

2/2/60

*Bulletin of the*  
**UNIVERSITY OF MINNESOTA**



Summer Session 1960

Lake Itasca Forestry and Biological Station

*Biology Session*

June 13 to July 16

## FOREWORD

The Itasca Biology Session presents an opportunity to sample broadly or in depth an almost infinite variety of habitats—hardwood, conifer, and prairie.

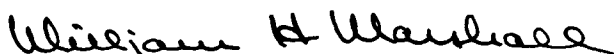
The staff, recruited from many universities, meets with students in seminar, laboratory, and field to explore the basic biological problems close at hand.

Facilities are ample, new, and beautifully located on Lake Itasca.

Students, ranging in experience from undergraduates to established biologists, learn from each other and contribute with enthusiasm to a common fund of knowledge.

These four components—the setting, staff, facilities, and student body—create an invaluable opportunity for biologists who wish to grow in their profession.

This is an invitation to you to participate in the program.



William H. Marshall  
Director of Biology Session

---

Volume LXIII

Number 3

February 1, 1960

### BULLETIN OF THE UNIVERSITY OF MINNESOTA

Published semimonthly January 1 to November 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.

**GENERAL  
INFORMATION**

**SPONSORSHIP**

Sponsored by the Summer Session, the Biology Session at the Lake Itasca Forestry and Biological Station 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 under the management of the director, Professor William H. Marshall. By agreement, the University of Wisconsin is participating in the policy and planning of the Biology Session through membership on the advisory committee.

**LOCATION**

The 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 four miles from the Station—where students will be met by Station transportation. State Highway 92 and U. S. Highway 71 provide easy access by car through the towns of Bagley, Bemidji, or Park Rapids.

**MAIL**

Mail for students should be addressed to: 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  
660 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 fifty 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 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.



*Ample dock and boat facilities are always available on the campus*

*Many projects combine laboratory  
and field techniques*



#### **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 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**

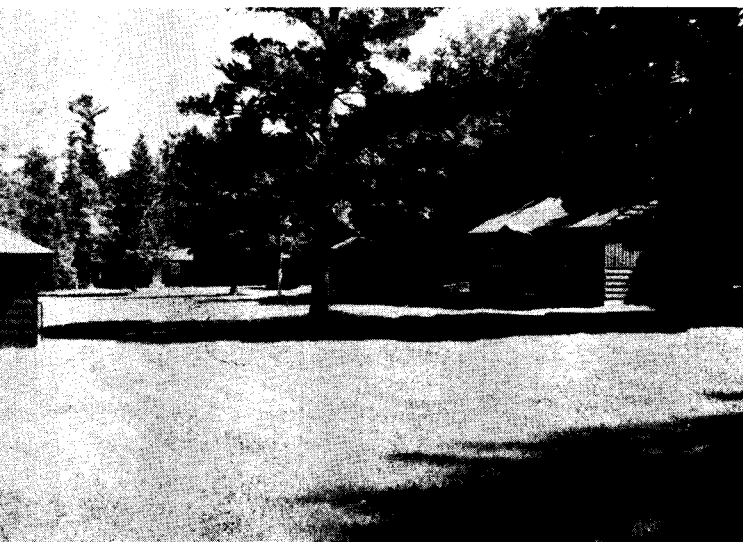
Ten well-equipped laboratories are located in five buildings. Much of the instruction is in the field where many varied habitats are within walking distance of the campus.

A fine herbarium of the region, collections of insects, fungi, bird skins, and small mammal skins are available for study. Two complete sets of aerial photos of the park area made in 1938 and 1951 are maintained at the Station with adequate stereoscopic equipment.

The Station equipment includes all necessary compound and dissecting microscopes, binoculars, collecting equipment, various types of nets, row boats, and launches, and the minor accessories for adequate 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.



*Student cabins are attractively situated on the lake shore*

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

**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 \$15 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 two or three good 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.

Off campus and within park boundaries, the State Park regulations govern. The State Park entry sticker (\$1) 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.

**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****ADMISSION**

Courses are open to all qualified graduate and undergraduate students who have had the usual preliminary courses in biological subjects. General rules for admission to the Summer Session apply to the Biology Session. Students with previous college work who wish to attend the Summer Session only may do so without filing credentials, provided they are in good standing and are not candidates for a degree. Students are advised to consult these regulations in the general *Bulletin of the Summer Session*.

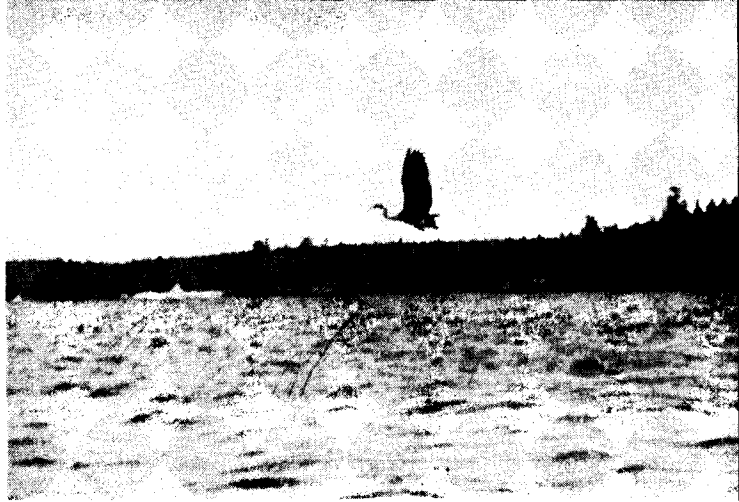
**GRADUATE SCHOOL**

Graduate students wishing to apply credits toward a degree at Minnesota must complete regular admission procedures. Graduate students in good standing at another recognized graduate school should complete the Transient Graduate Student form No. 218. All applications for admission must be sent directly to the Dean of the Graduate School, University of Minnesota, Minneapolis 14, Minnesota, not later than May 16.

Graduate work taken during the Biology Session may be considered for resident requirement at the University of Wis-



*Itasca birds afford many opportunities for study*



consin upon application to the Dean of the Graduate School at Madison and upon recommendation of the department concerned.

Only courses numbered 100 or over carry graduate credit.

**SCHOLARSHIPS**

The following awards are available for qualified students:

*Alexander P. Anderson and Lydia Anderson Fellowships* at \$350 each. These are available only to persons holding a degree from the University of Minnesota.

The *Caroline M. Crosby Memorial Fellowship in Botany* provides for tuition, room and board, travel, and miscellaneous expenses up to \$400.

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

**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, 660 Johnston Hall, University of Minnesota, Minneapolis 14, Minnesota. They must be completed by March 1, 1960.

**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 twenty-two teachers. The program is an intensive one stressing field biology and a small research project. Write the Dean of Summer Session, 660 Johnston Hall, University of Minnesota, Minneapolis 14, Minnesota.

**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. In exceptional cases registration 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 filled the Request for Reservation blank from inside the back cover of this bulletin. The Request for Reservation may be brought or mailed to 220 Coffey Hall, St. Paul Campus, or 135 Johnston Hall, Minneapolis Campus.

*The new research laboratory provides facilities for advanced students*



The IBM class reservation cards may be picked up at 220 Coffey Hall, St. Paul Campus, after May 23. Cards for out-of-town students will be available at the Itasca Station when the student registers.

**NORMAL LOAD**

Two courses are considered a normal load, although advanced students (including high school teachers whose employers require 10 credits of work in the summer) may take two courses and in addition 1 or 2 credits of a well-delimited research problem. Special permission must be secured from the director for a lighter or a heavier load.

**RESERVATIONS**

The Station cabins accommodate 92 students. Reservations are required and should be received by the University by June 1. 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 \$13.75 service charge for dormitory and dining room facilities and, in addition, an initial payment of \$70 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 a 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 14:

Tuition fee .....	\$63.00
Incidental fee .....	9.50
Laboratory fee .....	10.00
	<hr/>
	\$82.50

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 \$30.00 tuition per term and the incidental fee.

Independent investigators will pay a Research Table fee of \$25.

