Surgical Research (1)	Wangensteen and staff
217	Surgical Seminar (1)	Wangensteen and staff
218	Medical and Surgical Pathology Conference (1)	Wangensteen, staff of Pediatrics and Medicine
219	Surgery Literature Conference (1)	Wangensteen and staff
220	Vascular Conference (1)	Wangensteen and staff
221	Surgery-Physiology Conference (1)	Wangensteen and staff

Neurosurgery

First and Second Terms

127	Surgical Diseases of the Nervous System (1)	French and staff
188	Neurosurgical Externship (2)	French and staff
189	Neurosurgical Externship (1)	French and staff
190	Neurosurgical Investigation (2)	French and staff
305	Neurosurgical Diagnosis (3)	French and staff
308	Neurosurgical Service (4)	French and staff
311	Operative Surgery (4)	French and staff
316	Neurosurgical Research (3)	French and staff
318	Neurosurgical Conference (1)	French and staff

Orthopedic Surgery

First and Second Terms

122	Principles of Diagnosis, Treatment, Prognosis of Fractures, Dislocations (1)	Moe and staff
185	Externship in Orthopedic Surgery and Fractures (ar)	Moe and staff
186	Research Problems (ar)	Moe and staff
405	Orthopedic Diagnosis (5)	Moe and staff
408	Orthopedic Service (5)	Moe and staff
411	Orthopedic Operative Surgery (5)	Moe and staff
416	Orthopedic Research (5)	Moe and staff

Urology

First and Second Terms

173	Urology Lectures (1; prereq regis Med)	Creedy
180	Externship in Urology (ar)	Creedy and staff

250	Urological Surgery (4)	.....Creevy and staff
252	Urological Conference (4)	.....Creevy and staff
253	Urological Research (4)	.....Creevy and staff
257	Use of the Artificial Kidney (3)	.....Reiser

**LABORATORY
MEDICINE**

Laboratory Medicine

First Term or Second Term

235	Advanced Clinical Laboratory Medicine (ar)	.....Evans and staff
236	Research on Clinical Laboratory Problems (ar)	.....Evans and staff

Medical Technology

The basic professional program in medical technology leads to the degree of bachelor of science. For the graduate medical technologists, a program leading to a degree of master of science with a major in medical technology is available. (See section on Graduate School.) A 12-month certificate course for medical laboratory assistants begins in July or in September.

First Term

110	Advanced Clinical Laboratory Techniques (5)Hovde and staff
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Second Term

111	Advanced Clinical Laboratory Techniques (5)Hovde and staff
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**SCHOOL OF
NURSING**

The basic professional program in the School of Nursing leads to the degree of bachelor of science with a major in professional nursing. For the graduate nurse, the school conducts a program leading to the bachelor of science degree in nursing. A 4-quarter certificate program in practical nursing begins in the fall quarter. Programs leading to the master of education, master of nursing administration in nursing service, and master of science

dence in the interval between the end of second term and the beginning of the fall quarter.

Nurses who have completed a baccalaureate degree program but lack approved preparation for public health nursing may begin supplementary course work during the Summer Session. These nurses should apply in advance through usual University admission channels.

Undergraduate students in public health nursing who are enrolled in the program leading to a bachelor of science degree may continue with courses during the Summer Session. Registered nurses not previously matriculated but with interest in further collegiate preparation for nursing, including preparation for the public health nursing field, should apply to the School of Nursing.

First Term

50	Personal and Community Health (3)	Thomson
58	Health Programs for Mothers and Children (5)	Stocking
63	Public Health Nursing (2)	Facklam
64	Long-Term Patient Care (6 for both terms)	E. Anderson
65	Field Practice in Public Health Nursing (ar)	Facklam, Fredlund, Stocking
95	Human Nutrition (3)	Stief
123	Topics in Public Health (ar)	Staff
133	Mental Health (3)	K. Fritz
139	Advanced Field Practice in Public Health Nursing: Block Placement (ar)	von Bergen
173	Advanced Field Practice in Public Health Nursing: Functional Area (ar)	Murphy, Fritz, Blanchard, McIntyre, Pennebaker

Biostatistics

110	Biostatistics I (3)	Brown
111	Biostatistics Laboratory I (2)	Briese

Second Term

53	Introduction to Public Health	G. Anderson
64	Long-Term Patient Care (6 for both terms)	E. Anderson
65	Field Practice in Public Health Nursing (ar)	Facklam, Fredlund, Stocking
75	Introduction to Environmental Sanitation (3)	Bond
100A	Elements of Public Health I (3)	G. Anderson
123	Topics in Public Health (ar)	Staff
139	Advanced Field Practice in Public Health Nursing: Block Placement (ar)	von Bergen

173	Advanced Field Practice in Public Health Nursing: Functional Area (ar)	Murphy, Fritz, Anderson, Blanchard, McIntyre, Pennebaker
230**	Field Practice in Environmental Sanitation (ar)	Bond, Michaelsen, Stauffer

Biostatistics

120	Biostatistics II (3)	Brown
121	Biostatistics Laboratory II (2)	Loewenson
180	Introduction to Biostatistics (6)	McHugh

**Mortuary
Science**

The Department of Mortuary Science program during the first term consists of several courses which are required of all department students for graduation. These courses are usually introductory in content and are applied courses offered only by this department. Therefore, the transfer or advanced standing student who is planning on senior matriculation for the fall quarter 1963 will find it to his advantage to complete these courses prior to his entrance into his last year of study. Study in the department during the Summer Session also gives the student opportunity for personal orientation and counseling.

First Term

8	Orientation in Funeral Service (1)	Koschig
11	Introduction to Mortuary Management (2)	Slater
13	Mortuary Law (3)	Grayson

Second Term

9	Orientation in Funeral Service (1)	Koschig
12	Introduction to Embalming (3)	Thorsell
14	Mortuary Law (3)	Grayson

** Special fee; consult department.

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.

College of Science, Literature, and the Arts

Liberal arts and general education courses are offered by the College of Science, Literature, and the Arts to meet the special needs of four groups of students: students, usually with a Bachelor's degree as their immediate goal, seeking preparation both for professions and other careers and for gaining 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.

Summer courses offered by the College of Science, Literature, and the Arts are selected from the regular programs of its departments to meet these purposes, at introductory, intermediate, and advanced levels. A few of the summer programs are discussed in the following paragraphs.



Art—Undergraduate and graduate offerings in the Department of Art include courses in studio work (drawing, painting, printmaking, sculpture, photography) and art history and criticism. Departmental Library and University Galleries open for historical and creative research.

English—The English Department offers a wide variety of courses during the summer serving the requirements of the undergraduate and graduate student, the professional teacher, and the student with interests in literature, literary history, and criticism.

History—The summer offerings in the Department of History are carefully selected from the regular curriculum. The student will find a wide choice in American, European, ancient, medieval, and Asian history.

Interdisciplinary Programs—These courses, which cut across departmental lines, are designed particularly for the student who seeks to supplement his major or specialized studies with a liberal understanding of the humanities and the social sciences, or work in family life and personal orientation.

Library School—The Library School offers courses leading to a Master's degree, a 24-credit program leading to certification for school library work, and minor programs for undergraduates in the College of Science, Literature, and the Arts and the College of Education.

Courses are offered on a rotation plan in alternate summers for students not able to enroll during the regular academic year. It is possible to complete a Master's program attending only Summer Sessions. Basic courses required for admission to the Master's degree program, some of the graduate courses, and certification courses are offered in both summer terms.

Preparation for professional librarianship embraces 5 years of study beyond secondary school, including 1 year of professional content. The Master's degree program in library science meets this requirement. Inquiries concerning admission to this

program should be addressed to Dean of the Graduate School, 316 Johnston Hall, University of Minnesota, Minneapolis 14.

Music—Graduate and undergraduate courses of interest to general students as well as music majors will be offered both terms. These include: Fundamentals of Music, American Music, Symphonies of the Romantic Era, History of Church Music, Theory, and various phases of applied music including piano, voice, organ, and all orchestral and band instruments.

There will be a Summer Session chorus and band first term.

Attention is called to the Choral Arts Institute (July 1-14) culminating in a performance of a major choral work with orchestra under the direction of Robert Shaw scheduled by the Center for Continuation Study.

Organists will be interested in the organ workshop, in addition to a course in organ literature, scheduled at the Center for Continuation Study.

Courses in applied music are open to talented and qualified high school students. Advance college credit may be earned by students who plan to enroll in the University after graduation from high school.

Band directors will be interested in the special course in band arranging.

For special courses in music education during the second term see the notice under Music Education.

Philosophy—Courses in the Department of Philosophy are planned for the student whose objective is an understanding and appreciation of philosophy as a part of a liberal education or as preparation for professional work. Besides beginning courses in the Problems of Philosophy, Logic, and Ethics, there are advanced courses in the history of Western philosophy and a variety of particular subjects designed to serve the needs and interests of students who may not have philosophy as their major field of concentration.



Psychology—The beginning courses in General Psychology and Laboratory Psychology, which are prerequisite to most advanced courses, are available in the Summer Session. Specialized courses in abnormal psychology, the psychology of learning, and verbal behavior, as well as courses in such areas of application as the psychology of advertising and personnel work, are appropriate both for the nonpsychology major and for the major student with either general education or vocational and professional aims.

Sociology—Sequences in general sociology, social problems and social policy, and social research are among the offerings in the Department of Sociology. In co-operation with the School of Social Work a special sequence is designed as preparation for graduate study in the School of Social Work.

American Studies

First Term

Hum 23	American Life III (3)	Lemons
202	Introduction to American Studies (3)	Mondale
250	Readings in American Civilization (ar)	Ar.

Second Term

Hum 21	American Life I (3)	Brooks
251	Readings in American Civilization (ar)	Ar.

Note: See also approved courses in participating departments as listed in the *Program in American Studies*.

Anthropology

First Term

1A	Introduction to Anthropology: Prehistoric Man and Culture (3)	Murrill
80	The American Indian (3)	Spencer
121	Peoples and Cultures of the South Seas (3)	Murrill
140	Field Research in Archaeology (6)	Johnson
165	Personality and Culture (3)	Spencer
190-191-192	Directed Research (ar)	Staff

Second Term

2A	Introduction to Anthropology: Cultural Anthropology (3)	Gibbs
119	Contemporary Middle American Communities (3)	Altschuler

120	Peoples and Cultures of Africa (3)	Gibbs
150	Contact of Cultures (3)	Altschuler
190-191-192	Directed Research (ar)	Staff

Art

First Term

Introductory and General

1	Principles of Art (3)	Ar.
50	Introduction to the Visual Arts (3)	Ar.

History and Criticism

57	Renaissance and Baroque Art: 1500-1650 (3)	Waldfogel
59	Traveling Summer Course in European Art (5)	Eitner
67	Modern Art: Realism and Impressionism (3)	Waldfogel
101	Hellenistic Art Through Early Christian (3)	Ar.
112	Art of Japan (3)	Copeland

Drawing and Design

23-24-25	Drawing and Design (3 each)	Liebling, Quirt
73-74-75	Presentation Techniques (3 each)	Downs

Drawing and Painting

52	Drawing II (3)	Myers
54-55	Life Drawing (3 each)	Myers
70-71-72	Oil Painting (3 each)	Quirt
150-151-152	Problems in Painting (3 each)	Quirt

Photography

10-11-12	Photography (3 each)	Liebling, Downs
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Printmaking

32-33	Elements of Printmaking (3 each)	Myers
90-91-92	Printmaking (3 each)	Myers
190-191-192	Problems in Printmaking (3 each)	Myers

Second Term

Introductory and General

1	Principles of Art (3)	Torbert
50	Introduction to the Visual Arts (3)	Torbert

History and Criticism

138	Twentieth-Century Art in the United States (3)	.....Torbert
196	Readings in Art History and Criticism (3)Torbert

Drawing and Design

23-24-25	Drawing and Design (3 each)Busa
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Drawing and Painting

70-71-72	Oil Painting (3 each)Busa
150-151-152	Problems in Painting (3 each)Busa

Sculpture

40-41	Sculpture I (3 each)	.....Randell
80-81-82	Sculpture II (3 each)	.....Randell
180-181-182	Problems in Sculpture (3 each)	.....Randell

Botany

First Term**

1	General Biology (5)	.....Ar.
194	Problems (1-5)	.....Staff

Second Term

2	General Biology (5)	.....Ar.
195	Problems (1-5)	.....Staff

Classics

First Term

Classics

45	Greek and Roman Mythology (3)	.....R. A. Swanson
56	Elementary Linguistics (3)	.....D. C. Swanson
145	Greek and Roman Mythology (3)R. A. Swanson

Latin

171	Advanced Reading (3)D. C. Swanson
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** For botany courses given during the Biology Session at the Lake Itasca Forestry and Biological Station, see index.

Greek

171 Advanced Reading (3)R. A. Swanson

Second Term

Latin

172 Advanced Reading (3)Forbes

Communication

See Interdisciplinary Programs.

Economics

See index.

English

First Term

Freshman English

1B Freshman English (3)Ar.
3B Freshman English (3)Ar.

Literature

23 Introduction to Literature (6)Buckley
55 Shakespeare (3)O'Brien
56 Shakespeare (3)Ar.
72 American Literature (3)Herbert Brown
73 American Literature (3)Levenson
75 Chaucer (3)Clark
90H Magna Honors Thesis (3)Ar.
91H Summa Honors Thesis (3)Ar.
106 Whitman and Mark Twain (3)Mondale
136 Advanced Shakespeare (3)O'Brien
137 Nineteenth-Century Literature (3)Stange
154 American NovelHerbert Brown
162 Milton (3)Unger
165 Introduction to Modern English (3)Kirchner
197 Seventeenth-Century Literature (3)Unger
213 Bibliography (3)Stange

Second Term

Freshman English

1B Freshman English (3)Ar.
2B Freshman English (3)Ar.

Literature

21	Introduction to Literature (6)	Cody
54	English Novel (3)	Wright
55	Shakespeare (3)	Hurrell
56	Shakespeare (3)	Montgomery
74	American Literature (3)	Youngblood
90H	Magna Honors Thesis (3)	Ar.
92H	Summa Honors Thesis (3)	Ar.
100	Old English (6)	Ar.
105	Hawthorne and Melville (3)	Brom Weber
142	Twentieth-Century Literature (3)	R. Foster
156	American Drama (3)	Weales
158	American Poetry (3)	Wright
186	Dramatic Literature (3)	Hurrell
193	W. B. Yeats (3)	Youngblood

Family Studies

First Term

1	Dynamics of Dating, Courtship, and Marriage (3)	Torbett
1A	Dynamics of Dating, Courtship, and Marriage (3)	Torbett
15	The Home and Its Furnishing (3)	Ludwig

Second Term

1	Dynamics of Dating, Courtship, and Marriage (3)	Ross
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Foreign Study Seminar

See Interdisciplinary Programs.

Geography

First Term

4	Human Geography (5)	Webb
102	Central Europe (3)	Kuklinski
107	Soviet Union (3)	Kuklinski
301	Research Problems in Geography (ar)	Webb

Second Term

41	Geography of Primary Production (5)	Lukermann
101	Western Europe (3)	Dickinson
153	Urban Geography (3)	Dickinson
301	Research Problems in Geography (ar)	Lukermann

Third Term (August 29-September 18)

251-252	Seminar: Physical Geography (5)	Salisbury
276-277	Seminar: Agricultural Geography (5)	Mather



German

First Term

1	Beginning German (5)	Menze
3	Beginning German (5)	F. Wood
4	Intermediate German (3)	Ar.
5	Intermediate German (2)	Ar.
74	Nineteenth-Century Drama (3)	Menze
149	Directed Readings (3)	Ramras
162	Classical Period (3)	F. Wood
188	Heine (3)	Ramras

A Deutsches Haus is being planned. (See Special Programs)

Second Term

2	Beginning German (5)	Menze
75	Modern Drama (3)	Ramras
149	Directed Readings (3)	Menze
176	Kleist and Büchner (3)	Ramras

History

First Term

1	Civilization of the Modern World (3)	Bamford
2	Civilization of the Modern World (3)	R. Smith
16	Ancient Civilization (3)	Kildahl
17	History of Asia (3)	Taylor
20	American History (3)	Beatty
52	Ancient Civilization (3)	Kildahl
59	History of Asia (3)	Taylor
81	The United States in the Twentieth Century (3)	Trefousse
90	The American West (3)	Berkhofer
104B	High Renaissance (3)	Giesey
109	Europe in the Twentieth Century (3)	R. Smith
125B	Modern Russia (3)	Stavrou
125C	The Modern Near East (3)	Stavrou
148A	History of the South (3)	Noble
151	Intellectual History of the United States (3)	Noble
152	Current Interpretations and the Problem of Synthesis in American History (3)	Berkhofer
164	History of China, Prehistoric Times to Present (3)	Taylor
180	European Economic History Since 1500, Part 2 (3)	Bamford
180A	History of European Commerce (3)	Bamford
187C	Twentieth-Century American History (3)	Trefousse
200	Historical Bibliography and Criticism (3)	Giesey

Second Term

3	Civilization of the Modern World (3)	Wright
18	History of Asia (3)	Stein
21	American History (3)	Horning
22	American History (3)	Lupton

60	History of Asia (3)	Stein
88	American Colonies (3)	Rutman
94	American Diplomatic History (3)	Lupton
105C	English Constitutional History to 1485 (3)	Hoyt
108A	Europe in the Nineteenth Century (3)	Kraehe
125	Russia (3)	Horning
142	History of Germany (3)	Wright
156B	History of South Asia, Especially India (3)	Stein
159	Survey of Latin-American History (3)	Beatty
175A	Medieval English History (3)	Hoyt
177D	Nineteenth-Century European History (3)	Kraehe
186E	Seventeenth- and Eighteenth-Century American History (3)	Rutman

How to Study

See Psychology.

Humanities

See Interdisciplinary Programs.

Interdisciplinary Programs

First Term

Communication

3	Communication (3)	Jensen
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Family Studies

See Family Studies.

Foreign Study

161	Seminar for Foreign Study I (6)	Armajani, Laakso, Ryberg, Ar.
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Humanities

1	Humanities in the Modern World I (3)	Penn
4	Humanities in the Modern World IV (3)	Amberg
23	American Life III (3)	Lemons
51	Humanities in the Modern World (3)	Bryan
52	Humanities in the Modern World (3)	Kliger
53	Humanities in the Modern World (3)	Bryan
54	Humanities in the Modern World (3)	Amberg
62	The Roman and Medieval Heritage (3)	Ames
63	The Renaissance (3)	Ames

Personal Orientation

See Psychology.

Social Science

1	Personality (3)	Cooperman
2	Work (3)	Cooperman

Second Term

Foreign Study

162	Seminar for Foreign Study II (6)	Armajani, Laakso, Ryberg, Ar.
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Humanities

1	Humanities in the Modern World I (3)	Ramsland
2	Humanities in the Modern World II (3)	Ramsland
21	American Life I (3)	Brooks
54	Humanities in the Modern World (3)	Louden
61	The Greek Heritage (3)	Swanson
131	Humanities Proseminar (3)	Swanson

Social Science

3	Community (3)	Roshwald
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School of Journalism

First Term

11	Reporting for Nonmajors (3)	Sim
60	Graphic Arts: Processes (3)	Wilson
73	Magazine Writing (3)	Charnley
90	Mass Communications, News (3)	Charnley
109	History of Journalism (3)	Emery
121	Mass Media in Dynamic Society (3)	Gerald
123	Contemporary Problems in Freedom of Speech and Press (3)	Gerald
182	School Publications Workshop (3)	Wilson and staff
290	Special Problems in Mass Communications (3)	Staff

Second Term

78	Public Relations Methods (3)	Corcoran
79	Advertising Copy Writing (3)	Corcoran
111	History of American Broadcasting (3)	Kuczun
115	Communications Analysis: Content, Audiences, Effects (3)	Carter
124	International Communications, Foreign Affairs (3)	Selikoff
130	Public Opinion and Propaganda (3)	Carter
290	Special Problems in Mass Communications (3)	Staff

Library School

First Term

62	Reference I (3)	Jones
70	Selection of Library Materials (3)	Smith
74	Library Materials in the Classroom (3)	Pond
155	The College and University Library (3)	Jones
157	School Library Problems (3)	Pond
173	Reading Guidance for Adults (3)	Smith

Second Term

50	History of Libraries and Librarianship (3)	Shove
53	School Library Management (3)	Kromer
55	Library Administration (3)	Ozolins
83	Cataloguing and Classification (3)	Simonton
161	Literature of the Humanities (3)	Ozolins
162	Literature of the Natural Sciences (3)	Shove
171	Reading Guidance for Children (3)	Pond
172	Reading Guidance for Adolescents (3)	Pond

Mathematics**

First Term

Y	Higher Algebra (3)	Ar.
T	Trigonometry (3)	Ar.
5	Foundations of Arithmetic (3)	Ar.
10	College Algebra and Analytic Geometry (5)	Ar.
15	College Algebra (5)	Ar.
49	Analytic Geometry and Calculus I (5)	Ar.
53	Analytic Geometry and Calculus II (5)	Vessey
54	Analytic Geometry and Calculus III (5)	Countryman
100A	Foundations of Arithmetic (3)	Sine
109	Theory of Numbers (3)	Koch
125A	Critical Reasoning in Mathematical Analysis (3)	Miracle
131A	Advanced Algebraic Theories (3)	Sine
188	Topics in Topology (3)	Koch

10-Week Term—June 17-August 24

131C	Vector Analysis and Linear Algebra (5)	Indritz
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Second Term

T	Trigonometry (3)	Ar.
10	College Algebra and Analytic Geometry (5)	Ar.
15	College Algebra (5)	Ar.
40	Introduction to Calculus (5)	Ar.
49	Analytic Geometry and Calculus I (5)	Ar.
53	Analytic Geometry and Calculus II (5)	Ar.

** See also Department of Mathematics in the Institute of Technology.

54	Analytic Geometry and Calculus III (5)	Williamson
55	Intermediate Calculus (3)	Ar.
100C	Foundations of Geometry (3)	Ar.
112	Theory of Sets (3)	Fuhrken
125B	Critical Reasoning in Mathematical Analysis (3)	Miracle
131B	Advanced Algebraic Theories (3)	Fuhrken
179	Special Functions	Miracle

Music**

Note: The symbols E, L, U are "elective," "lower division," and "upper division," respectively.

First Term

A	Piano (0)	Freed, Weiser
D	Voice (0)	Schuessler
4	Fundamentals of Music (2)	Aird, Bencriscutto
7B	Ear Training (3)	Fetler
8B	Harmony (3)	Fetler
11E	Piano (2)	Freed, Weiser
11L	Piano (2)	Freed, Weiser
11U	Piano (2)	Freed, Weiser
12E	Voice (2)	Schuessler
12L	Voice (2)	Schuessler
12U	Voice (2)	Schuessler
13E	Violin (2)	Gilombardo
13L	Violin (2)	Gilombardo
13U	Violin (2)	Gilombardo
14E	Viola (2)	Gilombardo
14L	Viola (2)	Gilombardo
14U	Viola (2)	Gilombardo
15E	Cello (2)	Jamieson
15L	Cello (2)	Jamieson
15U	Cello (2)	Jamieson
16E	Bass (2)	Fitch
16L	Bass (2)	Fitch
16U	Bass (2)	Fitch
17E	Flute (2)	Niosi
17L	Flute (2)	Niosi
17U	Flute (2)	Niosi
18E	Oboe (2)	Angelucci
18L	Oboe (2)	Angelucci
18U	Oboe (2)	Angelucci
19E	Clarinet, Saxophone (2)	Williams
19L	Clarinet, Saxophone (2)	Williams
19U	Clarinet, Saxophone (2)	Williams
20E	Bassoon (2)	Beckerman
20L	Bassoon (2)	Beckerman
20U	Bassoon (2)	Beckerman
21E	Trumpet (2)	Chenette
21L	Trumpet (2)	Chenette

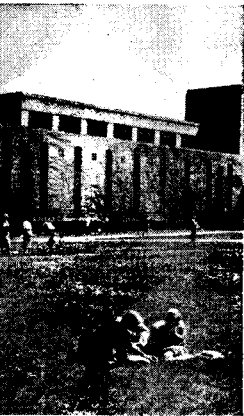
** See also Department of Music Education in the College of Education.

21U	Trumpet (2)	Chenette
22E	French Horn (2)	Speyer
22L	French Horn (2)	Speyer
22U	French Horn (2)	Speyer
23E	Trombone (2)	Weinman
23L	Trombone (2)	Weinman
23U	Trombone (2)	Weinman
24E	Tuba (2)	Walton
24L	Tuba (2)	Walton
24U	Tuba (2)	Walton
25E	Percussion (2)	Dahlgren
25L	Percussion (2)	Dahlgren
25U	Percussion (2)	Dahlgren
26E	Harp (2)	Miller
26L	Harp (2)	Miller
26U	Harp (2)	Miller
27E	Organ (2)	Fleischer
27L	Organ (2)	Fleischer
27U	Organ (2)	Fleischer
43	Chorus (1)	Aird
46	Concert Band (1)	Bencriscutto
100	Advanced Applied Music (2)	Staff
106A	American Music (3)	Riedel
110	Music Bibliography (3)	Riedel
116	Vocal Literature (2)	Schuessler
127	Composition (2)	Fetler
128	Composition (2)	Fetler
129	Composition (2)	Fetler
140	Choral Masters (3)	Aird
150	Organ Literature (2)	Fleischer
154	Music in the Middle Ages and Renaissance (3)	Riedel
161	Band Arranging (3)	Bencriscutto
162	Band Arranging (3)	Bencriscutto
175	Training in Advanced Musicianship (3)	Fetler
204	Graduate Applied Music (3)	Staff
212	Special Problems (3-9)	Riedel
227	Seminar in Composition and Orchestration (3)	Fetler
228	Seminar in Composition and Orchestration (3)	Fetler
229	Seminar in Composition and Orchestration (3)	Fetler

Second Term

A	Piano (0)	McNab
D	Voice (0)	Schuessler
4	Fundamentals of Music (2)	Abelson
7A	Ear Training (3)	Argento
7B	Ear Training (3)	Argento
11E	Piano (2)	McNab
11L	Piano (2)	McNab
11U	Piano (2)	McNab
12E	Voice (2)	Schuessler
12L	Voice (2)	Schuessler
12U	Voice (2)	Schuessler
13E	Violin (2)	Gilombardo
13L	Violin (2)	Gilombardo
13U	Violin (2)	Gilombardo
14E	Viola (2)	Gilombardo

14L	Viola (2)	.....	Gilombardo
14U	Viola (2)	.....	Gilombardo
15E	Cello (2)	.....	Jamieson
15L	Cello (2)	.....	Jamieson
15U	Cello (2)	.....	Jamieson
16E	Bass (2)	.....	Fitch
16L	Bass (2)	.....	Fitch
16U	Bass (2)	.....	Fitch
17E	Flute (2)	.....	Niosi
17L	Flute (2)	.....	Niosi
17U	Flute (2)	.....	Niosi
18E	Oboe (2)	.....	Angelucci
18L	Oboe (2)	.....	Angelucci
18U	Oboe (2)	.....	Angelucci
19E	Clarinet, Saxophone (2)	.....	Williams
19L	Clarinet, Saxophone (2)	.....	Williams
19U	Clarinet, Saxophone (2)	.....	Williams
20E	Bassoon (2)	.....	Beckerman
20L	Bassoon (2)	.....	Beckerman
20U	Bassoon (2)	.....	Beckerman
21E	Trumpet (2)	.....	Chenette
21L	Trumpet (2)	.....	Chenette
21U	Trumpet (2)	.....	Chenette
22E	French Horn (2)	.....	Speyer
22L	French Horn (2)	.....	Speyer
22U	French Horn (2)	.....	Speyer
23E	Trombone (2)	.....	Weinman
23L	Trombone (2)	.....	Weinman
23U	Trombone (2)	.....	Weinman
24E	Tuba (2)	.....	Walton
24L	Tuba (2)	.....	Walton
24U	Tuba (2)	.....	Walton
25E	Percussion (2)	.....	Dahlgren
25L	Percussion (2)	.....	Dahlgren
25U	Percussion (2)	.....	Dahlgren
26E	Harp (2)	.....	Miller
26L	Harp (2)	.....	Miller
26U	Harp (2)	.....	Miller
27E	Organ (2)	.....	Fleischer
27L	Organ (2)	.....	Fleischer
27U	Organ (2)	.....	Fleischer
100	Advanced Applied Music (2)	.....	Staff
104A	American Music (3)	.....	Riedel
114	History of Vocal Art (2)	.....	Schuessler
124	History of Opera (3)	.....	Argento
127	Composition (2)	.....	Argento
128	Composition (2)	.....	Argento
129	Composition (2)	.....	Argento
132	Symphonies of the Romantic Era (3)	.....	Riedel
204	Graduate Applied Music (3)	.....	Staff
212	Special Problems (3-9)	.....	Riedel
227	Seminar in Composition and Orchestration (3)	.....	Argento
228	Seminar in Composition and Orchestration (3)	.....	Argento
229	Seminar in Composition and Orchestration (3)	.....	Argento



Personal Orientation

See Psychology.

Philosophy

First Term

1A	Problems of Philosophy (3)	Bracken
2A	Logic (3)	Potter
3A	Ethics (3)	Mason
50A	History of Philosophy (Ancient) (3)	Bracken
106	American Philosophy from William James (3)	Potter
108	Political and Social Ethics (3)	Mason
160	Philosophy of Science (3)	Feigl

Second Term

1A	Problems of Philosophy (3)	Brodbeck
2A	Logic (3)	Kielkopf
3A	Ethics (3)	Raab
52A	History of Philosophy (Modern) (3)	Kielkopf
107	Philosophy of Modern Literature (3)	Terrell
140	Contemporary Philosophy (3)	Raab
150	Ethical Theory (3)	Terrell
164	Logic of Social Sciences (3)	Brodbeck

Political Science

First Term

A	The State in the Modern World (3)	Sorauf
1	American Government and Politics (3)	Hathaway
25	World Politics (3)	McLaughlin
85	Problems of World Politics (3)	Mills
101	Principles of the American Constitution I (3)	Sorauf
116	Local Government (3)	Backstrom
137	American Political Parties (3)	Backstrom
138	American Political Campaigns and Elections (3)	Hathaway
141	European Government and Politics, I (3)	Holt
142	European Government and Politics, II (3)	Holt
197	The Mediterranean Area in World Affairs (3)	Mills

Second Term

B	The State in the Modern World (3)	Flanigan
2	American Government and Politics (3)	Scott
108	Legislative Organization and Procedure (3)	Short
118	Metropolitan Government (3)	Scott
162	Recent Political Thought (3)	Perlmutter
168	Political Behavior (3)	Flanigan
187	Problems of European Politics (3)	Perlmutter
213	Institute on Public Administration (3)	Short, Warp, and visiting staff

Psychology

First Term

1-2	General Psychology (6)	Greenberg
4-5	Introductory Laboratory Psychology (4)	Haven
128-129	Psychology of Learning (6)	Trapold
144-145	Abnormal Psychology (6)	Winston
167	Measurement of Opinions and Attitudes (3)	Dunnette
190	Project in Psychology (3)	Lofquist
210	Research Problems (3)	Lofquist

Personal Orientation

1	How to Study (2)	Carlson
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Second Term

1-2	General Psychology (6)	Macker
4-5	Introductory Laboratory Psychology (4)	Boveng
132-133	Psychology of Motivation (6)	Russell
156	Psychology of Advertising (3)	Longstaff
160	Psychology in Personnel Work (3)	Longstaff
190	Project in Psychology (3)	Lofquist
210	Research Problems (3)	Lofquist

Personal Orientation

1	How to Study (2)	Carlson
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Romance Languages

First Term

French

1	Beginning French (5)	Renaud
3	Beginning French (5)	Poisson, staff
4	Intermediate French (5)	Poisson
54	French Conversation and Pronunciation (4)	Burks
125	The Classic Drama: Corneille and the Origins of the Classical Drama (2)	Renaud
148	The Drama of the Twentieth Century: Claudel, Giraudoux, Anouilh, Montherlant, Camus, Sartre (3)	Falk
161	The Novel of the Twentieth Century: Sartre and Camus (3)	Falk
259	Directed Readings (1-3)	Falk, Renaud
	A Maison Française is being planned. (See Special Programs)	

Spanish

1	Beginning Spanish (5)	Selig
1A	Beginning Spanish: Conversational Approach (5)	Cúneo

3	Beginning Spanish (5)	Rundorff
20	Intermediate Spanish (5)	Rundorff
73	Latin-American Civilization and Culture (2)	Cúneo
131	The Picaresque Novel (3)	Selig
259	Directed Readings (1-3)	Selig

Second Term

French

2	Beginning French (5)	Staff
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Spanish

2	Beginning Spanish (5)	Pattison
113	The Naturalistic Movement in Spain (2)	Pattison
260	Directed Readings (1-3)	Pattison

Slavic and Oriental Languages

First Term

Oriental

77	Asian Civilization: Japan (3)	Copeland
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Russian

A	Beginning Intensive Russian (7½)	Donchenko, Prokopov
24	Scientific Russian (5)	Nice
56	Russian Conversation (3)	Alexeev

Second Term

Russian

B	Beginning Intensive Russian (7½)	Donchenko, Prokopov
25	Scientific Russian (5)	Nice
57	Russian Conversation (3)	Alexeev

School of Social Work

First Term

Soc 50	Introduction to Theory and Practice of Social Work (3)	Cohn
Soc 91	Case Method Applied to Human Problems (3)	Cohn
CD 140**	Behavior Problems (3)	Harper
102	Special Topic—Treatment of the Delinquent Child (3)	Bridges
148	Concepts of Human Behavior (3)	Saloshin
171	Community Organization (3)	Francel
175	Social Group Work (3)	Pernell

** See Institute of Child Development in the College of Education.

Second Term

CD 140**	Behavior Problems (3)	Hoving
101	The Deprived Child (3)	Hovda
103	Management of Children with Social Emotional Problems (3)	Merl
160	Principles of Administration in Social Work (3)	Kidneigh

Social Science

See Interdisciplinary Programs.

Sociology

First Term

1	Man in Modern Society (3)	Francis
53	Elements of Criminology (3)	Vold
111	Population Theory (3)	Francis
120	Social Psychology (3)	Rose
122	Sociology of Conflict (3)	Vold
152	Sociology of Medicine and Medical Institutions (3)	Rose

Second Term

1	Man in Modern Society (3)	Sirjamaki
3	Social Problems (3)	Rubin
141	The Family (3)	Johnson
145	Urban Sociology (3)	Sirjamaki
146	Industrial and Occupational Sociology (3)	Rubin

Speech and Theater Arts

First Term

5X	Fundamentals of Speech (3)	Shapiro and staff
6	Fundamentals of Speech (3)	Shapiro and staff
31	Introduction to the Theater Arts (3)	Ballet
34	Stagecraft: Construction and Painting (3)	Ar.
51	Advanced Public Speaking (3)	J. V. Jensen
67	Phonetics (3)	Wendahl
81	Interpretative Reading (3)	Thompson
90	Costuming (3)	Warner
106	Discussion (3)	Cashman
107	Platform Reading (3)	Thompson
111	Stage Direction (3)	Ballet
122	Introduction to Research (3)	Bornmann
126	History and Criticism of American Public Address (3)	Bormann
131	Creative Dramatics (3)	Graham
141	Voice Science (3)	Moore

** See Institute of Child Development in the College of Education.

145	Basic Hearing Science (3)	Harris
152	Hearing Disorders (3)	Lassman
153	Audiometry and Hearing Aids (3)	Lassman
157-158-159	Clinical Methods and Practice in Audiology (3 each)	Lassman
161	Introduction to Speech Correction (3)	Jay Jensen
163	Speech Pathology (3)	Starr
164-165-166	Clinical Methods and Practice in Speech Pathology (3 each)	Henrikson, Starr
169	Speech in Human Behavior (3)	Shapiro
191	Technical Stage Problems (3)	Josal
211	Seminar in Dramatic Theory (3)	Ballet
217	Seminar in the Visual Arts of Drama (3)	Josal
218	Seminar in Theater Planning (3)	Josal
231	Seminar in Advanced Speech Problems (3)	Moore
235	Physiology of Hearing (3)	Ar.
236	Theories of Hearing (3)	Harris
261-262-263	Seminar in Speech Pathology (3 each)	Henrikson and staff
271-272-273	Seminar in Hearing (3 each)	Lassman
277	Seminar in Rhetoric (3)	Scott
281-282-283	Seminar in Organic Disorders of Speech (2 each)	Staff
291-292-293	Research (ar)	Staff

Note: For methods in directing speech activities, see College of Education, EdCI 177. For methods of teaching the hearing impaired, see College of Education, EdCI 127 and 128.

Second Term

5X	Fundamentals of Speech (3)	Smith and staff
6	Fundamentals of Speech (3)	Smith and staff
33	Beginning Acting: Technique (3)	Moulton
65	Radio and Television Speech (3)	Bart
78	Advanced Acting (3)	Adey
81	Interpretative Reading (3)	Fredricks
82	Interpretative Reading (3)	Fredricks
92	Lighting (3)	Borgen
101	Argumentation and Persuasion (3)	Howell
106	Discussion (3)	Ar.
125	Language for the Hearing Impaired (3)	Houchins
127	Speech for the Hearing Impaired (3)	Houchins
132	Children's Theater (3)	Graham
146	Industrial Audiology and Occupational Hearing Loss (3)	Ward
155	Lip Reading and Lip Reading Methods (3)	Lassman, Stassen
161	Introduction to Speech Correction (3)	Siegel
164-165-166	Clinical Methods and Practice in Speech Pathology (3 each)	Starr
171	History of the Theater (3)	Graham
174	American Theater (3)	Weales
175	Theater Symposium (6)	Ballet
207	Seminar in Persuasion (3)	Howell
216	Seminar in Stage Direction (3)	Moulton
251	Seminar in Listening Comprehension (2)	Nichols
261-262-263	Seminar in Speech Pathology (3 each)	Siegel
281-282-283	Seminar in Organic Disorders of Speech (2 each)	Staff
291-292-293	Research (ar)	Staff

Statistics

First Term

Econ 111	Introduction to Theory of Statistics (3)	Ar.
Stat 281	Advanced Topics in Statistics (ar)	Ar.

Second Term

Stat 41	Introduction to the Ideas of Statistics I (3)	Ar.
Stat 181	Topics in Statistics (ar)	Ar.

Zoology

First Term**

1	General Biology (5)	Ar.
100	Basic Zoology (ar)	Staff
197	Problems (ar)	Ar.

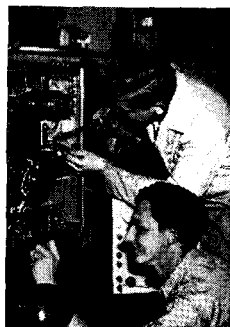
Second Term

2	General Biology (5)	Ar.
66	Introduction to Genetics and Eugenics (3)	Ar.
101	Basic Zoology (ar)	Staff
198	Problems (ar)	Ar.

Institute of Technology

The Institute of Technology includes the College of Engineering, the School of Architecture, the School of Chemistry (chemical engineering, chemistry, metallurgy), School of Mines and Metallurgy, School of Physics, Department of Geology and Geophysics, and Department of Astronomy.

A limited number of courses are listed in astronomy; civil, electrical, and mechanical engineering; engineering graphics; mathematics; mechanics and materials; metallurgy; and physics. The School of Mines and Metallurgy offers summer field trips



** For zoology courses given during the Biology Session at the Lake Itasca Forestry and Biological Station, see index.

in alternate years, as well as a few problems and research courses. The latter are open only to students previously registered at the University of Minnesota.

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 Sessions only.

**COLLEGE OF
ENGINEERING**

Aeronautics and Engineering Mechanics

Mechanics and Materials

First Term

27	Rigid-Body Mechanics I (3)	.....	Wilcox
28	Rigid-Body Mechanics II (3)	.....	Wilcox
40	Deformable-Body Mechanics I (3)	.....	Blatherwick

Second Term

28	Rigid-Body Mechanics II (3)	.....	Wilcox
29	Rigid-Body Mechanics III (3)	.....	Wilcox
41	Deformable-Body Mechanics II (3)	.....	Blatherwick

Civil Engineering

First Term

23	Surveying Camp (9)	Kersten, Fant, Bullen, Pederson
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English (Engineering)

First Term

85	Advanced Technical Communication (3)	Haga
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Second Term

86	Advanced Technical Communication (3)	Guthrie
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Engl 1B, 2B, and 3B, required Freshman English courses for students in the Institute of Technology, are offered in the College of Science, Literature, and the Arts.

General Engineering

First Term

70 Slide Rule (1) Springer

Mathematics**

First Term

12 College Algebra and Trigonometry II (5) Miller
13A Calculus I: Analytic Geometry and Calculus (5) Mortick
24A Calculus II: Analytic Geometry and Calculus (5) Osborn
25A Calculus III: Analytic Geometry and Calculus (5) Schwartz
26A Calculus IV: Differential Equations and Calculus (5) Loye
147 Vector Analysis (3) Lindgren
148 Differential Equations (3) Polansky
151†† Calculus V: Advanced Calculus (3) Polansky
165A Introduction to Programming Modern Digital
Calculators (3) Munro
173 Elementary Partial Differential Equations (3) Munro
174 Elementary Theory of Complex Variables (3) Lindgren

10-Week Term—June 17-August 23

131C Vector Analysis and Linear Algebra (5) Indritz

Second Term

13A Calculus I: Analytic Geometry and Calculus (5) Hager
24A Calculus II: Analytic Geometry and Calculus (5) Dolid
25A Calculus III: Analytic Geometry and Calculus (5) D. Sather
26A Calculus IV: Differential Equations and Calculus (5) Serbyn
149 Determinants and Matrices (3) Brauer
152†† Calculus VI: Advanced Calculus (3) Thompson
153†† Calculus VII: Advanced Calculus (3) Loye
175 Integral Transforms (3) Thompson

Mechanical Engineering

Engineering Graphics

First Term

25 Engineering Graphics (4) Springer

** See also Department of Mathematics in the College of Science, Literature, and the Arts.

†† 152 and 153 may be taken simultaneously; 151, 152, 153, and 173, 174, 175 are 9-credit sequences regularly taught during the academic year.

Mechanical Engineering

First Term

15	Casting, Working and Welding of Engineering Materials (3)	McElrath
21	Mechanisms: Kinematic Analysis (3)	Kleinhenz
90	Industrial Assignment (2)	Lund
91	Industrial Assignment (2)	Lund
92	Industrial Assignment (2)	Lund
93	Industrial Assignment (2)	Lund
133	Heat Transmission (3)	Ibele
146	Introduction to Combustion (3)	Murphy
162	Thermal Environmental Engineering (3)	Threlkeld

Second Term

16	Cold Processing of Materials (3)	McElrath
23	Mechanisms: Components and Synthesis (3)	Kleinhenz
33	Mechanical Engineering Laboratory I (2)	Liu
90	Industrial Assignment (2)	Lund
91	Industrial Assignment (2)	Lund
92	Industrial Assignment (2)	Lund
93	Industrial Assignment (2)	Lund
134	Thermodynamics of Fluid Flow (3)	Ibele
143	Turbomachinery (3)	Murphy

Mechanics and Materials

See Aeronautics and Engineering Mechanics.

SCHOOL OF CHEMISTRY

Analytical Chemistry

First Term

57	Quantitative Analysis (premed) (4)	Herr
101	Theory of Volumetric Analysis (3)	Herr
102	Laboratory in Gravimetric and Volumetric Analysis (4)	Herr
102A	Laboratory in Gravimetric and Volumetric Analysis (chemical engineers) (3)	Herr
301	Research in Quantitative Analysis (ar)	Staff

10-Week Term—June 17-August 23

173C	Analytical Chemistry for High School Teachers (4)	Bruckenstein
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178C Laboratory in Analytical and Physical Chemistry
for High School Teachers (4)Livingston, Bruckenstein

General Chemistry

First Term

4 General Principles of Chemistry (5)Brasted
6 Principles of Solution Chemistry (4)Johnson
14 General Principles of Chemistry (4)Brasted
24 General Principles of Chemistry (5)Brasted
26 General Principles of Chemistry (5)Johnson

Second Term

5 General Principles of Chemistry (5)Brasted
15 General Principles of Chemistry (4)Johnson
25 General Principles of Chemistry (5)Johnson

Inorganic Chemistry

First Term

103 Atomic Structure, Properties of Elements
Based Thereon (3)Spees
220 Advanced Inorganic Chemistry
Laboratory Methods (ar)Brasted, Spees
301 Research in Inorganic Chemistry (ar)Brasted, Johnson, Spees

Second Term

104 Chemistry of the More Representative Elements (3)Johnson
220 Advanced Inorganic Chemistry
Laboratory Methods (ar)Brasted
302 Research in Inorganic Chemistry (ar)Brasted, Johnson

Organic Chemistry

First Term

61 Elementary Organic Chemistry (4)Hill
102 Organic Qualitative Analysis (4)Dodson
139 Advanced Organic Chemistry Laboratory Work (2-5)Dodson
301 Research in Organic Chemistry (ar)Dodson
Graduate Thesis Work in Organic Chemistry (0)Dodson

Second Term

62 Elementary Organic Chemistry (4)Hill
199 Selected Topics in Natural Product Chemistry
(3M Visiting Lecturer Series) (3)Barton
302 Research in Organic Chemistry (ar)Hill
Graduate Thesis Work in Organic Chemistry (0)Hill

Physical Chemistry

First Term

100A	Physical Chemistry (3)	Conroy
104, 105	Physical Chemistry Laboratory (1 or 2)	Conroy
301	Research in Physical Chemistry (ar)	Staff

10-Week Term—June 17-August 23

176C	Physical Chemistry for High School Teachers (5)	Mead
178C	Laboratory in Analytical and Physical Chemistry for High School Teachers (See AnCh 178C) (4)	Livingston, Bruckenstein

Second Term

100B	Physical Chemistry (3)	Conroy
105, 106	Physical Chemistry Laboratory (1 or 2)	Livingston
117	Fundamentals of Reaction Kinetics (3)	Livingston
301	Research in Physical Chemistry (ar)	Staff

Metallurgy

First Term

56	Physical Metallurgy (3)	Jerabek
60	Physical Metallurgy (3)	Jerabek
170-171	Special Problems in Physical Metallurgy (1, 2, or 3)	Jerabek

Second Term

170-171	Special Problems in Physical Metallurgy (1, 2, or 3)	Jerabek
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**SCHOOL OF MINES
AND METALLURGY**

Metallurgical Engineering

First Term and Second Term

124	Special Problems in Mineral Dressing (ar)	Cooke
201	Research in Process Metallurgy (ar)	Bitsianes
204	Research in Mineral Dressing (ar)	Cooke

Mining Engineering

First Term and Second Term

151-152-153	Special Mining Engineering Problems (ar)	Ar.
212-213-214	Mining Research Problems (ar)	Ar.

**SCHOOL OF
PHYSICS**

First Term

1	Introduction to Physical Science (Mechanics) (3)	Ar.
1A	Physical Science Laboratory (1)	Ar.
50	Intermediate General Physics (Modern Physics), Part I (2)	Ar.
50A	Intermediate General Physics Laboratory, Part I (parallel to Phys 50) (½)	Ar.

10-Week Term—June 17-August 23

102C	Introduction to Electric and Magnetic Fields (5)	Ar.
109C	Modern Physics II (5)	Ar.
144C	Electrical Measurements Laboratory (3)	Ar.

Second Term

2	Introduction to Physical Science (Electricity and Magnetism) (3)	Ar.
2A	Physical Science Laboratory (1)	Ar.
50	Intermediate General Physics (Modern Physics), Part II (2)	Ar.
50A	Intermediate General Physics Laboratory, Part II (parallel to Phys 50) (½)	Ar.

Geology and Geophysics

First Term

1	Physical Geology (3)	Deffeyes
	Physical Geology Laboratory (2)	Shapiro

First Term and Second Term

100	Field Course (ar)	Staff
130	Geologic Problems (ar)	Staff

Astronomy

First Term

12	Descriptive Astronomy (3)	Kaufmanis
13	Stellar and Practical Astronomy (3)	Kaufmanis

College of Veterinary Medicine

Regular courses of the 4-year professional curriculum of the College of Veterinary Medicine are not offered during the Summer Session, except for VMC 113 for senior students. However, each department offers a number of advanced courses for graduate veterinarians and other qualified students.

Summer Institute in Radiation Biology

A 6-week course (June 17-July 27) for high school teachers of biology will place emphasis on the effects of irradiation in living systems. Radioisotope instrumentation and procedures will be utilized in laboratory studies.

The participant will receive stipends from the National Science Foundation and limited laboratory instrumentation from the Atomic Energy Commission for use in high school classroom demonstrations.

Outlines of the Summer Institute in Radiation Biology, University of Minnesota, application blanks, and other information regarding the course can be obtained from the director of the institute, Dr. Francis A. Spurrell, 120 Veterinary Clinic, University of Minnesota, St. Paul 1.

First and Second Terms

128**	Problems in Veterinary Bacteriology and Public Health (ar) ... Pomeroy, Anderson, Lindorfer, Loken
130††	Problems in Animal Physiology (ar) Good, Bergman
157‡‡	Veterinary Necropsies (ar) Sautter
158‡‡	Veterinary Surgical Pathology (ar) Sautter
171††	Problems in Veterinary Pharmacology (ar) Stowe, Hammond
191§§	Special Studies in Veterinary Anatomy (ar) Kitchell, Weber
201**	Advanced Poultry Diseases (ar) Pomeroy
201‡‡	Advanced Veterinary and Poultry Pathology (ar) Sautter, Higbee
202¶¶	Advanced Studies in Diagnosis and Therapeutics of Animal Diseases (ar) Hoyt, Mather, Sorensen, Low
203‡‡	Neoplasms of Domestic Animals (ar) Sautter
203§§	Experimental Comparative Veterinary Neurology (ar) ... Kitchell
204##	Special Problems in Animal Reproduction (ar) Zemjanis
205**	Advanced Veterinary Bacteriology (ar) Pomeroy, Lindorfer, Higbee
210△△	Advanced Veterinary Radiology (ar) Spurrell
220△△	Anesthesia (ar) Arnold, Usenik, Clifford
221**	Advanced Veterinary Public Health (ar) Anderson
225△△	Advanced Small Animal Surgery (ar) Arnold, Usenik, Clifford
230△△	Advanced Large Animal Surgery (ar) Arnold, Usenik
241‡‡	Problems in Veterinary Parasitology (ar) Griffiths

** Veterinary Bacteriology and Public Health.

†† Veterinary Physiology and Pharmacology.

‡‡ Veterinary Pathology and Parasitology.

§§ Veterinary Anatomy.

¶¶ Veterinary Medicine and Clinics.

Veterinary Obstetrics.

△△ Veterinary Surgery and Radiology.

Duluth Campus



General Information

The Duluth Campus offers undergraduate work in 36 fields leading to the A.A., B.A., or B.S. degrees and graduate work in a number of fields.

Being developed on a 200-acre site overlooking Lake Superior the Duluth Campus enjoys the city's famous summer climate. The panorama of the hillside city, fringing the largest body of fresh water in the world, is a view of rare beauty.

The 1963 UMD Summer Session student will discover a new excitement in Duluth and on the campus. The opening of the St. Lawrence Seaway linked Duluth to the seven seas of the world. During the past 4 years, more than 1,000 foreign vessels sailed into Duluth's harbor, enriching the city with the flavor of foreign tongues, exciting cargoes, and bustling docks. This, now, can be added to the wonderful recreation of the Arrowhead region and the beauty and convenience of the campus. The deep forests, trout and deep-sea fishing, hiking, golf, picnics, and camping are among the other diversions abounding in Duluth and its environs.

Almost \$11,000,000 has been expended in new buildings and other improvements on the new campus since the institution was converted from Duluth State Teachers College in 1947.

Facilities

Facilities include a science group of 2 classroom buildings and a 400-seat auditorium, the library, a health and physical education building, Kirby Student Center, an Air Force ROTC

center, a humanities building, a social sciences building, a student health center, the new Tweed Art Gallery, an education building, an industrial education building, a cross-campus concourse, and 18 residence units accommodating a total of 174 persons.

At 910 West Third Street, Darling Observatory, a popular community and campus facility in summer, is open for regular lecture and observation periods. A 9-inch refracting telescope, a model planetarium, photographic transparencies of star formations, and projection slides are available.

Under a plan integrated with the Graduate School of the University, it is possible to complete the master of arts degree on the Duluth Campus with a major in education, curriculum and instruction, educational psychology (high school counseling), or English. The master of arts program is designed especially to serve elementary school teachers and principals, secondary school teachers, rural teachers, and high school counselors. The master of arts program is implemented with a wide selection of courses especially for summer students.

The master of arts program at Duluth is on the B plan, and involves course work without thesis or language requirements. Candidacy and approval of the student's program are administered by committees appointed by the Graduate School. Complete details of Plan B requirements may be found in the current *Bulletin of the Graduate School*.

Students who wish graduate credit must apply for admission to the Graduate School, 316 Johnston Hall, University of Minnesota, Minneapolis 14, at least 4 weeks in advance of the term they wish to enter, and complete all requirements for admission. (See section on Graduate School.) If the student wants to take all of his graduate work on the Duluth Campus, he should write for information to the Academic Dean, University of Minnesota, Duluth, Duluth 12.



Master of Arts Degree

**Master's
Degree in
English**

A new graduate major is offered, leading to a Master's degree in English. This program, designed primarily for secondary school English teachers, will emphasize 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 12.

**Courses for
School
Librarians**

Teachers who wish work in library science will find two basic courses during the first term: Lib 53, School Library Management, and Lib 74, Library Materials in the Classroom. Offered through the co-operation of the Library School, these courses are part of a sequence which leads to minimum certification for school librarians in Minnesota.

**Home
Economics
Education**

The Home Economics department will offer two courses during the first term. Introduction to Nutrition (HE 31) is a required course for home economics majors. It may also be used for general education credit by all University students.

The second course, Adult Education in Home Economics (HEEd 194A), is offered for teachers. It is required for certification to teach home economics in secondary schools which have federally aided programs.

**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.

The Summer Session affords excellent counseling and testing services. New students may wish to take advantage of these opportunities, and possible exploratory courses, before enrolling in the fall quarter.

UMD is offering two institutes sponsored by the National Science Foundation. The Biology Institute is a continuation of one offered in 1962, and is for the purpose of preparing high school teachers to use the materials recommended by the Biological Sciences Curriculum Study Group.

The Mathematics Institute will acquaint teachers with the newer mathematics that has recently been introduced into the high school and will involve a thorough examination of the materials issued by the School Mathematics Study Group.

The purpose of the Current Economic Issues Workshop is to examine major international, national, and local economic issues. The workshop is offered in the late afternoon on Tuesday and Thursday for the convenience of teachers and businessmen of the area. Undergraduate or graduate credit may be earned. For more information, write to: Division of Social Sciences, University of Minnesota, Duluth, Duluth 12.

Industrial safety will be the theme of this first-term workshop offered by the Department of Industrial Education. It is for industrial education teachers, and for representatives of industry.

The 15th annual summer painting workshop, to be held during the second term, will feature a distinguished artist. His name will be added to the list of other famous instructors who have conducted summer workshops—Max Weber, Yasuo Kuniyoshi, Ralston Crawford, and Fletcher Martin.

Science Institutes

Current Economic Issues Workshop

Industrial Education Workshop

Workshop in Advanced Painting



**Workshop for
Elementary
School
Teachers**

During the week of July 29-August 2, a workshop will be conducted on the theme "Creativity in Elementary School Children." Lectures will be given and discussions will be conducted to enable the teacher to gain insights in recognizing creativity among children in different areas of the curriculum, and in encouraging and stimulating children toward the development of these capacities and abilities. For information regarding advance registration, write: General Extension Division, 110 New Garrick Building, Duluth 2, or call RA 2-1745.

**Educational
Television**

Utilization of television in the classroom will be the special emphasis of the first-term course (EdCI 107) designed for teachers. It is intended to be of help to persons who have had little or no experience in the use of this increasingly important teaching aid. Enrollment in the class will be limited, and persons wishing to enroll should write: Division of Education and Psychology, University of Minnesota, Duluth, Duluth 12.

**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; EdCI 149, The Teaching and Supervision of Mathematics in the Elementary School; EPsy 110, Educational Measurement in the Classroom; EPsy 133, Basic Procedures in Student Personnel Work; EPsy 159, Personality Development and Mental Hygiene; EPsy 182, Education of Exceptional Children; EPsy 191, Education of the Mentally Retarded in Secondary Schools. Questions about the minor and about state certification should be directed to: Special Education Laboratory, 14 Pattee Hall, University of Minnesota, Minneapolis 14.

Speech Correction—Opportunity is provided for observation at the 11th annual clinic for children with speech and hearing disorders, held June 24 to August 16. 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.

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. Beginning with the school year, 1963-64, all persons holding such positions in Minnesota must meet specific requirements.

Remedial Reading

Certain courses in this program may have limited enrollments, 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: Division of Education and Psychology, University of Minnesota, Duluth, Duluth 12.

Teachers wishing to complete requirements for the bachelor of science degree will find a wide selection of undergraduate courses both in professional education and in fields related to their specific teaching interests. The summer schedule of courses is especially helpful to in-service teachers who cannot pursue bachelor of science studies during the regular year. Bachelor of arts graduates interested in teaching may take summer courses which lead to certification for teaching in the elementary or secondary schools.

Bachelor of Science Degree for Teachers

A complete program in secondary school guidance and counseling, through the master of arts degree, is available on the Duluth Campus. Major courses offered during the 1963 Summer Session include the following: EPsy 110, Educational Measurement in the Classroom; EPsy 116, Statistical Methods in Education; EPsy 133, Basic Procedures in Student Personnel Work; EPsy 134, School Counseling Procedures; EPsy 140, Instruments and Techniques of Measurement; EPsy 159, Personality Development and Mental Hygiene; EPsy 193, Psychology of Human Learning; and EPsy 233, Problems in Guidance and Personnel Work.

Counselor Education

A required related course which will be offered is EdCI 135, Group Procedures in Guidance. For other related courses, see adviser.

Rural Education

During the second term a course will be offered which is of special importance to rural education, namely: The Community School (EdCI 118, 3 credits). The course is for teachers and administrators and is part of a series of graduate courses in rural education.

This series is designed to help provide a background for developing educational leadership. Thus, to a great extent, these courses *have content which is applicable in any school system, urban as well as rural.*

Elementary School Principalship

Courses are offered during the summer, which, if planned over a period of several terms, will enable a person to meet certification requirements for the elementary school principalship in Minnesota, as well as in most other states. Inquiries concerning particular problems may be addressed to: Department of Elementary Education, University of Minnesota, Duluth, Duluth 12.

Division of Education and Psychology

Child Development

First Term

100 Observation and Experimental Study of Children (3)Loy

Education

First Term

Ed 48	Orientation to Teaching (1)	Crawford
Ed 51A-B-C	Group Leadership (2)	Boman
Ed 61A-81A	School and Society (4)	Crawford
Ed 61B-81B	Educational Psychology (4)	Boman
EdAd 115	Elementary School Organization and Administration (3)	Verrill
EdCI 68	Teaching Language Arts in Elementary Schools (3)	R. Green
EdCI 103	Teaching Science in the Elementary School (3)	Verrill
EdCI 105	Audio-Visual Materials in Education (3)	Wells
EdCI 107	Radio and Television in Education (3)	Jensen
EdCI 109	Audio-Visual Materials and Equipment Laboratory (3)	Plumb
EdCI 113	High School Curriculum (3)	Plumb
EdCI 145	Reading Difficulties (3)	D. Smith
EdCI 149	Teaching and Supervision of Mathematics in the Elementary School (3)	H. Johnson
EdCI 150	Supervision and Improvement of Instruction (3)	H. Johnson
EdCI 168	Current Developments in the Social Studies (3)	Lindquist
EdCI 184	Supervision of Student Teaching (3)	Loy
EdCI 271	Problems in Curriculum Construction (ar)	Crawford, R. Green, House, H. Johnson, Lindquist, Plumb, A. Smith, Verrill, Voss, Walther, Wells, Wood
EPsy 116	Statistical Methods in Education (3)	DeYoung
EPsy 133	Basic Procedures in Student Personnel Work (3)	Tamminen
EPsy 140	Instruments and Techniques of Measurement (3)	Walther
EPsy 150	Clinical Practice in Remedial Teaching (3-6)	D. Smith
EPsy 159	Personality Development and Mental Hygiene (3)	Walther
EPsy 193	Psychology of Human Learning (3)	Tamminen
EPsy 233	Problems in Guidance and Personnel Work (ar)	Tamminen
Lib 53	School Library Management (3)	Kromer
Lib 74	Library Materials in the Classroom (3)	Kromer

Second Term

Ed 51A-B-C	Group Leadership (2)	Crawford
Ed 81C	Curriculum and Methods in Secondary Education (5)	Milbrath
EdAd 167	Junior High School (3)	Crawford
EdCI 63	Children's Literature (3)	R. Green
EdCI 64	Teaching Reading in Elementary Schools (3)	R. Green
EdCI 101	Driver Education (3)	Rickert
EdCI 102	Teaching Social Studies in the Elementary School (3)	Crawford
EdCI 118	The Community School (3)	Milbrath
EdCI 119	Curriculum of the Elementary School (3)	H. Johnson
EdCI 135	Group Procedures in Guidance (3)	Gum
EdCI 144	Teaching Reading in Junior and Senior High Schools (3)	Stensland
EdCI 169	Student Organizations and Activities (3)	Wood
EdCI 271	Problems in Curriculum Construction (ar)	Crawford, Dettmann, R. Green, House, H. Johnson, Plumb, A. Smith, Wood
EPsy 110	Educational Measurement in the Classroom (3)	H. Johnson
EPsy 134	School Counseling Procedures (3)	Gum
EPsy 148	Clinical Diagnosis of Reading Difficulties (3)	Karlsen

EPsy 182	Education of Exceptional Children (3)	.....	Karlsen
EPsy 191	Education of the Mentally Retarded in Secondary Schools (3)	.....	Karlsen
EPsy 233	Problems in Guidance and Personnel Work (ar)	.....	Gum
HEd 141	Critical Issues in Contemporary Education (3)	.....	Ehlers
HEd 179	Critical Thinking for Teachers (3)	.....	Ehlers
MuEd 51	Teaching Music in the Elementary School (3)	Mehling

Health Education

First Term

5	First Aid and Safety (1)	L. Peterson
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Home Economics

First Term

31	Introduction to Nutrition (3)	Palmer
HEED 194A	Adult Education in Home Economics (3)	Palmer

Industrial Education

First Term

102	The General Shop (3)	.....	Voss
106	Industrial Education Workshop: Industrial Safety (3-6)	.....	Voss

Physical Education for Men

First Term

M1	Orientation to Physical Education (1)	.....	L. Peterson
M5F	Apparatus (1)	.....	Wells
M16	Volleyball (1)	.....	L. Peterson
M34	Apparatus (1)	.....	Wells
M38	Physical Fitness (1)	.....	L. Peterson
M67	Coaching of Football (2)	.....	L. Peterson

Second Term

M4E	Basketball Fundamentals (1)	.....	N. Olson
M16	Volleyball (1)	.....	N. Olson
M60	Prevention and Care of Injuries (2)	.....	N. Olson
M68	Coaching of Basketball	.....	N. Olson

Physical Education for Men and Women

First Term

2	Archery (1)	.....	Wells
8	Tennis (1)	.....	L. Peterson
9	Bowling (1)	.....	Wells
21B	Intermediate Swimming (1)	.....	Richards
30	Elementary and Lead-up Games (1)	.....	Richards
31	Body Mechanics, Stunts, and Tumbling (1)	.....	Richards
32	Rhythms for Elementary Grades (1)	.....	N. Johnson
41	Ballroom Dance (1)	.....	N. Johnson
43A	Modern Dance (1)	.....	N. Johnson
44	Square Dance (1)	.....	N. Johnson
52	Teaching Physical Education in the Elementary School (2)	.....	Richards
94	History of Physical Education (3)	.....	Richards
95	Tests and Measurements (3)	.....	Wells

Second Term

3	Badminton (1)	.....	Rickert
4	Golf (1)	.....	N. Olson
8	Tennis (1)	.....	Rickert
101	Principles of Physical Education (3)	Rickert

Psychology

First Term

1	General Psychology (3)	DeYoung
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Second Term

2	General Psychology (3)	Amedeo
80	Child Psychology (3)	Amedeo

Division of Humanities

Art

First Term

4	Art Today (3)	.....	A. Smith
5	Introduction to Art (3)	.....	Kiser
10-11	Drawing (3 each)	.....	Kiser
20, 21	Design (2 each)	.....	Kiser
50, 51, 52	Crafts (3 each)	.....	Schauer



56	Art in Elementary Education (3)	A. Smith
99	Problems in Design and Crafts (6)	Schauer
110	Advanced Problems in Design (6)	Schauer
ArtEd 151	Curriculum Building in Art Education (3)	A. Smith
ArtEd 295	Problems in Art Education (3)	A. Smith

Second Term

96	Problems in Drawing or Painting (6)	Kantor
177	Workshop in Advanced Painting (6)	Kantor
ArtEd 183	Advanced Course in Teaching Art (3)	A. Smith
ArtEd 295	Problems in Art Education (3)	A. Smith

English

First Term

4	Freshman Composition (3)	Crockett
22	Introduction to Literature (5)	Rosenthal
59	Shakespeare (3)	Levang
73	American Literature (3)	W. Glick
130	Victorian Prose and Poetry (3)	Crockett
154	The American Novel (3)	W. Glick
165	Introduction to Modern English (3)	Rosenthal
192	Sixteenth-Century English Literature (4)	Levang

Second Term

5	Freshman Composition (3)	Hart
120	Interpretation of Poetry (3)	Tezla
135	Literary Criticism (3)	Tezla
156	American Drama (3)	Hart

Humanities

First Term

4	Appreciation of the Arts (3)	Miller
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Second Term

5	Appreciation of the Arts (3)	Miller
6	Arts in the Twentieth Century (3)	Miller

Music

First Term

11	Voice (1)	Downs
15	Strings (1)	House, J. Smith
19	Brass (1)	Murphy
21	Introduction to Music (3)	Miller
72	Advanced Conducting (2)	House

121	Advanced Harmony (2)	J. Smith
196	Opera Production (3)	Herz
204	Graduate Applied Music (2)	Downs, House, Murphy, J. Smith
215	Advanced Conducting (3)	House

Second Term

15	Strings (1)	House
204	Graduate Applied Music (2)	House
MuEd 101	Basic Concepts in Music Education (3)	House

Philosophy

Second Term

1	Problems of Philosophy (3)	Ehlers
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Speech

First Term

1	Fundamentals of Speech (3)	Hayes
67	Phonetics (3)	Pierce
95A,B,C,D,E	Special Areas of Study (2 each)	Pierce
119	Introduction to Speech Correction (3)	Pierce
181	Independent Study in Speech and Drama (1-3)	Pierce

Division of Science and Mathematics

Astronomy

Second Term

1	Elementary Astronomy (3)	Jackson
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Biology

First Term

1	General Biology, Lecture (3)	Hofslund
A	General Biology, Laboratory (2)	Hofslund

Second Term

2	General Biology, Lecture (3)	Carlson
B	General Biology, Laboratory (2)	Carlson

Botany

First Term

52	Plant Taxonomy (3)	Monson
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Chemistry

First Term

3	General Chemistry (5)	Moore
6	General Chemistry (5)	Moore
12	Qualitative Analysis (5)	Moore
58	Organic Chemistry (4)	Cowles
61	Organic Chemistry (3)	Cowles
61A	Organic Chemistry Laboratory (1)	Cowles

Second Term

4	General Chemistry (5)	Duval
7	General Chemistry (5)	Duval
59	Organic Chemistry (4)	Passer
62	Organic Chemistry (3)	Passer
62A	Organic Chemistry Laboratory (1)	Passer

Mathematics

First Term

1	Higher Algebra (5)	Legg
49	Analytic Geometry and Calculus I (5)	Syverson
52	Calculus IV and Differential Equations (5)	Legg, Syverson

Second Term

62	Introduction to Modern Algebra (3)	Hafstrom
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Natural Science

First Term

2B	Physical Science (3)	D. Olson
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Second Term

2A	Fundamentals of Mathematics (3)	Hafstrom
2C	Physical Science (3)	F. Glick
10	Conservation of Natural Resources (3)	Hofslund

Science

First Term

101	Mathematics for High School Teachers I (3)	Syverson
113	Chemistry for High School Teachers III (3)	Cowles
122	Construction and Use of Demonstration Apparatus (3)	D. Olson
124A	Contemporary Algebra for Junior High School Mathematics Teachers (3)	Burgstahler
125A	Contemporary Geometry for Junior and Senior High School Mathematics Teachers (3)	Nannini
126A	Contemporary Advanced Mathematics for Senior High School Mathematics Teachers (3)	Burgstahler, Nannini

Second Term

102	Mathematics for High School Teachers II (3)	Hafstrom
114	Chemistry for High School Teachers IV (3)	Passer
124B	Contemporary Algebra for Junior High School Mathematics Teachers (3)	Burgstahler
125B	Contemporary Geometry for Junior and Senior High School Mathematics Teachers (3)	Nannini
126B	Contemporary Advanced Mathematics for Senior High School Mathematics Teachers (3)	Burgstahler

Zoology

First Term

3	Human Anatomy (4)	Odlaug
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Division of Social Sciences

Business and Economics

First Term

1	Principles of Economics (5)	Davidson
34	Principles of Accounting (4)	Huntley
44	Elements of Statistics (3)	Meyers
50	Management (3)	Friest

81	Labor Economics (3)	Davidson
85	Production (3)	Friest
105A	Intermediate Accounting I (3)	Friest

Second Term

3	Principles of Economics (5)	Davidson
35	Principles of Accounting (5)	Dettmann
45	Elements of Statistics (3)	Boyer
58	International Trade (3)	Boyer
60	Transportation (3)	Boyer
65	Business Finance (3)	Andreasen
66	Insurance Principles (3)	Andreasen
68	Investments (3)	Andreasen
82	Social and Labor Legislation (3)	Davidson
105B	Intermediate Accounting II (3)	Dettmann
115A	Cost Accounting (3)	Friest
157	Marketing (3)	Friest

Economics

First Term

150A	Current Economic Issues (3)	Sielaff
150B	Current Economic Issues (3)	Sielaff
165	Economic Analysis: The Firm (3)	Meyers
166	Economic Analysis: Income and Employment (3)	Meyers

Second Term

150C	Current Economic Issues (3)	Sielaff
150D	Current Economic Issues (3)	Sielaff
168	Economics of Public Finance (3)	Friest

Geography

First Term

10	Principles of Physical Geography (3)	Hoag
11	Principles of Cultural Geography (3)	Witzig
49	Introduction to Weather (3)	Hoag
105	Mediterranean (3)	Witzig
113	Eastern Anglo-America (3)	Hoag

Second Term

10	Principles of Physical Geography (3)	Witzig
52	Economic Geography (3)	Witzig
67	Geography of Minnesota (3)	Hoag
102	Central Europe (3)	Witzig
110	South America (3)	Hoag

History

First Term

1	Civilization of the Modern World (3)	Maclear
21	American History (Early national development to 1848) (3)	Lindquist
59	Nineteenth-Century Europe (3)	Maclear
104A	The Renaissance and Reformation (3)	Maclear
131	Minnesota and the Northwest (3)	Lindquist

Second Term

22	American History (Civil War era and late nineteenth century) (3)	Larsen
23	American History (Twentieth century) (3)	Livingston
65	Twentieth-Century Europe (3)	Larsen
68	American History in the Twentieth Century (3)	Livingston
76	American History in the Nineteenth Century (3)	Larsen
141D	American Diplomatic History (3)	Livingston

Political Science

First Term

1	American National Government (3)	Wolf
2	American State Government (3)	von Glahn
51	Government and Conservation (3)	Wolf
160	American Political Thought (3)	Wolf
162	Recent Political Thought (3)	von Glahn
163	Political Theory and Utopia (3)	von Glahn

Second Term

1	American National Government (3)	Lease
2	American State Government (3)	Olsen
3	American Municipal Government (3)	Olsen
68	Problems of American National Government (3)	Olsen
71	Public Opinion and Propaganda (3)	Lease
86	Government of the U.S.S.R. (3)	Lease

Sociology

First Term

1	Introduction to Sociology (5)	Skinner
41	Marriage Analysis (3)	Pearson
53	Elements of Criminology (3)	Schmidt
70	Minority Group Relations (3)	Skinner
145	Urban Sociology (3)	Schmidt
151	Sociology of Education (3)	Pearson

Second Term

82	Rural Community Organization (3)	Pearson
141	The Family (3)	Pearson

Morris Campus

The University of Minnesota, Morris became an academic unit of the University of Minnesota by action of the Board of Regents on October 31, 1959. The University of Minnesota, Morris is a 4-year liberal arts college and conforms to the standards of academic excellence that the University maintains in its other colleges and campuses. It adheres to the standards of staffing comparable to those elsewhere in the University and offers similar though not necessarily identical courses as offered in other colleges of the University.

In addition to the liberal arts offering, training in pre-professional areas and elementary and secondary education are presently available. At this time only undergraduate courses are available, but it is hoped in the near future graduate level work may be added.

Summer school on the Morris Campus operates as a part of the total University of Minnesota Summer Session program and as such is under the administrative direction of the Summer Session office.

For a bulletin and more detailed information, write to the Office of Student Services, University of Minnesota, Morris, Morris, Minnesota.

**Division of
Humanities**

English

First Term

74 Modern Novel (3)Spring

Humanities

First Term

1 Humanities in the Modern World I (3)Spring

**Division of
Social Sciences**

History

First Term

21 United States in the Nineteenth Century (3)Pursinger
69 Europe in the Twentieth Century (3)Pursinger

Psychology

First Term

1 General Psychology I (3)Klinger
63 Child Psychology (3)Klinger

Sociology

First Term

1 Man in Modern Society (3)Milstone
55 Social Control of Deviant Behavior and
 Conflict (3)Milstone

**Division of
Science and
Mathematics**

Mathematics

First Term

71	Selected Modern Mathematical Topics for Elementary Teachers (3)	Gausman
72	Selected Modern Mathematical Topics for Secondary Teachers (3)	Gausman

**Division of
Education**

Education

First Term

53	Introduction to Education: The Elementary School and Curriculum (3)	Bruning
80	History of Education (3)	Bruning

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Delivered 5/9/63

OK Kill _____
Summer Session

1963



FIRST TERM

June 17 - July 20

SECOND TERM

July 22 - August 24

Bulletin

of the UNIVERSITY of MINNESOTA

UNIVERSITY OF MINNESOTA

Board of Regents

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Volume LXVI

Number 7

April 1, 1963

BULLETIN OF THE UNIVERSITY OF MINNESOTA

Published semimonthly January 1 to December 15 inclusive. Second-class postage paid at Minneapolis, Minnesota. Send change of address notices and other communications to Office of Admissions and Records, University of Minnesota, Minneapolis 14, Minnesota.

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 the *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, and location of the class.

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 6 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 6 or Communication 3, or 5 credits from either course 21, course 22, or course 23).

When no departmental abbreviation 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)	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30
Minneapolis (west)	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00
St. Paul	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00

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*.

Campus Maps—See back pages.

College and Department Abbreviation Code

Acct, Accounting	Ger, German
Aero, Aeronautics	Grk, Greek
AgEc, Agricultural Economics	HE, Home Economics
AgEd, Agricultural Education	HEd, History and Philosophy of Education
AgEn, Agricultural Engineering	HEEd, Home Economics Education
Agro, Agronomy and Plant Genetics	Hist, History
AmSt, American Studies	Hort, Horticulture
Anat, Anatomy	Hum, Humanities
AnCh, Analytical Chemistry	Hydr, Hydromechanics
Anes, Anesthesiology	IE, Industrial Engineering
AnHu, Animal Husbandry	InCh, Inorganic Chemistry
Anth, Anthropology	Ind, Industrial Education
Arch, Architecture	Ins, Insurance
ArEd, Art Education	IR, Industrial Relations
Art, Art	Ital, Italian
Ast, Astronomy	ITM, Mathematics (Institute of Technology)
BFin, Business Finance	Jour, Journalism
Bioc, Biochemistry (Agriculture)	Lat, Latin
Biol, Biology	Law, Law School
BLaw, Business Law	Lib, Library School
Bot, Botany	LMed, Laboratory Medicine
CD, Child Development	Math, Mathematics (SLA)
CE, Civil Engineering	MdBc, Biochemistry (Medical)
ChEn, Chemical Engineering	ME, Mechanical Engineering
Clas, Classics	MeAg, Mechanized Agriculture
Comm, Communication	Med, Medicine
Comp, Composition	MedT, Medical Technology
DInd, Dairy Industries	MetE, Metallurgical Engineering
DyHu, Dairy Husbandry	Mgmt, Management
Econ, Economics	MicB, Microbiology
Ed, General Education	MinE, Mining Engineering
EdAd, Educational Administration	Mktg, Marketing
EdCI, Curriculum and Instruction	MM, Mechanics and Materials
EdT, Methods and Student Teaching	Mort, Mortuary Science
EE, Electrical Engineering	MuEd, Music Education
Engl, English	Mus, Music
Ent, Entomology and Economic Zoology	NPsy, Psychiatry and Neurology
EPsy, Educational Psychology	NSci, Natural Science
FamS, Family Studies	NuAd, Nursing Administration
For, Forestry	NuEd, Nursing Education
Fren, French	Nurs, Nursing
FS, Foreign Study	Obst, Obstetrics and Gynecology
GC, General College	Oph, Ophthalmology
GE, General Engineering	OrCh, Organic Chemistry
Geog, Geography	Otol, Otolaryngology
Geol, Geology and Mineralogy	

Path, Pathology
 PCh, Physical Chemistry
 Ped, Pediatrics
 PEM, Physical Education for Men
 PetE, Petroleum Engineering
 PEW, Physical Education for Women
 Phcl, Pharmacology
 Phil, Philosophy
 Phsl, Physiology
 Phys, Physics
 PlPa, Plant Pathology and Botany
 PMed, Physical Medicine and Rehabilitation
 PO, Personal Orientation
 PoHu, Poultry Husbandry
 Pol, Political Science
 Prod, Production
 Psy, Psychology
 PubH, Public Health
 QA, Quantitative Analysis
 Rad, Radiology
 Rhet, Rhetoric
 Russ, Russian
 Scan, Scandinavian
 Soc, Sociology
 Soil, Soils
 Span, Spanish
 Spch, Speech and Theater Arts
 SSci, Social Science
 Stat, Statistics
 Surg, Surgery
 SW, Social Work
 Tran, Transportation
 VAna, Veterinary Anatomy
 VBac, Veterinary Bacteriology and Public Health
 VMC, Veterinary Medicine and Clinics
 VObs, Veterinary Obstetrics
 VPaP, Veterinary Pathology and Parasitology
 VPP, Veterinary Physiology and Pharmacology
 VSR, Veterinary Surgery and Radiology
 Zool, Zoology

Building Name Abbreviations

A, Armory
 AE, Aeronautical Engineering
 AgBot(StP), Agricultural Botany
 AgEng(StP), Agricultural Engineering
 Agr(StP), Agronomy
 AH, Appleby Hall
 Arch, Architecture
 BA(West), Business Administration
 Bo, Botany
 BoG, Botany Greenhouse
 Bu, Burton Hall
 C, Chemistry
 CB(West), Classroom Building
 CCS, Center for Continuation Study
 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
 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 Bldg (2035 Univ Ave)
 Hosp, University Hospitals
 Hr(StP), Horticulture
 HS, Health Service
 Hum(Morris), Humanities
 J, Jones Hall
 JacH, Jackson Hall
 JohH, Johnston Hall
 Lib, Walter Library
 LsPav(StP), Livestock Pavilion
 LyonL, Lyon Laboratories
 Mayo, Mayo Memorial
 MB(StP), Music
 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
 MurH, Murphy Hall
 MusEd, Music Education
 NGW, Norris Gymnasium for Women
 NH, Nicholson Hall
 NMA, Northrop Memorial Auditorium
 Owre, Owre Hall
 P, Pillsbury Hall
 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
 Sci(Morris), Science
 ShH, Shevlin Hall
 SnH(StP), Snyder Hall
 So(StP), Soils
 SocSci(West), Social Science
 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)
 TSCE, Temporary, South Court of Engineering
 TSF, Temporary, South of Folwell
 TSH(StP), Temporary, South of Haecker Hall
 VCHH, Variety Club Heart Hospital
 VetA(StP), Veterinary Anatomy
 VetC(StP), Veterinary Clinic
 VetS(StP), Veterinary Science
 VH, Vincent Hall
 WeH, Westbrook Hall
 WmsA, Williams Arena
 WuH, Wulling Hall
 Z, Zoology

Calendar

First Term

June	17	Monday	Orientation and registration
June	18	Tuesday	First term classes begin; fees due for students in all colleges
July	4	Thursday	Independence Day, holiday
July	18	Thursday	Commencement, 8 p.m.
July	20	Saturday	First term closes

Second Term

July	22	Monday	Registration and payment of fees
July	23	Tuesday	Second term classes begin
August	22	Thursday	Commencement, 8 p.m.
August	24	Saturday	Second term closes

Convocation, 8 p.m., Thursday

(See Official Daily Bulletin for announcement)

No application form need be filed by students with previous college work who plan to attend during the 1963 Summer Session only. See section on Admission and Registration for further details.

SUMMER SESSION 1963

The University of Minnesota is on the quarter system. Work equivalent to that taken in 1 quarter of the academic year may be taken in the Summer Session, but for convenience the Summer Session is divided into 2 terms of 5 weeks each.

The staff of the Summer Session is drawn largely from the scholars who teach in the academic year.

Duluth Campus

Graduate and undergraduate study is offered on the Duluth Campus, a 200-acre site overlooking Lake Superior. Dates of terms are the same as for the Twin Cities campuses. Degrees available include the associate in arts, the bachelor of arts, the bachelor of science, and the master of arts, the latter with majors in education, curriculum and instruction, educational psychology (high school counseling), and English.

Preprofessional, professional, and liberal arts curriculums are offered in 52 fields. The campus includes divisions of education and psychology, humanities, science and mathematics, and social sciences, as well as an Air Force ROTC program.

The climatic and scenic advantages of cooling Lake Superior and its famous North Shore enhance summer study at Duluth.

Two institutes will be sponsored by the National Science Foundation: one for high school biology teachers, and the other for high school mathematics teachers.

A new graduate major, in English, will be available to high school teachers seeking a Master's degree.

Teachers who wish work in library science will find two basic courses during the first term. Offered through the co-operation of the Library School, these courses are part of a sequence which leads to minimum certification for school librarians in Minnesota.

The Industrial Education Department will hold a first-term workshop on industrial safety. This course should prove helpful to industrial education teachers and representatives of industry. Another workshop, for teachers and businessmen, will be concerned with current economic issues: local, national, and international.

Teachers interested in special education will find work in speech correction and teaching the mentally retarded. Several courses deal with remedial reading, and these should be helpful to teachers wishing to meet new Minnesota certification requirements.

For a bulletin and more detailed information, write to the Student Personnel Services, University of Minnesota, Duluth, Duluth 12.

Morris Campus

The University of Minnesota, Morris is a 4-year liberal arts college. It adheres to the standards of staffing comparable to those elsewhere in the University and offers courses similar to, though not necessarily identical with, those offered in other colleges of the University.

The bachelor of arts degree is available. The curriculum also includes elementary and secondary education, as well as work in over 20 preprofessional areas.

The Summer Session on the Morris Campus operates as a part of the total University of Minnesota Summer Session program and as such is under the administrative direction of the Summer Session office. Because of the developing nature of the Summer Session program on the Morris Campus, only one term, the first, will be held. Dates of the term and tuition are the same as for the Twin Cities campuses.

For a bulletin and more detailed information, write to the Office of Student Services, University of Minnesota, Morris, Morris.

SPECIAL FEATURES AND PROGRAMS

The special programs that follow are noteworthy excerpts from our regular curriculum or they are institutes sponsored by University departments in co-operation with the Summer Session. For additional information write to Dean of Summer Session, 990 Johnston Hall, University of Minnesota, Minneapolis 14.

Modern Language Institute

During the first term of the Summer Session, the Modern Language Institute 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 will be Professor Arnold Mendel for the Deutsches Haus and Professor James F. Burks for the Maison Française. In each house there will be native assistants.

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 for the advanced and graduate students. To round out their programs it is recommended that the student 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. (For course information see Departments of German and Romance Languages, College of Science, Literature, and the Arts.)

The institute has 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, and international organizations or private business.

Fees and Scholarships—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. Several scholarships will be available.

Language Institutes for Teachers

A language institute under the National Defense Education Act will be offered for 30 elementary school teachers of German and 30 elementary school teachers of Spanish. For further information and for application blanks write to Professor Gerhard H. Weiss, 216 Folwell Hall, University of Minnesota, Minneapolis 14.

Summer Travel Course in European Art

The summer travel course in European art will be conducted by the Department of Art 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 cities to be visited are Lisbon, Madrid, Athens, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Frankfurt, Copenhagen,

Paris, and London. Five credits will be given in Art 59 to students successfully completing the course. The total cost is \$1,383 including University fees.

Members of the group will depart from New York by air on June 29, spend approximately 6 weeks in Europe, and return to New York on August 12.

Scandinavian Area Studies

The Scandinavian Area Studies program, held alternate summers at the University of Minnesota and the University of Wisconsin, is scheduled for the summer of 1963 at the University of Wisconsin. For detailed information write Professor Harald S. Naess, 67 Bascom Hall, University of Wisconsin, Madison, Wisconsin.

American Studies

During the summer of 1963, visiting professors will offer courses in various aspects of American culture, as will members of the University of Minnesota staff in the Departments of History, English, Sociology, Anthropology, Economics, Art, Music, Philosophy, Geography, Political Science, Speech and Theater Arts, School of Journalism, and the College of Education.

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.

Humanities Proseminar

The Humanities Proseminar will be offered during the second summer term. Professor Roy Swanson of the Departments of Classics and Humanities has chosen the theme "Irrationalism." Ancient, medieval, and modern attitudes toward essential irrationalism; tragic, romantic, and amoral irrationalism; Nazism; gratuitousness; the existential "absurd"; "belief" without faith; schools and cults of irrationalism.

Theater Arts Symposium

During the second term of the Summer Session the Department of Speech and Theater Arts offers a theater symposium, an intensive study of the art of the theater. Particular emphasis is placed on the productions and production methods of the Tyrone Guthrie Theatre, taking advantage of the unique opportunity to study *Hamlet*, *The Miser*, *The Three Sisters*, and *The Death of a Salesman* as presented by the Guthrie Theatre. The symposium will be conducted by professional directors, critics, actors, and designers, as well as University faculty members, providing a wide range of scholarly and professional opinion. Professor Weales of the University of Pennsylvania will also offer courses in American theater and American drama in the second term. The special tuition rate is \$85 plus incidental fee.

Speech Pathology

During the Summer Session, the Department of Speech and Theater Arts offers an expanded program in speech pathology and rehabilitation at both the graduate and undergraduate level. Students interested in continuing their training or working toward graduate degrees may do so through summer offerings. Professor Paul Moore, head of the Department of Speech, University of Florida, will be visiting lecturer in speech pathology during the first summer term, offering courses in the anatomy and physiology of voice production and the diagnosis of and therapy for voice disorders.

Students who wish to plan their summer work in relation to securing a degree in speech pathology should seek an early conference with Professor Ernest Henrikson or Professor Clark Starr, Speech and Hearing Clinic, Shevlin Hall, University of Minnesota, Minneapolis 14.

Audiology (Hearing)

Special offerings in audiology will be available both summer terms. During the first term, J. Donald Harris, director of U. S. Navy Auditory Research Laboratory, New London, Connecticut, will teach courses in Basic Hearing Science and Theories of Hearing. In the second term, Professor Rollie Houchins will offer courses for prospective teachers of the deaf, including Language for the Hearing Impaired, and Speech for the Hearing Impaired.

The audiology clinic and a demonstration class of hearing-impaired children will be among several special facilities and arrangements for supervised clinical and teaching experience.

Students wishing to plan a degree program or a special unit of study in audiology should arrange an early conference with Professor Frank Lassman, Audiology Clinic, D-311 Mayo Memorial, Minneapolis 14.

Public Administration Institute

An intensive institute at the graduate level intended primarily for government employees who serve in responsible administrative positions with local, state, or national governments will be offered during the first 2 weeks of the second summer term, July 22-August 2. The institute will feature lectures, seminars, and workshops designed to bring participants up to date on current trends in public administration. The sessions during the first week will focus on recent developments in organization theory relating to planning, decision-making, authority, and communication. The sessions during the second week will deal with administrative analysis and operations research, computers and management systems, politics and the budgetary process, and personnel administration. Faculty will include the staff of the University's Public Administration Center and visiting professors invited because of their recent and current research and publications on the several topics.

Courses in Russian

To help scientists and students of science become acquainted with the research of their Russian counterparts, the Summer Session will offer a course in scientific Russian. Students with no prior knowledge of the Russian language may register for Russ 24, Scientific Russian, and devote 10 class hours weekly to the mastery of this important language.

The major goal of this course will be the acquisition of a reading skill in the most direct fashion possible. Students will also be acquainted with the standard Soviet journals in the various fields.

Starting with the 1963 Summer Session, the Department of Slavic and Oriental Languages will offer an intensive beginning course in Russian (Russ A and B) which covers the same ground covered by the regular 3-quarter sequence during the academic year. Students completing the intensive summer course will be prepared to join students at the second-year level in the fall.

Journalism and Communications

The School of Journalism program includes courses for both undergraduate and graduate students interested in professional training. This year it provides two special courses for advisers of student publications in high schools, junior colleges, and colleges.

One is Jour 182, which has 2 workshop sections—1 for advisers and 1 for college publication editors—and which has open registration. The second is Jour 183, a special seminar for advisers who have been selected for this course by the Newspaper Fund, Inc. Registration in this course is controlled.

The school also offers courses on the Upper Division—Graduate School level in the area of mass communications. Among courses that carry Upper Division and graduate credit are History of Journalism; Mass Media in a Dynamic Society; Contemporary Problems in Freedom of Speech and Press; Development of American Broadcasting; Communications Analysis: Content, Audiences and Effects; International Communications and Foreign Affairs; and Public Opinion and Propaganda.

Murphy Hall, the School of Journalism 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 publications problems from the staffs of NSPA and ACP.

Efficient Reading

Adult reading needs are a matter of real concern. 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.

Home Economics

The School of Home Economics offers courses at both graduate and undergraduate levels during Summer Session. In some areas students may earn an advanced degree through summer offerings. Home economists returning to the teaching field or those wishing to prepare themselves for teaching should seek an early conference with Professor Roxana Ford, McNeal Hall, University of Minnesota, St. Paul 1.

Home economists in teaching agricultural extension (college, adult, or secondary school) or business will be especially interested in a concentrated course to be offered July 22-August 7 dealing with consumer selection guides for household equipment.

Extension clothing specialists and teachers of clothing in colleges will find the new offering in Experimental Methods of Clothing Construction useful.

Workshops in the College of Education

The College of Education section of this bulletin includes announcements of workshops in music, economic education, educational administration, and higher education.

Music Education

Music education courses cover the fields of supervision and teaching of music from kindergarten through secondary schools, as well as advanced research and literature in vocal, choral, and instrumental music. Graduate as well as undergraduate courses will be offered both terms.

Driver Education

The course in driver education (EdCI 101) will provide the background required for high school instructors in driver training. This course will be offered first term on the Minneapolis Campus, and second term on the Duluth Campus. Because registration is limited, interested students must apply in advance. A valid Minnesota driver's license is required.

Introduction to Elementary Education

Introductory courses for prospective elementary school teachers will be available in Summer Session. Admission to the College of Education as a regular student is prerequisite for registration. (See requirements under Ed 75A, first term, and Ed 75B, second term.)

Introduction to Secondary Education

Introduction to Secondary School Teaching (Ed 55A, first term, and Ed 55B, second term) will be offered for all students registered in a regular degree program of the College of Education. All students accepted for Ed 55A-B must be approved in advance for admission as regular students in the College of Education.

Special Education—Programs and Scholarships

Both terms will include a series of courses in all fields of special education—speech correction, and teaching the educable retarded, the deaf and hard-of-hearing, the blind, the crippled, the gifted, and the emotionally disturbed children. Scholarships, open to students from any state, are offered for those attending classes on education of blind children. (See following section on Education of Blind and Partially Seeing Children for information on applying for scholarships in this area.)

Work in special education also will be offered on the Duluth Campus.

Teaching the Mentally Retarded

Courses for teachers of mentally retarded children will be available both terms. Problems of Mental Deficiency (CD 143) is scheduled first term. A course on the mentally retarded in secondary schools (EPsy 191) will be offered first term on the Minneapolis Campus and second term at Duluth. Elementary teachers may take the comparable course for their level of instruction (EPsy 184) on the Minneapolis Campus first term.