**LATE FEES**

Tuition and fees are payable at the time of registration on or before June 14. After June 14 late fees will be charged as follows:

Wednesday, June 15 .....	\$2.00
Thursday, June 16 .....	3.00
Friday, June 17 .....	4.00
Monday, June 20 .....	5.00

No registration will be accepted after Thursday, June 16, without the approval of the director of the Biology Session and the payment of the late fee.

---

**STAFF MEMBERS**

**Lewis Berner**, professor of biological sciences, University of Florida, has wide field experience in Africa and is an authority on the ecology and the taxonomy of mayflies.

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

**L. D. Frenzel, Jr.**, associate professor of biology, Macalester College, has made intensive studies of small mammal populations in northern Minnesota.

**William H. Marshall**, professor of economic zoology, University of Minnesota, is director of the Biology Session. He specializes in wildlife management and ecology of game animals, and has published technical articles on waterfowl, fur bearers, and upland game species.

**William E. Martin**, instructor in botany, University of Minnesota, has carried out research on gradient analysis of plant distribution on coastal dunes.

**Paul H. Monson**, assistant professor of biology, University of Minnesota, Duluth, is a specialist in aquatic flowering plants having published technical articles on research in this field at Itasca and in Iowa.

**Thomas Morley**, associate professor of botany, 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.

**Rufus H. Thompson**, professor of botany, University of Kansas, is currently engaged in a systematic study of the life history and cytology of the green algae. He has contributed chapters to recent major works on fresh-water biology and has studied algae in New Zealand and South America.

**James Underhill**, assistant professor of zoology, University of Minnesota, has had extensive teaching and research experience in South Dakota and Minnesota. He has specialized in distribution problems and the limnological factors influencing the variation of fishes.

**Dwain Warner**, associate professor of zoology, University of Minnesota, has completed work on the distribution of birds in Mexico and is carrying out research on social parasitism in the cowbird.

**COURSES OF INSTRUCTION**

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

An asterisk (°) indicates courses that may be taken by graduate students for independent work under Plan B. A sharp sign (#) indicates that consent of instructor must be obtained. A triangle (△) indicates that consent of department must be obtained.

**BOTANY**

**PIPa 56. Introduction to the Study of Fungi.** See Plant Pathology.

**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. (4 cr; prereq 10 cr in botany or zoology, or #; WS) Monson

**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*. (2-4 cr; prereq 10 cr in botany or zoology, or #; TF) Morley

**135. Ecology of the Itasca Region.** The plant communities represented in Itasca Park and vicinity and their dynamic relationships. Also the relationships of the local communities to the vegetation of Minnesota as a whole. Use of modern methods of vegetational analysis and measurement of environmental factors. (4 cr; prereq Bot 50 or 130 or For 4; MTh) Martin

**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, *Freshwater Algae of the United States*. Field work to be arranged. (4 cr; prereq 10 cr in botany, biology, or zoology, or #; TF) Thompson

PIPa 156. Advanced Study of Fungi. See Plant Pathology.

196.° **Problems in Ecology, Taxonomy, Bryology, or Algology.** Advanced studies based on individual field work and research. (Cr ar; prereq #) Martin, Monson, Morley, Thompson

208.° **Research Problems in Taxonomy.** (Cr ar; prereq #) Monson, Morley

224.° **Research Problems in Ecology.** (Cr ar; prereq #) Martin

236.° **Research Problems in Cryptogams.** (Cr ar; prereq #) Thompson

**ENTOMOLOGY  
AND ECONOMIC  
ZOOLOGY**

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*. (4 cr; jr, sr; prereq Zool 1-2-3 or equiv; TF) Berner

124. **The Biology of Immature Insects.** A field and laboratory course treating of habits, habitat, life history, and identification of immature insects with particular emphasis on aquatic forms. Text: Peterson, *Larvae of Insects, Parts I and II*. (4 cr; prereq 15 cr in zoology and Ent 52 or equiv or  $\Delta$ ; WS) Berner

162. **Ecology of Terrestrial Vertebrates.** Field work demonstrating methods of studying vertebrate populations and their relationship to local environments. Text: Dice, *Natural Communities*. Field projects, analyses, and lectures. (4 cr; prereq Zool 57-58 and Ent 63, or equiv and Bot 50; MTh) (There will be a "cost basis charge" for mileage on field trips) Marshall, Frenzel

**196.° Special Problems in Entomology and Economic Zoology.** Advanced work in entomology and economic zoology and ample opportunity for individual research, especially in various phases of faunistic studies in terrestrial, aquatic, and forest entomology and economic zoology. (Cr ar; prereq #) Marshall, Berner, Frenzel

**PLANT  
PATHOLOGY  
AND BOTANY**

**56. Introduction to the Study of Fungi.** The structure, development, and identification of fungi, especially those of economic importance. (4 cr; jr, sr; prereq 9 cr in botany, or #; MTh) French

**156. Advanced Study of Fungi.** General characters of fungi; especially those used in identification; cultural and taxonomic procedures and practices. (4 cr; prereq 9 cr in botany, or #; MTh) French

**210.° Special Problems in Mycology.** Research work along the following suggested lines: taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; morphology or physiology of special forms. (Cr ar; grad; prereq Myc 105-106-107) French

**ZOOLOGY**

**55. 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*. (4 cr; prereq Zool 1-2-3, NSci 7-8-9, or equiv; WS) Underhill

**115. Advanced Natural History of Invertebrates and Fishes.** An advanced taxonomic and ecological survey of the local fauna including a detailed and independent ecological study of several taxonomic groups. Texts: Eddy and Hodson, *Taxonomic Keys of the Common Animals of Minnesota*; Pennak, *Fresh Water Invertebrates of the U. S.* (4 cr; prereq 15 cr in zoology; WS) Underhill



119. **Limnology.** The conditions for life in the water and distribution of aquatic animals. Text: Welch, *Limnology*. (4 cr; prereq 15 cr in zoology; MTh) Underhill

135. **Field Ornithology.** Field and laboratory studies of ecology and life histories of the birds in the Itasca Park region. (4 cr; prereq 15 cr in zoology; TF) Warner

197.\* **Problems in Ornithology, Ecology, and Limnology.** Principles and further work in special lines adapted to needs of individual students. (Cr ar; prereq Zool 1-2-3 or NSci 7-8-9 and #) Underhill, Warner

**CONDENSED  
COURSE  
SCHEDULE**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Bot 135	Bot 116	Bot 112	Bot 135	Bot 116	Bot 112
	Ent 162	Bot 155	Ent 124	Ent 162	Bot 155	Ent 124
	PIPa 56	Ent 59	Zool 55	PIPa 56	Ent 59	Zool 55
	PIPa 156	Zool 135	Zool 115	PIPa 156	Zool 135	Zool 115
	Zool 119			Zool 119		

**GRADUATE STUDENT THESES**

LEE, F. B. A comparison of bird occurrence and activity in two climax forests at Itasca Park, Minnesota. M.S. Thesis. 1948.

COLE, G. A. An ecological study of the microbenthic fauna of two Minnesota lakes. Ph.D. Thesis. 1949.

HENDRICKS, H. A. The microfauna of the sandy beaches of three Minnesota lakes. M.A. Thesis. 1949.

MALONEY, J. E. A study of the relationship of food consumption of the bluegill, *Lepomis macrochirus Rafinesque*, to temperature. M.S. Thesis. 1949.

OWENS, O. V. Some aspects of the ecological life histories of *Impatiens biflora* Walt. and *I. pallida* Nutt. M.S. Thesis. 1949.

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.

### RECENT RESEARCH PUBLICATIONS

OWNBEY, G. B. Natural hybridization in the genus *Cirsium*—*I. C. discolor* (Muhl ex Willd.) Spreng x *C. muticum* Michx. Bull. Torrey Bot. Club, 78:233-53. 1951.

QUIMBY, D. C. The life history and ecology of the jumping mouse, *Zapus Hudsonius*. Ecol. Mono., 21:61-95. 1951.

SPIETH, H. T. The breeding site of *Drosophila lacicola* Patterson. Science, 113(2931):232. 1951.