Education of Gifted Children

First term courses will include EdCI 165A, Arithmetic for Gifted Children, and EPsy 183, Education of Gifted Children. The latter will be available also in second term.

Education of Blind and Partially Seeing Children

In the first term, 3 courses will provide minimum preparation for an experienced regular class teacher to serve partially seeing children, and 3 will provide minimum preparation to serve blind children. This work may be taken for graduate credit or for credit as a summer student with the permission of the instructor.

A demonstration resource room for blind and partially seeing children will be in operation at the Tuttle Laboratory School; observation will be required of all students in EdCI 118 and 182. Those who wish may apply for scholarships on the education of blind children by writing the American Foundation for the Blind, 15 West 16th Street, New York 11, New York.

Orientation and Mobility for Blind Children

The course on orientation and mobility for blind children will be held during the last 4 weeks of the first term (June 24-July 19) on the Minneapolis Campus (see EdCI 126). It provides teachers with basic techniques which help blind children gain skill in orientation and mobility. Some scholarships of \$150 will be available. Application for admission and/or a scholarship may be made by writing Miss Jeanne R. Ken-

more, 15A Pattee Hall, University of Minnesota, Minneapolis 14. This course has been made possible through a grant from a special reserve trust of Secing Eye, Inc., Morristown, New Jersey.

Teaching Emotionally Disturbed Children

Courses in the newly developed program for educating teachers of children with behavioral disorders will be scheduled both terms. One course, Education of Emotionally Disturbed and Socially Maladjusted Children (EPsy 186), will be open to any qualified summer student; the Practicum (EPsy 288) is restricted to advanced students.

Teaching the Deaf and Hard-of-Hearing

Courses for teachers of the deaf will be offered both terms. Introduction to the Education of Hearing Impaired Children (EdCI 128) and Methods of Teaching School Subjects to the Hearing Impaired (EdCI 127), are scheduled for first term, with Language for the Hearing Impaired (Spch 125) and Speech for the Hearing Impaired (Spch 127) available second term. A demonstration class for deaf children will be conducted second term.

Institute on Teaching Farm Management

Agricultural education students in the Graduate School who register for Field Problems (AgEd 221) in the first term may include, as part of their study, 2 weeks' participation in the institute on the business analysis method in teaching farm management scheduled as an agricultural short course. The institute will include information about the present status, purposes, organization, and procedures of instruction in this area with attention given to relationships with the intermediate level regional analysis centers, the area vocational schools, experiment stations, and various other local and state educational agencies. Noncredit participants in the institute may secure information through the Director of Agricultural Short Courses, 205 Coffey Hall, University of Minnesota, St. Paul 1.

Programmed Learning

The basic course in programmed learning and laboratory (EPsy 195 and 195A) is offered first term. Registration in the laboratory section is limited to 20 students, and a recent course in psychology of learning is prerequisite to both the lecture and the laboratory.

Institutes for High School Teachers of Science

Physics and Chemistry—An Institute for High School Teachers of Physics and Chemistry, supported by the National Science Foundation, will be held on the Minneapolis Campus from June 17 to August 23. A limited number of stipends will be available. Teachers not receiving stipends may register by special permission.

Biology—For information on the Institute for High School Teachers of Biology at the Lake Itasca Forestry and Biological Station, see section on Biology Session.

Radiation Biology—An Institute in Radiation Biology, sponsored jointly by the Atomic Energy Commission, the National Science Foundation, and the University of Minnesota, will be conducted on the St. Paul Campus from June 17 to July 27 for high school teachers of biology. Stipends for the participants and dependency and travel allowances are available.

Teaching personnel are associated with the Departments of Agronomy and Plant Genetics, Zoology, Veterinary Surgery and Radiology, and the Division of Radiation Therapy.

Physiology for High School Teachers

The Department of Physiology is offering a new course which is specially designed to serve the interests of high school and college teachers of biology and others who feel the need of an introduction to the modern developments in general physiology. The course (Phsl 100) will deal primarily with basic processes, such as transport phenomena, energetic processes, excitation and conduction, and mechanical movement. It will serve as an introduction to biophysical phenomena in living systems.

Research and Training Stipends—Biology

For information regarding stipends in this field for work at the Lake Itasca Forestry and Biological Station, see section on Biology Session.

3M Distinguished Lectures in Chemistry

The 1963 3M visiting lecturer will be Professor D. H. R. Barton of the Imperial College of Science and Technology (University of London). Professor Barton who is one of England's most eminent organic chemists will give a series of lectures on selected topics in natural product chemistry. The series will begin July 22 and continue to August 24.

Geographical Field Session

Two intensive field research seminars, Geog 251-252 and Geog 276-277, will be given August 29-September 18 (1 week will be on the University of Minnesota Campus and 2 weeks in San Luis Valley, Colorado, with headquarters at Alamosa). Research will be focused upon related problems in physical and agricultural geography. Reservations must be made no later than June 6. For costs, detailed information, and reservations, contact Department of Geography, University of Minnesota, Minneapolis 14.

Statistics

The Statistics Department plans to offer courses ranging from elementary (Stat 41) through intermediate (Stat 111 and 181) to advanced (Stat 281) during both terms of the Summer Session. These courses are not directed toward any particular area of application, but should be of value to users of statistical techniques in many fields, as well as to those interested in the basic logic and conceptual structure of statistical inference.

Archaeological Field Session

Students enrolled in the archaeological field techniques course, Anth 140, will headquarter at Carlos State Park, located 10 miles north of Alexandria, Minnesota. The 6-credit course will contain instruction in field survey techniques, excavation procedures, and preliminary laboratory analysis. Students will participate in the excavation of Middle Woodland habitation and burial mound sites within the state park and in the adjacent areas. Field survey problems will be met in surveying the right-of-way of Interstate Highway 94 in Douglas County.

Center for Continuation Study Programs

For information on institutes and workshops offered by the Center for Continuation Study, please write to the Director, Center for Continuation Study, University of Minnesota, Minneapolis 14.

GENERAL INFORMATION

On its Minneapolis Campus the University of Minnesota places at the disposal of the Summer Session students the facilities of 11 schools and colleges comprising this great educational institution—their faculties, libraries, laboratories, observatory, and museums—and in addition a program of recreational activities including concerts and lectures, swimming, golf, tennis, billiards, and folk and ballroom dancing.

The location of the University also makes possible the use of the cultural and recreational facilities of a large metropolitan area. Lakes and lagoons on which to canoe, swimming beaches, picnic grounds in parks and along roadsides, evening concerts on lake shores and in parks, art centers, museums, libraries, beautiful 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 from the campus by public or private transportation. Major league baseball is a recent addition to Twin City recreational activities.

The College of Agriculture, Forestry, and Home Economics and the College of Veterinary Medicine are on the St. Paul Campus on which there are library, laboratory, and recreational facilities.

The campuses are connected by an intercampus bus line which gives regular service free to students enrolled for classes on both campuses. An interurban bus line also connects the campuses with the two cities, thus making available the added cultural advantages of two large metropolitan centers—an attraction for the Summer Session student that is unique with the University of Minnesota.

Intercampus Bus

For all students who are registered for classes on the St. Paul Campus, free transportation on the intercampus bus is provided. Passes for students registered in the College of Agriculture, Forestry, and Home Economics and the College of Veterinary Medicine will be issued at the Office of Admissions and Records, St. Paul Campus.

Undergraduate students registered in other colleges will obtain their passes at the post office on the ground floor of Coffman Memorial Union. Graduate student passes will be issued at the post office on Minneapolis Campus.

Tickets for persons not eligible for passes may be purchased at the Bursar's windows on either campus.

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 14.

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

General Offices

The office of the dean of the Summer Session is in 135 Johnston Hall. The Office of Admissions and Records and the Bursar's office are on the first floor of Morrill Hall and for the convenience of students registered in agriculture and home economics, branch offices are established on the second floor of Coffey Hall, St. Paul Campus. The offices of the several schools and colleges together with the office of student affairs function in the control of students during the summer just as during any other quarter of the year.

University Library

Full library privileges are available during the summer. Among the finest university libraries in existence, the University of Minnesota Libraries contain over 2 million volumes and a wide variety of periodicals and pamphlets. Large, comfortable reading rooms provide an excellent atmosphere for study.

All departmental libraries contain special collections of value to students. A branch library in which course reserve materials are available is located on the West Bank of the Minneapolis Campus.

Other available library facilities in the Twin Cities area include the Minneapolis Public Library, the St. Paul Public Library, the Minnesota Historical Society Library, and the James Jerome Hill Reference Library of St. Paul.

University Post Offices

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

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

On the Minneapolis Campus, post-office boxes are provided only for those students who have no assigned address. Students desiring this U. S. mail service should apply at the Coffman Union post office.

Official Daily Bulletin

Throughout the summer an Official Daily Bulletin is published in the *Minnesota Daily*, the student newspaper of the University of Minnesota. In addition to announcements for students and faculty, it contains programs of the various recreational activities and matters of general interest. The *Minnesota Daily* is delivered to boxes strategically placed on the campuses each morning on which it is published. *Each student is held responsible for a knowledge of such information appearing in the official notices as may affect him.*

Religious Activities

Twenty-three student religious organizations, representing various faiths and denominations, function on the Minneapolis Campus. There are nine religious foundation buildings on the University Avenue side of the campus which maintain programs of fellowship and recreation. Information may be secured from the Office of the Co-ordinator of Students' Religious Activities, 211 Eddy Hall.

University Health Service

The University Health Service conducts a dispensary and infirmary 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 free of charge. For services which are specialized and individual in character, such as dentistry, outpatient calls, drugs, prolonged hospitalization, etc., special fees are charged. Surgical care for pre-existing conditions is not provided.

Housing and Food Service

Minneapolis Campus Residence Halls—*Ada Comstock Hall* for women and *Centennial Hall* for men are modern residence halls reserved for the use of Summer Session students. Each hall will offer comfortable living in large double and single rooms with well-planned and healthful meals prepared and served under the direction of a trained dietitian. Meals will be served in Comstock Hall every day of the week while Centennial Hall will offer meals Monday through Friday. (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.

Sanford Hall, another residence hall for women, is situated on University Avenue near the campus. Sanford Hall will offer *rooms only* provided there is a sufficient number of residents. This hall has spacious, decorated lounges and large double and single rooms. Write for applications and additional information to the Director of Sanford Hall, University of Minnesota, Minneapolis 14.

Centennial Hall, an ultra-modern men's residence, offers comfortable living in large double and single rooms. A room and board contract (meals served Monday through Friday) will be offered provided there is a sufficient number of residents. Otherwise, contracts will be for *room only*. Early application is suggested. For application forms and additional information, write to Director of Centennial Hall, University of Minnesota, Minneapolis 14.

St. Paul Campus 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. This hall will offer *rooms only* during first term, and food may be obtained in a University cafeteria or in the Student Center adjacent to the building. For application forms and information, write to Director of Bailey Hall, University of Minnesota, St. Paul 1. For applications and additional information, write to the Director of Housing, 108 Wesbrook Hall, University of Minnesota, Minneapolis 14.

Private Residences—A considerable number of rooms in private homes, rooming houses, fraternities, and sororities is available, and vacancy listings may be secured after arrival on campus. Lists of sublets in housekeeping units such as apartments and houses are available beginning in May upon request. 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, on the Minneapolis Campus, and 101 Coffey Hall on the St. Paul Campus.

Food Service—Several restaurants and food services are available to students in Coffman Memorial Union. Largest is the cafeteria on the ground floor. Also there are a soda fountain and "commuters' lunchrooms" for students who bring lunches from home. Banquet, party, and private dining room facilities are also available. Lunchroom and soda fountain facilities are offered in the St. Paul Campus Student Center. In addition there are privately operated restaurants near the Minneapolis and St. Paul campuses.

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.

Special Students—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. Such students will be classified as “special” for the Summer Session only.

Persons about 24 years of age or older who have not had previous college work and who are not candidates for a degree but wish to complete certain specific college subjects will also be considered for admission as special students for Summer Session only.

Attendance during the Summer Session in no way guarantees special students admission to the regular academic year. Special students who wish to be considered for admission to a *subsequent term* must file regular admission applications early in the summer.

Graduate Students—The procedure for admission of graduate students is discussed in the section on the Graduate School (see index).

Degree Candidates—Those who expect to become *candidates for a degree* at the University during the Summer Session must have filed an application for admission and must have been regularly admitted to a college of the University.

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 14.

Registration Dates

In order that the short terms may prove of maximum value, and that the work of the courses may not be interfered with by late entrants, students are urged to complete their registration on the following dates:

First Term

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

Fee Payment, last day without penalty—Tuesday, June 18

Late fees are charged for the first term as follows for payment of fees on:

June 19-21	\$ 3.00
June 24-28	5.00
Thereafter	10.00

No registrations will be accepted for the first term later than Thursday, June 20, without special permission of the dean of the school or college concerned.

Second Term

Registration and Fee Payment—Monday, July 22, 8 a.m. to 4 p.m.

The late fees for the second term are as follows for payment of fees on:

July 23-26	\$ 3.00
July 29-August 2	5.00
Thereafter	10.00

No registrations will be accepted for the second term later than Thursday, July 25, without the special permission of the dean of the school or college concerned.

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

Place of Registration

First Term

June 17: Main Ballroom, Coffman Memorial Union (Minneapolis Campus students)
220 Coffey Hall (St. Paul Campus students)

Students registering in the College of Agriculture, Forestry, and Home Economics or the College of Veterinary Medicine should report to 220 Coffey Hall, St. Paul Campus, for registration materials.

Other students should report to the Main Ballroom, Coffman Memorial Union.

Students registering before or after the regular registration day, June 17, should begin registration at the Office of Admissions and Records, Minneapolis or St. Paul Campus as appropriate.

Second Term

July 22: Information Booth, first floor, Morrill Hall (Minneapolis Campus students)
220 Coffey Hall (St. Paul Campus students)

Students registering in the College of Agriculture, Forestry, and Home Economics or the College of Veterinary Medicine should report to 220 Coffey Hall, St. Paul Campus, for registration materials.

Other students should report to the Office of Admissions and Records Information Booth, first floor, Morrill Hall, Minneapolis Campus, for registration materials and instructions.

Courses to Be Reserved

As part of registration, all students, including graduate students, must tally for courses listed below. The student does this by obtaining an IBM class reservation card. Students registered during spring 1963 obtain tally cards at their college class reservation or tally offices either during the preliminary registration period or on June 17, 1963. Students registering for Summer Session only obtain tally reservation cards and tally at Coffman Memorial Union on June 17, 1963.** These class reservation cards must be attached to the student's registration blank when it is turned in to obtain statement of fees.

Analytical Chemistry

57—JohH 210

All other courses under 200—E 136

Art

All courses under 200 *except* 1, 50, 57,
59, 67, 101, 112, 138, 196—JohH
210

Art Education

17, 18, 19, 53, 80, 84, 151, 184—Bu 206

Astronomy

All courses—JohH 210

Botany

112, 116, 136, 155, 159 (Itasca)—CofH
220

Civil Engineering

All courses—E 136

Curriculum and Instruction

101, 107, 108, 126, 164A, 164B—Bu 206

Economics

1, 2, 65, 66, 165, 166—JohH 210

Education

55A, 55B, 75A, 75B—Bu 206

** Except students registering on the St. Paul Campus who tally at 220 Coffey Hall and Institute of Technology students who tally at Main Engineering 136.

Educational Administration

239—Bu 206

Educational Psychology110, 116, 116A, 150, 159, 195A, 216A,
217A, 218A, 282A, 282B—Bu 206**Engineering Graphics**

All courses—E 136

English (IT)

85, 86—E 136

English (SLA)

1B, 2B, 3B, 55, 56—JohH 210

Entomology, Fisheries, and Wildlife59, 124, 162 (*Itasca*)—CofH 220**Family Studies**

1, 1A, 15—JohH 210

General Chemistry4, 5—CofH 220 for AFHE, E 136 for
IT, and JohH 210 for other students
14, 24, 25, 26—E 136 for IT, and JohH
210 for other students
All other courses—E 136**General College**

All courses—NH 106

General Engineering

70—E 136

Geology

All courses—JohH 210

History and Philosophy of Education

180—Bu 206

Home Economics21, 23, 25, 28, 49, 69, 76, 86, 116, 126,
127, 131, 134, 152, 155, 166, 172,
179, 185, 187—CofH 220**Industrial Education**

136—Bu 206

Inorganic Chemistry

All courses under 200—E 136

Management

60—BA 225

Mathematics (IT)

All courses—E 136

Mechanical Engineering

All courses—E 136

Mechanics and Materials

All courses—E 136

Metallurgical Engineering

All courses under 200—E 136

Metallurgy

All courses under 200—E 136

Methods and Student Teaching

50, 52, 53A—Bu 206

Mining Engineering

All courses under 200—E 136

Music

4—JohH 210

Music Education

52—Bu 206

Organic Chemistry61, 62—CofH 220 for AFHE, E 136 for
IT, and JohH 210 for other students
All other courses under 200—E 136**Personal Orientation**

1—JohH 210

Physical Chemistry104, 105, 106—JohH 210
All other courses under 200—E 136**Physical Education for Men**

1A, 1B, 1C, 2A—JohH 210

Physical Education for Women

3, 7, 8, 32—JohH 210

Physics1A, 2A—JohH 210
All other courses under 200—E 136**Plant Pathology and Botany**56, 156 (*Itasca*)—CofH 220

Quantitative Analysis

61—BA 225

Rhetoric

22, 51—CofH 220

47—CofH 220 for AFHE, and JohH 210
for other students

Speech and Theater Arts

5X, 6, 33, 51, 65, 78, 81, 82, 106, 174—
JohH 210

Zoology

55, 115, 119, 135 (Itasca)—CofH 220

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 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:

Tuition fee (per term)	\$59.50
Incidental fee†† (per term)	11.00
Total fee (per term)	\$70.50

The following fees are payable each term at the time of registration by each student taking 4 credits or less (whether resident or nonresident) and must be paid before registration is complete:

Part-time tuition fee (4 credits or less) (per term)	\$46.50
Incidental fee†† (per term)	11.00
Total fee (per term)	\$57.50

Note—Regular tuition fees as provided during the academic year will be charged all students in Medicine and Nursing. In Law, Veterinary Medicine, and Dentistry, students pay tuition at the summer rate or academic year rate, whichever is higher. Special tuition fees are collected at the Biological Station. All students pay the Summer Session incidental fee.

Graduate students 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.

Eligible Summer Session staff members pay at the following rates: more than 3 credits, \$43 per term; 3 credits or less or thesis only, \$21.50 per term; plus incidental fee.

Refer to the index for fees in the following schools, colleges, and stations:

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

†† The incidental fee of \$11 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:

Civil Engineering

\$35.00—23 (summer camp)

Health Service (field trips and foreign study) \$6 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

\$10.00—Laboratory fee

††\$35.00—Research Table fee

Modern Language Institute (Summer Session)

\$40.00 per term—French (22, 58, 108); or German (22, 67, 107)

Music

\$35.00 for 2, \$70.00 for 4 half-hour individual lessons per week—A, D (no cr)

\$35.00 for 2 (2 cr), \$70.00 for 4 (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, 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.

Physical Education (men)

Towel and locker fee for students using PE facilities for activity, \$2.50 per term payable at department.

Uniforms (optional for class or recreation activity), \$2.00 per term payable at department.

Physical Education (women)

\$3.25 (maximum \$6.50 per term) 7, 8, 10, 32

Public Health

\$200.00—230 (September field course)

Speech and Theater Arts

\$85.00 tuition plus incidental fee—175 (Theater Symposium)

Special Fees

Music Practice Room

\$1.00 per term for 1, \$2.00 for 2, 50 cents for each additional hour per week—all instruments except organ

.25 per hour—small organ

.50 per hour—large organ

Speech and Hearing Clinic—Nonstudents

Articulatory cases, per 10 weeks—\$15.00 for 1, \$25.00 for 2, \$30.00 for 3, \$35.00 for 4, \$40.00 for 5 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 noncitizens

5.00—Credential examination

5.00—Large diploma

2.50—Master's thesis binding

25.00—Ph.D. thesis binding

5.00—Special examination

1.00—Record service fee, required of all new students

†† In lieu of tuition.

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. 16, 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. 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.

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 Thursday, July 18, 8 p.m.

Second term Thursday, August 22, 8 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 \$7.50

Institute of Technology 5.00

College of Education (except Nursing Education) 7.50

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.

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*—2 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. Applications should be sent to Dean of the Graduate School, University of Minnesota, Minneapolis 14.

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 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, 1962-1964*, pages 7-20.

Deadline Dates for Summer Session Students

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—Thursday, May 23, 1963; second term—Thursday, June 27, 1963). Oral examinations must be completed at least 5 weeks prior to the commencement date (first term—Thursday, June 13, 1963; second term—Thursday, July 18, 1963).

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.

Information concerning admission to the Graduate School should be obtained from the dean of the Graduate School. 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.

Undergraduate students also will find courses for their needs.

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.

The School of Home Economics will offer courses for undergraduate students and qualified graduate students in both terms. Courses leading to graduate degrees through Summer Session attendance will be offered in general home economics and home economics education. Graduate programs are planned individually with students.

AGRICULTURAL ECONOMICS (AgEc)

First Term

- 105. Advanced Farm Management.** Factors affecting a farmer's success and methods for evaluating a farm business. Analysis of an actual farm operation. (3 cr; prereq 12, 80 or equiv; 7:30-9:20 MTWThF [meets first 3 weeks only]; HH 210) Nodland
- 200. General Seminar in Agricultural Economics.** Special problems for individual work by qualified students. (3 cr; prereq # in advance of regis; ar) Staff

Second Term

- 201. General Seminar in Agricultural Economics.** (See 200, first term) Staff

AGRICULTURAL EDUCATION

See Index

AGRICULTURAL ENGINEERING (AgEn)

First Term

Mechanized Agriculture (MeAg)

- 131. Problems and Field Studies in Advanced Farm Mechanics.** Principles and practices pertaining to the implementation of instructional program in farm mechanics. (3-9 cr; prereq 130; 2:30-4:20 MTWThF; AgEn 109 and 35) Marvin, Taylor

AGRONOMY AND PLANT GENETICS (Agro)

First Term or Second Term

Agronomy

- 201.* **Research in Farm Crops.** Problems in physiology, production, and classification of crop plants. (Cr ar; prereq 121, 127; ar) Staff

Plant Genetics

- 241.* **Research in Plant Genetics.** (Cr and hrs ar) Staff
244. **Laboratory Methods in Plant Breeding.** Practice in plant breeding technique, methods of controlling pollination, and handling of plant cultures. (1½ cr; ar) Staff

ANIMAL HUSBANDRY (AnHu)

First Term

165. **Beef Cattle Production.** Adaptability, breeding, feeding, care, and management of commercial and purebred beef cattle. (3 cr; prereq 37, 62, or #; 12:30-2:20 MTWThF; PetH 110) Harvey

First Term or Second Term

- 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 #; ar) Comstock, Hanson, Harvey, Meade, Jordan, Kolari, Rempel, Smith

BIOCHEMISTRY (Bioc)

First Term or Second Term

203. **Research Problems.** Work on research problems in various fields of biochemistry. (2-5 cr; prereq grad, #; ar) Staff

DAIRY HUSBANDRY (DyHu)

First Term or Second Term

- 202.* **Research in Dairy Production.** Special problems assigned to fit student needs. (Cr ar; prereq prelim grad work; ar) Cole, Graham, Williams, Donker, Young

DAIRY INDUSTRIES (DInd)

First Term or Second Term

- 210.* **Research in Dairy Products.** Problems assigned to fit needs of student. (2-5 cr; prereq prelim grad work; ar) Coulter, Morris, Thomas
- 212.* **Research in Dairy Bacteriology.** Problems assigned to fit needs of student. (2-5 cr; prereq prelim grad work; ar) Olson, Jezeski

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.

First Term or Second Term

- 243.* Research in Entomology. (Cr ar) Hodson, Chiang, Cutkomp, Holdaway, Richards, Cook, Haydak, Peterson, Brooks, Price
- 267.* Research in Fishery Biology. (Cr ar) Smith, Waters
- 280.* Research in Wildlife Biology. (Cr ar) Marshall, Beer

FORESTRY (For)

OFFERED ON THE ST. PAUL CAMPUS

First Term or Second Term

- 200.* Research Problems in Silviculture. (Cr ar) Hansen, Duncan, B Brown, Bakuzis
- 203.* Research Problems in Forest Management. (Cr ar) Irving, B Brown, Meyer, Winsness
- 205.* Research Problems in Forest Economics. (Cr ar) Kaufert, Skok
- 207.* Research Problems in Forest Products Engineering. (Cr ar) Hossfeld, Kaufert
- 213.* Research Problems in Forest Utilization. (Cr ar) Hossfeld, Kaufert
- 215.* Research Problems in Forest Tree Physiology. (Cr ar) Sucoff
- 218.* Research Problems in Forest Measurements and Photogrammetry. (Cr ar) R M Brown, Meyer
- 220.* Research Problems in Forest Tree Genetics. (Cr ar) Pauley
- 221.* Research Problems in Forest Influences. (Cr ar) Duncan
- 222.* Research Problems in Forest Policy. (Cr ar) Irving, Skok, Winsness

OFFERED AT LAKE ITASCA FORESTRY AND BIOLOGICAL STATION

August 5 to September 13

Open only to students who have completed at least 2 quarters of forestry, or 1 year in a junior college or other college. Preparatory courses in botany, dendrology, and zoology are desirable. The schedule is arranged to occupy the student's full time for 5½ days per week. Largely field or laboratory work. In addition to the regular field work in For 5 and 6, special field trips to federal, state, and private forestry operations are required. Required of all forestry students in the Forest Resources Management curriculum, including transfer students. All students must register for the following courses:

- 2. Important Forest Plants. Identification and classification of the important forest plants of Itasca State Park, with emphasis on forest site and type, plant indicators. (2 cr) Ar

†† For additional courses in the first term, see index for Biology Session.

5. **Forest Ecology.** Lectures and laboratory exercises designed to give students basic information on forest types, ecological succession, tolerance, reproduction factors, and relative growth and longevity of important native forest tree species. (4 cr) Hansen
6. **Field Measurements.** Largely field work. Includes use of compass, pacing, and mapping; elementary work in tree measurements; timber estimating, including the elementary use of aerial photographs; growth determination. (2 cr) R M Brown
- Soil 3A. Field Forest Soils.** Field and laboratory studies in forest soils. (1 cr) Arneman

HOME ECONOMICS (HE)

First Term

- 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 SLA grad req; II MTWThF; JohH 122) Ludwig
21. **Color and Design.** Laboratory experiences in the selection and arrangement of home furnishings, selection and framing of pictures, lettering, poster making, block printing. (3 cr; prereq 20; VII-VIII MTWThF; McNH 359) Abell
25. **Design Applied to Crafts.** Emphasis upon well-designed and suitable articles for use in dress and in the home which can be made with simple equipment, such as weaving, metal and leather work. (3 cr; prereq 20...21 recommended; IV-V MTWThF; McNH 359) Abell
28. **Construction and Refinishing of Home Furnishings.** Laboratory problems in refinishing and reupholstering furniture and 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 #; II-III MTWThF; McNH 433) Myren
49. **Household Equipment.** Principles that should guide in the selection, operation, care, and convenient arrangement of equipment in the home. (3 cr; prereq soph, MeAg 35 or #; VII-VIII MTThF; McNH 128) Hocraffer
69. **Administrative Food Service Experience.** Planned experience in selected type of food service including menu planning, purchasing and storage of food, supervision of preparation and serving and maintenance of high sanitary conditions, accounting and bookkeeping. (5 cr; prereq 65; 30 hrs per wk for 5 wks; StP DC 152) Hitchcock
76. **Nutrition of the Family.** Principles of nutrition and the problems of food selection most commonly met in everyday living. (4 cr, §170 and §171; prereq 31, 40, physiology or human biology; VIII MTWThF, IX TTh; McNH 48) Morse
86. **Home Management Laboratory.** (Students should not register for a first period class) Residence for 5 weeks in 1 of the 2 home management houses, with direct experience in management and sharing the various activities and responsibilities involved in the group living of the students in residence. (Limited to 12) (4 cr; prereq 85...41 recommended; deposit of \$10 required) Jeary, McCandless
- 86A. **Home Management Laboratory.** (At home) (4 cr; prereq #; ar) Jeary
116. **Family Clothing Problems.** Influence of family composition, income, and occupation on family clothing; clothing in relation to family goals and values; theories of consumer behavior, decision making, and management in the solution of family clothing problems. (3 cr; prereq 50, AgEc 2 or Econ 2, Soc 1A or 1, Psy 2, or #; VII MTWThF; McNH 303) Williams

- 126. Special Problems in Crafts.** Advance study in area of crafts; weaving, enameling, leatherwork, metalwork, or other. One area may be selected for study, or a combination of two or more. (1-3 cr; prereq 20, 25 or #; IV-V MTWThF; McNH 359) Abell
- 127. Purchasing Home Furnishings.** Detailed study of home furnishings in terms of use, cost, and appearance. Includes furniture, dinnerware, floor and wall coverings, fabrics, and accessories. Actual materials, slides, and references used. Field trips. (Limited to 24) (3 cr; prereq 24; VI-VII MTWThF, VIII T; McNH 360) Ludwig
- 131. Laboratory Problems in Household Equipment.** Laboratory course on procedures and instruments used to determine operating characteristics of household appliances. (3 cr; prereq 49 or equiv course in equipment and a total of 8 cr hrs in food, clothing, and textiles, or #; II MTWThF, III TTh; McNH 124) Ehrenkranz
- 137. Modern Food Preparation Principles and Practices.** Experimental bases of principles underlying present day food preparation practices; development of experiences illustrative of such principles in high school teaching, dietetics, and foods in business. (3 cr; prereq 15 cr in food and nutrition, organic chemistry; III MTWThF; McNH 125) Trammell
- 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 food and nutrition; II MTWThF; McNH 125) Noble
- 155. Experimental Studies in Clothing Construction.** Comparison of selected procedures in clothing construction; evaluation of suitability for use in teaching at secondary, college, and adult levels. Individual experimental problems and class reports. (3 cr; prereq 53, tech exper, #; II-III MTWThF; McNH 327) Williams
- 166. Developments in Quantity Food Production.** Survey in recent trends in quantity food products and production from management viewpoint. Study of quality, yield, and related costs. (3 cr; prereq sr or grad, 63, 67 or #; StP DC 152) Hitchcock
- 172. Current Developments in Nutrition.** Fundamental facts and techniques for solving current nutrition problems. (3 cr; prereq 31, 40, Bioc 1A, Phsl 4 or #; VII MTWThF; McNH 44) Sirny, Morse
- 179. Readings in Nutrition.** Survey of literature in the field, oral and written reports. (Limited to 6) (2 cr; prereq 170; ar) Sirny, Morse
- 184. Home Management Principles.** Study and discussion of managerial aspects of homemaking; work simplification of household activities; financial records and budget-making for the individual and the family. (3 cr; prereq 40...41 advised; VII MTWThF; McNH 201) McCandless
- 295-296. Home Economics Problems.** Foods, nutrition, textiles and clothing, home management and family relationships, household equipment, related art. Independent study and written reports. (1-5 cr; prereq #) Davison, Ehrenkranz, Esteros, Morse, Noble, Sirny, Straus

Second Term

- 49. Household Equipment.** (See first term) (V-VI MTThF; McNH 128) McCandless
- 86. Home Management Laboratory.** (See first term) McCandless
- 120. Art History.** Art from the Egyptian period to present. Painting, sculpture, and architecture of the past studied for influences on contemporary period. Field trips. (3 cr; II MTWThF; McNH 360) Esteros
- 134. Consumer Selection Guides for Household Equipment.** 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 exper in teaching, extension, or business or #; July 22-August 7; 8:30-3:30 MTWThF; McNH 124) Ehrenkranz
152. **Problems in Consumer Textiles.** Contemporary textiles, their physical characteristics in relation to end use performance; agencies aiding consumer through development of standards; problems students have met in the textile field. (3 cr; prereq 50 or equiv; III MTWThF; McNH 303) Davison
179. **Readings in Nutrition.** (See first term) Simy
185. **Family Relationships.** Factors that promote satisfaction in family living and inter-relationships of the family and the community. (Limited to 30) (3 cr; prereq HEED 90 or #; IV MTWThF; McNH 201) Straus
187. **Readings in Family Relationships.** Independent study in selected areas with faculty conferences. (1-3 cr; prereq #) Straus
220. **Readings in Related Art.** Independent study and review of books and periodicals in selected areas of related art. Written reports. (1-3 cr; prereq #) Esteros
- 295-296. **Home Economics Problems.** (See first term) Staff

HOME ECONOMICS EDUCATION

See Index

HORTICULTURE (Hort)

First Term or Second Term

- 190-191-192. **Special Problems.** Problems based upon work given in preceding courses. (2-4 cr each; prereq #; ar) Staff
- 247.^o **Reports on Special Horticultural Topics.** (Cr ar, maximum 9) Staff
- 249.^o **Research in Horticultural Crop Breeding.** (Cr ar, maximum 9) Currence, Hutchins, Lauer

PLANT PATHOLOGY AND BOTANY (PIPa) §§

First Term or Second Term

- 206.^o **Research in Plant Pathology.** Special assignment of work in laboratory and field problems in pathological research. (Cr ar; PP) Kernkamp, C M Christensen, Eide, French, Hart, King, Kommedahl, Moore, Rowell, Wilcoxson, N Anderson
- 210.^o **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 107; PP) C M Christensen, N Anderson
- 254.^o **Research Problems in Plant Physiology.** Special assignment of work in applied plant physiology. (Cr ar; AgBot) Rowell, Linck, Sudia

§§ For additional courses in the first term, see index for Biology Session.

POULTRY SCIENCE (Poul)**First Term or Second Term**

- 214.* **Research in Poultry Science.** Research problems assigned to meet the needs of the student. (Cr ar; prereq #; ar) Staff
- 215.* **Research in Poultry Nutrition.** (Cr ar; prereq #; ar) Johnson, Waibel, Snetsinger
- 216.* **Research in Poultry Breeding.** (Cr ar; prereq #; ar) Shoffner
- 218.* **Research in Poultry Products.** (Cr ar; prereq #; ar) Swanson

RHETORIC (Rhet)**First Term**

22. **Public Speaking.** A practical course in the fundamentals of speech making. Particular emphasis upon organizing the speech and projecting it to the audience. (Limited to 20) (3 cr; prereq satisfaction of freshman communication requirements; IV MTWThF; AgEng 307) Cashman
44. **Humanities: The American Experience.** The development of major trends in American thought with particular emphasis on the impact of European ideas. Puritanism, agrarianism, transcendentalism, pragmatism, social Darwinism, collectivism. (3 cr; prereq 41; V MTWThF; AgEng 108) Carr
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. (Limited to 33) (3 cr [1 cr for SLA students]) Brown, Horberg, Seymour
- | | |
|---------------------------|----------------------------|
| Sec 1, I MTWThF, ForH 70 | Sec 4, III MTWThF, ForH 70 |
| Sec 2, II MTWThF, ForH 70 | Sec 5, IV MTWThF, ForH 70 |
| Sec 3, II MTWThF, ForH 60 | |

51. **Exposition.** Essays and articles, technical writing, application letters, review of English usage. (Limited to 25) (3 cr; prereq satisfaction of freshman communication requirements) Carr, Horberg
- | | |
|-----------------------------|------------------------------|
| Sec 1, II MTWThF, AgEng 307 | Sec 2, III MTWThF, AgEng 307 |
|-----------------------------|------------------------------|

Second Term

22. **Public Speaking.** (See first term) (IV MTWThF; AgEng 307) Nichols
47. **Efficient Reading.** (See first term) Wright, Price
- | | |
|---------------------------|----------------------------|
| Sec 1, I MTWThF, ForH 70 | Sec 3, III MTWThF, ForH 70 |
| Sec 2, II MTWThF, ForH 70 | Sec 4, IV MTWThF, ForH 70 |

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

SOILS (Soil)**First Term or Second Term**

- 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; prereq #: ar) Martin, Burson, Caldwell, MacGregor, Schmidt, Blake, Arneman, Rust, Farnham, Grava

Second Term

- 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

BIOLOGY SESSION

LAKE ITASCA FORESTRY AND BIOLOGICAL STATION

June 17-August 3

During a 7-week term of the Summer Session an excellent opportunity for the study of terrestrial and fresh-water biology in its most fundamental aspects is presented at the Biology Session, located 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 Science, Literature, and the Arts. Classes will be held at the station beginning June 17, ending August 3. Interested persons may find the following opportunities offered:

1. Elementary and advanced instruction 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, fields, or forests close to the station.
3. Opportunities for teachers of botany, zoology, and biology.
4. Opportunities for guest investigators for independent research in terrestrial and fresh-water biology.

For a special bulletin describing in detail the opportunities and facilities at the station and for reservations write to Dean of the Summer Session, 990 Johnston Hall, University of Minnesota, Minneapolis 14.

Research and Training 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 the Biology Session*).

Institute for High School Teachers of Biology

An Institute for High School Teachers of Biology will be held at the station again this year. The National Science Foundation has granted funds to provide for stipends of \$375, travel, and dependency allowances for 22 teachers.

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.

All students must make a reservation for the session not later than June 1. Students in the Twin Cities should present their Request for Reservation found on the back cover of the *Bulletin of the Biology Session* to 135 Johnston Hall, Minneapolis Campus, or to 220 Coffey Hall, St. Paul Campus. Out-of-town students should mail the Request for Reservation to the Director of the Biology Session, 300 Coffey Hall, University of Min-

†† See section on Admission and Registration.

nesota, St. Paul 1. The necessary class reservation cards will be held with the reservation request for use by the student when he registers at the station.

Fees and Expenses

Registrations will be accepted during May and until June 18 if class space is available.

The following fees are payable by each registrant on or before June 18 and must be paid before registration is completed:

Tuition fee	\$100.00
Incidental fee	15.40
Laboratory fee	10.00
	\$125.40
Total fees for the term	\$125.40

Graduate students 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 \$43.40 tuition per term and the incidental fee.

Individuals holding the Ph.D. degree or its equivalent, pursuing research as independent investigators, will pay a Research Table fee of \$35.

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 \$105 for the 7 weeks. A charge of \$19.25 is made for room in the dormitories and cabins of the Biological Station and is to be paid to the director during the first week of the session.

Laboratory fee includes the use of microscopes, nets, boats, various class supplies, and accessories.

The estimated cost of \$249.65 for the 7-week session does not include traveling expenses, clothing, laundry, and minor incidental personal expenses.

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

June 19-21	\$ 3.00
June 24-28	5.00
Thereafter	10.00

No registration will be accepted after June 20 without the approval of the director in charge.

First Term

(Seven Weeks)

Botany (Bot)

112. **Aquatic Flowering Plants.** (6 cr; prereq 10 cr in botany or zoology, or #; WS) Ownbey
116. **Summer Flora of Minnesota.** (6 cr; prereq 10 cr in botany or zoology, or #; TF) Morley
136. **Organisms, Microclimate, and Weather.** (6 cr; prereq 10 cr in biology, botany or zoology...a course in physics recommended; MTh) Lawrence
155. **Fresh-water Algae.** (6 cr; prereq 10 cr in botany, biology, or zoology, or #; TF) Drouet
159. **Lichens.** (6 cr; prereq 10 cr in botany or zoology; WS) Hale
- 196.* **Problems in Ecology, Taxonomy, Bryology, or Algology.** (Cr ar; prereq #) Staff

- 208.° Research Problems in Taxonomy. (Cr ar; prereq #) Ownbey, Morley
224.° Research Problems in Ecology. (Cr ar; prereq #) Lawrence
236.° Research Problems in Cryptogams. (Cr ar; prereq #) Drouet, Hale

Entomology, Fisheries, and Wildlife (Ent)

59. Field Entomology. (6 cr; prereq Biol 2 or equiv; WS) Cook
124. The Biology of Immature Insects. (6 cr; prereq Biol 2 and Ent 52 or equiv or Δ ; WS) Cook
162. Vertebrate Ecology. (6 cr; prereq Bot 50 and Zool 65, or equiv; MTh) Tester, Marshall
196.° Special Problems in Entomology, Fisheries, and Wildlife. (Cr ar; prereq #) Cook, Marshall, Tester

Plant Pathology and Botany (PIPa)

56. Introduction to the Study of Fungi. (6 cr; prereq jr, sr, 9 cr in botany, or #; MTh) French
156. Study of Fungi for Advanced Students. (6 cr; prereq 9 cr in botany, or #; MTh) French
210.° Special Problems in Mycology. (Cr ar; prereq grad, Myc 107) French

Zoology (Zool)

72. Natural History of Invertebrates and Fishes. (6 cr; prereq Biol 2 or equiv; MTh) Schmid
115. Advanced Natural History of Invertebrates and Fishes. (6 cr; prereq 15 cr in zoology; MTh) Schmid
119. Limnology. (6 cr; prereq 15 cr in general biology incl Biol 2 or equiv; WS) Underhill
135. Field Ornithology. (6 cr; prereq 15 cr in zoology; TF) Warner
197.° Problems in Ornithology, Ecology, and Limnology. (Cr ar; prereq Biol 2 or equiv, and #) Underhill, Warner

SCHOOL OF BUSINESS ADMINISTRATION

Admission

For admission to the School of Business Administration a student must have satisfied the requirements as listed in one of the 2-year prebusiness courses in the College of Science, Literature, and the Arts or the Institute of Technology. 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.

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.

ACCOUNTING (Acct)

First Term

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; I MTWThF; CB 105) Staff
25. **Principles of Accounting.** (Continuation of Acct 24) (3 cr, §55B; prereq 24; II MTWThF; CB 105) Staff
- 55A. **Elementary Accounting.** The equivalent of Acct 24 (Principles of Accounting) for School of Business Administration students and for 5-year combined engineering and business students. (4 cr, §24; counts as Lower Division course when transferred to SLA; prereq soph [summer only]; II MTWThF and 2 hrs ar; VH 307) Davis
85. **Introduction to Accounting.** Accounting concepts and practices, their relationship to the law. Designed for law and prelaw students. Course runs for two terms; both terms needed for credit. (5 cr; 8:00-8:50 MTWThF; FraH 20) Berryman
- 105A. **Intermediate Accounting I.** Review of accounting processes, nature and measurement of business income, accounting treatment of inventories and plant assets. (3 cr; prereq 26 or equiv; II MTWThF; CB 245) Lund

- 155A. Introduction to Managerial Accounting.** (See Acct 55A) (3 cr, §24 or §55A; prereq grad or #; II MTWThF and 2 hrs ar; VH 307) Davis
- 185A. Advanced Accounting.** Consolidated statements, fiduciary and fund accounting, partnership accounting. (3 cr; prereq 105C or ¶105C; IV MTWThF; CB 245) Lund
- 295A. Readings in Accounting.** Special readings especially useful to student's individual program and objectives, but not available in regular course offerings. (Cr ar; prereq consent of adviser and #) Staff

Second Term

- 25. Principles of Accounting.** (See first term) (I MTWThF; CB 105) Gray
- 26. Principles of Accounting.** (3rd qtr—see Acct 24, first term) (3 cr, §55B; prereq 25; II MTWThF; CB 225) Gray
- 55B. Elementary Accounting.** (Combined course—continuation of Acct 55A) The equivalent of Acct 25-26 (Principles of Accounting) for School of Business Administration students and for 5-year combined engineering and business students. (4 cr, §25-26; to be counted as Lower Division course when transferred to SLA; prereq soph [summer only], 55A; II MTWThF and 2 hrs ar; VH 205) Bentley
- 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; I MTWThF; CB 245) Bentley
- 85. Introduction to Accounting.** (See first term) (8:00-8:50 MTWThF; FraH 20) Berryman
- 105B. Intermediate Accounting II.** Accounting treatment of cash, receivables, investments, intangible assets, and applications of actuarial mathematics. (3 cr; prereq 105A; III MTWThF; CB 245) Berryman
- 155B. Introduction to Managerial Accounting.** (Combined course—continuation of Acct 155A) (See Acct 55B) (3 cr, §25-26 or §55B; prereq grad or #, 155A; II MTWThF and 2 hrs ar; VH 205) Bentley
- 265A. Managerial Cost Accounting.** (See Acct 55C) (3 cr, §55C, §115A, §115B; prereq 26 or equiv; I MTWThF; CB 245) Bentley
- 295A. Readings in Accounting.** (See first term) Staff

BUSINESS FINANCE (BFin)

First Term

- 56. Corporation Finance.** Principles governing the planning, raising, and control of short and long term funds for a business enterprise. Cash-flow, valuation, capital structures, investment banking, dividend policy, mergers, and reorganization. (3 cr, §156; prereq Acct 26; not suggested for students who have had Acct 105B; I MTWThF; CB 245) Stevenson
- 116. Investments.** The nature of different types of securities and the characteristics of industrial, utility, and financial enterprises and various government units from the viewpoint of the individual investor. Security analysis and portfolio needs. (3 cr; prereq 56 or 156; III MTWThF; CB 245) Stevenson
- 156. Corporation Finance.** (See BFin 56) (3 cr, §56; prereq grad, Acct 155B or #; I MTWThF; CB 245) Stevenson

Second Term

56. **Corporation Finance.** (See first term) (I MTWThF; CB 415) J Nelson
76. **Financial Management.** Financial problems of business concerns presented in case materials. Application of principles to such situations as budgeting, short- and long-term funds needs, debt and equity choices, mergers, and reorganizations. (3 cr, §276; prereq 56 or Acct 105B or Acct 115B; III MTWThF; CB 415) J Nelson
156. **Corporation Finance.** (See first term) (I MTWThF; CB 415) J Nelson
276. **Financial Management.** (See BFin 76) (3 cr, §76; prereq 56 or 156; III MTWThF; CB 415) J Nelson

BUSINESS LAW (BLaw)

First Term

58. **Business Law: Contracts.** Law of contracts. Case method used. (3 cr, §158; prereq Econ 2 or equiv; I MTWThF; CB 205) Wright
158. **Business Law: Contracts.** (See BLaw 58) (3 cr, §58; prereq grad or #; I MTWThF; CB 205) Wright

ECONOMICS (Econ)

First Term

1. **Principles of Economics.** The principles underlying economic activity and the way these principles work out through our economic institutions. Demand and supply, competition and monopoly, and the distribution of income. Econ 1-2 or equivalent are prerequisite for most advanced courses in business administration and economics. (3 cr, †1-2, §1T, §C, §50A; prereq 3rd qtr fr)
- | | |
|--------------------------------|----------------------------------|
| Sec 1, I MTWThF, CB 145, Borak | Sec 3, III MTWThF, CB 125, Staff |
| Sec 2, I MTWThF, CB 125, Staff | Sec 4, IV MTWThF, CB 140, Staff |
2. **Principles of Economics.** (Continuation of Econ 1) National income, money and banking, business cycles, and international trade. (3 cr, †1-2, §2T, §C, §50B; prereq 1 or equiv)
- | | |
|--------------------------------|---------------------------------|
| Sec 1, I MTWThF, CB 240, Staff | Sec 2, II MTWThF, CB 125, Staff |
|--------------------------------|---------------------------------|
65. **Intermediate Economic Analysis I: The Firm and Industry.** Behavior of firms under competitive and monopolistic conditions; factors influencing the firm's decisions regarding production, output, and prices. (3 cr, §65T, §165; prereq 2 or equiv)
- | | |
|----------------------------------|----------------------------------|
| Sec 1, II MTWThF, CB 240, Foster | Sec 2, III MTWThF, CB 240, Hause |
|----------------------------------|----------------------------------|
66. **Intermediate Economic Analysis II: Income and Employment.** Determinants of national income, employment, and price level, with particular attention to aggregate consumption and investment. (3 cr, §66T, §166; prereq 2 or equiv or #; I MTWThF; CB 220) Hause
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 2 or equiv; IV MTWThF; CB 240) Williamson
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. Condensed course given especially for School of Business Administration students. (3 cr, §168, §178A-B; prereq 2 or equiv; II MTWThF; CB 220) Borak

- 103. Economic Development.** Conditions necessary for increasing income, capital formation, measurement of economic growth, and problems of "underdeveloped" areas. (3 cr; prereq 2 or #; III MTWThF; CB 220) Williamson
- 104. International Economics.** Principal issues involved in international economic relationships. Significance of foreign trade and investment, international payments and foreign exchange, the gold standard, the International Monetary Fund and Bank, and the arguments over tariffs and foreign aid policies. (3 cr; prereq 2 or equiv; IV MTWThF; CB 145) Foster
- 111. Elements of Statistics.** (See Department of Statistics in the College of Science, Literature, and the Arts)
- 165. Elements of Economic Analysis: Firm and Household.** Individual decision making by households and by firms under conditions of monopoly, competition, and monopolistic competition. (3 cr, §65; prereq grad, 2 or equiv or #)
 Sec 1, II MTWThF, CB 240, Foster Sec 2, III MTWThF, CB 240, Hause
- 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, 2 or equiv or #; I MTWThF; CB 220) Hause
- 185A. Price Theory.** Theories of choice as applied to consumers, firms, and resource owners, economic behavior in competitive and monopoly market situations. (3 cr; prereq 65 or 165; II MTWThF; CB 115) Staff
- 190. Readings in Economics.** Arranged to cover areas in economics useful to individual programs and objectives but not available in regular course offerings. (Cr ar; prereq consent of adviser and #) Staff
- 290. Graduate Research.** (Cr ar) Staff

Second Term

- 1. Principles of Economics.** (See first term)
 Sec 1, II MTWThF, CB 145, Staff Sec 2, IV MTWThF, CB 220, Staff
- 2. Principles of Economics.** (See first term)
 Sec 1, I MTWThF, CB 220, Staff Sec 3, III MTWThF, CB 125, Staff
 Sec 2, I MTWThF, CB 255, Staff
- 65. Intermediate Economic Analysis I: The Firm and Industry.** (See first term) (I MTWThF; CB 230) Galloway
- 66. Intermediate Economic Analysis II: Income and Employment.** (See first term)
 Sec 1, II MTWThF, CB 220, Mohring Sec 2, III MTWThF, CB 220, Ar
- 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; and purposes and effect of antitrust laws and laws relating to "unfair business practices." (3 cr, §169, 189A; prereq 65 or 165 for business or economics majors, suitable background in law or political science for others or #; IV MTWThF; CB 125) Mohring
- 80. Survey of Economic Ideas.** Economic thinking from Adam Smith to J. M. Keynes, with emphasis on impact of industrial revolution and business cycle on the formation of theory. (3 cr; prereq 2 or equiv) Iwand

- 102. Contemporary Labor Issues.** A synthesis of the contributions made by various disciplines to the analysis of important labor problem areas. Current labor issues will be examined in the light of their broader economic, legal, political, and social implications. (3 cr; prereq IR 52 or 152 or equiv or #; II MTWThF; CB 240) Galloway
- 165. Elements of Economic Analysis: Firm and Household.** (See first term) (I MTWThF; CB 230) Galloway
- 166. Elements of Economic Analysis: Income and Employment.** (See first term)
 Sec 1, II MTWThF, CB 220, Mohring Sec 2, III MTWThF, CB 220, Ar
- 176A. Theory of Employment, National Income, and the Price Level I.** Equilibrium values for real output, employment, price level, and rate of interest under specified assumptions regarding the demand for and supply of money, the demand for and supply of labor, technical conditions of production, and the investment and consumption functions. (3 cr; prereq 66 or 166; III MTWThF; CB 125) Staff
- 189A. Government Regulation of Market Behavior.** General restraints of trade, monopoly, standards of fair competition and regulation of entry into trades and professions. Regulation of public utility rates and services. Economics and legal analysis of federal regulation; state and local regulation. (3 cr, §69; prereq 165 or equiv or #; IV MTWThF; CB 125) Mohring
- 190. Readings in Economics.** (See first term) Staff
- 290. Graduate Research.** (See first term) Staff

INDUSTRIAL RELATIONS (IR)

First Term

- 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 associations, industrial unrest and conflict, employment and unemployment, wage problems. (3 cr, §152; prereq Econ 2 or equiv; I MTWThF; CB 155) Smythe
- 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 52 or 152; IV MTWThF; CB 155) Smythe
- 152. Principles of Industrial Relations: Labor Marketing.** (See IR 52) (3 cr, §52; prereq grad or #, Econ 2 or equiv; I MTWThF; CB 155) Smythe
- 172. Principles of Industrial Relations: Manpower Management.** (See IR 72) (3 cr, §72; prereq 52 or 152; IV MTWThF; CB 155) Smythe
- 182A. Intermediate Labor Marketing.** Advanced labor marketing concepts, structures, and processes. Sources of information and different approaches to the study, analysis, and resolution of problems in the labor market. (3 cr; prereq 52 or 152; II MTWThF; BA 468) Mahoney
- 222. Compensation Theory.** Analysis and evaluation of traditional economic wage theories; research findings in wage and salary determination and compensation levels and relationships; development of modifications of wage theory appropriate to application in industrial relations. (3 cr; prereq 152, 172 or equiv; III MTWThF; BA 468) Mahoney

Second Term

- 52. Systems of Industrial Relations: Labor Marketing.** (See first term) (II MTWThF; CB 125) Smythe
- 152. Principles of Industrial Relations: Labor Marketing.** (See first term) (II MTWThF; CB 125) Smythe
- 202. Organization and Staffing.** Translation of organization goals and objectives to specific manpower goals and objectives, and staffing to meet the organization's manpower needs. Techniques for recruitment, selection, and assignment of manpower resources for optimal utilization. (3 cr; prereq 72 or 172; III MTWThF; BA 468) England
- 362. Seminar in Manpower Management.** (3 cr; prereq 182B; VI-VII TW; BA 468) Yoder

INSURANCE (Ins)

First Term

- 53. Risk Management and Insurance.** Recognition, measurement and evaluation of insurable personal, property, and liability risks of economic units. Tools of risk management; assumption, loss prevention, transfer, and others with emphasis on insurance. Design and implementation of the optimum risk management program. Government regulation of insurance. (3 cr, §153; prereq Econ 2 or equiv; II MTWThF; CB 255) Williams
- 93. Property and Liability Insurance I.** Nature and relative importance of insurable property and liability risks; analysis of property and liability insurance contracts; insurance surveys—optimum property and liability insurance programs. (3 cr, §223; prereq 53; IV MTWThF; CB 220) Williams
- 153. Risk Management and Insurance.** (See Ins 53) (3 cr, §53; prereq grad or #, Econ 2; II MTWThF; CB 255) Williams
- 223. Property and Liability Insurance I.** (See Ins 93) (3 cr, §93; prereq 153; IV MTWThF; CB 220) Williams

MANAGEMENT (Mgmt)

First Term

- 60. Business Policy and Management Control.** Managerial authority and responsibilities, organizational relationships, and effective executive action. Managerial problems of policy formulation involving decisions based upon a knowledge of all the major functions in the firm. (3 cr, §260; prereq 3rd qtr sr)

Sec 1, III MTWThF, CB 415, Doty

Sec 2, V MTWThF, CB 415, Doty

- 150A. Fundamentals of Management.** A first course in management at the graduate level covering functions of the manager: planning, organization, staffing, direction, and control. A consideration of activities, problems, and common remedies under each of these functional headings. Includes some case analysis designed to bring out specific points and develop insights into management problems. (3 cr, §old 70, §old 160, §old 170; prereq grad or #; I MTWThF; BA 837) Glaskowsky

Second Term

- 60. Business Policy and Management Control.** (See first term) (II MTWThF; CB 415) Glaskowsky

- 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; prereq sr; I MTWThF; CB 240) Glaskowsky
- 260. Policy Formulation and Administration.** An integrating course in the area of policy formulation and administration. Emphasis is on the duties and responsibilities of top management in establishing objectives and in co-ordinating interdepartmental policies and activities. The student must draw on his knowledge of marketing, production, finance, accounting, personnel, statistics, and other related fields in his solving of organization-wide administrative problems. (3 cr; prereq 2nd yr grad or equiv; II MTWThF; CB 415) Glaskowsky

MARKETING (Mktg)

First Term

- 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; IV MTWThF; CB 110) Rudelius
- 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 51, 57; II MTWThF; CB 110) Rudelius
- 157. Marketing Fundamentals.** (See Mktg 57) (3 cr, §57; prereq grad or #, Econ 2 or equiv; IV MTWThF; CB 110) Harper
- 187. Price Policy.** Selected topics on managerial and economic problems concerning market price and price policy. Methods by which goods and services are priced on industrial and consumer markets. Price behavior, administered pricing, price leadership, price lining, and government intervention. (3 cr; prereq 57; III MTWThF; CB 110) Harper
- 217. Market Analysis and Research.** (See Mktg 97) (3 cr, §97; prereq 51 or 151 and 57 or 157; II MTWThF; CB 110) Rudelius

Second Term

- 57. Principles of Marketing.** (See first term) (IV MTWThF; CB 245) Lewis
- 117. Sales Management I.** Sales policies and planning, sales organization, selection, training and compensation of salesmen, control of sales performance, sales budgets, and cost control. Case materials. (3 cr, §237; prereq 57; II MTWThF; BA 837) Lewis
- 237. Sales Management.** (See Mktg 117) (3 cr, §117; prereq 57; II MTWThF; BA 837) Lewis

PRODUCTION (Prod)

First Term

- 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 or equiv; II MTWThF; CB 155) Glaskowsky

Second Term

50. **Production Management.** (See first term) (V MTWThF; CB 220) R Vergin

QUANTITATIVE ANALYSIS (QA)

First Term

5. **Elements of Statistics.** Sources and collection of data; tabular and graphic presentation; frequency distributions; probability; sampling; introduction to statistical estimation and decision-making. (4 cr, §151, §Soc 45, §Psy 70; prereq Math 10 or equiv; III MTWThF; VH 207) Willis
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 415) Willis
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; prereq QA 5, Math 10 or equiv; Lect I MTWThF; VH 207) Davis

Sec 1, VI-VII T, VH 2, Davis

Sec 2, VII-VIII W, VH 2, Davis

Second Term

5. **Elements of Statistics.** (See first term) (II MTWThF; CB 255) Kozelka
51. **Business Statistics.** (See first term) (I MTWThF; CB 255) Kozelka

TRANSPORTATION (Tran)

First Term

54. **Transportation I: Principles.** Roles, interests, and relationships of users of the service, carriers, and regulatory agencies in the transportation field; national transportation policy approach. Organization of the transportation industry and administration of the transportation function by users of the service in their business activities. Economic aspects of railway, highway, pipeline, water, and air transportation. Current transportation problems; national transportation policy. (3 cr, §154; prereq Econ 2 or equiv; III MTWThF; CB 435) Nightingale
154. **Transportation I: Principles.** (See Tran 54) (3 cr, §54; prereq grad or #, Econ 2 or equiv; III MTWThF; CB 435) Nightingale
- 184B. **International Transportation: Water and Air.** Economic aspects. Overseas trade routes and shipping services. The American Merchant Marine: operation, management, and finance of American shipping. Regulatory policies and problems; Federal Maritime Board and Federal Maritime Administration. International air routes and services; national policy; operation, management, and finance of American overseas air carriers. Economic regulation and problems, including competition; Civil Aeronautics Board. International agreements and conventions among governments and among carriers. (3 cr; prereq 54 or 154; V MTWThF; BA 837) Nightingale

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: Bartholdi, Clark, Gorlin, Hall, Hampel, Holland, Holte, Jensen, Meyer, Morstad, Petersen, Serr, Wakely, Wittich, Yock.

Dentistry fees during the summer quarter are: full-time tuition, resident \$145, nonresident \$300; 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 \$22.

COLLEGE OF EDUCATION

Students should note that under the division headings, Curriculum and Instruction, Educational Administration, Educational Psychology, and Methods and Student Teaching, the courses are grouped for those interested in elementary, secondary, and higher education. Under each of the four divisions, courses of general interest are listed *General Courses*; these are followed by the 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 make application for admission nor 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. Adult special students are *not* regular degree candidates.

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 in elementary and secondary education listed in the following pages may be used for *renewal of teaching certificates*. Former teachers re-entering the profession should consult the advisers in elementary or secondary education or the dean's office, College of Education, 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.

Workshops

Graduate Credit for Workshops—The amount of graduate credit in workshops which may be used on a Master's degree program is limited. Graduate students planning to register for any workshop should consult their advisers concerning the possibility of using credit for the workshop in their graduate programs.

Workshops in Higher Education—Two workshops in higher education will be jointly sponsored by the College of Education and the North Central Association of Colleges and Secondary Schools. In the first term, the workshop will be scheduled from June 17 to July 13, primarily for staff members from liberal arts colleges. The

second term workshop, scheduled from July 22 to August 16, will be concerned with problems of teacher education. Applicants for either workshop should write to Dean of the College of Education, 204 Burton Hall, University of Minnesota, Minneapolis 14. (See EdCI 228)

Workshops in Industrial Education—Two workshops are scheduled for first term, one on teaching electricity and electronics, and the other on leadership development for industrial educators. (See Ind 136)

Workshop in Music Education—A second term workshop for music teachers will deal with a cappella and accompanied choral and vocal ensemble work in the senior high schools. (See MuEd 110)

Workshop for School Administrators—A first term workshop for elementary and secondary school plans is listed under EdAd 239. It will emphasize decision-making through the use of simulation techniques. Registration is limited and advance application is urged.

Workshop in Economic Education—In the second term, two workshops will assist selected groups of teachers to develop economic education materials and syllabi. The first (July 22 to August 3) is planned for teachers of world history; and the second (July 22 to August 3) is offered for teachers of occupational relations. (See EdCI 164A-B).

Student Teaching

Student teaching during summer terms is open only to certain groups of students completing programs in the College of Education: (a) regularly approved applicants for student teaching in nursing and 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 28 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.

Summer Demonstration High School

The University High school, grades 7 to 12, will be in session in Peik Hall during the first term. Instruction will be offered in art, the language arts, mathematics, social studies, science, speech, and typing. Remedial work in reading and mathematics will be provided for individuals and groups. The summer program emphasizes both remedial instruction and the enrichment of the student's background.

Admission to the University High School Summer Session is open to any pupil of normal high 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 14.

Students registered in student teaching will be assigned to observation and student teaching in the classes of the high school. The facilities of the high school are available to college classes for demonstration purposes. (I, II, III, IV MTWThF)

Summer Demonstration Elementary School

An elementary school, grades 1 to 6 inclusive, will be in operation during first term. A special resource classroom for blind children will be conducted. The school will be staffed by the principal and teachers of the Tuttle School which is used as the demonstration elementary school of the College of Education under a co-operative

agreement with the Board of Education of the City of Minneapolis. The school may be observed by students of elementary school 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 S.E.)

Psycho-Educational Clinic

The Psycho-Educational Clinic will be in operation during both terms for 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 (9:30 to 11:30 a.m.), 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 151. Information may be obtained from the Director, Psycho-Educational Clinic, Pattee Hall, University of Minnesota, Minneapolis 14.

Preschool

The Institute of Child Development maintains a preschool in the first term, available for demonstration and observation. Courses offered by the institute are given for teachers wishing nursery school training and others interested in child development.

Detailed Description of Courses

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

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) a B average 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. The battery of tests for entering students should be taken during the first term of registration, and dates will be announced in graduate classes and in the Official Daily Bulletin.

AGRICULTURAL EDUCATION (AgEd)

First Term

121. **Enterprise Analysis.** Analyzing the farm business as a basis for identifying problems. Planning learning experiences to improve farm management at the high school, young farmer, and adult levels. (3 cr; prereq #: 9:30-11:20 MTWThF first 3 wks; ar second 2 wks; Hr 301) Teske
171. **Procedures in Teaching Agriculture.** New developments in methodology of teaching agriculture; to assess innovations and procedures. Includes consideration of various levels of instruction. (3 cr; prereq #: 9:30-11:20 MTWThF first 3 wks; ar second 2 wks; Hr 102) Taylor

221. **Field Problems.** Making investigations, gathering data, and formulating plans regarding agricultural education. (3 cr; ar) Peterson, Swanson, Marvin
- 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, Swanson, Marvin

Second Term

221. **Field Problems.** (See first term) Peterson, Swanson, Marvin
- 232.° **Research in Agricultural Education.** (See first term) Peterson, Swanson, Marvin

ART EDUCATION (ArEd)

The Department of Art Education offers professional training and guidance for teaching and supervisory positions in the field of art. Art education provides opportunities to combine a creative art career with a teaching position, a combination popular with many outstanding contemporary artists.

During Summer Session the department places a strong emphasis on nonspecialist courses for elementary and secondary teachers who plan to integrate art with other subjects. For art education majors the summer program emphasizes graduate work toward advanced degrees.

See also Department of Art, College of Science, Literature, and the Arts.

First Term

18. **Design Activities for Elementary Education.** Relationships between art and nature. Problems in invention, arrangement and decoration, color, lettering, posters, bulletin board displays, etc. (Limited to 40) (3 cr; I-II MTWThF; WuH 240) Olson
19. **Functional Arts and Crafts in Elementary Education.** Influence of art on modern life. Typical opportunities for integrated experiences. Clothing, architecture and interior design, community planning, commercial and industrial design, puppetry, dramatics, intercultural relations, holiday projects, etc. (Limited to 35) (3 cr; III-IV MTWThF; WuH 210) Olson
53. **Introduction to Weaving.** Equipment, design, setting up and operation of table and floor looms. (Limited to 22) (3 cr; III-IV MTWThF; WuH 340) Smits
80. **Contemporary Crafts.** Basic materials, equipment, design criteria and techniques for textile, wood, metal, and ceramics. Contemporary emphasis for application to educational programs in elementary and secondary schools, adult education, special education, recreation, and occupational therapy. (Each section limited to 30) (3 cr) Bujnowski
 Sec 1, II-III MTWThF, WuH 110 Sec 2, IV-V MTWThF, WuH 110 and 120
 and 120
151. **Curriculum Building in Art Education.** Selection, evaluation, and organization of material for teaching units and projects. (Limited to 35) (3 cr; III MTWThF; WuH 130) Hastie
156. **Intercultural Education Through Art.** Approaches to international understanding and co-operation through recognition of aesthetic contributions of diverse peoples to American life. (3 cr; II MTWThF; WuH 220) Gayne
184. **Improving Art Programs in the Elementary School.** Evaluation and utilization of research findings and introduction of new materials. Development of closer co-operation between classroom teachers and art education specialists. (Limited to 40) (3 cr; prereq tchg exper or #; IV MTWThF; WuH 220) Gayne

185. **Improving Art Programs in the Secondary School.** For experienced teachers of art and advanced students; general research and critical examination of art programs. (3 cr; prereq tcbg exper or #; V MTWThF; WuH 130) Hastie
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 special consent of major adviser; ar) Gayne, Hastie
296. **Seminar: Art Education.** Reports, evaluation of problems, recent literature. Participation by art education staff and guest specialists from related departments and from off campus. (1 cr; VI Th; WuH 130) Gayne and staff

Second Term

17. **Pictorial Expression for Elementary Education.** Survey of art in life and education. Materials, techniques, and ideas important to children's art expression, relationship to adult expression, and significance in educational growth. (Limited to 40) (3 cr; III-IV MTWThF; WuH 240) Ragouzis
18. **Design Activities for Elementary Education.** Relationships between art and nature. Problems in invention, arrangement and decoration, color, lettering, posters, bulletin board display. (Limited to 40) (3 cr; I-II MTWThF; WuH 210) Ragouzis
84. **Teaching Art in the Elementary School.** Place and content of art in elementary school curriculum. (Limited to 40) (3 cr; prereq 6 cr from 17, 18, or 19; IV MTWThF; WuH 120) Hegg

INSTITUTE OF CHILD DEVELOPMENT (CD)

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, and the Child Development Clinic for the training of students in clinical work with children.

Nursery School

The Nursery School will be in session from 8:30 to 12:00 noon, beginning June 18 and closing July 19. Applications for the enrollment of children will be received at the office of the institute. Tuition is \$35 for the term. Parents are responsible for the transportation of their children to and from the school.

Child Development Clinic

The Child Development Clinic will operate during the first term of Summer Session. The clinic is open to parents seeking guidance concerning children's problems of adjustment.

First Term

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; IV MTWThF; CD 218) Odom
132. **Adolescent Development.** Physical, personal, and social changes occurring during adolescent years. (3 cr; prereq sr, 12 cr in psychology, educational psychology, sociology, or home economics; III MTWThF; CD 218) Hickman
140. **Behavior Problems.** Types, origin, development, and treatment of behavior difficulties in normal children. (3 cr; prereq 80 or equiv; I MTWThF; CD 218) Harper

143. **Problems of Mental Deficiency.** Diagnosis, care, training; social and vocational problems. (3 cr; prereq 80 or equiv; II MTWThF; CD 226) Barnard
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 development; III MTWThF; Pt 202) Barnard
180. **Personality Development.** Origins of personality in personal and interpersonal behavior. Theories of personality and adjustment. (3 cr; prereq 80; II MTWThF; CD 218) Wright
181. **Social Development.** Group formation and organization; social interaction and social relations; developmental changes. (3 cr; prereq 80; VI MTWThF; CD 226) Moore
250. **Practicum: Clinical Child Psychology.** Supervised experience in the use of diagnostic and remedial procedures to children's behavior problems. (Cr and hrs ar; prereq #) Duker, Ruebush
- 270.* **Readings and Research in Child Development.** Reports based on independent readings, research or projects in any field pertaining to child development or childhood education that meet the approval of the instructor. (Cr and hrs ar; required for M.A. Plan B students; prereq Δ) Staff

Second Term

80. **Child Psychology.** (See first term) (IV MTWThF; CD 218) Charlesworth
132. **Adolescent Development.** (See first term) (I MTWThF; CD 218) Hickman
140. **Behavior Problems.** (See first term) (III MTWThF; CD 218) Hoving
179. **Clinical Procedures with Children.** (See first term) (II MTWThF; CD 218) Duker
180. **Personality Development.** (See first term) (I MTWThF; CD 226) Wright
186. **Cognitive Development.** Development of thinking in children; theories of cognitive development; concept formation, problem solving and reasoning. (3 cr; prereq 80; II MTWThF; CD 226) Charlesworth
- 270.* **Readings and Research in Child Development.** (See first term) Staff

CURRICULUM AND INSTRUCTION (EdCI)

First Term

GENERAL COURSES

105. **Audio-Visual Materials in Education.** (3 cr; prereq sr; I MTWTh and 1 hr lab ar; NH 211) Pearson
107. **Radio and Television in Education.** Production, techniques of classroom use, selection of equipment, teaching appreciation, and the administration of radio and television in the schools. (Limited to 30) (3 cr; prereq 9 cr in education; III MTWThF; NH 211) Pearson
115. **Introduction to Education of Visually Handicapped Children.** Educational programs, services, and resources for blind and partially seeing children; exploration of historical background, philosophy, sociological, and psychological problems. (3 cr; prereq #; IV MTWThF; Tuttle School) Sibert

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; Tuttle School) Jenkins
117. **Braille II.** Development of classroom materials involving literary Braille code; mastery of Nemeth code of mathematics; opportunity for mastery of music code; consideration of newer approaches in setting up text and reference materials. (3 cr; prereq 116; 1:00-2:30; Tuttle School) Martin
126. **Orientation and Mobility for Blind Children.** (June 24-July 19) 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 forms write to Miss Jeanne R. Kenmore, 15A Pattee Hall, University of Minnesota, Minneapolis 14. (Limited to 20) (6 cr; prereq #; II-III and VII-VIII MTWThF; A 112) Kenmore
127. **Methods of Teaching School Subjects to the Hearing Impaired.** Adaptation of materials and teaching methods suitable in such areas as reading, arithmetic, social studies, and science. (3 cr; prereq Spch 127 or #; II MTWThF; JohH 114) Houchins
128. **Introduction to the Education of Hearing-Impaired Children.** Educational programs, services, and resources for hearing-impaired individuals; historical background; philosophy; sociological and psychological problems. (3 cr; prereq #; IV MTWThF; JohH 114) Houchins
145. **Reading Difficulties.** (3 cr; prereq 143 or 144 or equiv; IV MTWThF; Bu 120) Bond
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; CD 226) Wesenberg
- 174-175-176. **Clinical Methods and Practice in Speech Pathology.** (3 cr each; prereq #; ar) 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. Consideration of vision screening, visual efficiency, aids. Field trips, films, observations. (3 cr; prereq #; 8:00-8:50 MTWThF; Tuttle School) Kantar, Sibert
182. **Education of Partially Seeing Children.** Principles of preparation, selection, and effective use of instructional materials for the partially seeing child; adaptation of school environment. (3 cr; prereq 115 and 118, #; 9:30-11:00 MTWThF plus observation; Tuttle School) Sibert
- 201.* **Problems: Teaching Social Studies.** Individual research. (Cr and hrs ar; prereq 102, 155, or 168, 204 or #) Rogers, Gardner
- 205.* **Problems: Audio-Visual Education.** (Cr and hrs ar; prereq #) Pearson
- 271.* **Problems: Curriculum Construction.** (Cr and hrs ar; prereq #) Birkmaier, Boeck, Bond, Goossen, Chase, Curtin, Odland, Rogers, Woods, Gardner, Ziebarth
- 273.* **Problems: Reading.** (Cr ar; prereq 143 or 144, or #; V T; Bu 103) Bond, Balow, Chase, Kegler, Odland

ELEMENTARY EDUCATION

60. **Teaching Reading in the Elementary School.** (3 cr; prereq Ed 75A; III MTWThF; Bu 211) Odland

61. **Teaching Social Studies in the Elementary School.** (3 cr; prereq Ed 75B; IV MTWThF; NH 207) Rogers
62. **Teaching Mathematics in the Elementary School.** (3 cr; prereq Ed 75A, Math 5; IV MTWThF; Bu 123) Jackson
63. **Children's Literature.** (3 cr; III MTWThF; Bu 120) Peltola
64. **Teaching English in the Elementary School.** (3 cr; prereq Ed 75A; II MTWThF; WuH 230) Dykstra
65. **Teaching Science in the Elementary School.** (3 cr; prereq Ed 75A, 10 cr in natural science; II MTWThF; JohH 113) Jackson
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; Bu 123) 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; prereq sr, Ed 75B or tchg exper; III MTWThF; Bu 123) Goossen
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 #; 9:30-11:00 MTWThF; Tuttle School) Martin
119. **Elementary School Curriculum.** (3 cr; prereq Ed 75B or equiv; IV MTWThF; Bu 211) Coossen
121. **Literature for the Elementary School.** (3 cr; I MTWThF; Bu 120) Odland
143. **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; prereq 9 cr in education; III MTWThF; WuH 230) Bond
149. **Teaching and Supervision of Mathematics in Elementary School.** (3 cr; prereq 9 cr in education; II MTWThF; Pt 202) Stochl
150. **Supervision and Improvement of Instruction.** (3 cr; prereq 9 cr in education; III MTWThF; JohH 114) Curtin
153. **Teaching and Supervision of English in the Elementary Schools.** (3 cr; prereq Ed 75B or equiv; III MTWThF; NH 209) Chase
163. **Plastic Materials, Story Telling, and Social Studies for Young Children.** (3 cr; open to experienced teachers and others by #; VI MWF and hrs ar; CD 105) Headley
- 165A. **Arithmetic for Gifted Children.** Psychology of giftedness in general mathematics; social aspects. Development of creative thinking in children; discovery, generalization, analogy, and abstraction; laws of arithmetic, elementary theory of numbers, geometric intuition, combinatorics, and probability. Source material for teachers; pedagogical procedures. (3 cr; IV MTWThF; Pt 202) Stochl
166. **Current Trends, Kindergarten Education.** Continuing needs of children in our changing culture; current kindergarten practices and recent research. (3 cr; prereq tchg exper primary, kindergarten, or nursery school or #; IV MTWThF; CD 105) Headley

- 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 course must carry at least one other course in the College of Education. (2 cr; experienced teachers only; observation 4 hrs per wk ar MTWThF, Tuttle School; lect VI TTh, Bu 123) Arthur Jensen
- 261.* Problems: Improvement of Instruction.** (Cr and hrs ar; prereq #) Bond, Goossen, Curtin, Rogers, Stochl

SECONDARY EDUCATION

- 101. Driver Education.** Materials and methods for driver education; building a plan for driver education for a specific school; behind-the-wheel training. Valid Minnesota driver's license required. Content planned to meet requirements of State Department of Education for driver education in the schools. (Limited to 32) (3 cr; prereq Δ ; VI-VII MTWThF; ForH 85) Gebhard
- 113. High School Curriculum.** (3 cr; prereq Ed 55B or equiv; III MTWThF; PeikH 175) Woods
- 120. Education of Blind Students in Secondary Schools.** Adaptation of curriculum of junior-senior high school for blind students. Preparation of educational materials. Reader service, orientation and mobility, specialized equipment; utilization of guidance and counseling services, local, state, and national resources. (3 cr; prereq 115, 116, 118, and #; 8:00-8:50 MTWThF; Tuttle School) Kenmore
- 122. Literature for Adolescents.** (3 cr; prereq Ed 55B or junior-senior high school tchg exper; II MTWThF; PeikH 275) Kegler, Kemp
- 124. Foundations of Career Development.** Vocational theory and career development research; occupational analysis and industrial structure; various methods of classifying the world of work; labor force and employment trends; basic concepts for effective work in educational and vocational planning and development. (3 cr; I MTWThF; Bu 125) Rank
- 132. Teaching the Basic Business Subjects.** Recent trends and developments. (3 cr; I MTWThF; Bu 103) Price
- 136. Organization and Administration of Distributive Education.** Basic course for teacher-coordinators and vocational administrators. (3 cr; II MTWThF; Bu 103) Meyer
- 139. Co-ordination Techniques.** Problems of co-ordinators in the co-operative part-time program. (3 cr; IV MTWThF; Bu 103) Meyer
- 142. Business and Distributive Programs for Adults.** Selection and training of evening school instructors. (3 cr; I MTWThF; TNCD 113) Ar
- 144. Teaching Reading in Secondary Schools.** (3 cr; prereq 9 cr in education; I MTWThF; JohH 122) Chase
- 158. Materials and Methods in Office and Clerical Practice.** Recent research and developments. (3 cr; III MTWThF; Bu 103) Price
- 164C.†† Workshop, Economic Education.** For teachers of high school economics. (Limited to 15) (6 cr; prereq #; hrs ar; BA 1130) Smith, Warmke
- 168A. Methods and Materials for Teaching American History.** Techniques, course organization, evaluation of materials, the teaching of history skills; development of

†† 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.

- teaching units for senior and junior high schools. (3 cr; prereq ¶Hist 152, #; IV MTWThF; PeikH 155) Gardner
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; II MTWThF; FolH 206) Scott
185. **Advanced Course in the Teaching of Modern Languages.** New curriculums, classroom procedures; use of language laboratory and other mediums and evaluation techniques. Open to teachers of modern languages and registrants in language institutes. (3 cr; IV MTWThF; PeikH 215) Birkmaier
190. **Current Developments in Secondary School Science Teaching.** Curriculums, methods, materials of instruction, evaluation. (3 cr; prereq EdT 68B-C or 68M, equiv undergrad courses or exper in science tchg; III MTWThF; PeikH 355) Boeck
191. **Advanced Teaching and Supervision of Secondary Mathematics.** Present practices in methods, materials, and curriculum developments. (3 cr; IV MTWThF; PeikH 315) Ziebarth
195. **Current Development and Curriculum Construction in English.** Analysis and evaluation of curriculums and trends; emphasis on articulation. (3 cr; prereq EdT 75C or D or equiv; III MTWThF; PeikH 275) Kegler
- 195A. **Current Developments and Curriculum Construction in English—Project English.** Special curriculum and course of study projects related to Project English; development of units and materials; planning for subsequent experimental use. (3 cr; limited to Project English Institute personnel; IV MTWThF; PeikH 275) D Smith, Kegler
- 199E. **Internship: Recreation Leadership.** (Cr and hrs ar; available for master of education students in recreation) Fitzgerald
- 225.* **Problems: Secondary School Supervision.** (Cr ar; prereq #; VII-VIII W; PeikH 145) Keller, Woods
237. **Seminar: Business and Distributive Education.** (No cr; prereq #; ar) Price, Meyer, Warmke
- 238.* **Problems: Distributive Education.** (Cr and hrs ar; prereq #) Meyer
- 239.* **Problems: Business Education.** (Cr and hrs ar; prereq #) Price, Warmke
266. **Supervision of High School Instruction.** (3 cr; prereq EPsy 193, 293, or #; IV MTWThF; PeikH 175) Woods
- 287.* **Research Foundations of Secondary School Science Teaching.** Research in science education with implications for improvement of instruction in junior and senior high schools. (3 cr; I MTWThF; PeikH 355) Boeck
- 296.* **Problems: Teaching English.** (Cr and hrs ar) Kegler

HIGHER EDUCATION

- 228.*†† **Workshop: Problems of Higher Education and Teacher Education.** (6 cr; hrs ar MTWThF; June 17-July 12; ar) Paul Jenson, Eckert, and consultants
250. **Higher Education in the United States.** (3 cr; prereq yr grad study in any field or 18 cr in education; VI MTWThF; Bu 125) Eckert

†† 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.

Second Term

GENERAL COURSES

105. **Audio-Visual Materials in Education.** (See first term) (I MTWThF and 1 hr lab ar; NH 211) Pearson
106. **Co-ordinating an Audio-Visual Education Program.** Criteria of equipment, facilities, and materials, in-service training of teachers, and special problems encountered in small and large systems. (3 cr; prereq 105 or #; III MTWThF; WeH 206) Pearson
108. **Nonprojected Audio-Visual Materials and Equipment Laboratory.** Planning and making nonprojected materials for audio-visual education; use of materials and equipment. (Each section limited to 30) (3 cr; prereq 105 or ¶105; IV MTWThF; NH 207) Alton Jensen
- Sec 1, VI MW, NH 207
- Sec 2, VI TTh, NH 207
145. **Reading Difficulties.** (See first term) (I MTWThF; Bu 211) Wesenberg
- 201.° **Problems: Teaching Social Studies.** (See first term) Rogers, Gardner
- 205.° **Problems: Audio-Visual Education.** (See first term) Pearson
- 271.° **Problems: Curriculum Construction.** (See first term) Clymer, Goossen, Curtin, Rogers, Woods, Gardner, Ziebarth
- 273.° **Problems: Reading.** (See first term) (V T; Bu 103) Clymer, Balow, Odland

ELEMENTARY EDUCATION

61. **Teaching Social Studies in the Elementary School.** (See first term) (I MTWThF; Bu 123) Rogers
62. **Teaching Mathematics in the Elementary School.** (See first term) (II MTWThF; Pt 202) Jackson
63. **Children's Literature.** (See first term) (I MTWThF; Bu 120) Peltola
102. **Teaching Social Studies in the Elementary School.** (See first term) (III MTWThF; Psy 109) Rogers
103. **Teaching Science in the Elementary School.** (See first term) (III MTWThF; Bu 123) Goossen
119. **Elementary School Curriculum.** (See first term) (II MTWThF; NH 216) Goossen
143. **Teaching and Supervision of Reading in the Elementary School.** (See first term) (IV MTWThF; Bu 120) Clymer
149. **Teaching and Supervision of Mathematics in the Elementary School.** (See first term) (IV MTWThF; Pt 202) Stochl
150. **Supervision and Improvement of Instruction.** (See first term) (III MTWThF; Bu 103) Curtin
153. **Teaching and Supervision of English in the Elementary Schools.** (See first term) (I MTWThF; NH 207) Dykstra
- 261.° **Problems: Improvement of Instruction.** (See first term) Clymer, Goossen, Curtin, Rogers, Stochl
263. **Research in Mathematics Instruction in the Elementary School.** Consideration of needed research and problems in research design. (3 cr; II MTWThF; Psy 109) Stochl

SECONDARY EDUCATION

113. **High School Curriculum.** (See first term) (III MTWThF; Bu 211) Woods
122. **Literature for Adolescents.** (See first term) (I MTWThF; PeikH 175) Kegler, Kemp
125. **Occupational Information Laboratory.** (3 cr; prereq #; III MTWThF; P 110) Borow
131. **Advanced Teaching of Technical Business Subjects.** Recent research and trends. (3 cr; IV MTWThF; Bu 103) Price
144. **Teaching Reading in Secondary Schools.** (See first term) (II MTWThF; PeikH 175) Kegler
155. **Materials Laboratory for Social Studies Teachers.** Printed and audio-visual material useful in social studies classes. (3 cr; prereq #; III MTWThF; PeikH 145) Gardner
156. **Trends in Business Education.** (3 cr; II MTWThF; Bu 103) Price
- 164A.†† **Workshop: Economic Education.** (July 22-August 3) For teachers of world history. Developing economic education materials and syllabi. (Limited to 35) (3 cr; II-IV MTWThF; CB 105) Warmke
- 164B.†† **Workshop: Economic Education.** (July 22-August 3) For teachers of occupational relations. Developing economic education materials and syllabi. (Limited to 15) (3 cr; VI-VIII MTWThF; BA 1130) Warmke
168. **Current Developments in the Social Studies.** (3 cr; IV MTWThF; PeikH 145) Gardner
- 199E. **Internship: Recreation Leadership.** (See first term) Fitzgerald
- 225.* **Problems: Secondary School Supervision.** (See first term) (VII-VIII W; PeikH 145) Woods
237. **Seminar: Business and Distributive Education.** (See first term) Price, Warmke
- 238.* **Problems: Distributive Education.** (See first term) Meyer
- 239.* **Problems: Business Education.** (See first term) Price, Warmke
266. **Supervision of High School Instruction.** (See first term) (IV MTWThF; PeikH 175) Woods
- 296.* **Problems: Teaching English.** (See first term) Kegler

HIGHER EDUCATION

- 228.*†† **Workshop: Problems of Higher Education and Teacher Education.** (See first term) (6 cr; hrs ar MTWThF, July 29-August 23; ar) Mork, Troyer, Woestehoff, and consultants

GENERAL EDUCATION (Ed)

First Term

- 55A. **Introduction to Secondary School Teaching.** Open only to 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 15, in order to allow time for tests, interviews, and

†† 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.

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 to student teaching in the fall. (Each section limited to 30) (5 cr; prereq Psy 2; lect I MTWThF; WuH 230) Gardner, Randleman

Sec 1, II MTWThF, PeikH 175,
Randleman

Sec 3, III MTWThF, PeikH 385, Olstad
Sec 4, III MTWThF, PeikH 315, Ziebarth

Sec 2, II MTWThF, PeikH 385,
Olstad

75A. Introduction to Elementary School Teaching. Limited to students accepted for the Bachelor's degree program 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 15, in order to allow time for tests, interviews, and approval by the major department. (Limited to 80) (5 cr; prereq Psy 2, Δ ; II-III MTWThF; AH 150 and AH 101) Dykstra, R Johnson, Mitchell

Second Term

75B. 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. (Each section limited to 30) (5 cr; prereq 55A, $\#$; lect I MTWThF; WuH 230) Olstad, Randleman

Sec 1, II MTWThF, PeikH 385,
Olstad

Sec 3, III MTWThF, PeikH 385, Randleman
Sec 4, III MTWThF, PeikH 315, Ziebarth

Sec 2, II MTWThF, PeikH 315,
Ziebarth

75B. Introduction to Elementary School Teaching. Open only to students accepted for the elementary education major in the College of Education who have completed Ed 75A first term or previously. (Limited to 80) (5 cr; prereq 75A; I-II MTWThF; Arch 35 and Arch 45) Dykstra, R Johnson, Mitchell

EDUCATIONAL ADMINISTRATION (EdAd)

First Term

GENERAL COURSES

- 201. Foundations in Educational Administration.** Foundation for all students preparing for public school administrative positions. Aspects of administration relating to co-ordination, operation, and organization of elementary and secondary school in a local district. (3 cr; II MTWThF; Bu 211) Hooker
- 202. Foundations in Educational Administration.** Second quarter of the foundation course. (3 cr; prereq 201; IV MTWThF; JohH 106) Hooker
- 211. School Business Management.** Administration of school business affairs. (3 cr; prereq 210 or $\#$; II MTWThF; WuH 130) Domian
- 227. Teacher and Employee Administration.** Selection and placement of school employees, salary schedules, conditions of service, records and reports, and legal aspects. (3 cr; I MTWThF; Psy 109) Cunningham
- 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; VII-VIII W; PeikH 145) Cunningham, Domian, Hooker, Popper
- 236. Field Study.** Required for specialist in education certificate. The 10 credits will be based on a written report covering an approved field study. Students may register for the general planning and organization of their study without credits. (0-10 cr;

VII-VIII M; Bu 211) Cunningham, Domian, Goossen, Hooker, Keller, Curtin, Popper, Woods

- 239.†† **School Principal's Workshop.** Designed for students preparing for administrative posts and for principals now in the elementary and secondary schools. 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 of "Whitman" school and during the course of the workshop each person will make more than a hundred decisions relative to the operation of Whitman. (Limited to 25) (3 cr; III-IV MTWThF; PeikH 145) Cunningham, Popper

ELEMENTARY EDUCATION

200. **Seminar: Elementary School Administration.** (3 cr; VI-VII TTh and 1 hr ar; Bu 103) Curtin
- 270A.* **Problems: Elementary Education.** (Cr ar; prereq #; VII-VIII W; Bu 103) Bond, Goossen, Curtin

SECONDARY EDUCATION

167. **The 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; Psy 109) Popper
218. **Seminar: Secondary Education.** Current problems and literature. (3 cr; VI-VII TTh and 1 hr ar; PeikH 145) Keller
264. **The Secondary School Principalship.** (3 cr; I MTWThF; WuH 130) Ar
265. **Administering the High School Program.** (3 cr; III MTWThF; JohH 106) Ar
- 270B.* **Problems: Secondary Education.** (Cr ar; prereq #; VII-VIII W; PeikH 145) Cunningham, Domian, Goossen, Hooker, Keller, Curtin, Popper, Woods

Second Term

GENERAL COURSES

201. **Foundations in Educational Administration.** (See first term) (I MTWThF; Bu 125) Cunningham
202. **Foundations in Educational Administration.** (See first term) (II MTWThF; NH 122) Cunningham
210. **Public School Finances.** 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; III MTWThF; WuH 130) Hooker
224. **Legal Aspects of Public School Administration.** The constitutional, statutory, and common law bases of school administration; principles growing out of fundamental legal procedures. (3 cr; II MTWThF; Bu 211) Hooker
226. **School Plant Planning and Management.** Plant program planning and financing, including operation and maintenance of public school buildings. (3 cr; I MTWThF; Bu 103) Ar
- 228.* **Problems: Educational Administration.** (See first term) (VII-VIII W; PeikH 145) Cunningham, Domian, Hooker, 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.