STERN, W. L. and M. F. BUELL. Life form spectra of New Jersey Pine forest and Minnesota Jack Pine forest. Bull. Torrey Bot. Club, 78:61-65. 1951.

ABDEL-MALEK, E. T. *Cercaria chandleri*, a new echinostome species from the snail *Helisornia corpulentum*, in Lake Itasca, Minnesota. Trans. Amer. Microscopical Soc., 71:277-81. 1952.

CHANDLER, A. C. Two new species of *Oochoristica* from Minnesota skunks. Amer. Midl. Nat., 48:69-72. 1952.

ABDEL-MALEK, E. T. Life history of *Petasiger chandleri* (Trematoda Echinostomatidae) from the pied-billed grebe, *Podilymbus podiceps podiceps*, with some comments on other species of *Petasiger*. Jour. of Parasitology, 39:152-58. 1953.

BUELL, M. F. and W. A. NIERING. Vegetation of a raised bog near Itasca Park, Minnesota. Bull. Torrey Bot. Club, 80:123-30. 1953.

LEISMAN, G. A. The rate of organic matter accumulation on the sedge mat zones of bogs in the Itasca State Park region of Minnesota. Ecology, 34:81-101. 1953.

WARREN, BRUCE. A new type of metacercarial cyst of the genus *Apophallus*, from the perch, *Percu flavescens*, in Minnesota. Amer. Midl. Nat., 50:397-401. 1953.

CHANDLER, A. C. A new nematode, *Chlamydooprocta itascensis* n.gen.,n.sp. (Spiruridae) from a skunk, *Mephitis mephitis* in Minnesota. Amer. Midl. Nat., 51:313-15. 1954.

———. New strigeids from Minnesota birds and mammals. Amer. Midl. Nat., 52:133-41. 1954.

BUELL, M. F. and F. H. BORMAN. Deciduous forests of Ponemah Point, Red Lake Indian Reservation, Minnesota. Ecology, 36:646-58. 1955.

HICKEY, J. J., P. B. HOFSLUND, and H. F. BORCHERT. Bird nests in the Itasca State Park area, 1954. Flicker, 27:16-21. 1955.

MARSHALL, W. H. and M. F. BUELL. A study of the occurrence of amphibians in relation to a bog succession, Itasca State Park, Minnesota. Ecology, 36:381-87. 1955.

ROWLEY, JOHN R. A study of recent pollen at Lake Itasca Biological Station. Proc. Minn. Acad. Science, 23:50-60. 1955.

SEIM, A. L., M. F. BUELL, and R. I. EVANS. Bryophyte growth-forms and cover in a jack pine stand, Itasca Park, Minnesota. Bryologist, 58:326-29. 1955.

- BUELL, M. F. Spruce-Fir, Maple-Basswood competition in Itasca Park, Minnesota. *Ecology*, 37:606. 1956.
- FREEMAN, R. S. Life history studies on *Taenia mustelae* Gmelin, 1790 and the taxonomy of certain Taenoid cestodes from mustelidae. *Canadian Jour. Zoology*, 34:219-242. 1956.
- KENDEIGH, S. C. A trail census of birds at Itasca State Park, Minnesota. *Flicker*, 28:90-104. 1956.
- MARSHALL, W. H. Summer weights of raccoons in northern Minnesota. *Jour. of Mammalogy*, 37:445. 1956.
- BUELL, M. F. and W. A. NIERING. Fir-Spruce-Birch forests in northern Minnesota. *Ecology*, 38:602-10. 1956.
- MONSON, PAUL H. Variation in *Nymphaea*, the white waterlily, in the Itasca State Park region. *Proc. Minn. Acad. Science*, Vol. 25. 1957. In press.
- BELLIS, E. D. A study of movement of American toads in a Minnesota bog. *Copeia*, 1959: 173-174.
- CHRIST, J. C. A study of yellow birch (*Betula lutea*) in the bogs of Itasca Park, Minnesota. *Amer. Midl. Nat.*, 61:480-84. 1959.
- CLOUGH, G. C. Extension of range of woodland jumping mouse. *Jour. Mammalogy*, 40:449. 1959.
- ISAAC, D., W. H. MARSHALL and M. F. BUELL. A record of reverse plant succession in a tamarack bog. *Ecology*, 40:317-20. 1959.
- MARSHALL, W. H. Waterfowl brood studies. *Flicker*, 30:122-26. 1959.
- OLSON, W. A. A preliminary check-list of mosses of Itasca State Park, Minnesota. *Bryologist*. 1959. In press.

## LAKE ITASCA FORESTRY AND BIOLOGICAL STATION

### *Request for Reservation*

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

Address \_\_\_\_\_

Status (circle one): Grad.; Special; Research; Undergrad.

Freshman, Sophomore, Junior, Senior; and College \_\_\_\_\_

Occupation (if not full-time student) \_\_\_\_\_

Previous Station attendance (years) \_\_\_\_\_

Degree expected (when and where) \_\_\_\_\_

Courses to be taken: (List Department name and number)

\_\_\_\_\_

\_\_\_\_\_

Date of arrival \_\_\_\_\_ Car or bus? \_\_\_\_\_

Meal service begins June 12, supper. Buses will be met at Douglas Lodge.)

Please mail this form to Dean, Summer Session, 135 Johnston Hall,  
University of Minnesota, Minneapolis 14, Minnesota