- 230. School Community Relations.** Theory and practice of educational interpretation. Principles involved; techniques of working with groups; the teacher's contacts with the community; the role of the pupil; professional and lay organization. (3 cr; IV MTWThF; WuH 130) Popper
- 235. Seminar: Educational Administration.** Cases and concepts covering human relations, curriculum, school community relations, instructional problems, etc. Students analyze decision-making processes involved and use the research and writings in the fields covered. (3 cr; prereq MA in educational administration or #; VI-VII TTh and 1 hr ar; Bu 211) Domian
- 236. Field Study.** (See first term) (VII-VIII W; Bu 211) Domian, Cunningham, Goossen, Hooker, Curtin, Popper, Woods

ELEMENTARY EDUCATION

- 215. Elementary School Principalship.** (3 cr; III MTWThF; Pt 202) Curtin
- 270A.* Problems: Elementary Education.** (See first term) (VII-VIII W; Bu 103) Clymer, Goossen, Curtin

SECONDARY EDUCATION

- 264. The Secondary School Principalship.** (See first term) (II MTWThF; WuH 130) Popper
- 270B.* Problems: Secondary Education.** (See first term) (VII-VIII W; PeikH 145) Clymer, Cunningham, Domian, Goossen, Hooker, Curtin, Popper, Woods

EDUCATIONAL PSYCHOLOGY (EPsy)

First Term

GENERAL COURSES

- 110. Educational Measurement in the Classroom.** (Each section limited to 45) (3 cr) Hoyt
 Sec 1, IV MTWThF, JohH 122 Sec 2, VII MTWThF, Bu 123
- 116. Introduction to Statistical Methods.** Not equivalent to EPsy 216, 216A. (Each section limited to 60) (3 cr; not open to Master's or Ph.D. degree candidates who will take more than 1 qtr statistics; prereq grad or #)
 Sec 1, I MTWThF, JohH 115, Giese Sec 2, III MTWThF, JohH 115, Collier
- 116A. Introduction to Statistical Methods—Laboratory.** (Each section limited to 22) (2 cr; prereq §116)
 Sec 1, V-VI MWF, WuH 330, Sec 2, VI TTh, VII-VIII MF, WuH 330,
 MacEachern Mandeville
- 117. Basic Principles of Measurement.** (3 cr; prereq 116 or 216 or Psy 70 or equiv; VI MTWThF; Pt 202) Lathrop
- 140. Instruments and Techniques of Measurement.** (3 cr; prereq sr, 110 or 117; IV MTWThF, IV-V TTh; JohH 115) Edson, Wilk
- 148. Clinical Diagnosis of Reading Difficulties.** (3 cr; prereq EdCI 145; I MTWThF; Pt 202) Karlsen
- 150. Clinical Practice in Remedial Teaching.** Remedial tutoring of individual children who have difficulty in school learning. (Each section limited to 30) (3 cr; prereq EdCI 145 or 151 and #) Balow and clinical staff
 Sec 1, II MTWThF and 2 hrs ar, Sec 2, III MTWThF and 2 hrs ar, Pt 108
 Pt 108

- 151. Clinical Practice in Educational Diagnosis.** Measurement, interview technique, preparation of case reports. Work with children referred to the Psycho-Educational Clinic. (3 cr; prereq 210 or equiv, EdCI 145 and #; VI-VIII MTWThF; Pt 108) Balow and clinical staff
- 152. Introduction to School Psychological Services.** Relationship of the psychologist to teachers, administrators, parents, and the community. Problems of normal children, including diagnosis and treatment of educational and psychological disabilities. (3 cr; II MTWThF; Bu 125) Duker
- 159. Personality Development and Mental Hygiene.** (Each section limited to 55) (3 cr) Borow
- Sec 1, I MTWThF, NH 209
- Sec 2, IV MTWThF, NH 209
- 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 or equiv; I MTWThF; JohH 113) Force
- 183. Education of Gifted Children.** (3 cr; prereq Ed 55B or 75B or equiv; II MTWThF; FraH B25) Reynolds
- 184. Education of Mentally Retarded Children in Elementary Schools.** (3 cr; prereq 182 or #; III MTWThF; Bu 125) Force
- 186. Education of Emotionally Disturbed and Socially Maladjusted Children.** (3 cr; I MTWThF; AH 101) Wilderson, Wood
- 191. Education of the Mentally Retarded in Secondary Schools.** (3 cr; prereq 182 or #; III MTWThF; Psy 109) Karlsen
- 193. Psychology of Human Learning.** (3 cr; prereq sr; VI MTWThF; WuH 230) Neale
- 195. Automated and Programmed Learning.** Introduction to the principles and techniques of programmed instruction systems. Theoretical concepts and issues; systems and methods of programming; survey of available programs and devices; problems in application, development, evaluation, and research. (Limited to 60) (3 cr; prereq 193 or 293 or equiv, #; II MTWThF; JohH 115) Orlando
- 195A. Automated and Programmed Learning—Laboratory.** Applications of the principles and techniques in construction, development, use, and evaluation of system components; preparation of sample programs and related material. (Limited to 20) (2 cr; prereq EPsy 195 or ¶195 or equiv and #; VII-VIII MTWF; JohH 105) Orlando
- 200. Seminar Institute in Guidance.** Participants selected in advance. (1 cr; VII-VIII MW; Bu 125) Blocher, Hogan
- 201. Seminar: Counseling Needs of Able Students.** (3 cr; for Guidance Institute only; hrs ar; PeikH 75-77) Tennyson and staff
- 216. Statistical Methods in Education.** (3 cr; I MTWThF; Bu 211) MacEachern
- 216A. Statistical Methods in Education—Laboratory.** (Each section limited to 22) (2 cr) Giese
- Sec 1, II-III MWF, WuH 330
- Sec 2, IV MF, II-III TTh, WuH 330
- 218. Statistical Methods in Education.** (3 cr; I MTWThF; JohH 114) Collier
- 218A. Statistical Methods in Education—Laboratory.** (Limited to 22) (2 cr; VII-VIII TWTh; WuH 330) MacEachern
- 233.* Problems: Guidance and Personnel Work.** (Cr and hrs ar) Dugan, Edson, Blocher, Hogan

234. **Seminar: Counseling Theory and Research.** (3 cr; for Guidance Institute only; hrs ar; PeikH 75-77) Tennyson and staff
243. **Problems: Statistics for Students in Education and Psychology.** (3 cr; ar) Collier
253. **Research Problems.** (Cr ar; prereq #; ar) Bond, Collier, Edson, Hoyt, Reynolds, Torrance, Balow, Force, Duker, Karlsen, Neale, Orlando, Wilderson
288. **Practicum: Special Education.** Individually arranged, supervised experience in special education. May include supervision, administration or co-ordination teaching, and related work in schools, agencies, institutions, and other facilities of exceptional children. (Cr and hrs ar) Wilderson, Anderson, Kenmore, Wood
290. **Advanced Counseling Practicum.** (3 cr; for Guidance Institute only; hrs ar; PeikH 75-77) Tennyson and staff
- 294.^o **Recent Theory and Research in Human Learning.** (3 cr; prereq #; II MTWThF; JohH 106) Neale

SECONDARY EDUCATION

133. **Basic Procedures in Student Personnel Work.** (3 cr; prereq 9 cr in education; II MTWThF; Bu 120) Dugan
134. **School Counseling Procedures.** (3 cr; prereq 110 or 117, 133 and #; I MTWThF; Bu 123) Hogan
- 282A-B. **Supervised Practicum in Counseling.** (Limited to 15) (3 cr each; prereq #; I-IV MTWThF; PeikH 165) Burks, Benson

Second Term

GENERAL COURSES

60. **Introduction to Measurement and Statistics.** (3 cr; prereq 6 cr in psychology; IV MTWThF; Bu 125) Hoyt
110. **Educational Measurement in the Classroom.** (See first term) C Smith
 Sec 1, III MTWThF, FolH 101 Sec 2, IV MTWThF, FolH 101
116. **Introduction to Statistical Methods.** (See first term) (IV MTWThF; Bu 123) MacEachern
- 116A. **Introduction to Statistical Methods—Laboratory.** (See first term) (V-VI MWF; WuH 330) Giese
117. **Basic Principles of Measurement.** (See first term) (III MTWThF; WuH 230) Hoyt
150. **Clinical Practice in Remedial Teaching.** (See first term) Balow and clinical staff
 Sec 1, II MTWThF and 2 hrs ar, Sec 2, III MTWThF and 2 hrs ar, Pt 108
 Pt 108
151. **Clinical Practice in Educational Diagnosis.** (See first term) (VI-VIII MTWThF; Pt 108) Balow and clinical staff
152. **Introduction to School Psychological Services.** (See first term) (III MTWThF; Bu 125) Duker
159. **Personality Development and Mental Hygiene.** (3 cr; II MTWThF; Bu 120) Torrance
182. **Education of Exceptional Children.** (See first term) (I MTWThF; Pt 202) Force
183. **Education of Gifted Children.** (See first term) (III MTWThF; CD 226) Reynolds
186. **Education of Emotionally Disturbed and Socially Maladjusted Children.** (See first term) (V MTWThF; CD 226) Wilderson, Wood

193. **Psychology of Human Learning.** (See first term) (VI MTWThF; Bu 120) Neale
200. **Seminar Institute in Guidance.** (See first term) (VII-VIII MW; Bu 125) Blocher, Hogan
217. **Statistical Methods in Education.** (3 cr; I MTWThF; WuH 130) MacEachern
- 217A. **Statistical Methods in Education—Laboratory.** (Each section limited to 22) (2 cr) Giese
- Sec 1, VII-VIII MWF, WuH 330 Sec 2, IV-V TTh, IV MF, WuH 330
- 233.* **Problems: Guidance and Personnel Work.** (See first term) Blocher, Hogan, Tennyson
- 253.* **Research Problems.** (See first term) Clymer, Hoyt, Mork, Reynolds, Torrance, Balow, Force, Duker, Neale, Wilderson
288. **Practicum in Special Education.** (See first term) Wilderson, Wood
- 293.* **Psychology of Learning.** (3 cr; prereq 12 cr in psychology and educational psychology; II MTWThF; FolH 101) Neale

SECONDARY EDUCATION

133. **Basic Procedures in Student Personnel Work.** (See first term) (II MTWThF; Bu 123) Rank
134. **School Counseling Procedures.** (See first term) (II MTWThF; Bu 125) Blocher
- 282A-B. **Supervised Practicum in Counseling.** (See first term) (Limited to 15) (I-IV MTWThF; PeikH 165) Hogan, Summers

HISTORY AND PHILOSOPHY OF EDUCATION (HEd)

First Term

141. **Critical Issues in Contemporary Education.** Introduces graduate students to ideas involved in current theory and practice. (3 cr; IV MTWThF; JohH 113) Neff
180. **The School and Society.** (Each section limited to 100) (3 cr; prereq sr) Bagley
- Sec 1, II MTWThF, NH 211 Sec 2, III MTWThF, FolH 308
182. **Comparative Philosophies of Education.** Examination of competing philosophies of education. (3 cr; III MTWThF; JohH 113) Neff
- 241.* **Problems: History and Philosophy of Education.** For graduate students interested in research and original work in these areas. (Cr ar; prereq #; ar) Bagley

Second Term

131. **Comparative Education.** Compares European, Asiatic, and American systems and philosophies of education. Explores possibilities of international education. (3 cr; III MTWThF; Bu 120) Beck
156. **History of Ideas in American Education.** Readings in American political, economic, and social development, reference to the emerging system of public education. (3 cr; recommended as background for 170 but not a prereq for 170; II MTWThF; WuH 230) Bagley
180. **The School and Society.** (See first term) (Each section limited to 90)
- Sec 1, III MTWThF, NH 213, Bagley Sec 2, IV MTWThF, WuH 230, Beck
- 241.* **Problems: History and Philosophy of Education.** (See first term) Beck, Bagley

HOME ECONOMICS EDUCATION (HEED)**First Term**

91. **Observation, Materials, Teaching in Home Economics.** Philosophy of the home economics program; students' needs and interests; teaching materials, curriculum guides, and unit construction. Development of home economics in the school program. (5 cr; prereq HE 4, 21, 41, Ed 55B, ‡; IV-V MTWThF; McNH 103) Ar
190. **Readings in Home Economics Education.** Independent study under tutorial guidance. (1-3 cr; prereq ‡; ar) Ford
- 194A. **Adult Education in Home Economics.** Objectives of adult education in home-making; problems affecting community and family life; methods of helping adults and out-of-school youth in solving problems in home living. (3 cr; prereq 91, 93 or equiv; VI MTWThF; McNH 103) Ford
- 293.* **Problems in Home Economics Education.** Independent study of current educational problems. (1-9 cr; prereq 294 recommended or ‡; ar) Brown
294. **Research Methods.** Collection, treatment, and interpretation of data in areas of home economics; writing a technical report. (3 cr; prereq 192, ‡; IV-V MTThF; McNH 102) Brown

Second Term

190. **Readings in Home Economics Education.** (See first term) Ford
- 293.* **Problems in Home Economics Education.** (See first term) Brown

INDUSTRIAL EDUCATION (Ind)**First Term**

- 90-91. **Independent Study.** Self-directed study preceded by classroom instruction in basic research procedures. (3 cr each; prereq jr or ‡; VI MTWThF; TNCD 116) Nelson
101. **Tests in Industrial Subjects.** Application of principles of evaluation to shop and drawing subjects. (3 cr; prereq Ed 55B; II MTWThF; TNCD 113) Kavanaugh
115. **Supervision of Industrial Education.** Principles of creative supervision; duties, organization for supervision. (3 cr; prereq 35 or 105; I MTWThF; TNCD 116) Widdowson
125. **Philosophy and Practice of Industrial Education.** History, objectives, development, and current practices of the field. (3 cr, §35; III MTWThF; TNCD 116) Widdowson
- 136.†† **Instructional Materials Laboratory**
- Section A—Teaching Electricity and Electronics. Instruction will include new developments and techniques in teaching basic theory as well as special emphasis on the development of instructional materials related to the new Minnesota Curriculum Bulletin, No. 13. (3 cr; prereq experienced teacher or ‡; V-VI MTWThF; TNCD 15) Kavanaugh

Section B—Leadership Development for Industrial Education. For potential coordinators and directors of area vocational-technical schools. The content will cover the information and techniques and their application to the solution of

†† 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.

- administrative problems. (June 17 through July 3) (3 cr; prereq vocational personnel or #; I-III, VIII MTWThF; FolH 103) Moss
- 200.* **Research Problems.** (3, 6, or 9 cr; prereq approval of candidacy for Master's degree; individual conferences with adviser; hrs ar MTWThF; TNCD 103) Nelson, Moss, Kavanaugh
250. **Literature in Industrial Education.** Professional literature, organizations, leaders, and movements in the field. (3 cr; prereq #; II MTWThF; TNCD 116) Nelson

Second Term

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 113) Moss
105. **Administration of Industrial Education.** General and vocational phases; objectives, programs and practices, laws, rulings, and standards for aid; significant literature. (3 cr; prereq 35 or #; II MTWThF; TNCD 116) Nelson
150. **Vocational Education Surveys.** Practices and techniques in the study of communities or areas for the establishment or improvement of vocational courses and facilities. (3 cr; prereq 105 or 125; III MTWThF; TNCD 113) Moss
- 200.* **Research Problems.** (See first term) Nelson, Moss

METHODS AND STUDENT TEACHING (EdT)

First Term

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. (Limited to 3) (Cr ar; prereq #; ar) Kenmore, Anderson
- 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 summer term or to students who wish to qualify for the junior high school endorsement. (Limited to 40) (Cr and hrs ar; PeikH) Mork
- 53A. **Teaching Handicapped Children.** Observing work with special classes; teaching under direction. (Limited to 3) (6 cr; prereq #) Kenmore, Anderson
- 69.†† **Student Teaching in the Social Studies.** (1 cr; prereq jr, ¶Ed 55A; ar) Kyle
- 77.†† **Student Teaching in the Nursery School.** Five half days per week in supervised classroom participation. (3 cr; prereq sr, #; ar) Moore
- 84A-B-C. **Practice and Field Work in Recreation Leadership.** (2 cr each; prereq recreation major; ar) Fitzgerald
- 85A-B-C. **Practice and Field Work in Recreation.** (2 cr each for majors, 1 cr each for minors; prereq recreation majors or minors; ar) Fitzgerald

Second Term

50. **Junior Practicum in Special Education.** (See first term) (Hrs and rm ar) Ar
- 84A-B-C. **Practice and Field Work in Recreation Leadership.** (See first term) (Hrs and rm ar) Fitzgerald

†† Student teaching open only to students in College of Education regular degree programs. Application must be made prior to May 28. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

85A-B-C. Practice and Field Work in Recreation. (See first term) (Hrs and rm ar) Fitzgerald

MUSIC EDUCATION (MuEd)

(See also Department of Music in the College of Science, Literature, and the Arts)

First Term

51. **Teaching Music.** (Kindergarten-Primary grades) For nonmusic majors. Appreciation methods. (2 cr; prereq Mus 4; III MTWThF; ScH 104) Borg
52. **Teaching Music.** (Intermediate grades) For nonmusic majors. Appreciation, methods, materials. (Each section limited to 25) (2 cr; prereq 51, Mus 4 or #) Borg
 Sec 1, I MTWThF, NMA 4 Sec 2, V MTWThF, ScH 104
- 60††-61. **Supervision and Teaching of Music.** (2-12 cr; prereq sr, 53, Ed 55B, #; VIII W; ScH 104) Ivory
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; WuH 320) Caswell
150. **Organization, Supervision of Vocal-Instrumental Music in Elementary Schools.** Trends reflected in teaching materials and syllabi. Implications of supervision practices in other educational fields. (3 cr; prereq 6 cr in music education, 9 cr in music, and 6 cr in education; I MTWThF; NMA 5) Caswell, Ivory
170. **Recent Research and Literature.** Current research; evaluation of teaching materials; appraisal of research techniques. (3 cr; II MTWThF; NMA 4) Ivory
194. **Advanced Selection, Conducting of Choral Materials.** Criteria for selecting choral music for school groups. Analysis of selections of varying degrees of difficulty; application of advanced rehearsal and conducting techniques with the class as a performing choral group for student directors. (3 cr; prereq 124; III MTWThF, WuH 320; IV TTh, ScH 214) Caswell
- 224.* **Research Problems.** (3-9 cr; prereq knowledge of elementary statistics; VII T; Sch 104) Caswell, Ivory

Second Term

51. **Teaching Music.** (See first term) (II MTWThF; NMA 4) Abelson
52. **Teaching Music.** (See first term) (IV MTWThF; NMA 4) Abelson
- 110.†† **General Music Education Workshop.** Using a high school age laboratory group for demonstrations, the workshop explores materials and techniques for beginning and advanced a cappella and accompanied choral groups in the senior high school. Special attention to the development of a set of criteria to determine difficulty and appropriateness of choral materials, methods of voice classification, and techniques for vocal development. (3 cr; III MTWThF; ScH 104) Caswell
- 224.* **Research Problems.** (See first term) (VII T; ScH 104) Caswell

†† Student teaching open only to students in College of Education regular degree programs. Application must be made prior to May 28. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

†† 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 FOR MEN (PEM)

First Term

- 1A. **Beginning and Intermediate Swimming.** (Limited to 40) (1 cr; V MTWThF; CH Pool) Mowerson
- 1B. **Beginning Golf.** (Limited to 40) (1 cr; VI-VII MW; Golf Course) Bolstad
- 1C. **Beginning Golf.** (Limited to 40) (1 cr; VI-VII TTh; Golf Course) Bolstad
- 2A. **Beginning and Intermediate Tennis.** (Limited to 40) (1 cr; VI MTWThF; Tennis Courts) Mowerson
- 5B. **Gymnastics.** Stunts on the buck, side horse, long horse, parallel bars, low bar, high bar, rings, trampoline, springboard, and mats; stall bar exercises; rope climbing; and pyramid building. (1 cr; III MTWThF; CH) Anderson
- 7A. **Games and Relays.** Low organized games for gymnasiums, playgrounds, camps, etc; social games for recreation; progressive game parties; relays. (1 cr; I MTWThF; CH) Anderson
- 7C. **Recreational Games.** Badminton, aerial darts, deck tennis, paddle tennis, table tennis, bowling, horseshoes, and archery. (1 cr; II MTWThF; CH) Anderson
51. **Mechanics of Movement.** A study of the structure of the body and the principles and mechanics of bodily movements. (3 cr; prereq 50 or Anat 57; I MTWThF; CH 206) Osell
68. **Basketball Coaching.** Theory, styles of offense and defense, the conditioning and handling of players. (2 cr; prereq 4B; II MTWThF; CH 215) Kundla
- 73††-74-75. **Student Teaching.** Actual practice in teaching physical education activities. (3 cr each; prereq 55, Ed 55B; 10-12 hrs per wk ar; CH 218) Mowerson
135. **Tests and Measurements in Physical Education.** Analysis of tests and testing methods at all levels. Use of tests in physical activity programs. Application of principles of test construction to specific problems. (3 cr; prereq EPsy 60 or equiv; II MTWThF; CH 206) McAdam
- 224.° **Research Problems: School Health Education, Physical Education, and Recreation.** Individual problems in areas of philosophy, methods, curriculum, evaluation, and measurement; all levels. (Cr and hrs ar; prereq 236 and 135 or EPsy 116 or #; CH 220) Donnelly, Fitzgerald, McAdam
236. **Introduction to Research in Physical Education and Recreation.** Research methods applied to physical education and recreation; preparation of designs for research problems. (3 cr; IV MTWThF; CH 206) McAdam
238. **Administration of Physical Education in Colleges and Universities.** Administering programs and facilities in physical education and athletics; field trips and surveys of neighboring colleges. (3 cr; prereq 63 or #; I MTWThF; CH 215) Donnelly
241. **Administration of Public Recreation.** Organization for recreation; policies and procedures relating to finance, program, facilities, office management, legislation, and public relations. (3 cr; III MTWThF; CH 215) Fitzgerald

†† Student teaching open only to students in College of Education regular degree programs. Application must be made prior to May 28. Forms and instructions are available in the Student Teaching Office, 227 Burton Hall.

Second Term

- 1A. Beginning and Intermediate Swimming.** (Limited to 40) (1 cr; V MTWThF; CH Pool) Mowerson
- 1B. Beginning Golf.** (Limited to 40) (1 cr; VI-VII MF; Golf Course) Bolstad
- 1C. Beginning Golf.** (Limited to 40) (1 cr; VI-VII TTh; Golf Course) Bolstad
- 2A. Beginning and Intermediate Tennis.** (Limited to 40) (1 cr; VI MTWThF; Tennis Courts) Mowerson
- 65. Adapted Physical Education.** Philosophy, principles, and techniques of adapting the physical education program to meet the needs of handicapped pupils. (3 cr; prereq 51, Anat 57; I MTWThF; CH 206) Osell
- 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 experience on squad; V MTWThF; CH 215) Nash, Crawford
- 101. Principles of Physical Education.** Aims and scope of physical education; its place in education. (3 cr; prereq 55; II MTWThF; CH 215) McAdam
- 110. Recreation Surveys.** Techniques and practice. (3 cr; prereq 57-58, sr; I MTWThF; CH 206) Fitzgerald
- 224.* Research Problems: School Health Education, Physical Education, and Recreation.** (See first term) Donnelly, Fitzgerald, McAdam
- 233. Administration of the Physical Education Program in Secondary Schools.** Special administrative procedures in promotion of physical education program. (3 cr; prereq 63; IV MTWThF; CH 215) McAdam

PHYSICAL EDUCATION FOR WOMEN (PEW)

Physical Examination

It is recommended that every woman student avail herself of the opportunity offered by the University Health Service for a physical examination. The Department of Physical Education for Women strongly urges every person to make an appointment for a physical examination at the Health Service. Health Service approval must be secured for participation in activity courses designated by ††.

Facilities for Recreation

The swimming pool is open for recreational use from 1 to 2:30 p.m. during the first term and from 11 a.m. to 12 noon during the second term. At these times also the facilities of Norris Gymnasium for Women are open to women for individual practice; inquire in the main office concerning the procedure. The rental fee for suits and towels for open swimming is 20 cents. Towels for shower baths may be procured from the matron for 10 cents apiece. Health Service approval must be secured for participation in recreational swimming.

The University tennis courts and golf course are open to students at a nominal fee.

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.

1. Courses offered this summer which apply to the minor in physical education are PEW 10, 18, 25, 32, 37, 102, 117B.

2. Courses offered this summer which apply to the undergraduate major in physical education are PEW 10, 18, 25, 37, 102, 117B.
3. Courses offered this summer which apply to advanced and graduate degrees with a major in physical education are PEW 102, 117B, 118, 124, 130, 224.

Required Physical Education

Those interested in meeting a college requirement in physical education may register for PEW 3, 7, 8, 10, 32.

Elementary School Majors

PEW 70 is 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.

First Term

3. **Archery for Beginners.** Instruction will include shooting skills and techniques, proper handling of equipment, and rules and etiquette of the sport. Individual skill guidance is stressed. Equipment will be provided. (Limited to 24) (1 cr; V MTWTh; NGW 60) Tenney
- 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. Students are required to furnish own rackets and balls. (Each section limited to 20) (1 cr)

Sec 1, I MTWTh, NGW 151, Tenney	Sec 3, III MTWTh, NGW 151, Tenney
Sec 2, II MTWTh, NGW 151, Tenney	Sec 4, IV MTWTh, NGW 151, Eibner
8. **Golf for Beginners.** Open to those with little or no experience in golf. Fundamental strokes and individual analysis of the player's game are stressed along with the rules and etiquette of the game. (Each section limited to 20) (1 cr) Plack

Sec 1, I MTWTh, NGW 60	Sec 3, III MTWTh, NGW 60
Sec 2, II MTWTh, NGW 60	Sec 4, IV MTWTh, NGW 60
- 10.†† **Modern Dance.** Instruction will include skills and techniques of modern dance as well as dance composition. (1 cr; III MTWTh; NGW 153) Morrison
- 18.†† **The Teaching of Rhythm and Dance.** Methods of teaching the folk, square, and social dance forms at the junior and senior high school level. (2 cr; IV MTWThF; NGW 151) Morrison
25. **American Red Cross First Aid: Standard, Advanced.** Lectures, demonstrations, and practice in emergencies and first aid treatment. American Red Cross Standard Certificate in First Aid received upon successful completion of course. (2 cr; V MTWThF; NGW 3, 4) Hauptfuehrer, Morrison
- 32.†† **Beginning Swimming.** Instruction includes orientation activities, crawl, side stroke, backstroke, diving, and water safety skills. (Each section limited to 20) (1 cr; NGW 58) Eibner

Sec 1, V MTWTh, NGW 58	Sec 2, VI MTWTh, NGW 58
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- 37.†† **Teaching of Individual and Dual Sports.** Special techniques of teaching archery, badminton, bowling, golf, and tennis. Student teaching within the group. Organiza-

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

- tion of competitive and recreation programs. (2 cr; VI MTWThF; NGW 151, 60) Tenney
70. **Teaching Health, Physical Education in the Elementary School.** Methods of instruction in health and physical education for the elementary education major. (3 cr; prereq 45, 3rd qtr soph, elem ed major; II MTWThF; NGW 201) Hauptfuehrer
102. **The Physical Education Program for the Elementary and Secondary School.** Philosophy, objectives, trends, content, and evaluation in relation to the physical education curriculum. (3 cr; IV MTWThF; NGW 3) Jaeger
- 117B. **Advanced Instruction in School Health for Secondary Schools.** (3 cr; prereq 83 or #; II MTWThF; NGW 3) Slocum
- 118E.§§ **Problems: Teacher Education in Health, Physical Education, and Recreation.** For master of education students who are interested in participating in the conduct and development of professional teacher education programs in the field of school health education, physical education, and the recreational function of physical education. Individual projects and conferences. (3 cr; prereq #; ar) Jaeger, Slocum
124. **Supervision of Physical Education.** Presents a consideration of the function, organization, and administration of supervision in physical education; adaptations of accepted procedures for observation, guidance, and training of teachers in the field; standards for qualification of supervisors; problems peculiar to supervision of physical education. (3 cr; prereq #; III MTWThF; NGW 3) Slocum
- 224.° **Research Problems in School Health Education, Physical Education, and Recreation.** Individual problems and conferences for M.A. and Ph.D. candidates. (Cr ar; prereq 236 and 135 or EPsy 116 or #; ar) Jaeger, Slocum

Second Term

- 7.†† **Tennis for Beginners.** (See first term) (1 cr) Lampe
 Sec 1, IV MTWTh, NGW 151 Sec 2, V MTWTh, NGW 151
8. **Golf for Beginners.** (See first term) (1 cr) Lampe
 Sec 1, I MTWTh, NGW 60 Sec 2, II MTWTh, NGW 60
- 118E.§§ **Problems: Teacher Education in Health, Physical Education, and Recreation.** (See first term) Wilson
130. **Contributions of Basic Sciences to Physical Education.** Recent research in basic sciences and application in selected areas. (3 cr; prereq #; I MTWThF; NGW 3) Wilson
- 224.° **Research Problems in School Health Education, Physical Education, and Recreation.** (See first term) Wilson

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

§§ Courses marked "E" carry credit toward the degree of master of education.

GENERAL COLLEGE (GC)

Admission to the General College requires graduation from an accredited high school or satisfactory performance on University entrance tests, but no specific pattern of high school subjects. The college offers a program of broad general education rather than courses which are introductory to more advanced ones in a given field. A general education is planned to help a student make adjustments to living in modern society, to conditions of employment, and to home and civic responsibilities. The degree of associate in arts is conferred by the University upon students who successfully complete a 2-year program in the General College. Students who successfully demonstrate their ability to handle work of college caliber in the General College may make application to transfer to another college of the University without undue loss of time or credit.

The regular *Bulletin of the General College*, which may be received upon request from the Office of Admissions and Records of the University, indicates in detail the requirements for the associate in arts degree, general regulations, and additional general information. All students entering the General College for the first time are required to take an over-all comprehensive examination, the results of which will be useful to the student and his adviser in planning his program for subsequent quarters.

For more complete description of the courses during the summer terms, see the regular *Bulletin of the General College*.

First Term

- 3A. Home Life: Marriage and Family Living.** Emphasizes the particular values of family life for the individual and for society by a study of biological, psychological, and sociological foundations of the family; a study 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, and problems of parenthood. (3 cr; III MTWThF; NH 213) W Anderson
- 7D. Physical Science: Geology.** Origin and interpretation of the surface features of the land. A consideration of Minnesota's 10,000 lakes leads to the study of the work of glaciers, water, and wind. Mountain-making, the common rock types and their origin, the age of the earth, and significance of fossils are briefly treated. (3 cr; IV MTWThF; NH 213; field trips VI-VII W) M Harris
- 8A. Applied Mathematics.** Measurement, calculation 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 application. Problems provide a broad acquaintance with the language and nature of many fields. (3 cr; I MTWThF; NH 207) Schwabacher
- 10A. Human Biology: Fundamental Similarities in the Living World.** Study of the variety and relationship of living organisms serves to illustrate the general principles in biology. Special emphasis is given to man's place in the world of living organisms. Man's embryonic development, heredity, racial characteristics, and evolution are considered. (3 cr; II MTWThF and lab hr ar; NH 213) Dearden
- 20B. Practical Law.** Negotiable instruments, corporations, and securities, partnership, and domestic relations are the topics studied. (3 cr; III MTWThF; FoH 105) Donnelly
- 23A. Art Laboratory.** Provides the student with a variety of art experiences. Problems may be selected according to individual needs and interests. Laboratory work is

supplemented with readings, discussion, lectures, and field trips. (3 cr; III-IV MTWThF; NH 102) Safer

- 29A. World Literature I.** Seeks to integrate life and literature and to relate the student's experiences 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 122) Burrows
- 30A. Reading and Vocabulary Development.** Drill exercises, films, slides, and reading practice help the student improve reading speed and comprehension. Progress is measured by reading tests, charts of timed readings and exercises, and by reading assignments. *Those who fall below a stipulated score in the initial diagnostic test will not be allowed to continue.* (3 cr; I MTWThF; NH 216) Draxten
- 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. Work on his own writing difficulties, dictionary usage, and brief study of the history and development of language. (3 cr; III-IV MTWTh; NH 216) Finnberg
- 32A. Oral Communication: Basic Principles.** Work is planned to aid the student in developing confidence in speech situations. Through observation, study, personality analysis, and participation in various speech activities, the student is shown the close relationship between personality and speech behavior. (3 cr; for practical nursing students only; IV MTWThF; NH 107) Kurak
- 41A. Man in Society: His Personal Role.** Examines a limited number of problems in the social order and suggests a method of study to promote better understanding of these problems. The role of the individual is stressed. (3 cr; I MTWThF; NH 213) F Johnson
- 44B. Current History.** Subject matter and methods of instruction are constantly adapted to the changing headlines of the day by a fusion of contemporary readings with background sources, so that the student's awareness of the news and ability to judge current events in proper perspective are intensified. (3 cr; II MTWThF; NH 207) F Harris

Second Term

- 5B. Functions and Problems of Logic.** Analysis of common errors and fallacies in thinking and study of valid methods for drawing conclusions from evidence. (3 cr; II MTWThF; NH 207) Benson
- 10B. Human Biology: How the Living Machinery in Man Works.** A study of the operational mechanisms of cells, glands, organs, and systems, integrated in the functioning of man's body as a dynamically balanced whole. (3 cr; prereq 10A; II MTWThF; NH 213) 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, notes, and risk insurance. Student acquires useful skills and a basis for sound judgment to apply to financial problems. (3 cr; III MTWThF; NH 207) McCutcheon
- 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 122) Wyvell
- 31D. Writing Laboratory: Business Writing.** Student is given practice in writing the kinds of letters necessary for ordinary business transactions: letters of inquiry, order, complaint or adjustment, and application. *Final drafts of letters must be typed.* (3 cr; prereq 31A...31B advised; III-IV MTWTh; NH 216) Kivits

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- 32A. Oral Communication: Basic Principles.** (See first term) (I MTWThF; NH 122) Hagen
- 38A. General Geography.** The earth and its inhabitants are described and interpreted in a regional framework. Emphasis is placed on obtaining an understanding of the physical earth, the distribution of population, man's culture and economies, the interrelationships between man and physical elements, and the background of several world problems. (3 cr; I MTWThF; NH 213) Steinhauser
- 46D. Problems of International Relations.** Problems such as war, defense, technological interdependence, international trade, foreign aid, ideological conflict, and international organization are studied, with emphasis on awakening realization of the importance of these issues in the life of the individual citizen. (3 cr; IV MTWThF; NH 213) Jones

LAW SCHOOL

First and Second Terms

Courses in the Law School Summer Session are open only to students who have completed at least 1 year of work in the University of Minnesota Law School or in another accredited law school. All Law School courses run through both the first and second terms. For further information, write to Law School, University of Minnesota, Minneapolis 14.

- 122. Business Associations.** Creation, form, nature, termination of agency, partnerships, unincorporated business associations; powers, duties, liabilities, compensation of agents, partners, business associates; risks in conduct of business by representatives. (3 cr; III TWTh [1st term], III WTh [2nd term]; FraH 20) Choper
- 123. Private Corporations.** Structure and characteristics; formation and promotion; issuance and transfer of securities; exercise and sale of control; shareholder's suits; capital creation and reduction; distributions; authority and responsibility of representatives; sale of assets and mergers; reorganization; dissolution. (6 cr; prereq 122 or ¶122; II MTWThF; FraH 20) Morris
- 125. Remedies.** Equity, damages, restitutions; primary emphasis upon equitable relief, with legal material largely restricted to contract. (6 cr; II MTWThF; FraH 120) Miller
- 128. Taxation I.** Principles of federal income taxation of individuals; introduction to and selected problems in federal income taxation of decedents' estates, trusts, partnerships, and corporations; introduction to and selected problems in federal and estate and gift taxation. (6 cr; IV MTWThF; FraH 20) Chirelstein
- 142. Conflicts.** Jurisdiction, judgments, choice of law. (6 cr; IV MTWThF; FraH 120) Cound
- 167. Securities Regulation.** Legal and financial aspects of federal and state securities acts; registration; prospectus; distribution; remedies implied from statutes. (3 cr; prereq 123; III WF [1st term], III MTF [2nd term]; FraH 120) Choper
- 175. International Law.** Nature and sources of international law, jurisdiction of states over persons and property, recognition of states and government, the law of treaties; international organization. (3 cr; V TW [1st term], V TWTh [2nd term]; FraH 20) Christie
- 185. Jurisprudence.** Philosophies of law; theories of justice; analysis of legal language; definitions of law. (3 cr; III TWTh [1st term], III WTh [2nd term]; FraH B-1) Christie
- Acct 85. Introduction to Accounting.** (See Department of Accounting under School of Business Administration) (5 cr [3 Law School cr])

Note: Hours of classes in the Law School are as follows:

I 8:00- 8:50	IV 11:20-12:20
II 9:00-10:00	V 1:00- 2:00
III 10:10-11:10	

Law School tuition during the summer quarter is:

3 credits, \$46.50 (residents), \$50 (nonresidents); 6 credits, \$93 (residents), \$100 (nonresidents); 9 credits or more, \$119 (residents); 9 credits, \$150 (nonresidents); 12 or more credits, \$200 (nonresidents). In addition each student will pay the incidental fee of \$22.

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 Minneapolis General Hospital, the Veterans Administration Hospital, and Ancker Hospital in St. Paul. Registration may be for 1 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 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 Center for Continuation Study. These courses are primarily for practitioners and are largely practical in nature. Circulars may be obtained from the Center for Continuation Study.

Clinics and conferences in the University Hospitals, the Minneapolis General Hospital, the Veterans Administration Hospital, and the Ancker 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 \$150 for residents of Minnesota, and \$310 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 \$22. Students in certain courses are required to furnish microscopes.

Medical Students or Physicians Registering for Externships—A tuition fee of \$59.50 *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 \$11 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.

ANATOMY (Anat)

First Term or Second Term

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)

First Term

REQUIRED COURSES

101. **Principles of Anesthesia.** (2 cr; prereq regis med) Van Bergen and staff

First Term and Second Term

ELECTIVE COURSES

169. **Research in Anesthesia.** Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) Van Bergen and staff
181. **Externship in Anesthesiology.** (Limited to 6) (4 cr; hrs ar) Van Bergen and staff
182. **Externship in Anesthesiology and Respiratory Problems.** (Limited to 3) (4 cr; prereq Anes 181) Van Bergen and staff

REQUIRED COURSES FOR GRADUATE MEDICAL 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 in 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****REQUIRED COURSES**

100. **Biochemistry.** (7 cr; prereq organic and physical chemistry and physics; lect IV, VI MTWThF, MH 213; lab I-III MTWTh, MH 201) Barnum, Carr, Van Pilsum

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) Barnum, Carr, Van Pilsum
205. **Research in Biochemistry.** (Cr and hrs ar) Barnum, Carr, Van Pilsum

Second Term**REQUIRED COURSES**

101. **Biochemistry.** (7 cr; prereq 100; lect IV, VI MTWThF, MH 213; lab I-III MTWTh, MH 201) Armstrong, Ungar, Koerner

ELECTIVE COURSES

153. **Problems in Biochemistry.** (See first term) Armstrong, Ungar, Koerner
205. **Research in Biochemistry.** (See first term) Armstrong, Ungar, Koerner

MEDICINE (Med)*Division of Internal Medicine***First and Second Terms**

104. **Introduction to Internal Medicine.** (2 cr per qtr for 4 qtrs; prereq 101, LMed 102; 4:00-4:50 alt W; Eustis Amph) Watson
112. **Clerkship: Internal Medicine.** (16 cr; prereq regis med; 8:00-5:00 MTWThFS) Goetz and staff

ELECTIVE COURSES††

180. **Externship in Medicine.** Care of medical patients on an inpatient service at an advanced level of responsibility. University, Veterans Administration, Minneapolis General, Mt. Sinai, and Ancker Hospitals. (6 cr per period; prereq sr; offered 3 elective periods; hrs ar) Watson, Hagen, Hoffbauer, A Schultz, Hammarsten
181. **Research in Medicine.** Research opportunities in the following areas are available at University or affiliated hospitals: gastroenterology, hypertension and sodium metabolism, lipid metabolism as related to atherosclerosis, liver disease, adrenal disease, carbohydrate metabolism and clinical diabetes, internal medicine. A detailed listing of these opportunities is available in the departmental office. (Cr ar) Staff
184. **Special Clinical Problems.** Opportunities for study in the following areas of clinical interest are available at University or affiliated hospitals: clinical electrocardiography and vectorcardiography, clinical and basic problems in bile pigment and porphyrin metabolism, infectious diseases, endocrinology and metabolic disease including

†† Prior arrangements with departmental office.

diabetes and thyroid disturbances. A detailed listing of these opportunities is available in the departmental office. (Cr ar) Staff

- 201. **Clinical Medicine.** (Cr and hrs ar) Watson and staff
- 202. **Diseases of the Cardiovascular Apparatus.** (Cr and hrs ar) Frantz and staff
- 203. **Research in Medicine.** (Cr and hrs ar) Watson and staff
- 206. **Clinical Conference.** Presentation of problem cases. Discussion of diagnosis and treatment and consideration of pertinent literature. (1 cr; 9:00-9:50 F; Todd Amph) Watson and staff
- 207. **Clinical Pathological Conference.** Presentation of clinical features, necropsy findings, and discussion. Medical and surgical cases. (1 cr; 11:00-11:50 W; 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; 9:00-9:50 M; Todd Amph) Peterson, Watson, and staff
- 210. **Seminar: Infectious Disease.** (1 cr; hrs ar) Spink
- 211. **Electrocardiographic Conference.** (1 cr; 3:30-4:20 T) Tuna and others
- 214. **Seminar: Cardiovascular.** Weekly conference on clinical cardiovascular problems, held jointly by the Departments of Medicine, Surgery, and Radiology. (1 cr; 4:00-4:50 W; Todd Amph) Wang and staff

Division of Dermatology

First and Second Terms

ELECTIVE COURSES

- 182. **Externship in Dermatology.** (Limited to 4) (Cr and hrs ar) Lynch
- 183. **Problems in Dermatology.** (Limited to 4) (Cr and hrs ar) Lynch and staff
- 225. **Clinical Dermatology.** (Cr and hrs ar) Lynch and staff
- 226. **Seminar in Dermatology.** (Cr and hrs ar) Lynch and staff
- 227. **Dermatologic Histopathology.** (1 cr; hrs ar) Goltz
- 228. **Research: Dermatology.** (Cr and hrs ar) Lynch and staff
- 229. **Research Methods in Dermatology.** (Cr and hrs ar) Goltz and staff
- 230. **Biochemistry of the Skin.** (Cr and hrs ar) Rukavina, Smith

MICROBIOLOGY (MicB)

First Term

- 122. **Physiology of Bacteria Laboratory.** Techniques employed in study of bacterial physiology and metabolism. (3 cr; required of all grad students in microbiology, open to others, #; prereq 121; registration must be for 1 term; lect V M, lab II-IV MW; Mayo A-205) Bernlohr, Rogers
- 201. **Research.** (Cr and hrs ar) Staff

Second Term

- 122. **Physiology of Bacteria Laboratory.** (See 1st term) Bernlohr, Rogers
- 201. **Research.** (Cr and hrs ar) Staff

OBSTETRICS AND GYNECOLOGY (Obst)**First Term or Second Term****REQUIRED COURSES**

120. **Obstetrics and Gynecology.** Physiology of pregnancy, labor, and the puerperium. (4 cr; prereq 124; 4:00-5:00 T; MMA 100) 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. (Limited to 10) (Cr and hrs ar) McKelvey and staff

First Term**ELECTIVE COURSES**

201. **Advanced Obstetrics and Gynecology, Part I.** (Cr ar) McKelvey and staff
205. **Advanced Obstetrics and Gynecology, Part II.** (Cr ar) McKelvey and staff
209. **Advanced Obstetrics and Gynecology, Part III.** (Cr ar) McKelvey and staff
216. **Research.** (Cr ar) Staff
301. **Externship.** (6 cr) Staff

Second Term**ELECTIVE COURSES**

204. **Advanced Obstetrics and Gynecology, Part I.** (Cr ar) McKelvey and staff
208. **Advanced Obstetrics and Gynecology, Part II.** (Cr ar) McKelvey and staff
212. **Advanced Obstetrics and Gynecology, Part III.** (Cr ar) McKelvey and staff
219. **Research.** (Cr ar) Staff
302. **Externship.** (6 cr) McKelvey and staff
303. **Obstetric and Gynecologic Histology.** (6 cr; hrs ar) McKelvey and staff

OPHTHALMOLOGY (Opth)**First Term**

203. **Basic and Applied Ophthalmology.** (2 cr; 9:00-12:00 S; O-P Clin) Harris and staff

First and Second Terms

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

OTOLARYNGOLOGY (Otol)

First and Second Terms

COURSES FOR GRADUATE STUDENTS

- 230. **Clinical Otolaryngology.** (3 cr; 9:00-12:00 MTWThF; Outpatient clinic and Operating Room) Boies and staff
- 231. **Clinical Rhinology and Laryngology.** (3 cr; 9:00-12:00 MTWThF; Outpatient Clinic and Operating Room) Boies and staff
- 232. **Surgery of the Ear, Nose, and Throat.** (3 cr; 9:00-12:00 MTWThF; Outpatient Clinic and Operating Room) Boies and staff

PATHOLOGY (Path)

First Term

- 104. **Autopsies.** (Cr and hrs ar; prereq 102) Dawson
- 106. **Diseases of the Heart.** (1 cr; prereq 102; hrs ar) Edwards
- 111. **Conference on Autopsies.** (1 cr; prereq 102; V T; JacH 104) Dawson
- 112.†† **Diagnosis of Tumors.** (2½ cr; prereq 102; hrs ar) Hebbel
- 113.†† **Surgical Pathology.** (Cr and hrs ar; prereq 102) Hebbel
- 120. **Diseases of the Lungs.** (1 cr; prereq 102; hrs ar) Dawson
- 150. **Problems in Pathology.** (Cr and hrs ar; prereq 102) Dawson
- 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

Second Term

- 104. **Autopsies.** (See first term) Dawson, Hebbel
- 106. **Diseases of the Heart.** (See first term) Edwards
- 111. **Conference on Autopsies.** (See first term) Dawson
- 112.†† **Diagnosis of Tumors.** (See first term) Hebbel
- 113.†† **Surgical Pathology.** (See first term) Hebbel
- 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.** (See first term) (Cr and hrs ar) Dawson, Hebbel

PEDIATRICS (Ped)

First and Second Terms

REQUIRED COURSES

- 120. **Clinical Lecture.** Pediatrics. (2 cr; prereq regis med; 4:00-5:00 W; Eustis Amph) J Anderson and staff
- 135. **Clinical Clerkship.** (12 cr; prereq regis med) J Anderson and staff

†† Second term 112 and 113 are not repetitions of the first term but rather continuations.

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
202. **Pediatric Clinic.** (5 cr; II-IV MTWThF; O-P depts. of Minneapolis General Hospital or University Hospitals) J Anderson and staff
204. **Residency in Pediatrics.** Three-month residency in pediatrics at University Hospitals, Minneapolis General Hospital, Northwestern or Ancker 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)

First and Second Terms

10. **Pharmacology for Nursing Students.** (2 cr; 22 hrs; lect IV TTh; Owre 113) Cranston and staff
109. **Pharmacological Problems.** (Cr and hrs ar) Shideman and staff
203. **Research in Pharmacology.** (Cr and hrs ar) Shideman and staff

PHYSICAL MEDICINE AND REHABILITATION (PMed)

First Term or Second Term

- 103. Physical Therapy Clinic. (Cr and hrs ar) Gullickson
- 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; hrs ar) Kottke
- 206. Conference. (1 cr; hrs ar) Staff
- 210. Research in Physical Medicine. (Cr and hrs ar) Kottke, Kubicek
- 212. Electromyography. (Cr and hrs ar) Kottke

Occupational Therapy

Consult Occupational Therapy office, 860 Mayo Memorial, University of Minnesota, Minneapolis 14.

PHYSIOLOGY (Phsl)

First Term

REQUIRED COURSES

- 4. Human Physiology. Elementary course consisting of lectures and demonstrations for students desiring an introduction to the subject. (4 cr; prereq 1 qtr zoology and 1 qtr chemistry; lect or dem II-III TWThF; Owre 111) King

ELECTIVE COURSES

- 100. General Physiology. For high school teachers in biological sciences and for others who wish an introduction to modern physiological science. (4 cr; prereq college algebra, 1 yr chemistry, college physics; I-II MTWF; MH 307) Walker
- 203. Research in Physiology. (Cr and hrs ar) Visscher and staff

Second Term

REQUIRED COURSES

- 51. Human Physiology. (6 cr; prereq zoology and 1 yr college chemistry; primarily for 5-yr nursing and physical therapy students; lect VI MWF, VII TThF, VIII TTh, Owre 111; conf IV TTh, Owre 111; lab VII-IX MW, MH 307) Lee

ELECTIVE COURSES

- 203. Research in Physiology. (Cr and hrs ar) Visscher and staff

PSYCHIATRY AND NEUROLOGY (NPsy)**First Term or Second Term**

- 101. Clinical Neurology. (1 cr) Baker
- 103. Clinical Clerkship. (12 cr) Staff
- 145. Readings in Psychiatry. (Cr ar) Staff
- 145x. Readings in Neurology. (Cr ar) Staff
- 181. Externship in Neurology. (Cr ar) Baker and staff
- 182. Problems in Basic and Clinical Neurology. (Cr ar) Baker and staff
- 191. Externship in Adult Psychiatry. (Cr ar) Staff
- 192. Externship in Child Psychiatry. (Cr ar) Jensen and staff
- 193. Problems in Psychiatry. (Cr ar) Staff
- 202. Case Conference. (1 cr) Hathaway and staff
- 203. Psychometric Clerkship. (Cr ar) Hathaway and staff
- 208. Clinical Neurology. (Cr ar) Baker and staff
- 209. Research in Neurology. (Cr ar) Baker and staff
- 212. Survey of Neuropathology. (1 cr) Staff
- 226. Neurological-Neurosurgical Conference. (1 cr) Staff
- 228. Research in Neuropathology. (Cr ar) Staff
- 231. Applied Electroencephalography, Myography. (Cr ar) Staff
- 233. Applied Neuropathology. (Cr ar) Staff
- 251. Clinical Inpatient Psychiatry. (Cr ar) Staff
- 252. Clinical Outpatient Psychiatry. (Cr ar) Staff
- 253. Clinical Child Psychiatry. (Cr ar) Jensen and staff
- 254. Advanced Clinical Inpatient Psychiatry. (Cr ar) Staff
- 255. Advanced Clinical Outpatient Psychiatry. (Cr ar) 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. Descriptive Psychopathology. (1 cr) Staff
- 265. Personality Development and Psychodynamics. (1 cr) Staff
- 291. Seminar in Current Literature. (1 cr) Simon
- 292. Specialized Supervised Psychotherapy. (1 cr) Hastings and staff

RADIOLOGY (Rad)**First Term or Second Term****ELECTIVE COURSES (UNDERGRADUATES)**

- 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

- 111. **Medical Roentgenologic Conference.** Weekly meetings with the medical staff at which all the important medical cases which have had X-ray diagnostic procedures are reviewed from both the clinical and roentgenological points of view. (1 cr; VI Th; 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; Todd Amph) Feinberg, Langer
- 135C. **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 viewpoints. (1 cr; II S; Todd Amph) Amplatz
- 163A. **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 and hrs ar) Peterson and staff
- 204. **Research Related to Radiation Therapy.** (Cr and hrs ar) Mosser
- 206. **Roentgenoscopy.** Theory and practical application of roentgenoscopy, particularly to diseases of the gastrointestinal tract, lungs, and heart. (3 cr; hrs ar) Peterson and staff
- 207. **Roentgen and Radium Therapy.** Treatments of patients under supervision both with medium and high voltage machines and with radium. Problems in connection with these treatments will be thoroughly discussed. (Cr and hrs ar) Mosser
- 209. **Roentgen Diagnosis.** Theory and practical application of roentgen diagnostic methods to medical cases in general. (3 cr; hrs ar) Peterson and staff
- 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; hrs ar) Peterson and staff
- 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 point of view. (1 cr; IX Th; Todd Amph) Peterson, Lober
- 240. **Conference in Radiation Therapy.** Discussion of methods and dosage used for treatment of patients referred for X-ray and radium therapy and review of the results from previous treatments on patients with similar conditions. (1 cr; IX W; Cobalt Room) Mosser

Surgery (Surg)

Division of General Surgery

First and Second Terms

REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

129. **Clinical Lectures in General Surgery.** (1 cr per yr; prereq regis med)
 135. **Clinical Clerkship.** (16 cr; prereq regis med)

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
 183. **Externship in Affiliated Hospitals.** (Cr and hrs ar)

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 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. **Surgical Service.** 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. **Roentgenological-Surgical 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. **Surgery, Medicine, and Pediatrics Pathological 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)

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 188. **Neurosurgery Externship, University Hospitals.** (Cr ar; prereq regis med)
- 189. **Neurosurgery Externship, Veterans Administration Hospital.** (Cr ar; prereq regis med)
- 190. **Neurosurgery Investigation.** (Cr ar; prereq regis med)

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. **Neurosurgical Service.** 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; offered 1963-64 and alt yrs)
- 140. **Clinical Lectures in Orthopedic Surgery.** (1 cr; prereq regis med; offered 1962-63 and alt yrs)

ELECTIVE COURSES FOR UNDERGRADUATE STUDENTS

- 185. **Externship in Orthopedic Surgery and Fractures.** (Cr ar; prereq regis med)
- 186. **Research Problems.** (Cr ar; prereq regis med)

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, Arnesen, and staff
- 403. **Fractures.** The orthopedic fellow acts as house surgeon on the fracture service at Minneapolis 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, Arnesen, 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. **Orthopedic Service.** The orthopedic fellow acts as house surgeon at the University Hospitals. (5 cr) Moe, Arnesen, 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, Arnesen, 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, Arnesen, and staff
416. **Orthopedic Research.** Problems in experimental or clinical surgery. University Hospitals. (5 cr) Moe, Arnesen, and staff

Division of Urology

First and Second Terms

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
257. **Use of the Artificial Kidney.** Principles, mechanics, and practical use of various medical devices. (3 cr; hrs ar) Reiser

Laboratory Medicine

LABORATORY MEDICINE (LMed)

First Term or Second Term

235. **Advanced Clinical Laboratory Medicine.** (Cr and hrs ar; prereq #) Evans and staff
236. **Research on Clinical Laboratory Problems.** (Cr and hrs ar; prereq #) Evans and staff

MEDICAL TECHNOLOGY (MedT)

First Term

110. **Advanced Clinical Laboratory Techniques.** Assignment on individual basis for observation, study, and practice in special problems; techniques and methodology in 1 or 2 of the units of the clinical laboratories (chemistry, hematology, histology, immunology or microbiology). (5 cr; prereq grad; ar) Hovde and staff

Second Term

111. **Advanced Clinical Laboratory Techniques.** (See first term) (5 cr; prereq 110; ar) Hovde and staff

School of Nursing

Courses and Fees

The program of courses in the 1963 School of Nursing Summer Session has been planned primarily to meet the needs of graduate nurses. Graduate nurses planning to register for *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 submit applications including transcripts at least 2 months in advance of the opening of the first term.

Curriculums for Graduate Nurses Leading to the Degrees of Master of Science, Master of Education in Nursing Education, and Master of Nursing Administration

Elective courses and undergraduate courses required prior to enrollment in Masters' programs are available during the Summer Session. Students registering for these programs for the first time should complete their application and consult the major adviser prior to the beginning of the session. Students in education register in the College of Education. Students in administration register in the School of Nursing. Students in psychiatric nursing register in the Graduate School. Students pay Summer Session fees.

Curriculums for Graduate Nurses Leading to the Degree of Bachelor of Science

Nursing education and nursing service administration majors may register for courses during Summer Session. Only those students presently enrolled and who can complete all requirements by spring quarter, 1964, in regularly scheduled courses are eligible for these programs. Students in nursing education register in the College of Education. Students in administration register in the School of Nursing. Students pay Summer Session fees.

Students enrolled in or planning to enter the general nursing program in fall quarter, 1963, may register in the School of Nursing for general education courses and pay Summer Session fees. Those students who plan to seek admission to this program 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*.

Basic Curriculum in Professional Nursing Leading to a Degree of Bachelor of Science

High school graduates and transfer students from colleges or universities may register for prenursing courses in the Summer Session. (See *Bulletin of the School of*

Nursing). Students register in the College of Science, Literature, and the Arts and pay Summer Session fees. Plan B students already enrolled in the School of Nursing who elect to attend Summer Session pay Summer Session fees. Plan A students register in the School of Nursing and pay regular School of Nursing fees.

Curriculum in Practical Nursing Leading to a Certificate

The fourth quarter of the 4-quarter program leading to a certificate in practical nursing is offered during the Summer Session. New applicants are admitted at the beginning of the fall quarter only. For additional information see *Bulletin of the School of Nursing*. Students register in the School of Nursing and pay regular School of Nursing fees.

First Term

- Nurs 181. Research in Nursing.** Exploration of needs for research in nursing and discussion of ways in which selected research efforts might be undertaken. (3 cr; prereq regis in grad program or Δ ; VI MTWThF; MH 118)
- NuAd 160. Ward Administration.** Principles of administration applied to a nursing unit; analysis and maintenance of nursing service; planning and assisting in clinical teaching programs. (3 cr; prereq 170 or $\#$; II MTWThF; Owre 117) Grainger
- NuAd 170. Foundations of Nursing Service Administration.** Principles of administration as applied to hospital nursing service. (3 cr [no cr to grad students in nursing administration]; prereq jr, sr, grad, or grad nurse; IV MTWThF; MH 214) Grainger
- 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; prereq 170, nursing administration major, or $\#$; III MTWThF; Owre 117) Dunning
- NuAd 176. Elements of Administration in Nursing.** Role of research in improving nursing services; administration of personnel services; evaluation of nursing service. (5 cr; prereq 177; I-II MTWThF; MH 214) Harris

Second Term

- NuAd 193. Principles of Administration Applied to Nursing Service Administration.** Community resources and agencies; legal aspects of nursing service. (6 cr; open only to 4th-qtr students in master of nursing administration program; prereq 192; II-III MTWThF; Owre 117) Walseth

School of Public Health (PubH)

Summer courses at the graduate level are designed both for completion of Master's degree programs and, in the fields of environmental health and veterinary public health, for students beginning such programs. It is expected that all students in these latter two 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.

Nurses who have completed a baccalaureate degree program but lack approved preparation for public health nursing may begin supplementary course work during the Summer Session. These nurses should apply in advance through usual University admission channels.

Undergraduate students in public health nursing who are enrolled in the program leading to the bachelor of science degree may continue with courses during the

Summer Session. Registered nurses not previously matriculated but with interest in further collegiate preparation for nursing, including preparation for the public health nursing field, should apply to the School of Nursing.

First Term

- 50. Personal and Community Health.** Fundamental principles of health conservation and disease prevention. (3 cr, §2 or 3 or 3A or 3B or 4 or 5 or 51 or 52 or 100; III MTWThF; Bo B6) Thomson
- 58. Health Programs for Mothers and Children.** Health problems of mothers and of children, birth through school age; handicapping conditions; community organization including school health programs; nursing functions. (5 cr; prereq nurses, 53, 133 or ¶53, ¶133; II-III MTWThF; MMA 100) Stocking
- 63. Public Health Nursing.** Changing role of public health nurse in control of tuberculosis and other communicable diseases; orientation to occupational nursing; staff nurse contribution to agency planning. (2 cr; prereq 53, 58, 65, 133, or #; VI-VII MF, VII W; MMA 125) Facklam
- 64. Long-Term Patient Care.** Field experience and seminar; assignment to chronic disease unit in hospital under supervision of faculty; rehabilitation techniques; application to public health nursing situations. Continued second term. (6 cr for both terms; students must register for both terms; prereq nurses, 53, 58, 95, 133, Soc 50; I-II TWThF; ar) E Anderson
- 65. Field Practice in Public Health Nursing.** Practical experience in selected public health agencies; relationship of theory to practice. (Cr ar; prereq 53, 58, 62 or 62A, 95, 133, Soc 50, C avg) Facklam, Fredlund, Stocking
- 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) Steif
- 123. Topics in Public Health.** Selected readings in public health with discussion based on these readings. (Cr ar; prereq #) Staff
- 133. Mental Health.** Emotional factors underlying wholesome family relations or interfering with successful adjustment in family and community. (3 cr; prereq 62 or 62A or experience in public health nursing or #; I MTWThF; MMA 125) K Fritz
- 139. Advanced Field Practice in Public Health Nursing: Block Placement.** Opportunity for concentration of public health nursing field practice under supervision of coordinator of mental health program. (Cr ar; prereq #) von Bergen
- 173. Advanced Field Practice in Public Health Nursing: Functional Area.** Opportunity for field placement in suitable functional area including administration, supervision, consultation, or teaching under guidance of faculty members. (Cr ar; prereq public health nurses only, 174, 177, or #) Murphy, Fritz, Blanchard, McIntyre, Pennebaker

BIOSTATISTICS

- 110. Biometric Principles.** Role of statistics in research; estimation; sampling distribution; tests of significance; power; regression; correlation; other measures of association; standard distributions including normal, t , χ^2 , F , binomial, Poisson; special distributions arising from nonparametric procedures. (3 cr; prereq ¶111; IV MTWThF; ForH 180) Brown
- 111. Biostatistics Laboratory.** Presentation of data; descriptive statistics; practice in practical application of principles and methods covered in PubH 110. (2 cr; prereq

¶110; III TThF and 7 hrs per wk ar during morning, afternoon hrs by special ar only; ForH 80) Briese

Second Term

53. **Introduction to Public Health.** Basic concepts of disease prevention and control through community programs. (5 cr; I-II MTWThF; MMA 125) G Anderson
64. **Long-Term Patient Care.** (See first term) E Anderson
65. **Field Practice in Public Health Nursing.** (See first term) Facklam, Fredlund, Stocking
75. **Introduction to Environmental Sanitation.** Principles of urban and rural sanitation relating to water, food, wastes, housing, accidents, radiation, air, insects, rodents. (3 cr; prereq 3 cr in public health; IV MTWThF; MMA 100) Bond
- 100A. **Elements of Public Health I.** Occurrence and prevention of communicable, degenerative, and industrial diseases; protection of food, water, and milk; maternal and child health. (3 cr; prereq 3, 3A or 50 and a course in microbiology; I-II MTWThF; MMA 125) G Anderson
123. **Topics in Public Health.** (See first term) Staff
139. **Advanced Field Practice in Public Health Nursing: Block Placement.** (See first term) von Bergen
173. **Advanced Field Practice in Public Health Nursing: Functional Area.** (See first term) Murphy, Fritz, Anderson, Blanchard, McIntyre, Pennebaker
230. °° **Field Practice in Environmental Sanitation.** (Cr ar; prereq #) Bond, Michaelsen, Stauffer

BIostatISTICS

120. **Biostatistics II.** (Continuation of PubH 110) (3 cr; prereq 110 with grade not lower than C, ¶121; IV MTWThF; ForH 180) Brown
121. **Biostatistics Laboratory II.** Practice in application of principles and methods covered in PubH 120. (2 cr; prereq ¶120; III TThF, and 7 hrs per wk ar during morning, afternoon hrs by special ar only; ForH 80) Loewenson
180. **Introduction to Biostatistics.** Variation; frequency distribution; probability; estimation; significance tests; binomial, normal, Poisson distribution; serial dilutions; most probable number. (6 cr; prereq sanitation and sanitary engineering students only, others #; III MTWThF, Owre 113, plus 9 hrs per wk lab ar, Mayo 1220) McHugh

MORTUARY SCIENCE (Mort)

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 1963 for their final year in either 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.

First Term

8. **Orientation in Funeral Service.** Designed for a fuller understanding of funeral service. Aptitudes, skills, and personal qualifications; field trips. (1 cr; IV TTh; VH 6) Koschig
11. **Introduction to Mortuary Management.** Funeral service as a profession. Current statistics and studies. (2 cr; III MTWTh; VH 6) Slater
13. **Mortuary Law.** Mortuary jurisprudence, probate of estates, administratorships, social security, life insurance forms, public and personal liability. (3 cr; I MTWThF; VH 210) Grayson

Second Term

9. **Orientation in Funeral Service.** Designed for a fuller understanding of funeral service. Aptitudes, skills, and personal qualifications; field trips. (1 cr; IV TTh; VH 6) Koschig
12. **Introduction to Embalming.** Techniques; orientation. (3 cr; prereq 10; III MTWTh; VH 6) Thorsell
14. **Mortuary Law.** Aspects of business law as they relate to funeral service. (3 cr; I MTWThF; VH 113) Grayson

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Courses in the College of Science, Literature, and the Arts—the Arts College—in the 1963 Summer Session are for the most part selected from the regular SLA curriculum. The complete curriculum is described in the *Bulletin of the College of Science, Literature, and the Arts* which may be obtained from the Office of Admissions and Records or the SLA office.

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. They are usually open to sophomores who have a C average in the prerequisite courses.

Certain courses offered this summer by the School of Business Administration, the Medical School, the Institute of Technology, and the College of Agriculture, Forestry, and Home Economics are open to Arts College students under conditions described in the Arts College bulletin. Admission to Summer Session is described in the section on Admission and Registration of the Summer Session bulletin; cost, housing, and admission information is provided in the section on General Information of this Summer Session bulletin as well as in the *Bulletin of General Information*.

Students are urged to bring questions or problems to the SLA offices, 214 and 223 Johnston Hall, or (on Monday, June 17) to the SLA desk in the Union Main Ballroom.

AMERICAN STUDIES (AmSt)

(See section on Special Programs)

First Term

- Hum 23. American Life III.** The rise of American intellectual and cultural nationalism and its place in the modern world. (3 cr; IV MTWThF; ForH 60) Lemons
- 202. Introduction to American Studies.** Exposition of interdisciplinary methods and of the concept of American Studies; reading of classics in American civilization. (3 cr; prereq MA candidate or Δ ; IV-V MTh; VH 127B) Mondale
- 250. Readings in American Civilization.** Independent study of interdisciplinary aspects of American civilization under guidance of members of various departments. (Cr and hrs ar; prereq Δ) Ar

Second Term

- Hum 21. American Life I.** Individualism in American life and thought. (3 cr; I MTWThF; MurH 308) Brooks
- 251. Readings in American Civilization.** (See 250, first term) Ar

Note—See also approved courses in participating departments as listed in the separate brochure, *Program in American Studies*.

ANTHROPOLOGY (Anth)

First Term

- 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 of early glacial times through the Old

and New Stone Ages to the dawn of civilization in the Bronze and Iron Ages. (3 cr, §old 2 [such students should register for 2A]; I MTWThF; ForH 115) Murrill

80. **The American Indian.** The peopling of North and South America. Physical and cultural characteristics of the tribes of the major culture areas. (3 cr; prereq 2A or 100; II MTWThF; ForH 115) Spencer
121. **Peoples and Cultures of the South Seas.** Survey of the races and cultures of the Pacific Islands (Oceania, Polynesia, Micronesia, and Melanesia). (3 cr; prereq 1A and 2A or 100; III MTWThF; ForH 285) Murrill
140. **Field Research in Archaeology.** Archaeological field excavation, survey, and research in prehistoric sites in Carlos State Park. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials. (6 cr [may be taken for cr only once]; prereq 90 and Δ) Johnson
165. **Culture and Personality.** Role of culture in the formation of personality. Problems of individual adjustments to the demands of culture. Psychological approach to culture. (3 cr; prereq sr, 2A or 100 or Δ [waived for majors in public health, nursing, psychology, sociology, and social work]; IV MTWThF; ForH 285) Spencer
- 190-191-192. **Directed Research.** (Cr and hrs ar; prereq sr, Δ) Staff

Second Term

- 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, §old 1 [such students should register for 1A]; I MTWThF; ForH 115) Gibbs
119. **Contemporary Middle-American Communities.** Mexican and Guatemalan village communities, particularly those composed entirely or in part of Indian-speaking peoples. Application of anthropological concepts and methods to the study of folk cultures. (3 cr; prereq 2A or 100 [waived for majors in Latin-American Area Studies]; IV MTWThF; ForH 285) Altschuler
120. **Peoples and Cultures of Africa.** A survey of the races, languages, and cultures of Africa south of the Sahara. Peoples representative of each culture area will be studied with special conditions. (3 cr; prereq 1A and 2A or 100; III MTWThF; ForH 285) Gibbs
150. **The Contact of Cultures.** Processes of acculturation. Impact of civilization on native cultures. (3 cr; prereq 1A and 2A or 100; II MTWThF; ForH 285) Altschuler
- 190-191-192. **Directed Research.** (Cr and hrs ar; prereq sr, grad, Δ) Staff

ART (Art)

(See also Art Education)

First Term

HISTORY OF ART

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; IV MTWThF; NH 45) Eitner

50. **Introduction to the Visual Arts.** Similar to Art 1 in organization and basic content. An expanded program of reading and more extensive contact with works of art. (3 cr; IV MTWThF; NH 45) Eitner
57. **Renaissance and Baroque Art: 1500-1650.** Painting, sculpture, and architecture in Europe from Michelangelo to Rubens. Titian, Tintoretto, and the 16th century in Venice. Palladio and the academic attitude in architecture. Caravaggio, El Greco, and the early baroque style of Bernini and Velazquez. (3 cr; prereq 1 or 50 or Δ ; III MTWThF; J 207b) Waldfoegel
59. **Traveling Summer Course in European Art.** The summer travel course in European art will be conducted by the Department of Art 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 cities to be visited are Lisbon, Madrid, Athens, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Frankfurt, Copenhagen, Paris, and London. (5 cr for successful completion of course; cost, \$1,383 including University fees; members of group will depart from New York by air June 29, spend approx 6 wks in Europe, and return to New York Aug 12) Eitner
67. **Modern Art: Realism and Impressionism.** Painting, sculpture, and architecture during the second half of the 19th century with particular emphasis on the schools of Paris, their influence and parallels in England, Germany, and the United States. (3 cr; prereq 1 or 50 or Δ ; I MTWThF; J 207b) Waldfoegel
- 101.* **Hellenistic Through Early Christian Art.** Art of the Hellenistic kingdoms, Hellenic and Etruscan art in Italy. Art of the Roman Empire. Transformation of classical styles under the influence of oriental traditions and of Christian religion. Development of Christian art. Art of the Byzantine Empire. Survivals of classical forms in early medieval art. (3 cr; prereq sr, grad or Δ ; II MTWThF; J 207b) Eitner
- 112.* **Art of Japan.** Development of painting, sculpture, and minor arts in Japan from earliest times to the present. (3 cr; prereq sr, grad or Δ ; I MTWThF; J 207a) Copeland

STUDIO COURSES

10-11-12. **Photography.** Introductory sequence in photography.

10. 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; controlled enrollment)

Sec 1, III-IV MTWThF, J 2, Downs

Sec 2, I-II MTWThF, J 2, Liebling

11. For students who have had previous instruction in photography or have worked in photography and know the principles of development 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 Δ ; controlled enrollment)

Sec 1, III-IV MTWThF, J 2, Downs

Sec 2, I-II MTWThF, J 2, Liebling

12. History and criticism. Its use in illustration, printing, advertising, and its relationship to film and television. Field project in creative photography. (3 cr; prereq 11 or Δ ; controlled enrollment)

Sec 1, III-IV MTWThF, J 2, Downs

Sec 2, I-II MTWThF, J 2, Liebling

- 23-24-25. Drawing and Design I.** Foundation sequence for future work in the Department of Art. Investigation through discussion and studio work of the characteristics and principles common to all visual arts.
23. Experience in handling the tools and materials of drawing. Source material in nature, and problems in descriptive and imaginative drawing. Investigation of design principles through drawing and elementary perspective. (3 cr; prereq 1 or ¶1; controlled enrollment)
 Sec 1, I-II MTWThF, J 109, Quirt Sec 2, III-IV MTWThF, J 109, Liebling
24. Basic tools of the artist and the elements and principles of design. Line, shape, texture, value, and color are considered separately and as they relate to one another. (3 cr; prereq 23; controlled enrollment)
 Sec 1, I-II MTWThF, J 109, Quirt Sec 2, III-IV MTWThF, J 109, Liebling
25. Development of the work in Art 24 with primary emphasis on the means of organization through projects in such areas as: illustration, graphic design, photography, and certain printing processes. (3 cr; prereq 24; controlled enrollment)
 Sec 1, I-II MTWThF, J 109, Quirt Sec 2, III-IV MTWThF, J 109, Liebling
- 32-33. Elements of Printmaking**
32. Foundation course. Familiarizes the student with the media of printmaking in general. Problems in engraving, etching, and other techniques employed in working on metal plate, as well as lithography, woodcuts, and combined processes. (3 cr; I-II MTWThF; J 203; controlled enrollment) Myers
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; prereq 32; I-II MTWThF; J 203; controlled enrollment) Myers
- 52. Drawing II.** Drawing from model, still life, and nature. Principles of anatomy. (3 cr; prereq 25 or equiv, with Δ; III-IV MTWThF; J 10; controlled enrollment) Myers
- 54-55. Life Drawing.** (Continuation of Art 52-53) Places particular emphasis on drawing from the model. Related studies of past and contemporary drawing and painting employing the human figure. (3 cr each; prereq 52 or equiv, with Δ; III-IV MTWThF; J 10; controlled enrollment) Myers
- 70-71-72. Oil Painting.** Introduction to medium of oil; individual projects and instruction. (3 cr each; prereq 54; III-IV MTWThF; J 200; controlled enrollment) Quirt
- 73-74-75. Presentation Techniques.** A study of the visual means of communicating ideas in the fields of exhibition techniques, illustration, and advertising. An investigation of the characteristics and the creative use of various media. (3 cr each; prereq 25 or Δ [no prereq for architects]; I-II MTWThF; J 4; controlled enrollment) Downs
- 90-91-92. Printmaking.** Problems in engraving, etching, and other techniques employed in working on metal plate, as well as lithography, woodcuts, and combined processes. (3 cr each; prereq 32 or Δ; I-II MTWThF; J 203; controlled enrollment) Myers
- 150-151-152. Problems in Painting.** (3 cr each; prereq 72 and Δ; III-IV MTWThF; J 200; controlled enrollment) Quirt

- 190-191-192. Problems in Printmaking.** For advanced students. Work in black and white and color in metal, lithographs, and wood blocks. (3 cr each; prereq 92 or Δ ; I-II MTWThF; J 203; controlled enrollment) Myers
- 200. Advanced Problems in Studio Work.** (3 cr; prereq #; hrs ar; J 200) Quirt

Second Term

HISTORY OF ART

- 1. Principles of Art.** (See first term) (IV MTWThF; J 207b) Torbert
- 50. Introduction to the Visual Arts.** (See first term) (IV MTWThF; J 207b) Torbert
- 138.° Art in the United States.** Contemporary movements. The Armory Show and development of modern realism, expressionism, and abstraction. Frank Lloyd Wright and modern American architecture. (3 cr; prereq sr, grad or Δ ; II MTWThF; J 207b) Torbert
- 196. Readings in Art History and Criticism.** (3 cr; prereq #) Torbert

STUDIO COURSES

- 20. Basic Drawing.** An introduction to studio work; exploration of contemporary and traditional methods. Work from nature; various drawing mediums. (3 cr; prereq 1 or \S 1; III-IV MTWThF; J 109; controlled enrollment) Munoz
- 23-24-25. Drawing and Design I.** (See first term) (I-II MTWThF; J 200) Busa
- 40-41. Sculpture I.**
40. Beginning course. An intensive study of structure in nature with emphasis on accurate observation. Life drawing prepares the student for each sculpture problem. The sculpture medium is clay. Some instruction in plaster casting. (3 cr; prereq 1 or \S 1; I-II MTWThF; HolB 140; controlled enrollment) Randell
41. Integrates basic principles examined in Art 40. Natural form is studied for its sculptural possibilities. A more imaginative approach to the study of nature is encouraged. In addition to clay, direct plaster construction is the principal medium. Drawing from life precedes each problem. (3 cr; prereq 40; I-II MTWThF; HolB 140; controlled enrollment) Randell
- 52. Drawing II.** Drawing from model, still life, and nature. Principles of anatomy. (3 cr; prereq 25 or equiv, with Δ ; I-II MTWThF; J 109; controlled enrollment) Munoz
- 54-55. Life Drawing.** (Continuation of Art 52-53) Places particular emphasis on drawing from the model. Related studies of past and contemporary drawing and painting employing the human figure. (3 cr each; prereq 52 or equiv, with Δ ; I-II MTWThF; J 109; controlled enrollment) Munoz
- 70-71-72. Oil Painting.** (See first term) (III-IV MTWThF; J 200) Busa
- 80-81-82. Sculpture II.** Direct carving in stone and wood with attention given to possibilities of materials and sculptural design. Experimental work in metal, plastics, and combinations of sculptural materials. Some direct modeling in plaster. (3 cr each; prereq 42 or equiv; III-IV MTWThF; HolB 140; controlled enrollment) Randell
- 150-151-152. Problems in Painting.** (See first term) (III-IV MTWThF; J 200) Busa
- 180-181-182. Problems in Sculpture.** Advanced work in wood, stone, plaster, metal, and other materials of sculpture. Students work individually on projects. (3 cr each; prereq 82 or Δ ; III-IV MTWThF; HolB 140; controlled enrollment) Randell
- 200. Advanced Problems in Studio Work.** (See first term) (Hrs ar; J 200) Busa

BOTANY (Bot)††**First Term**

- Biol 1.†† 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; lect V MTWTh, V-VI F, Bo B6; lab VI-VIII MTWTh, Z 101) Skjegstad
- 194.* Problems.** Advanced work in some specialized field of botany. (1-5 cr; prereq #; ar) Staff

Second Term

- Biol 2.†† General Biology.** (See Biol 1, first term) (5 cr; prereq 1 or equiv; lect V MTWTh, V-VI F, Bo B6; lab VI-VIII MTWTh, Z 101) Olson
- 195.* Problems.** (See Bot 194, first term) (1-5 cr; prereq #; ar) Staff

CLASSICS**First Term***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, §43; prereq soph; I MTWThF; FolH 206) R Swanson
- 56. Elementary Linguistics.** Introduction to current language science, involving brief history of the field and its methods, summary of the chief language families, basic phonetics of the European languages, how words are made and how they are analyzed, principles of language change, reconstruction of earlier stages in a language from extant dialects, and applications of linguistic science to language teaching and learning. (3 cr; prereq 1 yr foreign language study on college level or equiv, or #; II MTWThF; FolH 304) D Swanson
- 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, §43, §45; I MTWThF; FolH 206) R Swanson

Greek (Grk)

- 171. Advanced Reading.** (3 cr; prereq 63 or Δ ; II MTWThF; FolH 305) R Swanson

Latin (Lat)

- 171. Advanced Reading.** (3 cr; prereq 63 or Δ ; III MTWThF; FolH 305) D Swanson

†† For additional courses in the first term, 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.

§§ No knowledge of Latin or Greek required.

Second Term

Latin (Lat)

172. **Advanced Reading.** (3 cr; prereq 63 or Δ ; I MTWThF; FolH 305) Sonkowsky

COMMUNICATION

See Index

ECONOMICS

See Economics in the School of Business Administration and Agricultural Economics in the College of Agriculture, Forestry, and Home Economics.

Note—See the *Bulletin of Science, Literature, and the Arts* for information about the major or minor in economics leading to the bachelor of arts degree.

EFFICIENT READING

See Index

ENGLISH §§

First Term

Literature (Engl)

- 1B. **Freshman English.** (Each section limited to 28) (3 cr, §A or §1A or §Comp 4 or §Comm 1; prereq classif card 1 or 2 or 3)

Sec 1, I MTWThF, VH 6, Ar
Sec 2, I MTWThF, VH 205, Ar

Sec 3, I MTWThF, VH 2, Ar

- 3B. **Freshman English.** (Each section limited to 28) (3 cr, §C or §3A or §Comp 6 or §Comm 3; prereq B or 2A or 2B or Comp 5 or Comm 2)

Sec 1, I MTWThF, VH 309, Ar
Sec 2, I MTWThF, VH 306, Ar

Sec 3, I MTWThF, VH 113, Ar

23. **Introduction to Literature.** The romantic movement and the Victorians. Wordsworth, Byron, Shelley, Keats, Carlyle, Tennyson, Browning, and Arnold. (6 cr; prereq ††; I-II MTWThF; VH 301) Buckley
55. **Shakespeare.** Plays from Shakespeare's early and middle periods: *Richard II, A Midsummer Night's Dream, The Merchant of Venice, Julius Caesar*, and 2 or 3 other plays selected by the instructor. (Limited to 35) (3 cr; prereq ††; II MTWThF; VH 309) O'Brien
56. **Shakespeare.** Plays from Shakespeare's middle and later periods: *Twelfth Night, Hamlet, Macbeth, The Tempest, Troilus and Cressida* or *Measure for Measure; Othello* or *Antony and Cleopatra*. (Limited to 35) (3 cr; prereq 55 or †; II MTWThF; VH 205) Ar
72. **American Literature.** Notable authors from the Puritans to Melville. (3 cr; prereq ††; IV MTWThF; VH 301) Herbert Brown

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

††† Completion of or exemption from Freshman English requirement.

§§ Credit will be allowed in English for Clas 45.

73. **American Literature.** Whitman through Stephen Crane. (3 cr; prereq 72 except for education minors or #; IV MTWThF; VH 207) Levenson
75. **Chaucer.** Selections from *The Canterbury Tales* with introduction dealing with the grammar and literary forms of 14th-century English. (3 cr; prereq ††; III MTWThF; VH 306) Clark
- 90H. **Magna Honors Thesis.** (3 cr; prereq candidate for *magna cum laude* and Δ) Ar
- 91H. **Summa Honors Thesis.** (3 cr; prereq candidate for *summa cum laude* and Δ) Ar
106. **Whitman and Mark Twain.** (3 cr; prereq ††; II MTWThF; VH 306) Mondale
136. **Advanced Shakespeare.** The work of the poet's maturity. Special attention to *Othello*, *King Lear*, *Antony and Cleopatra*, *Cymbeline*, *The Winter's Tale*. (3 cr; prereq 55-56; III MTWThF; VH 309) O'Brien
137. **Nineteenth-Century Literature.** Poetry and prose of the early Victorian period. (3 cr; prereq ††; II MTWThF; VH 207) Stange
154. **American Novel.** History of the American novel from the beginning through Howells. (3 cr; prereq ††; III MTWThF; VH 301) Herbert Brown
162. **Milton.** The minor poems, *Areopagitica*, *Paradise Lost*, and *Samson Agonistes*. (3 cr; prereq ††; IV MTWThF; VH 113) Unger
165. **Introduction to Modern English.** A scientific approach to the sounds and grammar of present-day English, with some attention to syntax; implications for a reasonable attitude toward English usage in America. (3 cr; prereq ††; II MTWThF; VH 2) Kirchner
197. **Seventeenth-Century Literature.** Prose and nondramatic poetry of the earlier part of the century. (3 cr; prereq ††; II MTWThF; VH 113) Unger
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) Stange
298. **Independent Reading.** (3 cr; prereq MA degree or equiv) Ar

Second Term

Literature (Engl)

- 1B. **Freshman English.** (See first term) (I MTWThF; VH 6) Ar
- 2B. **Freshman English.** (Each section limited to 28) (3 cr, §B or §2A or §Comp 5 or §Comm 2; prereq A or 1A or Comp 4 or Comm 1)
 Sec 1, I MTWThF, VH 306, Ar Sec 2, I MTWThF, VH 205, Ar
21. **Introduction to Literature.** Chaucer to Milton. (6 cr; prereq ††; I-II MTWThF; VH 301) Levine
54. **The English Novel.** Trollope, George Eliot, Meredith, Hardy, Conrad, and Butler. (3 cr; prereq ††; II MTWThF; VH 113) Wright
55. **Shakespeare.** (See first term) (III MTWThF; VH 309) Hurrell
56. **Shakespeare.** (See first term) (III MTWThF; VH 113) Montgomery

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

†† Completion of or exemption from Freshman English requirement.

74. **American Literature.** Dreiser to the present. (3 cr; prereq 72 except for education minors or #; II MTWThF; VH 207) Youngblood
- 90H. **Magna Honors Thesis.** (See first term) Ar
- 92H. **Summa Honors Thesis.** (See first term) (Prereq 91H) Ar
100. **Old English.** Introduction to sounds and grammar with some prose reading. Relation to modern English stressed. (6 cr; prereq ††; I-II MTWThF; VH 2) Ar
105. **Hawthorne and Melville.** (3 cr; prereq ††; III MTWThF; VH 2) Weber
142. **Twentieth-Century British and American Literature.** A critical survey of major figures. (3 cr; prereq ††; III MTWThF; VH 1) R Foster
156. **American Drama.** A study of the principal American dramatists. (3 cr; prereq ††; III MTWThF; VH 207) Weales
158. **American Poetry.** Major poets of the late 19th and of the 20th centuries. (3 cr; prereq ††; IV MTWThF; VH 1) Wright
186. **Form and Idea in Dramatic Literature.** Experimental and realistic drama. (3 cr; prereq ††...55-56 recommended; IV MTWThF; VH 113) Hurrell
193. **The Poetry of W. B. Yeats.** (3 cr; prereq ††; IV MTWThF; VH 207) Youngblood
299. **Independent Reading.** (3 cr; prereq MA degree or equiv) Ar

FAMILY STUDIES (FamS)

First Term

1. **Dynamics of Dating, Courtship, and Marriage.** Function of the family today, problems of dating and courtship, the engagement, relations of husband and wife, family crises, and bases of marital stability. (3 cr; I MTWThF; JohH 106) Torbett
- 1A. **Dynamics of Dating, Courtship, and Marriage.** (See FamS 1) Designed for Upper Division or married students. (3 cr; prereq 1; III MTWThF; JohH 105) Torbett
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 SLA grad requirements; II MTWThF; JohH 122) Ludwig

Second Term

1. **Dynamics of Dating, Courtship, and Marriage.** (See first term) (I MTWThF; ForH 244) Ross

FOREIGN STUDY SEMINAR

See Interdisciplinary Programs

GEOGRAPHY (Geog)

First Term

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) Webb

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

102. **Central Europe.** The physical and human geography of Central Europe, followed by a more intensive discussion of population patterns, resources, and industries in the individual countries. (3 cr; prereq 10 cr or #; I MTWThF; CB 435) Kuklinski
107. **Soviet Union.** Character of and bases for the regional diversity of physical resources, population, agriculture, manufacturing, and transportation in the U.S.S.R. (3 cr; prereq 10 cr or #; IV MTWThF; CB 435) Kuklinski
301. **Research Problems in Geography.** (Cr ar) Webb

Second Term

41. **Geography of Primary Production.** Introductory economic geography with special emphasis on commodities of commercial significance. Particular attention is given to world patterns of raw material occurrence and production, and to associated centers of industrial fabrication. (5 cr; II-III MTWThF; CB 435) Lukermann
101. **Western Europe.** The physical and human geography of western Europe considered as a whole, followed by a more intensive discussion of selected topics on the British Isles, France, the Low Countries, the Rhine basin, Norway, and Denmark. (3 cr; prereq 10 cr or #; IV MTWThF; CB 435) Dickinson
153. **Urban Geography.** Discussion of character and distribution of cities in present-day world, including analysis of their development. Emphasis placed on internal character of cities, their associations with rural areas, and their functional differentiation. (3 cr; prereq 4 or #; I MTWThF; CB 435) Dickinson
301. **Research Problems in Geography.** (Cr ar) Lukermann

Geographical Field Session

(August 29-September 18)

Two intensive field research seminars, Geog 251-252 and Geog 276-277, will be given August 29-September 18 (1 week will be on the University of Minnesota campus and 2 weeks in San Luis Valley, Colorado, with headquarters at Alamosa). Research will be focused upon related problems in physical and agricultural geography. Reservations must be made no later than June 6. For costs, detailed information, and reservations, contact Department of Geography.

- 251-252. **Seminar: Physical Geography.** One week will be spent on the University of Minnesota campus and 2 weeks in the field studying geographical variations in the mountain basins and associated ranges. (Limited to 8) (5 cr; prereq #) Salisbury
- 276-277. **Seminar: Agricultural Geography.** One week will be spent on the University of Minnesota campus and 2 weeks in the field studying geographical problems associated with settlement and land-use in the Southern Rocky Mountains. (Limited to 8) (5 cr; prereq #) Mather

GERMAN (Ger)

First Term

1. **Beginning German.** (5 cr; I-II MTWThF; FolH 209½) Menze
3. **Beginning German.** (5 cr; prereq 2 or 2 yrs high school German; I-II MTWThF; FolH 209) F Wood
4. **Intermediate German.** Selected readings from literature. (3 cr; prereq 3 or 3A or 3B or 3 yrs high school German...¶5 recommended; I-II MWF; FolH 207) Ar

5. **Intermediate German.** Elementary composition and conversation. (2 cr; prereq 3 or 3A or 3B or 3 yrs high school German...¶4 recommended; I-II TTh; FolH 207) Ar
74. **Nineteenth-Century Drama.** (3 cr; prereq 56, or 4 and Δ; IV MTWThF; FolH 208) Menze
149. **Directed Readings.** (2-3 cr; prereq #; 1st meeting IV W, June 19, FolH 210; for remainder of course there will be only individual consultations) Ramras
162. **Eighteenth Century.** Sturm und Drang. (3 cr; prereq sr, grad, 14 cr in courses 70 and above or equiv; III-IV TTh; FolH 108) Ramras
187. **Heine.** (3 cr; prereq sr, grad, 14 cr in courses 70 and above or equiv; III-IV MW; FolH 108) F Wood

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
107. **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

Second Term

2. **Beginning German.** (5 cr; prereq 1 or 1 yr high school German; I-II MTWThF; FolH 209) Menze
75. **Modern Drama.** (3 cr; prereq 56, or 4 and Δ; IV MTWThF; FolH 208) Ramras
149. **Directed Readings.** (See first term) (1st meeting V W, July 24, FolH 210) Ramras
176. **Kleist and Büchner.** (3 cr; prereq sr, grad, 14 cr in courses 70 and above or equiv; III-IV TTh; FolH 108) Menze

HISTORY (Hist)

First Term

1. **Civilization of the Modern World, Part 1.** Rise of the European state system as framework within which Western civilization developed, and economic, cultural, political, intellectual, and religious implications to the emerging system. (3 cr; I MTWThF; CB 150) Bamford

†† See Modern Language Institute under Special Programs.