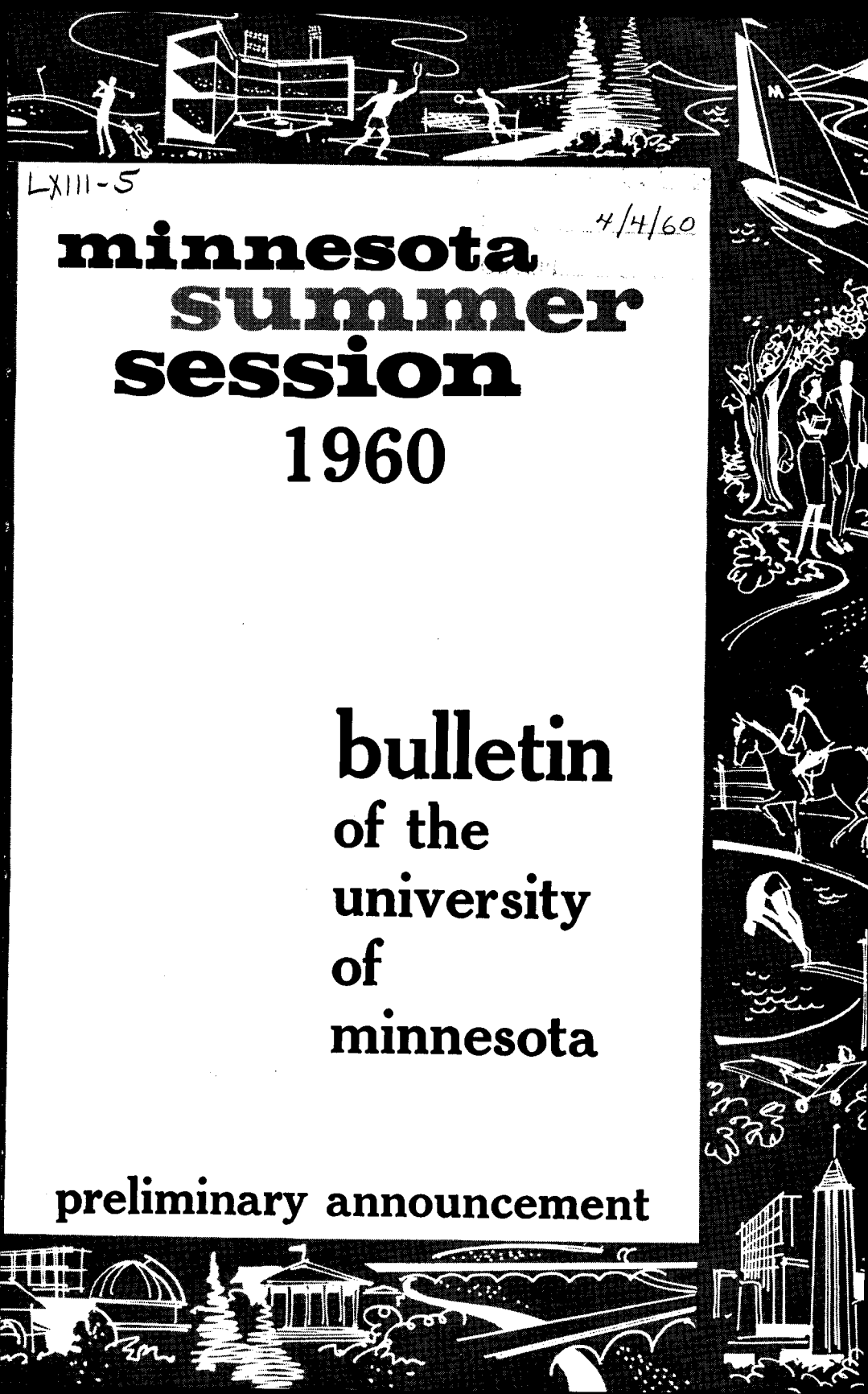
LXIII-5

4/4/60

# **minnesota summer session 1960**

**bulletin  
of the  
university  
of  
minnesota**

**preliminary announcement**

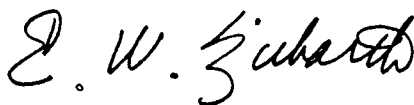


# Foreword

---

This bulletin describing the Summer Session activities of the University of Minnesota is our invitation to you to participate in an extensive program carefully planned for study and recreation. It is our hope that these activities will serve your interests and that you will accept our invitation.

The Summer Session is large, but it is not impersonal. Both courses and recreation programs are designed with the special needs of the summer student in mind, and we welcome your reaction to them.



E. W. ZIEBARTH  
Dean, Summer Session

---

Volume LXIII

Number 5

March 1, 1960

BULLETIN OF THE UNIVERSITY OF MINNESOTA

Published semimonthly January 1 to November 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.

1960

# **UNIVERSITY OF MINNESOTA**

**Minneapolis, Minnesota**



## **SUMMER SESSION**

**First Term**

**June 13-July 16**

**Second Term**

**July 18-August 20**

# Table of Contents

---

- ✓ ★ SPECIAL PROGRAMS
- ✓ ★ GENERAL INFORMATION
- ✓ ★ HOUSING AND FOOD SERVICE
- ✓ ★ ADMISSION AND REGISTRATION
- ✓ ★ RECREATION
- ✓ ★ 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, 650 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**

Instead of the traditional Casa Hispánica the department is sponsoring a group which will study at the University of Guadalajara, Mexico. There, for a moderate expenditure, students will participate in a program of university courses under professors both from Guadalajara and from various American institutions. They will also have numerous opportunities for using Spanish in everyday situations. For details write to: Dean of Summer Session, 650 Johnston Hall, University of Minnesota, Minneapolis 14.

The directors of the residence houses will be Professor Herman Ramras 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, Spanish, 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.

## **Scandinavian Area Studies**

The Scandinavian Studies program, held alternate summers at the University of Wisconsin and the University of Minnesota, is scheduled for the summer of 1960 at the University of Minnesota. For detailed information consult Professor Arik Gustafson, Department of Scandinavian, 13 Folwell Hall, University of Minnesota, Minneapolis 14.

During the summer of 1960, visiting professors in history and literature will offer courses in various aspects of American culture, as will members of the University of Minnesota staff in these and other departments (anthropology, sociology, economics, education, 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.

In recognition of the increasing use of laboratories in language teaching, the Department of Classics will offer Latin 171, Advanced Reading, in the second term as an aid to teachers who are interested in new linguistic methods. The course will present the fundamentals of descriptive linguistics in relation to the teaching of Latin, with emphasis on the basic differences between English and Latin linguistic patterns. The relationships between descriptive linguistics and traditional grammar and syntax will also be explored; and the modification of Latin reading techniques will be studied in the light of recent laboratory experience.

## **Latin**

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 Scientific Russian 24 (Slavic and Oriental Languages) and devote ten class hours weekly to the mastery of this important language.

## **Scientific 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 scientific fields.

## **Journalism and Communi- cations**

The School of Journalism program contains courses for both undergraduate and graduate students interested in professional training. This year it provides a special workshop course for advisers of student publications in high schools, junior colleges, and colleges. Fitted around the workshop are special courses in graphic arts and magazine writing.

The School also offers courses on the Upper Division-Graduate level in the area of mass communications. Among courses that carry Upper Division and graduate credit are Literary Aspects of Journalism, International Communications and Foreign Affairs, Development of Radio and Television Communications, Interpretation of Contemporary Affairs, Propaganda and Public Opinion, and The Press in a Dynamic Society.

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, Amsterdam, Paris, and London. Five credits will be given in Art 59 to students successfully completing the course. Cost \$1,295 including University fees.

Members of the group will depart from New York by air on June 26, spend approximately 6 weeks in Europe, and return to New York on August 5.

Adult reading needs are a matter of real concern. Efficient Reading (Rhetoric 47), designed for the average and above-average adult reader, provides a unique combination of activities for improving reading speed, comprehension, and vocabulary.

### **Efficient Reading**

City and state supervisors of home economics education and supervising homemaking teachers in secondary schools will be interested in Home Economics Education 190, Readings in Supervision, which will be offered first term.

### **Home Economics**

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 (Extension 6654 or 6816).

### **Religious Activities**

During the Summer Session, the Department of Speech and Theater Arts offers an expanded program in speech pathology at both the graduate and undergraduate levels. Students interested in continuing their training or working toward graduate degrees may do this through the summer offerings. A special feature of the 1960 Summer Session will be a six-credit course in aphasia, which will bring to Minnesota national authorities in the study of aphasia and the behavior of brain-damaged children and adults.

### **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, Minneapolis 14.

**Audiology  
(Hearing)**

Professional audiology continues to offer opportunities for specialists in communication disorders to cope with clinical problems of measurement, diagnosis, and guidance; and to carry out educational and rehabilitative programs with the acoustically handicapped. An expanded program of courses in audiology with opportunities for supervised clinical experience will be available in both terms.

An important feature of the 1960 Summer Session will be the offering of courses in the Physiology of the Ear and Theories of Hearing by Professor Merle Lawrence of the University of Michigan.

Students can work toward graduate degrees with specialization in audiology during the summer terms. Those concerned with certification in the American Speech and Hearing Association or with a degree program should plan an early conference with Professor Frank M. Lassman, Room D-311, University of Minnesota Hospitals, Minneapolis 14.

**Driver  
Education**

The course in driver education (Curriculum and Instruction 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 will find it basic. It will be given both terms 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 (Curriculum and Instruction 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.

In the first term, there will be a workshop on production and automation practices for industrial arts classes. Production problems will be studied through laboratory experiences and numerous experiments will be carried out to develop ways of automating production projects in an industrial arts shop.

### **Industrial Education Workshops**



General Woodwork for non-majors will be offered first term. This course is intended for special class teachers, recreation leaders, and others needing help in woodworking and allied activities.

During the second term, Instructional Materials Laboratory, a special two-week workshop for qualified vocational directors, co-ordinators, and instructors in vocational education has been planned.

Introductory and advanced training for counselors is featured at the University of Minnesota. In both terms, complete offerings of graduate courses for high school counselors will be available.

### **Graduate Programs for Counselors**

Tentative plans are under way for an institute on counseling first term, with a basic section scheduled at Duluth and an advanced section scheduled at Minncapolis. A special announcement describing these plans will be available later.

The University High School will be in operation during the first term. The Tuttle Demonstration Elementary School will operate during the last four weeks of the first term (June 20-July 16) and the first week of the second term (July 18-23). All school staff members will be welcome to observe these programs.