2. **Civilization of the Modern World, Part 2.** Struggle for control over the Western states system, and emergence of liberal democracy in the modern world. (3 cr; IV MTWThF; CB 235) R Smith
16. **Ancient Civilization, Part 3.** Roman civilization to A.D. 305. (3 cr; III MTWThF; CB 230) Kildahl
17. **History of Asia, Part 1.** Ancient history and culture of China, Japan, and India to A.D. 1200. (3 cr; III MTWThF; CB 145) Taylor
20. **American History, Part 1.** Colonial and early national period. (3 cr; I MTWThF; CB 5) Beatty
52. **Ancient Civilization, Part 3.** Roman civilization to A.D. 305. (3 cr; III MTWThF; CB 155) Kildahl
59. **History of Asia, Part 1.** Ancient history and culture of China, Japan, and India to A.D. 1200. (3 cr; III MTWThF; CB 145) Taylor
81. **The United States in the Twentieth Century, Part 3.** 1932 to present. (3 cr; III MTWThF; CB 130) Trefousse
90. **The American West, Part 1.** Colonial frontier. (3 cr; II MTWThF; CB 145) Berkhofer
- 104B. **Europe in the Late Middle Ages, Renaissance, and Reformation, Part 2.** High Renaissance (1450-1515). (3 cr; II MTWThF; CB 225) Giesey
109. **Europe in the Twentieth Century, Part 1.** 1890-1918. (3 cr; I MTWThF; CB 235) R Smith
- 125B. **Modern Russia, Part 1.** The reign of Nicholas II to 1914. (3 cr; II MTWThF; CB 230) Stavrou
- 126C. **The Modern Near East: The Balkans and the Arab World, Part 2.** From the fall of Constantinople (1453) to the Congress of Berlin (1878). (3 cr; III MTWThF; CB 140) Stavrou
- 148A. **History of the South, Part 3.** 1890 to the present. (3 cr; III MTWThF; CB 235) Noble
151. **Intellectual History of the United States, Part 3.** (3 cr; II MTWThF; CB 150) Noble
152. **Current Interpretations 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; prereq ¶EdCI 168A, #; III MTWThF; PeikH 155) Berkhofer
164. **History of China, Prehistoric Times to Present, Part 1.** To 221 B.C. (3 cr; IV MTWThF; CB 205) Taylor
180. **Proseminar: European Economic History Since 1500, Part 2.** (3 cr; III MTWThF; CB 210) Bamford
- 180A. **Proseminar: History of European Commerce, Part 2.** (3 cr; III MTWThF; CB 210) Bamford
- 187C. **Proseminar: Twentieth-Century American History, Part 3.** (3 cr; II MTWThF; SocSci 736) Trefousse
200. **Seminar: Historical Bibliography and Criticism, Part 1.** (3 cr; 12:30-2:00 MWF; SocSci 736) Giesey

Second Term

3. **Civilization of the Modern World, Part 3.** Impact of industrialism upon Western and world civilization in the 20th century. (3 cr; II MTWThF; CB 155) Wright
18. **History of Asia, Part 2.** Asia, A.D. 1200-1800. Chinese empire period; India (Muslim domination); Japanese feudalism; the beginning of Western influence. (3 cr; III MTWThF; CB 205) Stein
21. **American History, Part 2.** Sectionalism and national development. (3 cr; I MTWThF; CB 10) Horning
22. **American History, Part 3.** Modern America. (3 cr; II MTWThF; CB 5) Lupton
60. **History of Asia, Part 2.** Asia, A.D. 1200-1800. Chinese empire period; India (Muslim domination); Japanese feudalism; the beginning of Western influence. (3 cr; III MTWThF; CB 205) Stein
88. **American Colonies, Part 3.** In the empire and the revolutionary crisis. (3 cr; II MTWThF; CB 140) Rutman
94. **American Diplomatic History, Part 2.** Period of national development. (3 cr; III MTWThF; CB 140) Lupton
- 105C. **English Constitutional History to 1485, Part 3.** England in the later Middle Ages. (3 cr; III MTWThF; CB 145) Hoyt
- 108A. **Europe in the Nineteenth Century, Part 2.** Age of realism, materialism, nationalism, and imperialism, 1850-1900. (3 cr; IV MTWThF; CB 155) Kraehe
125. **Russia, Part 1.** Origins of the Slavs, the eastward movement, and the rise of Russia through the death of Peter the Great. (3 cr; IV MTWThF; CB 145) Horning
142. **History of Germany, Part 3.** Since 1871. (3 cr; IV MTWThF; CB 230) Wright
- 156B. **History of South Asia, Especially India, Part 3.** Modern India, 1757-1947. (3 cr; IV MTWThF; CB 205) Stein
159. **Survey of Latin-American History, Part 3.** Recent Latin-American history. (3 cr; II MTWThF; CB 205) Beatty
- 175A. **Proseminar: Medieval English History, Part 3.** (3 cr; IV MTWThF; SocSci 633) Hoyt
- 177D. **Proseminar: Nineteenth-Century European History, Part 2.** (3 cr; 1:00-2:40 TTh; SocSci 736) Kraehe
- 186E. **Proseminar: Seventeenth- and Eighteenth-Century American History, Part 2.** (3 cr; III MTWThF; SocSci 633) Rutman

INTERDISCIPLINARY PROGRAMS

First Term

Communication (Comm)

3. **Communication.** (Continuation of Comm 1-2) (3 cr, §Engl C or §3A or §3B or §12H; prereq 2; II MTWThF, VH 6) Jensen

Foreign Study (FS)

161. **Seminar for Foreign Study I.** Directed field study (SPAN program) in selected foreign countries, investigating current economic, political, educational, cultural, and religious patterns of life. Each student will study the country carefully before em-

barking and write a comprehensive report of his findings upon returning. (6 cr; prereq approval before December by a faculty selection committee [grad students must also have approval of adviser]) Armajani, Laakso, Ryberg, St John

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: Voltaire, Goethe, and Rousseau. One historical novel, Tolstoy's *War and Peace*. (3 cr; I MTWThF; ForH 180) Penn
4. **Humanities in the Modern World IV.** The humanities since World War I. Authors studied include Freud, Lenin, Koestler, T. S. Eliot, Kafka, and others. Background topics include civilization between two wars, impact of psychoanalysis, communism versus fascism. (3 cr; IV MTWThF; ForH 85) Amberg
23. **American Life III.** The rise of American intellectual and cultural nationalism and its place in the modern world. (3 cr; I MTWThF; MurH 308) Lemons
51. **Humanities in the Modern World.** (See Hum 1) (3 cr, §1; II MTWThF; ForH 170) Bryan
52. **Humanities in the Modern World.** Industrial revolution; liberalism and socialism. Period from about 1776 to 1890. Authors: Mill, Ibsen, Dostoyevski, Tolstoy, Flaubert, and the classical economists. (3 cr, §2; IV MTWThF; ForH 150) Klinger
53. **Humanities in the Modern World.** From about 1840 to about 1914. Authors: Darwin (*Evolution and Its Influence*), Nietzsche, Kierkegaard, and Mann. (3 cr, §3; III MTWThF; ForH 180) Bryan
54. **Humanities in the Modern World.** The humanities since 1914. Authors studied include Lenin, Koestler, George Orwell, Freud, T. S. Eliot, and others. Background topics include civilization since 1914 in an era of wars and revolutions; rise of communist and fascist dictatorships. Impact of psychoanalysis. (3 cr, §4; III MTWThF; ForH 150) Amberg
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; ForH 175) Ames
63. **The Renaissance.** The 14th to 17th centuries. Rise of Italian communes, commercial life, banking; age of Lorenzo the Magnificent in Florence; ideal of beauty in art, politics, and morals; universal man. High Renaissance and the power of Rome. Golden Age of Spain and beginnings of Age of Reason. Readings from Pico della Mirandola, Machiavelli, Castiglione, Montaigne, Pascal, Cervantes. Renaissance and baroque art and architecture. (3 cr, §13; IV MTWThF; ForH 160) Ames

Social Science (SSci)

1. **Personality.** Historical, political, social, psychological, and cultural factors that influence human behavior. The impact of personality structure on social and cultural patterns. (3 cr; II MTWThF; MurH 308) Roshwald
2. **Work.** Division of labor and economic organization in modern societies. The functions of economic systems. Economic instability. Comparative economic systems. Work attitudes in traditional and modern societies. (3 cr; III MTWThF; MurH 308) Roshwald

Second Term

Foreign Study (FS)

162. **Seminar for Foreign Study II.** (Continuation of FS 161) (See first term) (6 cr) Armani, Laakso, Ryberg, St John

Humanities (Hum)

1. **Humanities in the Modern World I.** (See first term) (3 cr; I MTWThF; ForH 170) Ramsland
2. **Humanities in the Modern World II.** Industrial revolution; liberalism and socialism. Period from about 1776 to 1890. Authors: Mill, Ibsen, Dostoyevsky, Tolstoy, Flaubert, and the classical economists. (3 cr; II MTWThF; ForH 130) Ramsland
21. **American Life I.** Individualism in American life and thought. (3 cr; I MTWThF; MurH 308) Brooks
54. **Humanities in the Modern World.** (See first term) (3 cr, §4; IV MTWThF; ForH 115) Louden
61. **The Greek Heritage.** The Golden Age of Athens—tragedy, concepts of goodness and beauty, struggle for the state. Concepts of reason, justice, order. Selected readings in Homer, Plato, and the tragedians. (Limited to 70) (3 cr, §11; III MTWThF; FolH 204) Swanson
131. **Humanities Proseminar.** Ancient, medieval, and modern attitudes toward essential irrationalism: tragic, romantic, and amoral irrationalism; Nazism; gratuitousness; the existential "absurd"; "belief" without faith; schools and cults of irrationalism. (3 cr; prereq sr; IV MTWThF; FolH 203) Swanson

Social Science (SSci)

3. **Community.** The web of human relations in traditional and modern societies. Caste and class in the United States. The government of societies; democracy and totalitarianism. (3 cr; I MTWThF; ForH 160) Uppal

SCHOOL OF JOURNALISM (Jour)

(See Section on Special Programs)

First Term

11. **Reporting 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 newswriting; 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 English requirement; I MTWThF; MurH 212) Sim
60. **Graphic Arts: Processes.** Letterpress, offset, lithography, gravure, and silk screen processes; history of processes, relative costs, effective use, and copy preparation for each; significant graphic arts developments. (3 cr, §old 65; prereq jr; I MTWThF; MurH 207) Wilson
73. **Magazine Writing.** Planning and writing feature articles for general, class, and trade publications; marketing; problems of magazine editing; employee publication and industrial journal problems. (3 cr; prereq 15, or #: III MTWThF; MurH 311) Charnley

90. **Mass Communications and the News.** How the news (in print, on the air, by film) gets to, and affects, the public. Evaluation of news gathering and presentation methods. Contemporary influences on communication media. Individual news media and news commentators. (3 cr; not open to jour maj; II MTWThF; MurH 311) Charnley
109. **History of Journalism.** A survey of the development of American newspapers and periodicals, from early beginnings in Europe to the present day; the rise of radio and television; the relation of communications developments to political, economic, and social trends in America. (3 cr; IV MTWThF; MurH 308) Emery
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 15 or 18 for jour maj, # for others; II MTWThF; MurH 302) Gerald
123. **Contemporary Problems in Freedom of Speech and Press.** Impact of international and domestic political tension on freedom of expression; recent constitutional interpretations of interest to journalists, teachers, and the lay public; the Bill of Rights today. (3 cr; IV MTWThF; MurH 302) Gerald
182. **School Publications Workshop.** Intensive study of the role of the high school and college newspaper and yearbook; analysis of content; study of design and make-up, typography, photography, processes. Separate study sections for college yearbook or newspaper editors, and for school publications advisers. (3 cr; not open to U of Minn jour maj; prereq jr, sr and #, grad, or #; 1:00-4:30 MTWThF; MurH 311) Wilson and others
290. **Special Problems in Mass Communications.** Individual problems course for graduate students with major or minor programs in journalism. (3 cr; prereq #; ar) Staff

Second Term

78. **Public Relations Methods.** Publicity, external and internal communication, use of media; techniques and application of institutional promotion and 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 #; I MTWThF; MurH 311) Corcoran
79. **Advertising Copy Writing.** Advertising appeals; techniques of writing advertising copy for newspapers, magazines, direct mail, posters, brochures; planning advertising campaigns. (3 cr; prereq 41 or 51, and 57 and 60; II MTWThF; MurH 212) Corcoran
111. **Development of American Broadcasting.** Historical and economic development of radio and television in the United States; government regulation, industry self-regulation, forms of social control; issues in contemporary broadcasting; the journalist as broadcaster. (3 cr, §120; IV MTWThF; MurH 302) Kuczun
115. **Communications Analysis: Content, Audiences, Effects.** Research procedures and methods for analyzing content and audiences of newspapers, periodicals, radio, television, and motion pictures. Field and experimental approaches to studies of mass media effects. (3 cr; prereq QA 5 or Soc 45, or Psy 70 or equiv or #...Psy 167 recommended; I MTWThF; MurH 302) Carter
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 Upper Division course in history or political science; III MTWThF; MurH 311) Selikoff

130. **Public Opinion and Propaganda.** Functions of the press and other communication agencies in the formation of public opinion. Studies of persuasion and attitude change. Problems in the interpretation of opinion and attitude research in the mass media field. Pressure-group activities and political and international propaganda. (3 cr; prereq 15 cr in social sciences; II MTWThF; MurH 308) Clarke
290. **Special Problems in Mass Communications.** Individual problems course for graduate students with major or minor programs in journalism. (3 cr; prereq #: ar) Staff

LIBRARY SCHOOL (Lib)

The Graduate School, through the Library School, offers a program leading to the Master's degree with a major in library science. This is the only program preparing students for full-time professional library work. In addition, the Library School offers, through the College of Education, a program of 24 credits in library science to prepare students for part-time library work in connection with teaching. For application forms and requirements write to the Library School, 3 Walter Library, University of Minnesota, Minneapolis 14.

Students preparing to be school librarians should apply for admission to either the graduate program or the minimum certification program for school librarians. Minimum certification courses are: Lib 50 or 55 (not both), 53, 62, 70, 74, 83, 171, and 172. Prerequisites to graduate courses are: Lib 50, 55, 62, 70, and 83.

First Term

62. **Reference I.** General reference tools and other sources of information; theory and practice of reference work. (3 cr; II MTWThF; Lib 4A) Jones
70. **Selection of Library Materials.** Techniques, standards for selection of books, magazines, pamphlets, phonograph records, films, etc. (3 cr; IV MTWThF; Lib 4A) Smith
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) Pond
155. **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 55; IV MTWThF; Lib 4B) Jones
157. **School Library Problems.** Library objectives in relation to educational objectives, larger units of school service, value and effect of standards. (3 cr; prereq 55; III MTWThF; Lib 4A) Pond
173. **Reading Guidance for Adults.** The learning and reading ability of adults. The promotion of adult reading and the evaluation of book collections. (3 cr; prereq 70; II MTWThF; Lib 4B) Smith

Second Term

50. **History of Libraries and Librarianship.** Social trends affecting libraries and their functions in society; librarianship as a profession. (3 cr; IV MTWThF; Lib 4A) Shove
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; IV MTWThF; PeikH 125) Kromer

55. **Library Administration.** Introduction to principles of library administration and management. (3 cr; III MTWThF; Lib 4A) Ozolins
83. **Cataloguing and Classification.** Basic principles of descriptive cataloguing, rules of entry, subject headings and classification in libraries. (3 cr; II MTWThF; Lib 4A) Simonton
161. **Literature of the Humanities.** Bibliographical and other reference sources, including reviewing mediums. Developments and trends in the subjects covered. (3 cr; prereq 62; I MTWThF; Lib 4B) Ozolins
162. **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 62; II MTWThF; Lib 4B) Shove
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 70; I MTWThF; Lib 4A) Pond
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 70; III MTWThF; Lib 4B) Pond

MATHEMATICS (Math)

(See also Department of Mathematics, Institute of Technology)

First Term

- Y. Higher Algebra.** Essentially the equivalent of the second year of high school algebra. Included are factoring, fractions, linear equations and systems in one or more unknowns, determinants of order 2 and 3, graphing, exponents, radicals, ratio, proportion, variation, quadratic equations. (3 cr; prereq 1 yr elementary algebra; I MTWThF; ForH 150) Ar
- T. 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 53, even to students with high school trigonometry; prereq plane geometry and either Y or high school higher algebra, §10 allowed; II MTWThF; ForH 150) Ar
- 5. 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; prereq 1 yr elementary algebra and 1 yr high school geometry or equiv, and enrollment as elementary education student, or Δ ; III MTWThF; ForH 85) Ar
- 10. College Algebra and Analytic Geometry.** For students requiring only some analytic geometry and college algebra without trigonometry, or 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; prereq Y or high school higher algebra; III-IV MTWThF; ForH 130) Ar
- 15. 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 1 and 2 variables, progressions, complex numbers, inequalities, theory of equations, permutations and combinations, binomial theorem, probability, mathematical induction, determinants. (5 cr, #10; prereq Y or high school higher algebra and T or high school trigonometry; III-IV MTWThF; ForH 185) Ar
49. **Analytic Geometry and Calculus I.** (Lower Division course) Course description covers sequence 49-53-54. 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, inverse 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 2 and 3 dimensions. (5 cr, #40; prereq 15 or 10 and either T or high school trigonometry; I-II MTWThF; ForH 130) Ar
53. **Analytic Geometry and Calculus II.** (Upper Division course) See Math 49 for course description. (5 cr; prereq 49, or 40 with grade of B; III-IV MTWThF; ForH 170) Vessey
54. **Analytic Geometry and Calculus III.** (Upper Division course) (See Math 49 for course description) (5 cr; prereq 53; I-II MTWThF; ForH 85) Countryman
- 100A. **Foundations of Arithmetic.** Development of the real number system from the natural numbers. Special attention is given to related algebraic structures and interrelations with set theory. Classical number theory is treated to some extent. (3 cr; prereq 54 or #; I MTWThF; ForH 185) Ar
109. **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 54; V MTWThF; ForH 185) Koch
- 125A. **Critical Reasoning in Mathematical Analysis.** Careful examination of the notions of limit, sequence, series, function, derivative, and integral, designed to give students a more mature understanding of these concepts. Technique of developing accurate proofs, and roles of both intuition and logic in connection with these techniques. (3 cr; prereq 54; IV MTWThF; ForH 175) Miracle
- 131A. **Advanced Algebraic Theory.** Linear dependence of vectors; dimension; matrices; systems of linear equations. Introduction to more abstract concepts of algebra by means of examples drawn from matrix calculus and polynomials. (3 cr; prereq 54; II MTWThF; ForH 180) Ar
188. **Topics in Topology.** Elementary and intuitive concepts associated with typical curves and surfaces. Construction of models. Elements of homotopy. (3 cr; prereq 54; III MTWThF; ForH 175) Koch

Second Term

- T. **Trigonometry.** (See first term) (I MTWThF; ForH 130) Ar
10. **College Algebra and Analytic Geometry.** (See first term) (I-II MTWThF; ForH 150) Ar
15. **College Algebra.** (See first term) (I-II MTWThF; ForH 60) Ar
40. **Introduction to Calculus.** Designed for those who wish a brief introduction to calculus which includes some integration. Students planning to take further work should take Math 49. Functions and limits, differentiation of algebraic, trigo-

- nometric, exponential and logarithmic functions with applications to velocity and acceleration, maxima and minima, approximation by differentials. Integration with standard forms with application to area, volume, simple differential equations. (5 cr, §49; prereq 15 or 10 and T or high school trigonometry; III-IV MTWThF; ForH 130) Ar
49. **Analytic Geometry and Calculus I.** (See first term) (III-IV MTWThF; ForH 85) Ar
53. **Analytic Geometry and Calculus II.** (See first term) (I-II MTWThF; ForH 85) Ar
54. **Analytic Geometry and Calculus III.** (See first term) (III-IV MTWThF; ForH 150) Williamson
55. **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 54; II MTWThF; ForH 180) Ar
- 100C. **Foundations of Geometry.** Synthetic and analytic projective geometry, role of the theorems of Desargues and Pappas. Treatment of affine, Euclidean and non-Euclidean geometrics according to the Erlanger program. Axiomatics. (3 cr; prereq 54; I MTWThF; ForH 175) Ar
112. **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 55 or Phil 155 or #; III MTWThF; ForH 115) Fuhrken
- 125B. **Critical Reasoning in Mathematical Analysis.** (See first term) (3 cr; prereq 125A; IV MTWThF; ForH 170) Miracle
- 131B. **Advanced Algebraic Theory.** (See 131A, first term) (3 cr; prereq 131A; II MTWThF; ForH 115) Fuhrken
179. **Special Functions.** Gamma, Beta, and Bessel functions, spherical harmonies, Laguerre, Legendre, Tchebycheff and Hermite polynomials. Emphasis on the properties and formal developments of these functions, with an attempt to unify and motivate their treatment. (3 cr; prereq 54; V MTWThF; ForH 115) Miracle

MUSIC (Mus)

(See also Music Education)

First Term

- A.** **Piano.** (No cr; for students without entrance requirements in piano; hrs ar; ScH 107) Freed, Weiser
- D.** **Voice.** (No cr; for students without entrance requirements in voice; hrs ar; ScH 107) Schuessler
4. **Fundamentals of Music.** (2 cr; for nonmusic majors [primarily child development students and elementary teachers])
 Sec 1, I MTWThF, MusEd 103, Aird Sec 2, III MTWThF, NMA 4, Bencriscutto
- 7B. **Ear Training.** Résumé of aural work included in Mus 4T-6T, with concentration on their application. (3 cr; prereq #; I MTWThF, ScH 103; IV MWF, ScH 103) Fetler
- 8B. **Harmony.** Résumé of part writing and harmonization of chorales which are included in Mus 4T-6T, with concentration on their application. (3 cr; prereq #; II MTWThF, ScH 103; IV TTh, ScH 103) Fetler
- 11E.** **Piano.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Freed, Weiser

- 11L.** Piano. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Freed, Weiser
- 11U.** Piano. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Freed, Weiser
- 12E.** Voice. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Schuessler
- 12L.** Voice. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Schuessler
- 12U.** Voice. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Schuessler
- 13E.** Violin. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Gilombardo
- 13L.** Violin. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Gilombardo
- 13U.** Violin. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Gilombardo
- 14E.** Viola. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Gilombardo
- 14L.** Viola. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Gilombardo
- 14U.** Viola. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Gilombardo
- 15E.** Cello. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 15L.** Cello. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 15U.** Cello. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar
- 16E.** Bass. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 16L.** Bass. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 16U.** Bass. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar
- 17E.** Flute. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Niosi
- 17L.** Flute. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Niosi
- 17U.** Flute. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Niosi
- 18E.** Oboe. Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 18L.** Oboe. Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 18U.** Oboe. Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar

- 19E.°° **Clarinet, Saxophone.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Williams, Handlon
- 19L.°° **Clarinet, Saxophone.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Williams, Handlon
- 19U.°° **Clarinet, Saxophone.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Williams, Handlon
- 20E.°° **Bassoon.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 20L.°° **Bassoon.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 20U.°° **Bassoon.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar
- 21E.°° **Trumpet.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Chenette
- 21L.°° **Trumpet.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Chenette
- 21U.°° **Trumpet.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Chenette
- 22E.°° **French Horn.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 22L.°° **French Horn.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 22U.°° **French Horn.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar
- 23E.°° **Trombone.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Weinman
- 23L.°° **Trombone.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Weinman
- 23U.°° **Trombone.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Weinman
- 24E.°° **Tuba.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Walton
- 24L.°° **Tuba.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Walton
- 24U.°° **Tuba.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Walton
- 25E.°° **Percussion.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 25L.°° **Percussion.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Ar
- 25U.°° **Percussion.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Ar
- 26E.°° **Harp.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Miller
- 26L.°° **Harp.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Miller

- 26U.** Harp.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Miller
- 27E.** Organ.** Elective for nonmusic majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Fleischer
- 27L.** Organ.** Lower Division for music majors. (2 cr; prereq entr exam; hrs ar; ScH 107) Fleischer
- 27U.** Organ.** Upper Division for music majors. (2 cr; prereq placement test; hrs ar; ScH 107) Fleischer
- 43. University Chorus.** (1 cr; prereq #; IV MTWThF; NH 45; 7:30-9:30 pm M and/or Th) Aird
- 46. Concert Band.** (1 cr; prereq #; V MTWThF; NMA 4, 5) Bencriscutto
- 100.** Advanced Applied Music.** Advanced literature in piano, voice, organ, and orchestral instruments. (2 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 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 1 course from 36, 62, 68, 72, 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 #; V MTWThF; ScH 3) Schuessler
- 127-128-129.* Composition.** Original work in various forms. (2 cr each; prereq 99 and 123; VII MTWThF; ScH 103) Fetler
- 140. Realization and Interpretation of Choral Masterpieces.** Musical and vocal techniques necessary for presentation of great choral compositions from Renaissance to 20th century. (3 cr; prereq 6T or #; II MTWThF; ScH 104) Aird
- 150. Organ Literature.** Development of organ literature and playing from the 14th century to the present. The mutual influence of organ construction and organ composition will be emphasized, as well as the various national schools of organ playing. Demonstration on the organ. (2 cr; prereq grad organ and musicology student, sr with #; VI MTWThF; ScH 104) Fleischer
- 154. Music in the Middle Ages and Renaissance.** Monophonic music from the period of Gregorian chant to English madrigal school. (3 cr; prereq 36; IV MTWThF; ScH 104) Riedel
- 161-162. Band Arranging.** Scoring for band instruments, creative arrangements for marching or concert bands. (3 cr each; prereq 6T, or 143, or MuEd 65, or #; VI MTWThF; NMA 4, 5) Bencriscutto
- 175. Training in Advanced Musicianship.** Sight singing and dictation of melodic, harmonic, rhythmic, 2- and 3-part contrapuntal materials; score reading, both vocal and instrumental; training in tonal memory; aspects of conducting. (3 cr; prereq 6T; VI MTWThF; ScH 103) Fetler
- 204.** Graduate Applied Music.** Individual lessons. (3 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 212.* Special Problems.** (3-9 cr; prereq 110; VII M; ScH 104) Riedel

227-228-229.° Seminar in Composition and Orchestration. (3 cr each; prereq #; VII MTWThF; ScH 103) Fetler

Second Term

A.** Piano. (See first term) McNab

D.** Voice. (See first term) Schuessler

4. Fundamentals of Music. (See first term) (III MTWThF; NMA 4) Abelson

7A. Ear Training. Résumé of aural work included in Mus 1T-3T, with concentration on their application. (3 cr; prereq #; I MTWThF; ScH 103) Argento

7B. Ear Training. (See first term) (III MTWThF; ScH 103) Argento

11E through 27U.** (See first term) Ar

100.** Advanced Applied Music. (See first term) Staff

104A. American Music. (See Mu 106A, first term) (I MTWThF; ScH 104) Riedel

114. History of Vocal Art. Significant schools of singing from 1600 to the present. (2 cr; prereq 18 cr in 12, or #; IV MTWThF; ScH 3) Schuessler

124. History of Opera. Opera as music and drama: production, styles, cultural background, from late 16th century to present—modern repertoire, broadcast by the Metropolitan Opera Company. (3 cr; prereq 9 cr in history of music or history of art or history of theater or European history from 1600, or #; V MTWThF; ScH 104) Argento

127-128-129.° Composition. (See first term) (II MTWThF; ScH 3) 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 #; II MTWThF; ScH 104) Riedel

204.** Graduate Applied Music. (See first term) Staff

212.° Special Problems. (See first term) (VI W; ScH 104) Riedel

227-228-229.° Seminar in Composition and Orchestration. (See first term) (II MTWThF; ScH 3) Argento

PERSONAL ORIENTATION

See Psychology

PHILOSOPHY (Phil)

First Term

1A. Problems of Philosophy. Introduction to the subject; main field of investigation; permanent problems; principal methods and schools of philosophy; historical and contemporary views. (3 cr; II MTWThF; ForH 185) Bracken

2A. Logic. Difference between logical and fallacious reasoning; the functions and uses of language; rules of good definition and sound argument. (3 cr; III MTWThF; ForH 115) Potter

3A. Ethics. Problems which arise when human beings attempt to think systematically about conduct and values (are there absolute standards?), the problem of free will, and a survey of historical views about the right and the good. (3 cr; I MTWThF; MurH 175) Mason

- 50A. History of Western Philosophy.** The origin of Greek thought, from Thales to Aristotle, with special emphasis on Plato and Aristotle. (3 cr; IV MTWThF; ForH 115) Bracken
- 106. American Philosophy from William James.** Among philosophers discussed: James, Dewey, Santayana, Blanshard. (3 cr; I MTWThF; ForH 285) Potter
- 108. Political and Social Ethics.** Ethical principles, theoretical and practical, at the basis of the social order. (3 cr; III MTWThF; ForH 160) Mason
- 160. Philosophy of Science.** Provides a clear understanding of meaning, methods, and implications of modern science through examination of basic concepts, presuppositions, and procedures. Topics include description, explanation, prediction, experimentation; space, time, number, matter, energy; causality, probability, statistics; organic life, evolution, mind. (3 cr; II MTWThF; ForH 285) Feigl

Second Term

- 1A. Problems of Philosophy.** (See first term) (IV MTWThF; ForH 185) Allaire
- 2A. Logic.** (See first term) (I MTWThF; ForH 180) Kielkopf
- 3A. Ethics.** (See first term) (II MTWThF; ForH 185) Raab
- 52A. History of Philosophy (Modern).** Modern philosophy from Descartes to Hegel; impact of science; backgrounds of contemporary philosophical problems. (3 cr; III MTWThF; ForH 180) Kielkopf
- 107. Philosophy in Modern Literature.** Survey of basic philosophical ideas in modern civilization as they are expressed in major works of literature. (3 cr; I MTWThF; ForH 185) Terrell
- 140. Contemporary Philosophy.** Current systematic and critical philosophies, especially idealism, naturalism, pragmatism, positivism, and existentialism, as represented by their principal exponents. (3 cr; IV MTWThF; ForH 175) Raab
- 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 justification of moral standards; examination of representative systems. (3 cr; III MTWThF; ForH 185) Terrell
- 158. Theory of Knowledge.** Analysis of logical structure and experimental roots of knowledge. Topics include meaning, validity, truth, reason and experience, induction, criteria of objectivity and reality. (3 cr; II MTWThF; ForH 175) Allaire

PHYSICAL EDUCATION FOR WOMEN (PEW)

The following courses may be taken for elective credit in the College of Science, Literature, and the Arts:

First term: PEW 3, 7, 8, 10, 32

Second term: PEW 7, 8

POLITICAL SCIENCE (Pol)

First Term

- A. The State in the Modern World.** (Course A of A-B-C) The development, principles, and operation of the modern nation state. (3 cr; III MTWThF; CB 215) Sorauf
- 1. American Government and Politics.** (Course 1 of 1-2†-3) 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 235) Hathaway
25. **World Politics.** Introduction to contemporary international relations, policies of the great powers, nationalism, internationalism. (3 cr; I MTWThF; CB 215) McLaughlin
85. **Problems of World Politics.** International relations of Southeast Asia and the policies of the leading powers; contemporary domestic political and economic problems and their prewar origins; communism; the Chinese minority. (3 cr; II MTWThF; CB 215) Mills
101. **Principles of the American Constitution I.** Nature of constitutions, judicial review, national-state relations. (3 cr; prereq 2 or equiv; IV MTWThF; CB 215) Sorauf
116. **Local Government.** Local units of government in their social, legal, and theoretical context. (3 cr; prereq 2 or 5 or #; III MTWThF; CB 225) 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 5 or #; I MTWThF; CB 225) Backstrom
138. **American Political Campaigns and Elections.** Examination of national, state, and local campaigns and elections, including field work in local political parties and election campaigns. (3 cr; prereq 2 or 5 or #; IV MTWThF; CB 225) Hathaway
143. **Government and Politics of the Soviet Union.** Reasons for the rise of Bolshevism; sources and nature of its ideology; history of the 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 #; III MTWThF; CB 205) Cooperman
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 205) Cooperman
197. **The Mediterranean Area in World Affairs.** Economic, political, and strategic conditions, policies of the European and Asiatic states; postwar conflict of interests between the Western powers and Russia. (3 cr; IV MTWThF; CB 255) Mills

Second Term

- B. **The State in the Modern World.** (Course B of A-B-C) (See A, first term) (3 cr; III MTWThF; CB 230) Flanigan
- 2.† **American Government and Politics.** (Course 2 of 1-2†-3) Organization of national, state, and local government: legislative, executive, and judicial branches and their procedures. (3 cr; II MTWThF; CB 235) Scott
108. **Legislative Organization and Procedure.** Congress and the state legislatures at work. (3 cr; prereq 2 or 5 or #; II MTWThF; CB 230) Short
118. **Metropolitan Government.** Metropolitan problems; governmental organization and political processes. (3 cr; prereq 2 or 5 or #; III MTWThF; CB 215) Scott
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 #; II MTWThF; CB 215) Perlmutter

168. **Political Behavior.** Role and function of leadership, interests, and group behavior; consequences of organization; attitudes and psychology of political preference. (3 cr; I MTWThF; CB 215) Flanigan
187. **Problems of European Politics.** Contemporary development of intra-European relations and organization; changing role of key European states; Europe's position in world politics. (3 cr; IV MTWThF; CB 215) Perlmutter
213. **Institute on Public Administration.** (July 22-August 2) Intensive course for government employees on recent trends: organization theory—planning, decision-making, authority, communication; administrative analysis and operations research; computers and management systems; politics and budgetary process; personnel administration in the sixties; the social sciences and public administration. Lectures, seminars, and workshops. (3 cr; prereq grad in govt service or #; lect III-IV MTWThF, CB 240; workshops and seminars, VI-VII MTWThF, ar) Warp, Short, and visiting lecturers

PSYCHOLOGY

First Term

Personal Orientation (PO)

1. **How to Study.** Practical assistance to the student in developing efficient study habits, organizing materials, preparing for examination, and improving the speed and comprehension of reading. (Limited to 30) (2 cr, but cr added to SLA grad requirement; I MTWThF; JohH 105) Carlson

Psychology (Psy)

- 1-2.† **General Psychology.** General introduction to study of human behavior. Prerequisite for all advanced courses in psychology. (3 cr each; prereq soph or 3rd qtr fr with B avg; II-III MTWThF; Jach 74) Greenberg
- 4-5.† **Introductory Laboratory Psychology.** Experiments illustrating subject matter of contemporary psychology. Included are human and animal learning, motivation, verbal behavior, problem solving, visual perception, psychological measurement, personality, and social psychology. (2 cr each; prereq soph, 2 or ¶1-2; II-IV MTWThF; WeH 101) Haven
- 128-129. **Psychology of Learning.** Psychological theory: characteristics and function. Critical analysis of all learning theories and their application to problems of normal and abnormal behavior. (3 cr each; prereq 9 cr in psychology; I-II MTWThF; FolH 101) Trapold
- 144-145.† **Abnormal Psychology.** Normal and abnormal behavior contrasted. Dynamics and determinants of personality maladjustments. (3 cr each; prereq either 9 cr in psychology...or 6 cr in psychology, plus either Biol 2 or 12 cr in social science; II-III MTWThF; VH 1) Winston
167. **Measurement of Opinions and Attitudes.** Problems of sample survey techniques, including the preparation of questionnaires, methods of sampling, procedures in data analysis, social implications of polling, and applications of survey techniques in public affairs and in social science research. (3 cr; prereq sr, 70 or equiv; I MTWThF; FolH 102) Dunnette
190. **Project in Psychology.** Individual library study or experimental investigation. (Cr ar; prereq sr, #) Lofquist
210. **Research Problems.** (Cr ar; prereq #) Lofquist

Second Term

Personal Orientation (PO)

1. **How to Study.** (See first term) (I MTWThF; Arch 140) Carlson

Psychology (Psy)

- 1-2.† **General Psychology.** (See first term) (JacH 74) Macker
- 4-5.† **Introductory Laboratory Psychology.** (See first term) Boveng
- 132-133. **Psychology of Motivation.** Classical and contemporary theories of motivation. Elaboration of basic drives into motives, acquisition of new drives and goals; dynamics of the elaborated drive structure. Motivation in complex situations involving set, level of aspiration, the Zeigarnik effect, frustration, etc. (3 cr each; prereq 9 cr in psychology; II-III MTWThF; FolH 102) Russell
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; prereq 2 and Principles of Economics; II MTWThF; VH 1) Longstaff
160. **Psychology in Personnel Work.** Selection and retention of a stabilized personnel. Standardized interview; principles and technique of employment tests; methods of judging character qualities; rating scale; personnel classification methods; morale and its measurement. (3 cr; prereq 2, 5, or 3 cr in statistics, and Principles of Economics or #; III MTWThF; VH 301) Longstaff
190. **Project in Psychology.** (See first term) Lofquist
210. **Research Problems.** (See first term) Lofquist

ROMANCE LANGUAGES

First Term

French (Fren)

1. **Beginning French.** (5 cr; I-II MTWThF; FolH 201) Renaud
3. **Beginning French.** (5 cr; prereq 2, or 2 yrs high school French; III-IV MTWThF; FolH 201) Poisson, staff
4. **Intermediate French.** (5 cr; prereq 3, or 3 yrs high school French; III-IV MTWThF; FolH 201) Poisson
54. **French Conversation and Pronunciation.** In addition to regular conversation course, 2 hrs per week (individually arranged) are devoted to practical phonetics and pronunciation drill. (3 cr; prereq 4; VI-VII MWF; FolH 201) Burks
125. **The Classical Drama: Corneille and the Origins of the Classical Drama.** (3 cr; prereq sr with #, grad; IV TWThF; FolH 203) Renaud
148. **The Drama of the Twentieth Century: Claudel, Giraudoux, Anouilh, Montherlant, Camus, Sartre.** (3 cr; I MTWThF; FolH 203) Falk
161. **The Novel of the Twentieth Century: Sartre and Camus.** (3 cr; prereq sr with #, grad; III MTWThF; FolH 203) Falk
259. **Directed Readings.** (1-3 cr; prereq #; ar) Falk, Renaud

Offered only in Maison Française

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 native instructors. (5 cr; prereq 2 or equiv; VI-VII MTWThF) Staff
58. **Advanced Practical French Conversation.** Fluency acquired by presenting short oral reports and oral *explication de texte*, and participating in debates. (5 cr; prereq 4 or equiv; VI-VII MTWThF) Staff
108. **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

Spanish (Span)

1. **Beginning Spanish.** (5 cr; III-IV MTWThF; FolH 202) Selig
- 1A. **Beginning Spanish: Conversational Approach.** (5 cr; I-II MTWThF; FolH 202) Cúneo
3. **Beginning Spanish.** (5 cr; prereq 2, or 2 yrs high school Spanish; I-II MTWThF; FolH 204) Rundorff
20. **Intermediate Spanish.** (5 cr; prereq 3, or 3 yrs high school Spanish; I-II MTWThF; FolH 205) Rundorff
73. **Latin-American Civilization and Culture.** (2 cr; prereq 20 or 21 or #; III TWThF; FolH 205) Cúneo
131. **The Picaresque Novel.** (3 cr; prereq 65, 66, 67 or 68, 69; II MTWThF; FolH 203) Selig
259. **Directed Readings in Spanish.** (1-3 cr; prereq #; ar) Selig

Second Term*French (Fren)*

2. **Beginning French.** (5 cr; prereq 1, or 1 yr high school French; I-II MTWThF; FolH 201) Staff

Spanish (Span)

2. **Beginning Spanish.** (5 cr; prereq 1, or 1 yr high school Spanish; III-IV MTWThF; FolH 201) Pattison
113. **The Naturalistic Movement in Spain.** (2 cr; prereq 65, 66, 67 or 68, 69; II TWThF; FolH 203) Pattison
260. **Directed Readings in Spanish.** (1-3 cr; prereq #; ar) Pattison

SLAVIC AND ORIENTAL LANGUAGES**First Term***Oriental (Ortl)*

77. **Asian Civilization: Japan.** General introduction to Japanese culture. (3 cr; knowledge of Japanese not required; IV MTWThF; FolH 304) Copeland

Russian (Russ)

- A. **Beginning Intensive Russian.** (See section on Special Programs) Covers the same material covered in the first 1½ quarters of the regular first-year sequence, Russ 1-2-3. (7½ cr; I-III MTWThF; FolH 303) Nice, Prokopov
24. **Scientific Russian.** (See section on Special Programs) Concentration on the development of reading skill for students of science who wish to make use of Soviet technical publications. (5 cr; II-III MTWThF; FolH 308) Nice
56. **Conversation.** (3 cr; prereq #; I MTWThF; FolH 304) Alexeev

Second Term*Russian (Russ)*

- B. **Beginning Intensive Russian.** Covers the same material covered in the second 1½ quarters of the regular first-year sequence, Russ 1-2-3. (7½ cr; prereq A; I-III MTWThF; FolH 303) Nice, Prokopov
24. **Scientific Russian.** (5 cr; prereq #; II-III MTWThF; FolH 308) Nice
57. **Conversation.** (3 cr; prereq #; I MTWThF; FolH 304) Alexeev

SOCIAL SCIENCE

See Interdisciplinary Programs

SCHOOL OF SOCIAL WORK (SW)**First Term**

- Soc 50. **Introduction to Theory and Practice of Social Work.** (See Sociology) Cohn
- Soc 91. **Case Method Applied to Human Problems.** (See Sociology) Cohn
- CD 140. **Behavior Problems.** (See Institute of Child Development in College of Education) Harper
102. **Special Topic: Treatment of the Delinquent Child.** Orientation to facilities and treatment resources for working with delinquent children and the role of correctional facilities. Open to teachers, institutional personnel, social workers, and others. (3 cr; II MTWThF; ForH 160) Bridges
148. **Concepts of Human Behavior.** An introduction to some concepts of behavior essential to successful work with people. Open to teachers, counselors, and others. (3 cr; IV MTWThF; ForH 244) Saloshin
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; ForH 160) Francel
175. **Social Group Work.** Analysis of the process of working with groups for either treatment, educational, or socialization purposes. Open to teachers, recreational workers, hospital personnel, and others. (3 cr; VI MTWThF; ForH 160) Pernell

Second Term

- CD 140. **Behavior Problems.** (See Institute of Child Development in College of Education) Hoving

101. **The Deprived Child.** A consideration of the problems of children suffering from various forms of deprivation, review of pertinent literature, suggested societal problems. Designed for teachers and others working with children. (3 cr; II MTWThF; ForH 160) Hovda
103. **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 160) Merl
160. **Principles of Administration in Social Welfare.** Study of the process of transforming social policy into services with emphasis on human relations in administration. Open to those seeking a better understanding of administration. (3 cr; IV MTWThF; ForH 160) Kidneigh

SOCIOLOGY (Soc)

First Term

1. **Introduction to Sociology: Man in Modern Society.** Characteristics of human group life. An analysis of the factors associated with development of human group life and man's social environment; the structure of the social environment and its influence upon the individual's behavior. (3 cr; II MTWThF; CB 5) Francis
50. **Introduction to the Theory and Practice of Social Work.** Survey of social service with consideration of areas of social needs, social agencies, their purpose and function, and the methodology and philosophy of social work practice. (3 cr; prereq 3; IV MTWThF; CB 150) Cohn
53. **Elements of Criminology.** General survey of field of criminology. (3 cr; prereq 1 or 1A or #; I MTWThF; CB 230) Vold
91. **Case Method Applied to the Study of Human Problems.** General application of the interviewing method for students who plan to work in fields involving interpersonal relationships. (3 cr; prereq 50 or #; VI MTWThF; CB 225) Cohn
111. **Population Theory.** Emphasizes cultural and social phases of population change, with particular reference to birth rates, death rates, and migration. Implications of population change are also discussed. (3 cr; prereq 1 or #; IV MTWThF; CB 230) Francis
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 influences and its limits. (3 cr; prereq 1 or #; III MTWThF; CB 150) Rose
122. **Sociology of Conflict.** Manifest forms of antagonism among groups of persons; causes of conflict; methods of resolving through accommodations; role of conflict and social change. (3 cr; prereq 1 or #; II MTWThF; CB 140) Vold
152. **Sociology of Medicine and Medical Institutions.** Social factors associated with the incidence of physical and mental illness and its treatment. The social organization of medical institutions. Public needs and medical services. The sociology of aging, and the social problems of the aged. (3 cr; prereq 1 or #; I MTWThF; CB 140) Rose

Second Term

1. **Introduction to Sociology: Man in Modern Society.** (See first term) (3 cr; I MTWThF; CB 5) Sirjamaki

3. **Social Problems.** Survey course in contemporary social problems with special emphasis on personal demoralization and social disorganization. (3 cr; II MTWThF; CB 10) Rubin
141. **The Family.** Evolution of the family: development of family unity or disunity, roles of the several members of the family, methods of investigation of the family. (3 cr; prereq 1 or #; II MTWThF; CB 150) Johnson
145. **Urban Sociology.** Introduction to study of cities; urban ecology; urban institutions and urban way of life. (3 cr; prereq 1 or #; III MTWThF; CB 155) Sirjamaki
146. **Industrial and Occupational Sociology.** Analyzes the occupational group, the factory, and the business enterprise as social institutions, with particular attention to contrasting functions of formal and informal organization and to significance of co-operation, authority, communication, status, and group norms in the working situation. (3 cr; prereq 1 and 15 cr in sociology, psychology, political science, or economics; IV MTWThF; CB 140) Rubin

SPEECH AND THEATER ARTS (Spch)

(See Theater Symposium and Programs in Speech Pathology and Audiology under Special Programs)

First Term

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 (Office of the Dean of Students), 225 Shevlin Hall.

- 5X.†† **Fundamentals of Speech.** Development of basic skills in speech; voice and action, oral reading, discussion, extemporaneous speaking. (3 cr) Shapiro and staff
- | | |
|--|---|
| Sec 1, I MTWThF, FolH 306
(Limited to 25) | Sec 2, II MTWThF, FolH 306
(Limited to 15) |
|--|---|
6. **Fundamentals of Speech.** Second quarter of Spch 5-6. (Limited to 15) (3 cr; prereq 5; II MTWThF; FolH 306) Shapiro and staff
31. **Introduction to the Theater Arts.** History and theory of plays and playwriting as well as various arts and crafts of the theater. (3 cr; II MTWThF; ShH 115) Ballet
- 31L. **Laboratory in Introduction to the Theater Arts.** Laboratory in scenery design and construction, stage operation, theater lighting, costuming or make up. (1 cr; prereq 31 or ¶31; ar) Josal
34. **Stagecraft: Construction and Painting.** Theory and practice in construction, painting, and shifting of stage scenery. (3 cr; prereq soph, 31; ar) Ar
51. **Advanced Public Speaking.** Preparation and delivery of speeches on current public issues. (Limited to 25) (3 cr; prereq 5; I MTWThF; FolH 307) J V Jensen
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; I MTWThF; FolH 409) Wendahl
81. **Interpretative Reading.** Aesthetic theory of literature and of oral reading. Practice in reading for interpretation and mastery of technique (fiction). (Limited to 25) (3 cr; prereq 5; IV MTWThF; FolH 305) Thompson

†† Credit for Spch 5X without Spch 6 by petition only.

90. **Costuming.** Theory, design, and construction of costumes for stage and television. (3 cr; prereq 5, 31, 34; I MTWThF; NH 315) Warner
106. **Discussion.** Co-operative thinking; recognition and definition of problems, critical analysis, examination of possible solutions. Planning, preparing for, participating in, and leading classroom, public, and radio and television discussions. (Limited to 25) (3 cr; prereq 5; III MTWThF; FolH 306) Cashman
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 307) Thompson
111. **Stage Direction.** Theory of direction. Exercises in blocking and production of short scenes. (3 cr; prereq sr, 4, 31, 32, 33, 34, 90 or 92, 91 and Δ ; III MTWThF; ShH 115) Ballet
122. **Introduction to Research.** Graduate research in speech; selections of topics and methods of investigation. Required of all graduate majors in speech. (3 cr; prereq sr, 5, Psy 2, Spch 31, 32, or Δ ; V MTWThF; FolH 305) Bormann
- 126A. **History and Criticism of American Public Address.** Survey of the history of religious and reform speaking in the United States, 1620-1920. (3 cr; prereq 5, Psy 2; IV MTWThF; FolH 307) Bormann
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; prereq 31 or elementary education major, or #... 32 recommended; IV MTWThF; NH 122) Graham
141. **Voice Science.** Respiration, articulation, and phonation. (3 cr; prereq 5, 67, or #, Psy 5; IV MTWThF; FolH 409) Moore
145. **Basic Hearing Science.** Psychological correlates of the stimulus dimension. Primary auditory abilities. Scaling of auditory dimensions; binaural hearing; speech reception. The solution of auditory problems throughout the animal phyla. (3 cr; prereq 152 or #; VII MTWThF; Mayo A-675) Harris
152. **Hearing Disorders.** Basic orientation to audiology. Physiology and anatomy of auditory mechanism. Symptomatology and pathology of hearing disorders, their medical and surgical treatment. Clinical and classroom management. (3 cr; prereq 5, 67, Psy 2 or #; II MTWThF; Mayo A-675) Lassman
153. **Audiometry and Hearing Aids.** Theory and practice of clinical and group audiometry; screening and diagnostic techniques, pure tone and speech audiometry; hearing conservation programs. Characteristics of modern hearing aids; selection and usage problems. (3 cr; prereq 5, 67, 152, Psy 2 or #; VI MTWThF; Mayo A-675) Lassman, Stassen
- 157-158-159. **Clinical Methods and Practice in Audiology.** Methods and supervised practice in the analysis, diagnosis, and rehabilitation of communication disorders of persons with auditory impairments. (3 cr; prereq 152, 153, and #; ar) Lassman
161. **Introduction to Speech Correction.** Basic orientation in speech correction. Analysis of common disorders of speech, their characteristics, prevention, and correction. Designed as a basis for more advanced study in speech pathology or for a basic understanding of the field. (3 cr; prereq 5, Δ ; IV MTWThF; FolH 306) Jensen
169. **Speech and Language in Human Behavior.** Basic orientation in the place of speech and language in human behavior. Individual projects and collateral reading. (3 cr; III MTWThF; FolH 409) Shapiro
- 181-182-183. **Readings in Speech.** Directed reading and preparation of reports on selected subjects. (Cr ar; prereq 5 and 6 addtl cr in speech, and #; ar) Staff

- 191. Technical Stage Problems.** Theory of stage costume, scenic design, theater architecture, stagecraft, and lighting. Special projects and reports. (3 cr; prereq 111, 112, 113; ar MTWThF; WeH 304) Josal
- 211. Seminar in Dramatic Theory.** Critical theory of theatrical arts. Major trends in drama as related to dramatic production. (3 cr; prereq 173 and 9 cr in dramatic literature; ar) Ballet
- 217. Seminar in the Visual Arts of Drama.** Examination of selected aesthetic theories of plastic and poetic arts; relationship to visual aspects of dramatic production. (3 cr; prereq theater major or #; ar) Josal
- 218. Seminar in Theater Planning.** Principles in planning and design of stages, auditoriums, and associated facilities; application to educational theater. (3 cr; prereq 190, 191, 193, or equiv; ar) Josal
- 231. Seminar in Advanced Speech Problems.** Diagnosis and treatment of voice disorders. (3 cr; prereq #; ar) Moore
- 236. Theories of Hearing.** Recent physiological and neurophysiologic contributions to auditory theory. Applications to the pathological auditory system. (3 cr; prereq #; IX MTWThF; Mayo A-675) Harris
- 261-262-263. Seminar in Speech Pathology.** Significant literature in speech pathology. Evaluation of research methods. (3 cr each; prereq 5, 67, 122, 163, Psy 2 or #; ar) Henrikson and staff
- 271-272-273. Seminar in Hearing.** Major experimental research in psychophysiological and psychoacoustical nature of hearing. Critical analysis of theory and research method. (3 cr each; prereq 152, 153, 155, #; ar) Lassman
- 277. Seminar in Rhetoric.** Historical and critical study of rhetorical theory. Examination of research. (3 cr; prereq 109 or #; ar) Scott
- 281-282-283.* Seminar in Organic Disorders of Speech.** Anatomical, physiological, and neurological abnormalities that are characterized by disorders of speech or voice. Pertinent literature; medical sources. (2 cr each, may be repeated with consent; prereq 263, or #; ar) Staff
- 291-292-293. Research.** Open to graduate students engaged in research on special problems. (Cr ar) Staff

Note: For methods in directing speech activities, see College of Education, EdCI 177. For methods of teaching the hearing impaired, see College of Education, EdCI 127 and 128.