### **Demonstration Facilities**

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

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

### **Introduction to Elementary Education**

Introductory courses for prospective elementary school teachers, not ordinarily available in Summer Session, will be given this year. These courses (General Education 75A and 75B, first term, and 75B, second term) have been planned particularly for persons with Bachelor's degrees who wish to prepare themselves for teaching in the elementary schools and for others regularly enrolled in our elementary education major. Admission to the College of Education as a regular student is prerequisite for registration in these courses.

### **Introduction to Secondary Education**

The summer program will include Introduction to Secondary School Teaching (General Education 55A, first term, and 55B, second term). All students accepted for Education 55A-B must be approved in advance for admission as regular students in the College of Education.

### **Workshop for School Administrators**

As a part of the advanced graduate program (one year beyond the Master's degree) leading to the certificate of Specialist in Education—School Administration, a workshop is scheduled for the first term: Problems in State School Administration (Educational Administration 234). This workshop will require half-time work from the participants for the full term of five weeks. The group will be limited in size, and the completion of the Master's degree program for school superintendents is required for enrollment.

A special announcement concerning the Specialist in Education program for school administrators will be sent to those who request it.

### **Special Education—Program and Scholarships**

Both summer terms will include an expanded series of courses in all fields of special education—speech correction, the educable retarded, the deaf and heard-of-hearing, the blind and partially seeing, and gifted children.





Special scholarships, open to students from any state, are offered for those attending classes on the education of blind children. (See following section on Education of Blind and Partially Seeing Children for information on applying for scholarships in this area.)

The University staff will be augmented by visiting instructors in the area of education of the deaf. This program is designed for teachers in the field and for those who are working to meet the requirements of Minnesota and of other states for the State Department of Education certification in teaching the deaf. Teachers of regular classes who wish to earn the special certificate should plan to attend both terms if possible.

First term courses from which the student may choose are Hearing Disorders (Speech 152), Audiometry and Hearing Aids (Speech 153), and Clinical Practice in Audiology (Speech 157). In the second term the work will include Education of the Auditorially Handicapped Child (Educational Psychology 185), Language Training for the Deaf (Speech 127), Auditory Training (Speech 156), Clinical Practice in Audiology (Speech 157), Advanced Clinical Audiology (Speech 270), Seminar in Hearing (Speech 271-272-273), and a demonstration class of deaf children. There are also related courses in speech correction psychology, child development and welfare, and education.

Full sequences of courses for teachers of mentally retarded children will be offered in both terms. Problems of the Mentally Retarded in Secondary Schools (Educational Psychology 191) is one of the special courses available in the first term. Teachers who hold regular teaching certificates and who have at least two years' teaching experience in regular classes may earn provisional certificates to teach the retarded in Minnesota by attending either one or both of the 1960 summer terms. Professor Seymour Sarason will be a visiting faculty member in this field during the second term.

### **Teaching the Deaf and Hard-of-Hearing**

### **Teaching the Educable Mentally Retarded**

### **Education of Blind and Partially See- ing Children**



Seven courses for teachers and administrators on the education of blind and partially seeing children will be offered first term. The courses will include one which is an introduction to the education of visually handicapped children (Curriculum and Instruction 115), and one on the structure and function of the eye with educational implications of visual impairment (Curriculum and Instruction 178). A beginning course in Braille (Curriculum and Instruction 116) and an advanced one (Curriculum and Instruction 117) will include instruction in the Braille codes and in the preparation of various types of school materials in Braille. Three methods courses will emphasize special materials and equipment, instructional procedures, and use of related resources. Curriculum and Instruction 182 is concerned with the child who is partially seeing, 118 with the blind child in the elementary grades, and 120 with the blind student in the secondary schools. A demonstration resource room for blind and partially seeing children will be in operation at the Tuttle Demonstration School. 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.

### **3M Distinguished Lectures in Chemistry**

Again in 1960 the 3M Visiting Lectureship, sponsored by Minnesota Mining and Manufacturing Company, will bring an outstanding chemist to the campus during the first term, to discuss current advances of significance in chemistry. Professor H. C. Longuet-Higgins, F.R.S., of the University of Cambridge, England, will present a series of lectures on recent progress in the understanding of valence and of molecular structure. (See Physical Chemistry 199)

### **Institutes for High School Teachers of Science**

#### **Mathematics, Physics and Chemistry**

An Institute for high school teachers of mathematics, physics and chemistry, supported by the National Science Foundation will be held on the Minneapolis Campus from June 13 to August 5. 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 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 13 to July 23 for high school teachers of biology. Stipends for the participants, dependency and travel allowances are available.

Teaching personnel are associated with the Departments of Agronomy and Plant Genetics, Zoology, Divisions of Radiation Therapy, and Veterinary Surgery and Radiology. (See College of Veterinary Medicine.)

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

## **Research and Training Stipends—Biology**

The third Graduate Summer Session of Statistics in the Health Sciences will be held this year at the University of Minnesota, June 16-July 30, under the auspices of the School of Public Health. This program, supported by a training grant from the National Institutes of Health, is designed to meet some of the educational and training needs of persons engaged in work in health and health-related agencies or those preparing themselves for such work. A special announcement is available upon request to the Dean of Summer Session, 650 Johnston Hall, University of Minnesota, Minneapolis 14.

## **Biostatistics**

**Ground Water  
Development**

For the second successive year, the School of Public Health will offer a special intensive program on Development of Ground Water Supplies. This program, conducted at the request and with the assistance of the International Cooperation Administration, will place special emphasis on the public health aspects of such supplies. While designed primarily for engineers employed in foreign areas, the content will be applicable to those engaged in water supplies programs in state health departments in the United States. The course will be limited in registration and will continue through both terms. For further information write the School of Public Health, University of Minnesota, Minneapolis 14.

**Archaeological  
Field Session**

An intensive five-week course, Anthropology 140, in archaeological field research under the direction of the Department of Anthropology will be given at the Northwest School and Experiment Station at Crookston during the second term of the Summer Session. Research will center upon archaic habitations and burial sites in the Glacial Lake Agassiz basin.

**Statistics  
(Interdis-  
ciplinary)**

Interdisciplinary work in statistics sponsored by the Graduate School Committee on Statistics will be given second term. These courses, Statistics 281, Topics in Statistics, and Economics 121A, Introduction to the Theory of Statistics, will be of interest to all students of statistics.

**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

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 Dean of Summer Session, 650 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 two terms make it possible for the student to complete a full quarter's academic work.

The listing of courses which follows each college 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.

The Summer Session consists of two terms of five weeks each: June 13 to July 16 and July 18 to August 20. Students may register for subjects of their choice in either or both terms. Registration and payment of fees for the first term close at 4:00 p.m. on Tuesday, June 14. First term classes on the Minneapolis Campus will begin Tuesday, June 14, at 8:00 a.m. while classes on the St. Paul Campus will begin at 7:30 a.m.



## **Dates of Summer Session**

Registration and payment of fees for the second term close at 4:00 p.m. on Monday, July 18. Classes for this term will open Tuesday, July 19.

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

### **Libraries**

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

Departmental libraries on both campuses contain special collections of value to students.

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.

### **Speech and Hearing Clinic**

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.

### **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. Home calls in the vicinity of the campus are made in case of emergency.

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

# Housing and Food Service

## **Minneapolis Campus**

*Ada Comstock Hall*, a residence hall for women, situated along the Mississippi River close to the center of University life, will be open for room and board for the first and second terms this summer. This hall offers comfortable living in large double and single rooms, with well-planned healthful meals served under the direction of a trained dietitian. Applications will be filled in order of date received. To assure a choice of rooms, application should be made as early as possible.

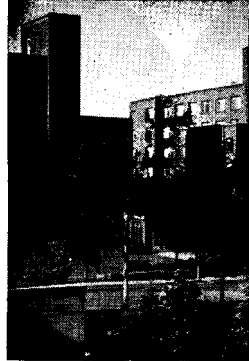
Write for applications and additional information to the Director of Comstock Hall, University of Minnesota, Minneapolis 14.