Second Term

- 5X.†† Fundamentals of Speech.** (See first term) Smith and staff
- 6. Fundamentals of Speech.** (See first term) Smith and staff
- 33. Beginning Acting: Technique.** Fundamentals of body movement, rhythms, and acting technique. Individual and group performances. (Limited to 20) (3 cr; prereq 32; III MTWThF; ScH 19) Moulton
- 65. Radio and Television Speech.** Speech arts and psychology of radio and television. Practice exercises, projects, and reports on problems of appeal and audience response. (Limited to 25) (3 cr; prereq 5; III MTWThF; MurH 302) Bart

†† Credit for Spch 5X without Spch 6 by petition only

78. **Advanced Acting.** Characterization, styles of acting, and stage technique. Presentation of scenes from great plays. (Limited to 20) (3 cr; prereq 32; IV MTWThF; Sch 19) Adey
81. **Interpretative Reading.** (See first term) (II MTWThF; FolH 305) Fredricks
82. **Interpretative Reading.** (See first term) Poetry. (Limited to 25) (3 cr; prereq 5, 81; IV MTWThF; FolH 305) Fredricks
92. **Lighting.** Theory and practice in applying methods and principles of lighting in theater and television. (3 cr; prereq 5, 31, 34; I MTWThF; WeH 306) Borgen
101. **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
106. **Discussion.** Co-operative thinking; recognition and definition of problems, critical analysis, examination of possible solutions. Planning, preparing for, participating in, and leading classroom, public and radio and television discussions. (Limited to 25) (3 cr; prereq 5; II MTWThF; FolH 307) Smith
125. **Language for the Hearing Impaired.** Differential effects of deafness on speech. Analysis of speech disorders of the persons with hearing loss. Methods of developing and improving speech of deaf and hard of hearing children and adults. (3 cr; prereq 152 or #; I MTWThF; Pt 204) Houchins
127. **Speech for the Hearing Impaired.** Language problems resulting from marked and/or early deafness. Methods of developing and teaching language to the deaf. Underlying theory and supervised practice with the deaf individual. (3 cr; prereq 152 or #; IV MTWThF; Pt 204) Houchins
132. **Children's Theater.** Theory and practice of selection, direction and production of plays for children's audiences. (3 cr; prereq 5, 31, or #; IV MTWThF; NH 122) Graham
146. **Industrial Audiology and Occupational Hearing Loss.** (3 cr; II MTWThF; Mayo A-675) Ward
155. **Lip Reading and Lip Reading Methods.** Supervised practice in teaching lip reading to hard-of-hearing persons. (3 cr; prereq 5, 67, 152, Psy 2, or #; I MTWThF; Mayo A-675) Lassman, Stassen
161. **Introduction to Speech Correction.** (See first term) (FolH 307) Siegel
- 164-165-166. **Clinical Methods and Practice in Speech Pathology.** (3 cr each; prereq sr, 5, 67, 161, 162, 163; ar) Starr
171. **History of the Theater.** Plays, arts, and crafts of the theater from their beginnings to present. Special reports and projects. (3 cr; prereq sr, 5, 31; II MTWThF; FolH 110) Graham
174. **American Theater.** The theater as an aspect of American culture; especially 20th century. (Limited to 25) (3 cr; prereq 31 or grad; IV MTWThF; FolH 306) Weales
- 175.†† **Theater Symposium.** An intensive study of the art of the theater with particular emphasis on productions and production methods of the Tyrone Guthrie Theatre. Conducted by professional critics, actors, directors, and designers as well as University faculty members. (6 cr; prereq grad or #; VI-VII MTWThF; Showboat) Ballet and staff
- 181-182-183. **Readings in Speech.** (See first term) Staff

†† Spch 175 carries special tuition rate.

- 207. Seminar in Persuasion.** Contemporary public address. Literature of persuasion, methods of study in persuasion. (3 cr; prereq 5, 101, 102, 103, Psy 2, 140, 10 cr in social science; ar) Howell
- 216. Seminar in Stage Direction.** Great plays and their potentials for meaningful and effective production in the modern theater. (3 cr; prereq 111, 112, 113; ar) Moulton
- 251. Seminar in Listening Comprehension.** Research problems and methods. Evaluation of published research. (2 cr; prereq #; III MTWThF; AgEng 221) Nichols
- 261-262-263. Seminar in Speech Pathology.** (See first term) (3 cr each; prereq 5, 67, 122, 163, Psy 2, or #; ar) Siegel
- 271-272-273. Seminar in Hearing.** (See first term) Lassman
- 281-282-283.* Seminar in Organic Disorders of Speech.** (See first term) Staff
- 291-292-293. Research.** Open to graduate students engaged in research on special problems. (Cr ar) Staff

STATISTICS (Stat)

First Term

- Econ 111. Introduction to Theory of Statistics.** Acquaints the nonspecialist with some of the basic concepts and methods of classical statistics. Focused on problems of hypothesis testing and estimation. (3 cr; prereq Math 10, or #; II MTWThF; ForH 244) Ar
- 281. Advanced Topics in Statistics.** (Cr and hrs ar) Ar
- EPsy 216. Statistical Methods in Education.** (See Educational Psychology)
- EPsy 216A. Statistical Methods in Education—Laboratory.** (See Educational Psychology)
- EPsy 218. Statistical Methods in Education.** (See Educational Psychology)
- EPsy 218A. Statistical Methods in Education—Laboratory.** (See Educational Psychology)
- EPsy 243. Problems in Statistics.** (See Educational Psychology)
- PubH 110. Biometric Principles.** (See School of Public Health, Division of Biostatistics)
- PubH 111. Biostatistics Laboratory.** (See School of Public Health, Division of Biostatistics)

Second Term

- 41. Introduction to Theory of Statistics I.** The role of statistics in scientific investigation. Deterministic and probabilistic models. Probabilistic models as an aid to inference. Types of inference and decision procedures. Bayes' theorem. Maximum likelihood, best unbiased and likelihood procedures. Decision theory. (3 cr; prereq Math 10 or #; II MTWThF; ForH 244) Ar
- 181. Topics in Statistics.** (Cr and hrs ar) Ar
- EPsy 116. Introduction to Statistical Methods.** (See Educational Psychology)
- EPsy 116A. Introduction to Statistical Methods—Laboratory.** (See Educational Psychology)
- EPsy 217. Statistical Methods in Education.** (See Educational Psychology)
- EPsy 217A. Statistical Methods in Education—Laboratory.** (See Educational Psychology)
- PubH 120. Biostatistics II.** (See School of Public Health, Division of Biostatistics)
- PubH 121. Biostatistics Laboratory II.** (See School of Public Health, Division of Biostatistics)

ZOOLOGY (Zool)**First Term**

- Biol 1.†† 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; lect V MTWTh, V-VI F, Bo B6; lab VI-VIII MTWTh, Z 101ABCD) Skjegstad
- 100. Zoological Techniques.** (Cr and hrs ar; prereq grad only) Staff
- 197. Problems.** Advanced work in some special line. (3 cr or more; prereq 3 or old Biol 3 or new Biol 2 and #; ar) Ar

Second Term

- Biol 2.†† General Biology.** (Continuation of 1) (See first term) Olson
- 66. Introduction to Genetics and Eugenics.** Facts and theories of heredity with special reference to man; chances of man to inherit traits; possible benefits of control by man for the betterment of himself and society. (3 cr; prereq 3 or old Biol 3 or new Biol 2 or equiv or 10 cr in botany or zoology; II MTWThF; Bo B6) Ar
- 101. Zoological Techniques.** (See 100, first term) Staff
- 198.* Problems.** Advanced work in some special line. (3 cr or more; prereq 3 or old Biol 3 or new Biol 2 and #; ar) Ar

†† For zoology courses given during the Biology Session at Lake Itasca Forestry and Biological station, see index.

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

INSTITUTE OF TECHNOLOGY

ASTRONOMY (Ast)

First Term

- 12. Descriptive Astronomy.** Brief survey of what is known about the earth, the moon, the sun, and the planets and their motions, followed by a description of the nature of the physical universe. Nonmathematical course. (3 cr; II MTWThF and 1 clear evening per wk for observations with telescope; Ph 166) Kaufmanis
- 13. Stellar and Practical Astronomy.** Description of the constellations and of the properties and motions of stars. (3 cr; III MTWF and 2 clear evenings per wk for observation; Ph 166) Kaufmanis

GEOLOGY AND GEOPHYSICS (Geol)

First Term

- 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. (Limited to 100) (3 cr; no prereq, but high school physics and chemistry advisable; II MTWThF; P 110) Deffeyes
- A. Physical Geology Laboratory.** Practical study of rocks, minerals, maps, and other materials related to Geol 1. (Limited to 30) (2 cr; prereq 1 or ¶1; VI-VII MTWThF; TSF 157) Deffeyes

First Term or Second Term

- 100. Field Work.** (Cr and hrs ar; prereq Δ or by transfer from another institution) Staff
- 130. Geologic Problems.** (Cr and hrs ar; prereq $\#$) Cloud

College of Engineering

AERONAUTICS AND ENGINEERING MECHANICS

Mechanics and Materials (MM)

First Term

- 27. Rigid-Body Mechanics I.** 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. (3 cr; prereq ITM 25A and Phys 14; II MTWThF and 1 hr ar; AE 21) Wilcox
- 28. Rigid-Body Mechanics II.** Application of the principles of particle motion; kinematics; potential and potential energy; planetary motion; impact; introduction to forced and free mechanical vibrations. (3 cr, §Phys 100 or §Phys 100A; prereq 27 and ITM 26A; III MTWThF and 1 hr ar; AE 21) Wilcox
- 40. Deformable-Body Mechanics I.** Stress and strain; applications to tension and torsion members; beams; columns; design considerations; statically indeterminate members. (3 cr; prereq 27; II MTWThF and 1 hr ar; ME 106) Blatherwick

Second Term

28. **Rigid-Body Mechanics II.** (See first term) (II MTWThF and 1 hr ar; AE 21) Wilcox
29. **Rigid-Body Mechanics III.** Dynamics of rigid-body motion; extension of the principles of impulse and work-energy; Euler's equations of motion; the gyroscope; virtual work; stability; generalized co-ordinates. (3 cr, §Phys 101A; prereq 28; III MTWThF and 1 hr ar; AE 21) Wilcox
41. **Deformable-Body Mechanics II.** Stress, strain, and deformation analysis of beams, columns, rings, and cylindrical pressure vessels. (3 cr; prereq 40; II MTWThF and 1 hr ar; ME 106) Blatherwick

CIVIL ENGINEERING (CE)

First Term

- 23.** **Surveying Camp.** Applied problems and lectures in mapping, route surveying, control surveys, traverses, triangulation, leveling, and engineering astronomy. (9 cr; prereq 20; ar) Kersten, Fant, Bullen, Pederson

ENGINEERING ENGLISH (Engl)

Engl 1B, 2B, and 3B are offered in the College of Science, Literature, and the Arts.

First Term

85. **Advanced Technical Communication.** (Limited to 22) (3 cr; prereq completion of Freshman English requirement)

Sec 1, I MTWThF, ME 208, Haga
Sec 2, I MTWThF, ME 214, Ar

Sec 3, II MTWThF, ME 208, Haga

Second Term

86. **Advanced Technical Communication.** (See first term) (Prereq 85)

Sec 1, I MTWThF, ME 208, Guthrie
Sec 2, I MTWThF, ME 214, Ar

Sec 3, II MTWThF, ME 208, Guthrie

ENGINEERING GRAPHICS

See Department of Mechanical Engineering

GENERAL ENGINEERING (GE)

First Term

70. **The Slide Rule.** Computation practice and theory. Design of special scales. (1 cr; prereq ITM 11 or ¶11; IV TTh; Arch 10) Springer

MATHEMATICS (ITM)

(See also Department of Mathematics, College of Science, Literature, and the Arts)

First Term

12. **College Algebra and Trigonometry II.** Inequalities, progressions, logarithmic and exponential equations. Trigonometric formulas and identities, trigonometric curves, inverse trigonometric functions, trigonometric equations, complex numbers. Theory

- of equations, permutations, combinations, probability, determinants. (5 cr; prereq 11; III-IV MTWThF; ChE 150) Miller
- 13A. Calculus I: Analytic Geometry and Calculus.** Fundamentals of analytic geometry, straight line, graphs, and equations. Functions, limits, derivative, applications to velocity, acceleration, geometry. Antiderivative, rectilinear motion, area. Rules of differentiation, conic sections, maxima and minima, rates. Calculus of trigonometric functions. (5 cr; prereq 8, 11, 12 or equiv; I-II MTWThF; ChE 150) Mortick
- 24A. Calculus II: Analytic Geometry and Calculus.** Differentials, parametric equations. Definite integral, mean-value theorem, areas, volumes, work, energy, moments of inertia. Further topics in analytic geometry. Calculus of exponential, logarithmic, and hyperbolic functions. Techniques of integration. (5 cr; prereq 13A; III-IV MTWThF; MinMet 120) Osborn
- 25A. Calculus III: Analytic Geometry and Calculus.** Further applications of integration, polar co-ordinates, vectorial treatment of motion in a curve. Methods of approximation, solid analytic geometry with vectors, partial differentiation, multiple integration. (5 cr; prereq 24A; I-II MTWThF; MinMet 120) Schwartz
- 26A. Calculus IV: Differential Equations and Calculus.** Further study of limits, L'Hospital's rule. Sequences, series, Taylor's formula. Convergence, absolute and conditional, improper integrals, power series. Differential equations; equations of first order; standard methods of solution; linear equations with constant coefficients, applications; simultaneous equations; integration by series, numerical methods. (5 cr; prereq 25A; III-IV MTWThF; MinMet 124) Loye
- 131C. Vector Analysis and Linear Algebra.** (See section on Special Programs) (June 17 to August 23) 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; C 100; conf hrs ar) Indritz
- 147. 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, §152, §154; prereq 25 or 25A; III MTWThF; ChE 154) Lindgren
- 148. Differential Equations.** Linear differential and difference equations with constant coefficients, isoclines, phase plane, reduction in order, numerical solutions, series solutions, Bessel functions, Legendre polynomials, introduction to boundary value problems. (3 cr, §150 or §150A; prereq 80 or 26A; II MTWThF; MinMet 116) Polansky
- 151.†† Calculus V: Advanced Calculus.** Functions of one and several variables; continuity, Riemann integral, partial derivatives, Taylor's theorem, implicit function theorem, transformations, and mappings. (3 cr; prereq 26 or 26A; I MTWThF; MinMet 124) Polansky
- 165A. Introduction to Programming Modern Digital Calculators.** Organization of a modern digital calculator. Number systems. Elementary coding, flow charts, code checking techniques, scaling, subroutines, assembly techniques, interpretive programs. Informal laboratory. (3 cr; prereq 25A; IV MTWThF; MinMet 116) Munro
- 173.†† Elementary Partial Differential Equations.** Partial differential equations of theoretical physics, Fourier series, proof of convergence, orthogonal systems, Sturm-

†† Note that 152 and 153 may be taken simultaneously in the second term; 151, 152, 153 and 173, 174, 175 are 9-credit sequences regularly taught during the academic year.

Liouville systems, solutions of boundary value problems by separation of variables, applications. (3 cr; prereq 147, 148 or 152, 153 or #; III MTWThF; MinMet 116) Munro

174.†† **Elementary Theory of Complex Variables.** Complex numbers, derivatives, and integrals of analytic functions, elementary functions and their geometry, Cauchy's integral theorem and formula, Laurent expansions, evaluation of contour integrals by residues. (3 cr; prereq 26A; II MTWThF; MinMet 124) Lindgren

Second Term

13A. **Calculus I: Analytic Geometry and Calculus.** (See first term) (III-IV MTWThF; MinMet 120) Hager

24A. **Calculus II: Analytic Geometry and Calculus.** (See first term) (I-II MTWThF; MinMet 120) Dolid

25A. **Calculus III: Analytic Geometry and Calculus.** (See first term) (III-IV MTWThF; MinMet 124) D Sather

26A. **Calculus IV: Differential Equations and Calculus.** (See first term) (I-II MTWThF; MinMet 124) Serbyn

149. **Determinants and Matrices.** Determinants, matrices, linear equations, vector spaces, quadratic and bilinear forms, characteristic roots, applications to systems of ordinary differential equations. (3 cr, §142; prereq 25A; IV MTWThF; MinMet 116) Brauer

152.†† **Calculus VI: Advanced Calculus.** Maxima and minima in several variables, vector algebra and calculus, Green's and Stokes' theorems, integrals depending upon a parameter. (3 cr, §147; prereq 151; I MTWThF; MinMet 116) Thompson

153.†† **Calculus VII: Advanced Calculus.** Infinite series, computation with series, series with variable terms, uniform convergence, power series. Fourier series and orthogonal functions, special functions. (3 cr; prereq 151; II MTWThF; MinMet 116) Loye

175.†† **Integral Transforms.** Laplace transforms, inversion formula and method of residues, applications to systems of ordinary and partial differential equations, problems in heat conduction and mechanical vibrations, Fourier transforms, three-dimensional wave equation. (3 cr; prereq 174; III MTWThF; MinMet 116) Thompson

MECHANICAL ENGINEERING

Engineering Graphics (EG)

First Term

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 ¶ITM 13A or #; lect V MTWThF, VII M, Arch 10; rec VII TTh, Arch 10; lab open hrs, E 201) Springer

†† Note that 152 and 153 may be taken simultaneously in the second term; 151, 152, 153 and 173, 174, 175 are 9-credit sequences regularly taught during the academic year.

Mechanical Engineering (ME)**First Term**

15. **Casting, Working, and Welding of Engineering Materials.** Identification and classification of metals. Fundamentals of patterns. Sand molding, core making and shell molding. Machine molding and melting. Mechanical working of metals and alloys. Welding techniques, e.g., gas, arc. Properties of molding sands. Precision casting. Inspection testing, e.g., magnaflux, X-ray. Plastic materials and fabrication. (3 cr; prereq IE 50, Met 56, and MM 142; lect IV TWThF, ME 106; lab VII-IX TTh, ME 50) McElrath
21. **Mechanisms: Kinematic Analysis.** Techniques of motion transfer. The influence of constraints. Analysis of velocities and accelerations including the Coriolis effect. Kinematic equivalence. (3 cr; prereq EG 16 or 25, MM 28; lect V TWThF, ME 321; lab VII WF, ME 325) Kleinhenz
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; prereq ¶work-study program; ar) Lund
91. **Industrial Assignment, Part I.** (See ME 90) Lund
92. **Industrial Assignment, Part I.** (See ME 90) Lund
93. **Industrial Assignment, Part I.** (See ME 90) Lund
133. **Heat Transmission.** Introduction to conduction, convection, and radiation of heat and their utilization in engineering applications. Heat exchangers. (3 cr; prereq 31, Hydr 101 or Hydr 103 or Aero 100 or ¶; III MTWThF; VI T; ME 208) Ibele
146. **Introduction to Combustion.** Flame propagation, quenching and ignition in a homogeneous gaseous mixture; combustion of solid and liquid particles, packed beds, and gaseous jets. (3 cr; prereq 133 or ¶133; II MTWThF, VI W; ME 321) Murphy
162. **Thermal Environmental Engineering.** Solar radiation; weather and climate; steady-state and periodic heat transmission in structures; thermal loads for enclosed spaces; effects of thermal environment upon people, processes, and materials; systems for year-round control of thermal environment. (3 cr; prereq 160; III MTWThF, VI T; ME 321) Threlkeld

Second Term

16. **Cold Processing of Materials.** Machine tool operation, theory and economics of metal cutting, product inspection including measurement of dimensions, surface roughness and hardness. (3 cr; prereq IE 50, Met 56 and MM 142; lect IV TWThF, ME 106; lab VII-IX TTh, ME 171) McElrath
23. **Mechanisms: Components and Synthesis.** Component classes. Standard components and their synthesis to produce desired motion. Influence of automatic control and materials on mechanisms synthesis. (3 cr; prereq 22, MM 29; lect V TWThF, ME 321; lab VII-IX WF, ME 325) Frohrib
33. **Mechanical Engineering Laboratory I.** Principles of industrial measuring instruments. Humidity, pressure, vacuum, level, area, and temperature measuring systems. Telemetering and calibration procedures. (2 cr; prereq 30 or ¶30; lect IV TTh, ME 321; lab VII-IX TTh, ME 370) Liu
90. **Industrial Assignment, Part II.** (See first term) Lund

91. **Industrial Assignment, Part II.** (See first term) Lund
92. **Industrial Assignment, Part II.** (See first term) Lund
93. **Industrial Assignment, Part II.** (See first term) Lund
134. **Thermodynamics of Fluid Flow.** Thermodynamic analysis of internal flow of viscous and compressible fluids. Applications to various flow processes and components in engineering systems. (3 cr; prereq 32, Hydr 103; III MTWThF, VI T; ME 208) Ibele
143. **Turbomachinery.** Theoretical analysis of energy transfer between fluid and rotor, principles of axial, mixed, and radial flow compressors and turbines. Applications to gas turbines, fluid transmissions, and power plants. (3 cr; prereq 134 or ¶134; II MTWThF, VI W; ME 321) Murphy

MECHANICS AND MATERIALS

See Department of Aeronautics and Engineering Mechanics

School of Chemistry

ANALYTICAL CHEMISTRY (AnCh)

First Term

57. **Quantitative Analysis (Premed).** Introductory course covering the general principles and methods of gravimetric and volumetric analysis. Typical problems are assigned and attention is given to proper laboratory practice. (4 cr; prereq GeCh 6 or 26; lect, rec, quiz V MWF, VI F, C 325; lab VI-VIII MW, V-VIII TTh, VII-VIII F, C 310) Herr
101. **Quantitative Analysis.** Introductory lecture course covering the general principles and theoretical foundations of volumetric analysis. (3 cr; prereq 100 or ‡; lect, rec, quiz V-VI TThF; C 325) Herr
102. **Quantitative Analysis Laboratory.** Introductory course covering the methods of quantitative analysis. (4 cr; prereq 101; lab VI-IX MWF, V-IX TTh; C 310) Herr
- 102A. **Laboratory in Gravimetric and Volumetric Analysis.** (3 cr; for chemical engineers; prereq 101 or ¶101; lab VI-VIII MW, V-VIII TTh, VII-VIII F; C 310) Herr
- 173C. **Analytical Chemistry for High School Teachers.** (See section on Special Programs) (June 17 to August 23) An introduction to classical and modern analytical chemistry. (4 cr; 3 lect, 1 rec per wk; III MTWThF; C 100) Bruckenstein
- 178C. **Laboratory in Analytical and Physical Chemistry for High School Teachers.** (See section on Special Programs) (June 17 to August 23) The first 3 weeks will be devoted to classical quantitative analysis. Approximately 4 weeks of the laboratory time will be devoted to physicochemical experiments. For the greater part these will be related to the physical properties of matter, thermochemistry, and chemical equilibrium. Apparatus used will range from simple homemade devices to specialized commercially available equipment. The remaining time is to be spent on modern analytical methods making use of commercially available instruments, such as ultraviolet, visible and infrared spectrophotometers, pH meters, polarographs, etc. (4 cr; prereq ¶173C and PCh 176C; VI-IX MWF; C 190) Bruckenstein, Livingston
301. **Research in Quantitative Analysis.** (Cr and hrs ar) Staff

GENERAL CHEMISTRY (GeCh)**First Term**

4. **General Principles of Chemistry.** General laws of chemistry, principles of structure, and chemical behavior of matter. (5 cr; for premedics, predentals, etc; lect I MTWThF, C100; rec ar; lab V-VII MW, C ar) Brasted
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, C 225; rec ar; lab V-VIII MW, C ar) Johnson
14. **General Principles of Chemistry.** Basic principles and concepts of chemistry with a similar but more rigorous treatment to that of GeCh 4. (4 cr; prereq Phys 11, 12, or #; lect I MTWThF, C 100; rec ar; lab V-VIII MWF, C ar) Brasted
24. **General Principles of Chemistry.** Basic principles and concepts of chemistry with a similar but more rigorous treatment to that of GeCh 4. (5 cr; for chemistry and chemical engineering majors; lect I MTWThF, C 100; rec ar; lab V-VIII MWF, C ar) Brasted
26. **General Principles of 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. (5 cr; prereq 5, 15, or 25; lect II MTWThF, C 225; rec ar; lab V-VIII MWF, C ar) Johnson

Second Term

5. **General Principles of Chemistry.** (See GeCh 4, first term) (Prereq 4) Brasted
15. **General Principles of Chemistry.** (See GeCh 14, first term) (Prereq 14) Johnson
25. **General Principles of Chemistry.** (See GeCh 24, first term) (Prereq 24) Johnson

INORGANIC CHEMISTRY (InCh)**First Term**

- 103.* **Atomic Structure and the Properties of the Elements Based Thereon.** Nature of atomic and molecular electronic systems and the properties of various elements, including the transition elements. (3 cr; prereq PCh 103; lect III MTWThF, C 215; rec ar) Spees
220. **Advanced Inorganic Chemistry Laboratory Methods.** (Cr and hrs ar) Brasted, Spees
- 301.* **Research in Inorganic Chemistry.** (Cr and hrs ar) Brasted, Johnson, Spees

Second Term

- 104.* **Chemistry of the More Representative Elements.** A systematic study of the A Group elements of the Periodic Table—based upon structural considerations. Designed also to serve as a refresher course for teachers of general and inorganic chemistry. (3 cr; prereq 103 or #; lect III MTWThF, C 215; rec ar) Johnson
220. **Advanced Inorganic Chemistry Laboratory Methods.** (Cr and hrs ar) Brasted
- 302.* **Research in Inorganic Chemistry.** (Cr and hrs ar) Brasted, Johnson

ORGANIC CHEMISTRY (OrCh)

First Term

- 61.†† **Elementary Organic Chemistry.** (For all colleges) Discussion of important classes of organic compounds, both aliphatic and aromatic. Laboratory includes the preparation of typical substances. (4 cr; prereq 12-15 cr chemistry; lect I MTWThF, C 325; rec II TTh, C 325; lab II-IV MWF, C 390; lab conf III TTh, C 325) Beyler
102. **Organic Qualitative Analysis.** Reactions of typical functional groups and an introduction to the methods of organic qualitative analysis. Includes instruction in problem solving. (4 cr; prereq 63 and 64 or equiv; lect III MW, C 315; 18 hrs lab work ar) Dodson
139. **Advanced Organic Chemistry Laboratory Work.** Selected laboratory synthetic problems, which may include original work. Includes considerable individual instruction. (2-5 cr; prereq 64 or equiv; 12-30 hrs lab work ar) Dodson
301. **Research in Organic Chemistry.** (Cr ar; prereq 102 or equiv, Δ) Dodson
- Graduate Thesis in Organic Chemistry.** (0 cr; prereq Δ) Dodson

Second Term

- 62.†† **Elementary Organic Chemistry.** (See OrCh 61, first term) (4 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) Beyler
199. **Selected Topics in Natural Product Chemistry.** (3 cr; prereq #; VII MWF; C 100) Barton
302. **Research in Organic Chemistry.** (Cr ar; prereq 102 or equiv, Δ) Beyler
- Graduate Thesis in Organic Chemistry.** (0 cr; prereq Δ) Beyler

PHYSICAL CHEMISTRY (PCh)

First Term

- 100A.†† **Elementary Physical Chemistry.** Primarily for premedical students and for students of biology. (3 cr per term; prereq 1 yr college chemistry, 1 yr college physics, Math 40; lect I MTWThF, C 225; lab VI-VIII MW, C 190) Conroy
- 104, 105. **Physical Chemistry Laboratory.** (1 or 2 cr; prereq 101 or 108 for 104, 102 or 108 for 105; VI-VIII MW; C 190) Conroy
- 176C.* **Physical Chemistry for High School Teachers.** (See section on Special Programs) (June 17 to August 23) Elementary concepts of quantum theory, with application to atomic and molecular structure and spectra, nuclear phenomena, and photochemistry. (5 cr; prereq calculus and Phys 100C or 107C or equiv; II MTWThF; C 100) Mead
- 178C. **Laboratory in Analytical and Physical Chemistry for High School Teachers.** (See AnCh 178C) (June 17 to August 23) (4 cr; prereq ¶173C and ¶176C; VI-IX MWF; C 190) Bruckenstein, Livingston
301. **Research in Physical Chemistry.** (Cr and hrs ar) Staff

†† To receive credit for any part of this course, a student must complete both OrCh 61 and 62.

¶¶ PCh 100B is a continuation of 100A. The entire course PCh 100A-B must be completed before credit will be assigned (6 credits). Grades will not be sent in at the end of the first term.

Second Term

- 100B.†† Elementary Physical Chemistry.** Primarily for premedical students and students of biology. (3 cr per term; prereq 100A; lect I MTWThF, C 225; lab VI-VIII MW, C 190) Conroy
- 105, 106. Physical Chemistry Laboratory.** (1 or 2 cr; prereq 102 or 108 for 105, 103 or 108 for 106; VI-VIII MW; C 190) Livingston
- 117.* Fundamentals of Reaction Kinetics.** Empirical analysis of rate measurements, collision theory, transition state theory, chain reactions. (3 cr; prereq 103 or 103H; I MTWThF; C 215) Livingston
- 301. Research in Physical Chemistry.** (See first term) Staff

METALLURGY (Met)

First Term

- 56. Physical Metallurgy.** (ME, MinE, PetE, IndAdm) Introductions to principles. Theory of metals and alloys, constitution diagrams, heat treatment, relation of structure to properties. (3 cr; prereq 3rd yr [IndAdm see adviser]; I MTWThF, VI Th; MinMet 116) Jerabek
- 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, VI Th; MinMet 116) Jerabek
- 170-171.§§ Special Problems in Physical Metallurgy.** Laboratory investigation. (1-3 cr each) Jerabek

Second Term

- 170-171.§§ Special Problems in Physical Metallurgy.** (See first term)

School of Mines and Metallurgy

METALLURGICAL ENGINEERING (MetE)

First Term or Second Term

- 124.*§§ Special Problems in Mineral Dressing.** (Cr and hrs ar; prereq 112) Cooke
- 201. Research in Process Metallurgy.** (Cr and hrs ar) Bitsianes
- 204. Research in Mineral Dressing.** (Cr and hrs ar) Cooke

MINING ENGINEERING (MinE)

First Term or Second Term

- 151-152-153.*§§ Special Mining Engineering Problems.** Literature survey or research work on mining problems. (Cr and hrs ar; prereq 112) Ar
- 212-213-214.*† Mining Research Problems.** (Cr and hrs ar) Ar

†† PCh 100B is a continuation of 100A. The entire course PCh 100A-B must be completed before credit will be assigned (6 credits). Grades will not be sent in at the end of the first term.

§§ Open only to students previously registered at the University of Minnesota. Advance arrangement necessary.

COLLEGE OF VETERINARY MEDICINE††

All classes scheduled by arrangement

Summer Institute in Radiation Biology

A 6-week course is offered for high school teachers of biology. The course will place emphasis on the effects of irradiation in living systems. Radioisotope instrumentation and procedures will be utilized in laboratory studies.

The participant will receive stipends from the National Science Foundation and limited laboratory instrumentation from the Atomic Energy Commission for use in high school classroom demonstrations.

Outlines of the Summer Institute in Radiation Biology, University of Minnesota, application blanks, and other information regarding the course can be obtained from Francis A. Spurrell, Director of the Institute, 120 Veterinary Clinic, University of Minnesota, St. Paul 1.

First Term and Second Term

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, #) Kitchell, 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, #) Kitchell

VETERINARY BACTERIOLOGY AND PUBLIC HEALTH (VBac)

- 128.* **Problems in Veterinary Bacteriology and Public Health.** (Cr ar; prereq 103 or equiv, #) Pomeroy, Anderson, Lindorfer, Loken
- 201.* **Advanced Poultry Diseases.** Investigations of specific infectious disease problems of poultry. (Cr ar; prereq 131, #) Pomeroy
- 205.* **Advanced Veterinary Bacteriology.** Special topics, techniques, collateral reading, and conferences. (Cr ar; prereq #) Pomeroy, Higbee, Lindorfer
- 221.* **Advanced Veterinary Public Health.** Discussion of veterinary public health programs and selected diseases common to animals and man. (Cr ar; prereq 127, #) Anderson

VETERINARY MEDICINE AND CLINICS (VMC)

- 113A-B. **Clinics.** Medical, radiological, obstetrical, surgical, and ambulatory clinics and laboratory examinations in diseases of animals. (3 cr each; prereq 101, #) Staff
- 202.* **Advanced Studies in Diagnosis and Therapeutics of Animal Diseases.** Detailed examination, discussions, and treatment of cases of animal diseases. (Cr ar; prereq 104, 131, #) Hoyt, Mather, Sorensen, Low

†† Tuition fees per term in College of Veterinary Medicine are \$62.50 for resident and \$145 for nonresident students, and incidental fee per term is \$11. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

VETERINARY OBSTETRICS (VObs)

- 204.° **Special Problems in Animal Reproduction.** (Cr ar; prereq #) Zemjanis

VETERINARY PATHOLOGY AND PARASITOLOGY (VPaP)

157. **Veterinary Necropsies.** Necropsies, techniques, examination of tissue sections and preparation of records. (1-3 cr; prereq 153, #) Sautter
- 158.° **Veterinary Surgical Pathology.** Neoplasms, surgical biopsies, postmortem material; review of pertinent literature. (1-3 cr; prereq 153, #) Sautter
- 201.° **Advanced Veterinary and Poultry Pathology.** Clinical material, collateral reading, and conferences. (Cr ar; prereq #) Sautter, Higbee
- 203.° **Neoplasms of Domestic Animals.** (Cr ar; prereq #) Sautter
- 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
- 171.° **Problems in Veterinary Pharmacology.** (Cr ar; prereq 152 or equiv, #) Stowe, Hammond

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
- 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, Clifford
- 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, #) Arnold, Usenik, Clifford
- 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

UNATTACHED UNIVERSITY DEPARTMENTS

AIR SCIENCE (Air)

First Term or Second Term

- 31. Leadership Laboratory. (0 cr; 2 hrs per wk; days ar; A 11) Thompson
- 32. Leadership Laboratory. (0 cr; 2 hrs per wk; days ar; A 11) Thompson
- 36. Leadership Laboratory. (0 cr; 2 hrs per wk; days ar; A 11) Thompson

MORRIS CAMPUS

First Term

Division of Humanities

ENGLISH (Engl)

74. **Modern Novel.** A study of the major 20th-century novelists, principally American, including James, Hemingway, Fitzgerald, Faulkner, and others. (3 cr; MTWThF; Hum 204) Spring

HUMANITIES (Hum)

1. **Humanities in the Modern World I.** The study of certain pivotal works in the development of Western civilization through the 18th and early 19th centuries. Among the authors included, for example, are Pope, Voltaire, Goethe, and Rousseau. The works are studied not as isolated literary or philosophical documents, but as part of the total intellectual and artistic movements which have come to be designated as neoclassicism and romanticism. This is a beginning course designed to arouse the interests of students in subjects which can be later pursued more intensively in specific subject matter areas. (3 cr; MTWThF; Hum 204) Spring

Division of Social Sciences

HISTORY (Hist)

21. **United States in the Nineteenth Century.** A survey of the development of the United States from the Age of Jefferson through the rise of industrial capitalism at the end of the century. Includes the emergence of nationalism, sectionalism, the Civil War, and Reconstruction. Essentially a survey of social, intellectual, and economic forces bearing upon the rise of the United States as a world power. (3 cr; MTWThF; Hum 108) Pursinger
69. **Europe in the Twentieth Century.** Europe at the close of the Age of the New Imperialism, the coming of World War I, and the century of violence, the Russian Revolution and its impact on Europe, the confusion throughout the 1920's, the forces giving rise to totalitarian leaders, World War II, the Cold War and its origins. This course is essentially political, social, and intellectual in nature. Surveys the European continent from the Atlantic to the Ural Mountains. (3 cr; MTWThF; Hum 108) Pursinger

PSYCHOLOGY (Psy)

1. **General Psychology I.** Survey of methods and results in the study of the behavior of man, the course of his development, the role of motivation, the organization of his personality, the nature of intelligence, and properties of social interaction. (3 cr; MTWThF; Hum 109) Klinger
63. **Child Psychology.** Science of child development and its applications. Attention is given to the mental, social, and emotional development of the child in relation to physical maturation and the environmental factors which influence personality development. (3 cr; prereq Psy 1 or #; MTWThF; Hum 109) Klinger

SOCIOLOGY (Soc)

1. **Man in Modern Society.** Characteristics of human group life and man's social environment; the structure of the social environment and its influence upon the individual's behavior. (3 cr; MTWThF; Hum 110) Milstone
55. **Social Control of Deviant Behavior and Conflict.** Analysis of the concept of deviant behavior and conflict and its role in social change. Such problems as minority group conflict and labor-management conflict will be evaluated. (3 cr; MTWThF; Hum 110) Milstone

Division of Science and Mathematics**MATHEMATICS (Math)**

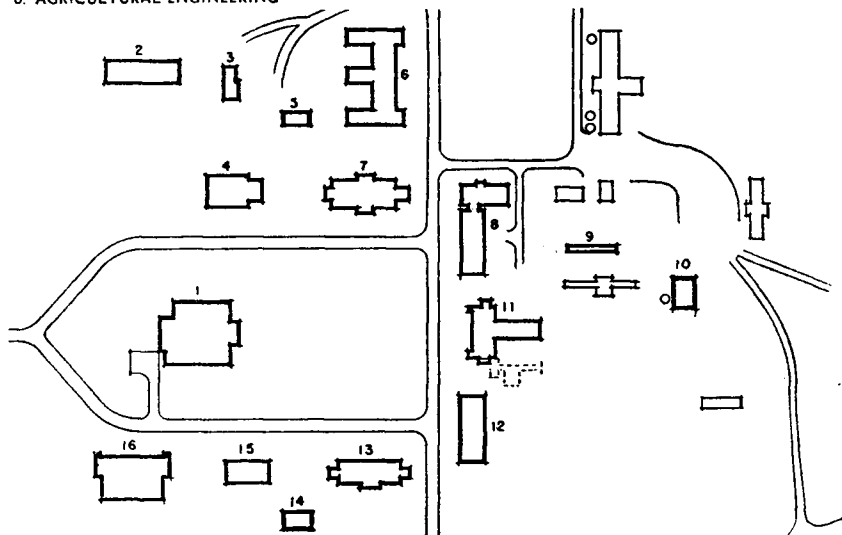
71. **Selected Modern Mathematical Topics for Elementary Teachers.** Topics to be selected from number system, different bases, logarithms, sets, geometry, and elementary algebra. (3 cr; MTWThF; Sci 103) Gausman
72. **Selected Modern Mathematical Topics for Secondary Teachers.** Topics to be selected from sets, symbolic logic, Boolean algebra, groups, fields, vectors, matrices, functions, permutations, and probability. (3 cr; MTWThF; Sci 103) Gausman

Division of Education**EDUCATION (Ed)**

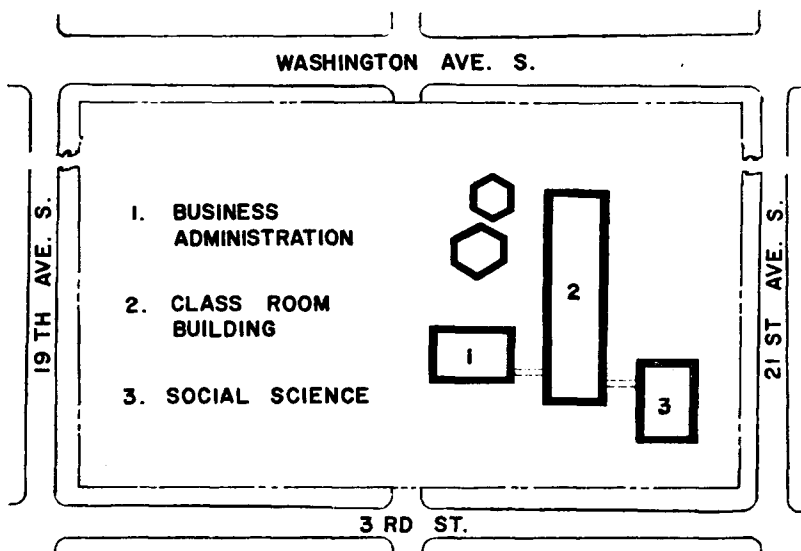
53. **Introduction to Education: The Elementary School and Curriculum.** The purposes and programs of the elementary school, classroom and curriculum organization, instructional activities and practices, unit method of teaching, the elementary school teacher in the profession, and recent trends in curriculum development. (3 cr; prereq soph; MTWThF; Hum 206) Bruning
80. **History of Education.** A study of the historical and philosophical development underlying current educational problems and practices; concerned with important educational theories, epistemological concepts, educational aims, and sociological and ethical implications. (3 cr; prereq jr; MTWThF; Hum 206) Bruning

MORRIS CAMPUS

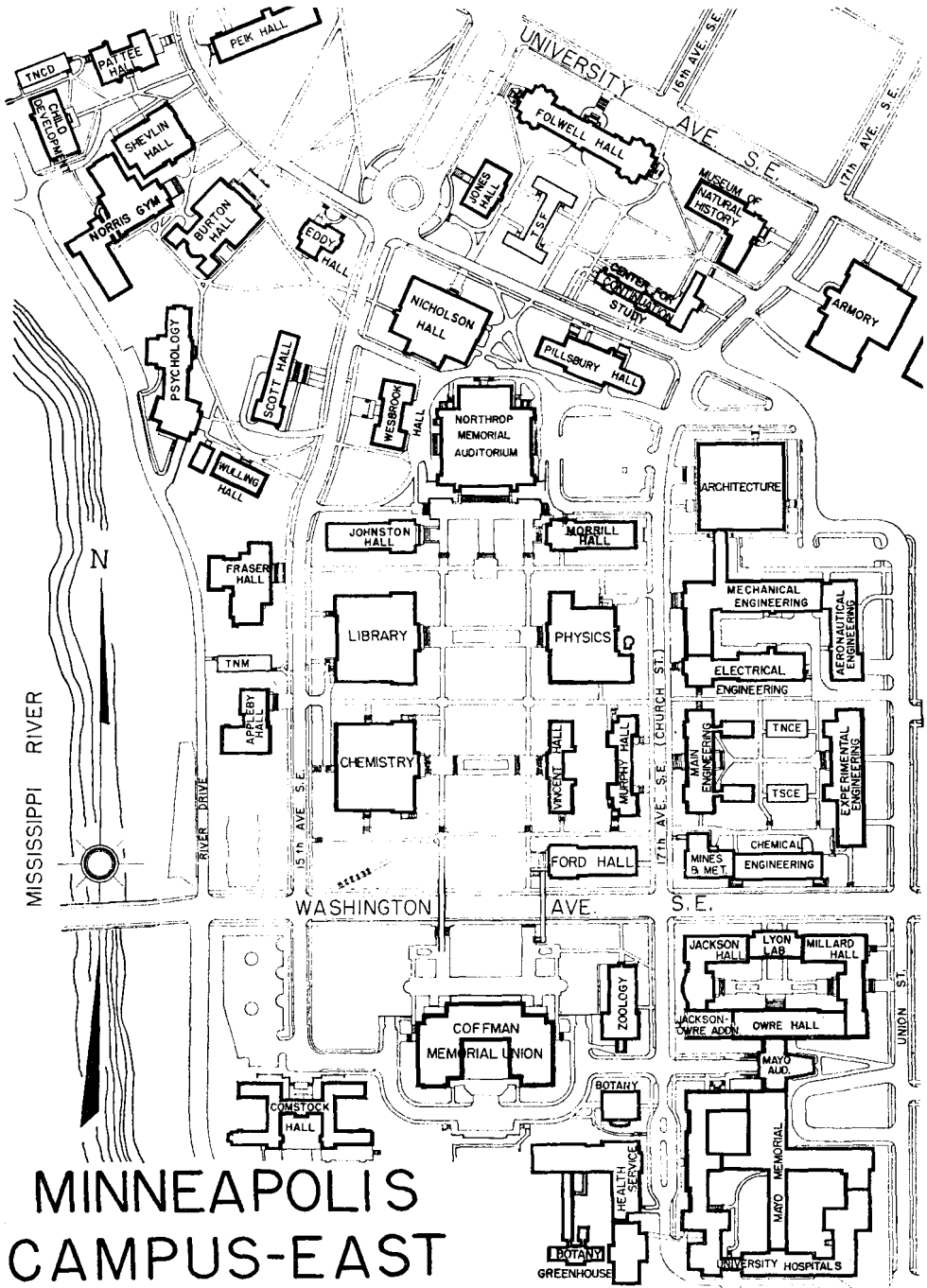
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|-------------------------------|-----------------------------------|----------------------|
| 1. EDSON HALL | 7. GIRLS' DORMITORY | 12. SENIOR HALL |
| 2. JUNIOR HALL | 8. HUMANITIES AND SOCIAL SCIENCES | 13. SPOONER HALL |
| 3. HOME MANAGEMENT HOUSE | 9. GREENHOUSE | 14. STUDENT SERVICES |
| 4. SCIENCE AND HOME ECONOMICS | 10. HEATING PLANT | 15. MUSIC HALL |
| 5. SUPERINTENDENT'S RESIDENCE | 11. DINING HALL AND DORMITORY | 16. GYMNASIUM |
| 6. AGRICULTURAL ENGINEERING | | |



MINNEAPOLIS CAMPUS—WEST



SEE MINNEAPOLIS CAMPUS—EAST →



MINNEAPOLIS CAMPUS-EAST

SEE MINNEAPOLIS CAMPUS-WEST

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