*Sanford Hall*, another residence hall for women, is situated on University Avenue near the entrance to the campus. Sanford Hall will offer rooms only for the first summer term, and for the second term provided there is a sufficient number of residents. This hall has spacious newly 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 ultramodern men's residence, offers comfortable living in large double and single rooms. A room and board contract (meals served Monday through Friday) will be available provided there is a sufficient number of residents. Otherwise, contracts will be for room only. Early application is suggested.

## **Residence Halls**



For application forms and additional information, write to Director of Centennial Hall, University of Minnesota, Minneapolis 14.



### **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. Meals may be obtained in a University cafeteria adjacent to the building.

For application forms and additional information, write to Director of Bailey Hall, University of Minnesota, St. Paul 1.

### **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 sub-lets are available beginning in May upon request.

For further information, write to Student Housing Bureau, 209 Eddy Hall on the Minneapolis Campus, or 215 Coffey Hall on the St. Paul Campus.



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

## **Food Service**

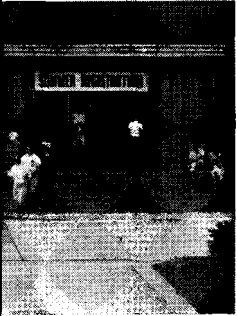
Well-prepared food at moderate prices and quick, efficient service are featured in the Cafeteria and Fountain Grille. The Commuters' Lunchroom is open with vending machine service. Service in these units is provided Monday through Friday of each week.

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 Dining Center will provide cafeteria service during the first term. The new Student Center (St. Paul Campus Union) will provide lunchroom and soda fountain facilities during both terms.

# 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 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 13, 8:00 a.m. to 4:00 p.m.

Fee payment, last day without penalty: Tuesday, June 14

*Second term* Registration and fee payment: Monday, July 18, 8:00 a.m. to 4:00 p.m.

## **Place of Registration**

### **First Term**

June 13: 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 13, should begin registration at the Office of Admissions and Records, Minneapolis or St. Paul Campus as appropriate.

### **Second Term**

July 18: Information Booth, Administration Building (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, Administration Building, 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.*

### **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 dean of the college in which the student is registered. *Only in exceptional cases will any change be made after classes have begun.*

## Late Registration

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

Wednesday, June 15 .....	\$2.00
Thursday, June 16 .....	3.00
Friday, June 17 .....	4.00
Monday, June 20 .....	5.00

No registrations are allowed for the first term after Thursday, June 16, 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:

Tuesday, July 19 .....	\$2.00
Wednesday, July 20 .....	3.00
Thursday, July 21 .....	4.00
Friday, July 22 .....	5.00

No registrations will be accepted for the second term later than Thursday, July 21, 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) .....	\$57.50
Incidental fee (per term) .....	9.50
	<hr/>
Total fee (per term) .....	\$67.00

### Part-time Fees

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 tuition fee (4 credits or less) (per term) .....	\$45.00
Incidental fee (per term) .....	9.50
	<hr/>
Total fee (per term) .....	\$54.50

### Incidental Fee

The incidental fee of \$9.50 per term entitles each student to the privileges of Coffman Memorial Union, Health Service, and the recreation program including the *Minnesota Daily*.

### Special Fees

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

In addition, course fees are charged for Civil Engineering Camp, Modern Language Institute, Music, Physical Education, Public Health, and Itasca Biological Station 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 \$30.00 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, \$35.50 per term; 3 credits or less or thesis only, \$17.75 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.

## Sports Program

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 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.

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

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.

The University Theater by its presentation of exceptionally fine plays on campus and by its North Central States and International Touring Companies has won world-wide acclaim. The theater will present a season of legitimate drama as one of the outstanding features of the Summer Session.

The MINNESOTA CENTENNIAL SHOWBOAT will again be operated on the Mississippi River by the University Theater, a high point of the Summer Session activities.



## **Excursions**

## **Concerts and Lectures**

## **University Theater**



## Films

A feature film, either foreign or domestic, will be shown one day a week. Another 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.

## Coffman Memorial Union

Summer Session students will find an informal, friendly spirit in the Coffman Memorial Union which offers a pleasant respite from the rigors of classroom activities. Quiet and comfortable lounges, efficient dining rooms, and varied recreation rooms give the Union a pleasant setting for informal, social, and recreational activities.

## Facilities

Facilities include billiards, bowling with automatic pin-spotters in operation, table tennis, and a coeducational game room for recreation . . . 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 in folk and modern dancing, instruction classes in bridge and personal grooming, as well as social hours, parties, musical programs, and art exhibits. Most of these are available to students without charge. Some of the dancing and social hour programs are conducted on the outdoor terrace.



Bowling instruction, in addition to open bowling, is available in the bowling lanes.

On the St. Paul Campus the new 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.

### **Student Center**

Facilities include lounges, a ballroom, a craft shop, television, a photo darkroom, conference rooms, and a games area, which includes bowling lanes, table tennis, and billiard tables.

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

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.

### **Museum of Natural History**

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 frequently changing program of major art exhibitions which include paint-

### **University Gallery**

ings, 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.

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 session (thereafter at certain hours) and are to be returned at the close of that session. A nominal fee is charged. The Pictorial Reference Files provide mounted photographs and color reproductions for individual study as well as for study exhibitions posted in the Third Floor East exhibition area. Materials may be borrowed or posted for any necessary period. There is no fee.

For further information please inquire at the offices of the Gallery, 310 and 316 Northrop Memorial Auditorium, or call extensions 6200 or 6514.

### **Art Library**

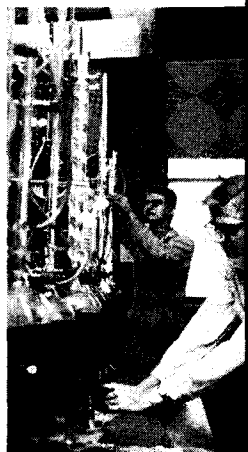
The Art Library, located in 307 Northrop Auditorium, maintains a collection of 6,000 books and several periodicals. In addition to "Y" books and reference material of limited circulation, a large number of books is in open stacks and may be taken out on one-month loans. The facilities of the Library 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.

# Schools and Colleges

The Graduate School of the University of Minnesota brings together in a single organization all programs and offerings of the University which lead to the higher degrees of master of arts, master of science, and doctor of philosophy.

## Graduate School

The University's libraries, laboratories, and clinics, supplemented by libraries, hospitals, and other institutions in the Twin Cities, offer excellent facilities and possibilities for graduate students. These privileges are, in general, open to those who have received Bachelor's degrees from accredited colleges and universities and who are adequately prepared for graduate work in their chosen fields of study.



## Applications

Students must make application for admission at least four weeks before the opening of the term they expect to attend in order to avoid delay, last-minute disappointment, and possible penalty for late registration. Applications for admission must be accompanied by an official transcript in duplicate of all undergraduate work and of all graduate work completed. 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.

Students, *before their arrival at the University*, 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 and on application for degree candidacy, 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 Dean 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 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 workshops, readings, seminar and special problems, as well as regularly scheduled classes. It is possible to complete a Master's program in General Home Economics or Home Economics Education by attending only Summer Sessions.

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 and Second Term**

203            Research Problems (2-5) ..... Staff

### **Agricultural Economics**

#### **First Term**

109            Agribusiness (3) ..... Goldberg  
 200            General Seminar in Agricultural Economics (3) ..... Staff  
 205            Special Seminar for Foreign Graduate Students  
                  in Agricultural Economics (6) ..... Berg and 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**

130            Farm Shop Management (3) ..... Marvin  
 131            Problems and Field Studies in Advanced Farm  
                  Mechanics (3) ..... Marvin

### **Agronomy and Plant Genetics**

#### **First Term and Second Term**

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

### **Animal Husbandry**

#### **First Term**

164            Sheep Production (3) ..... Jordan  
 213            Research in Animal Husbandry (3-5) ..... Comstock, Hanson  
                  Harvey, Jordan, Meade

## Second Term

213	Research in Animal Husbandry (3-5)	Comstock, Hanson, Harvey, Jordan, Meade
-----	------------------------------------	--

## Dairy Husbandry

### First Term and Second Term

208	Research in Dairy Production (ar)	Cole, Donker, Williams, Graham
-----	-----------------------------------	-----------------------------------

## Dairy Industries

### First Term and Second Term

210	Research in Dairy Products (2-5)	Coulter, Morris, Thomas
212	Research in Dairy Bacteriology (2-5)	Olson, Jezeski

## Entomology and Economic Zoology

### First Term\*

197	Introduction to Research (2 or more)	Staff
204	Research in Entomology (3 or more)	Staff

### Second Term

197	Introduction to Research (2 or more)	Staff
204	Research in Entomology (3 or more)	Staff

## Forestry

### First Term and Second Term

200	Research Problems in Silviculture (ar)	Staff
205	Research Problems in Forest Economics (ar)	Staff
207	Research Problems in Wood Technology (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

### 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 one year in a junior or other college and plan to register in forestry at the University and have at least one course in botany.*

2	Important Forest Plants (2)	Rees
5	Forest Ecology (4)	Hansen
6	Field Forest Measurements (2)	Brown
Soils 3A	Field Forest Soils (1)	Arneman

\* For Entomology and Economic Zoology courses given at the Biology Session at the Lake Itasca Biological Station, see index.



## Home Economics

### First Term

FL 15	The Home and Its Furnishings (3)	Ludwig
3	Clothing Construction A (3)	Williams
24	Problems in Home Planning and Furnishing (5)	Esteros
25	Design Applied to Crafts (3)	Abell
49	Household Equipment (3)	Hocraffer
66	Administrative Food Service Experience (5)	Hitchcock
76	Nutrition of the Family (4)	Morse
86	Home Management Laboratory (4)	Nielsen, Turney
126	Special Problems in Crafts (1-3)	Abell
127	Purchasing Home Furnishings (3)	Ludwig
137	Modern Food Preparation: Principles and Practices (3)	Gordon
154	Pattern Design and Alteration (3)	Carlson
165	Workshop in Administrative and Therapeutic Dietetics (3)	Gornican, Hitchcock
184	Home Management Principles (3)	Turney
208	Microanalysis of Textile Fibers (2-3)	Davison
220	Readings in Related Art (1-3)	Esteros
249	Seminar in Foods (1-2)	Noble
295-296	Home Economics Problems (1-5)	Davison, Ehrenkranz, Esteros, Morse, Noble

### Second Term

31	Introduction to Nutrition (3)	Hitchcock
49	Household Equipment (3)	Ehrenkranz
86	Home Management Laboratory (4)	Nielsen, Turney
89	Special Problems in Household Equipment (3)	Ehrenkranz
185	Family Relationships (3)	Ar.
295-296	Home Economics Problems (1-5)	Davison, Ehrenkranz, Esteros, Morse, Noble

## Home Economics Education

See courses listed under College of Education.

## Horticulture

### First Term and 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 and Second Term

206	Research in Plant Pathology (ar)	J. J. Christensen, Eide, Hart, C. M. Christensen, King, French, Kommedahl, Rowell
-----	----------------------------------	---

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

210	Problems in Mycology (ar).....	J. J. Christensen, C. M. Christensen
254	Research Problems in Applied Plant Physiology (ar).....	Rowell, Linck, Landon
260	Research Problems in Agricultural Botany (ar).....	J. J. Christensen, Kommedahl, Linck

## **Poultry Husbandry**

### **First Term and Second Term**

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

## **Rhetoric**

### **First Term**

22	Public Speaking (3) .....	Cashman
47	Efficient Reading (4 sec) (3) .....	Brown, Mixon, Price
51	Exposition (3) .....	Price
Hum 1A	Age of the Enlightenment (3) .....	Carr
Hum 24	American Humanities (3) .....	Carr

### **Second Term**

22	Public Speaking (3) .....	Nichols
47	Efficient Reading (4 sec) (3) .....	Wright, Whipp
Spch 251	Seminar: Listening Comprehension (2) .....	Nichols

## **Soils**

### **First Term and Second Term**

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

Individual laboratory or field work on special problems in a phase of soils other than the student's major thesis. Arrangements must be made in advance.

### **Second Term\***

3A	Field Forest Soils (1) .....	Arneman
----	------------------------------	---------

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

## **Biology Session**

The Biology Session at the Lake Itasca Forestry and Biological Station is open during the first term. The Station is located in the famous Itasca State Park with its wide variety of natural habitats all within easy reach of several well-equipped laboratories. A broad selection of courses in botany, entomology, and zoology is available. Field courses stress natural history and ecology as well as the taxonomy and identification of organisms.

Graduate and independent research work opportunities are particularly inviting. Arrangements can be made by qualified graduate students and researchers to continue their program through the entire field season. These arrangements must be made well in advance of the opening of the session on June 13.

### **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.

### **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, 650 Johnston Hall, University of Minnesota, Minneapolis 14.



Courses other than those listed below plus research problems may be arranged to suit individual needs.

**First Term**

**Botany**

PIPa 56	Introduction to the Study of Fungi. See Plant Pathology.	
112	Aquatic Flowering Plants (4)	Monson
116	Summer Flora (4)	Morley
135	Ecology of the Itasca Region (4)	Martin
155	Fresh-water Algae (4)	Thompson
PIPa 156	Advanced Study of Fungi. See Plant Pathology.	
196	Problems (1-5)	Martin, Monson, Morley, Thompson
208	Research Problems in Taxonomy (1-5)	Monson, Morley
224	Research Problems in Ecology (1-5)	Martin
236	Research Problems in Cryptogams (1-5)	Thompson

**Entomology and Economic Zoology**

59	Field Entomology (4)	Berner
124	Biology of Immature Insects (4)	Berner
162	Ecology of Terrestrial Vertebrates (4)	Marshall, Frenzel
196	Special Problems in Entomology and Economic Zoology (ar)	Marshall, Berner, Frenzel

**Plant Pathology and Botany**

56	Introduction to the Study of Fungi (4)	French
156	Study of Fungi for Advanced Students (4)	French
210	Problems in Mycology (ar)	French

**Zoology**

55	Natural History of Invertebrates and Fishes (4)	Underhill
115	Advanced Natural History of Invertebrates and Fishes (4)	Underhill
119	Limnology (4)	Underhill
135	Field Ornithology (4)	Warner
197	Problems in Ornithology, Ecology, and Limnology (ar)	Underhill, Warner

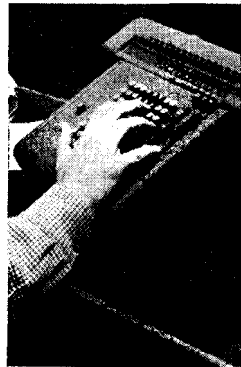
**School of  
Business  
Administration  
(including  
Economics)**

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 two-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 and economics 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.



**Business Administration**

**First Term**

5	Elements of Statistics (4)	Hastings
24	Principles of Accounting (3)	Ar.
26	Principles of Accounting (3)	Ar.
50	Production Management (3)	Wickesberg
51	Business Statistics (3)	Hastings
52	Modern Industrial Relations: Labor Marketing (3)	Mohr
53	Insurance Principles (3)	Williams
54	Transportation I: Principles (3)	Nightingale
55A	Elementary Accounting (4)	Ar.
55D	Analysis of Financial Statements (3)	Ar.
56	Corporation Finance (3)	Olson
57	Principles of Marketing (3)	Holloway
58	Business Law: Contracts (3)	Wright
60	Business Policy and Management Control (3)	Ar.
72	Modern Industrial Relations: Manpower Management (3)	Ar.
93	Property and Liability Insurance I (3)	Williams
97	Market Analysis and Research I (3)	Holloway
105A	Intermediate Accounting I (3)	Bentley
115A	Cost Accounting (3)	Bentley
150	Administration of Production (3)	Wickesberg
151	Elements of Statistics (3)	Hastings

152	Principles of Industrial Relations: Labor Marketing (3)	Mohr
153	Insurable Risks and Insurance (3)	Williams
154	Transportation I: Principles (3)	Nightingale
155A	Introduction to Managerial Accounting (3)	Ar.
156	The Modern Corporation (3)	Olson
157	Marketing Management (3)	Holloway
158	Business Law: Contracts (3)	Wright
160	Management Organization and Business Policy (3)	Ar.
161	Business Statistics (3)	Hastings
172	Principles of Industrial Relations: Manpower Management (3)	Ar.
174	Transportation II: Traffic Management (3)	Nightingale
176	Investments (3)	Olson
185A	Advanced Accounting (3)	Lund
212	Employee Development and Training (3)	Ar.
217	Market Analysis and Research (3)	Holloway
265B	Corporate Statements (3)	Ar.
272	Graduate Topics in Industrial Relations (3)	England

Note: Graduate Readings and Research in Business Administration, by the staff, available in the following areas: Industrial Management and Administration (BA 290 A, B); Statistics (BA 291 A, B); Manpower Economics and Industrial Relations (BA 292 A, B); Insurance (BA 293 A, B); Transportation (BA 294 A, B); Accounting (BA 295 A, B); Finance (BA 296 A, B); Marketing (BA 297 A, B).

### Second Term

5	Elements of Statistics (4)	Willis
25	Principles of Accounting (3)	Berryman
51	Business Statistics (3)	Willis
52	Modern Industrial Relations: Labor Marketing (3)	Mohr
55B	Elementary Accounting (4)	Meyers
55C	Managerial Costs (3)	Nelson
56	Corporation Finance (3)	Nilsen
57	Principles of Marketing (3)	Lewis
76	Finance Management (3)	Nilsen
105B	Intermediate Accounting II (3)	Berryman
115B	Cost Accounting (3)	Nelson
117	Sales Management I (3)	Lewis
151	Elements of Statistics (3)	Willis
152	Principles of Industrial Relations: Labor Marketing (3)	Mohr
155B	Introduction to Managerial Accounting (3)	Meyers
156	The Modern Corporation (3)	Nilsen
157	Marketing Management (3)	Lewis
161	Business Statistics (3)	Willis
175B	Data Processing (3)	Meyers
182B	Intermediate Manpower Management (3)	Yoder
237	Sales Management (3)	Lewis
265A	Managerial Cost Accounting (3)	Nelson
276	Finance Management (3)	Nilsen
282	Graduate Topics in Industrial Relations (3)	Ar.

Note: Graduate Readings and Research in Business Administration, by the staff, available in the following areas: Statistics (BA 291 A, B); Manpower Economics and Industrial Relations (BA 292 A, B); Accounting (BA 295 A, B); Marketing (BA 297 A, B).

## Economics

### First Term

1	Principles of Economics (3)	Bronfenbrenner, ar.
2	Principles of Economics (3)	Krueger
65	Intermediate Economic Analysis: The Firm (3)	Boddy
66	Intermediate Economic Analysis: Income and Employment (3)	Coen
67	Money and Banking (3)	Coen
69	Government Regulation of Business (3)	Simler
104	International Economics (3)	Krueger
162	Union Government and Policies (3)	Simler
165	Economic Analysis: Firms and Households (3)	Boddy
166	Economic Analysis: Income and Employment (3)	Coen
167	Economics of Money and Banking (3)	Coen
169	Government Regulation of Market Behavior (3)	Buttrick
178A	Public Finance (3)	Heller
185A	Price Theory (3)	Bronfenbrenner
190	Readings in Economics (1 to 3)	Staff
280A	History of Economic Thought: Before 1870 (3)	Buttrick
290	Economic Theory Workshop (ar)	Boddy

### Second Term

1	Principles of Economics (3)	Ar.
2	Principles of Economics (3)	Ar.
65	Intermediate Economic Analysis: The Firm (3)	Richter
66	Intermediate Economic Analysis: Income and Employment (3)	Smith
68	Elements of Public Finance (3)	Maynes
69	Government Regulation of Business (3)	Simler
103	Economic Development (3)	Tsuru
121A*	Introduction to the Theory of Statistics (3)	Buehler
150A	Current Economic Issues (3)	Smith
165	Economic Analysis: Firms and Households (3)	Richter
166	Economic Analysis: Income and Employment (3)	Maynes
169	Government Regulation of Market Behavior (3)	Simler
182	Economic Security (3)	Turnbull
184	Economic Problems of the Far East (3)	Tsuru
185B	Market Structure (3)	Richter
190	Readings in Economics (1 to 3)	Staff
281A*	Topics in Statistics (3)	Buehler

\* See Department of Statistics, College of Science, Literature, and the Arts.


## 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 administration leaders, counselors, and other education leaders. 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, 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.

All teachers are urged to examine the broad offerings of the College of Science, Literature, and the Arts, where the various departments have many valuable courses for teachers in the summer terms. Teachers will wish to strengthen their liberal and general education through the summer offerings in the humanities and social sciences, literature, speech, music, art, and all of the other liberal arts departments. Both secondary and elementary school teachers may plan a program combining courses in professional education with the liberal and general education courses of the other divisions of the University, emphasizing either their own teaching subjects or related and broadening activities.

Beginning and advanced courses for counselors, school psychological workers, reading specialists, and teachers of special classes



for exceptional children are strongly emphasized. A two-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 where the demand is still rising sharply for teachers and well-qualified principals, 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 the community school and on all phases of elementary instruction, supervision, and administration.

### **Institute of Child Development and Welfare**

Courses in the Institute of Child Development and Welfare 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 beginning and advanced courses in child psychology, guidance of children's activities, adolescent psychology, behavior problems of children, child development, atypical children, and mental retardation. The preschool will provide facilities for observation and participation.

Graduate courses meet some of the requirements for a Master's degree under either Plan A or Plan B.

### **Physical Education for Men**

Teachers will find a full program of professional courses. Students may work toward the degree of bachelor of science with either a major or minor in physical education or in recreation, master of education with a major in physical education or in recreation, master of arts with a major in physical education, or doctor of philosophy in education with major emphasis in physical education.



## **Physical Education for Women**

Regular professional courses will be available for students majoring in physical education under the bachelor of science, master of education, and master of arts programs and also for doctoral students majoring in education with an emphasis on school health and physical education.

Students wishing to qualify as part-time teachers of physical education in Minnesota may take courses toward an undergraduate minor in physical education or in school health education.

A regular program of teaching demonstrations in physical education will be presented during the first term at the Tuttle Demonstration Elementary School.

### ***Credit for Required Physical Education***

Since the various colleges of the University either require physical education or give elective credit in this field, certain courses are open to students who wish to satisfy this need or interest.

### ***Recreational Opportunities***

All women students may use the facilities of Norris Gymnasium for Women for leisure recreation, recreational swimming, tournaments and individual practice in golf, archery, tennis, badminton, sports demonstrations, movies, and clinics.

## **Agricultural Education**

### **First Term**

81	Teaching Agriculture in the Secondary School (4)	..... Kitts
121	Enterprise Analysis (3)	..... Peterson
156	Rural Education through Extension Methods (3)	.....Christensen
221	Field Problems (3)	..... Kitts, Peterson
232	Research (3-9)	..... Kitts, Peterson
250	Supervision of Vocational Agriculture (3)	..... Peterson

## Second Term

91	Supervised Teaching Experience (6) .....	Kitts, Christensen
221	Field Problems (3) .....	Kitts, Peterson
232	Research (3-9) .....	Kitts, Peterson

## Art Education

### First Term

17	Pictorial Expression for Elementary Education (3) .....	Cherry
18	Design Activities for Elementary Education (3) .....	Cherry
153	Curriculum Building in Art Education (Programs for exceptional children; gifted, retarded) (3) .....	Hastie
184	Improving Art Programs in the Elementary School (3) .....	Gayne
189	Application of Aesthetic Theory in Education (3) .....	Hastie
284	Research in Art Education (3) .....	Gayne
295	Problems in Art Education (ar) .....	Gayne, Hastie
296	Seminar in Art Education (1) .....	Gayne, Hastie

### Second Term

17	Pictorial Expression for Elementary Education (3) .....	Hegg
18	Design Activities for Elementary Education (3) .....	Hegg
184	Improving Art Programs in the Elementary School (3) .....	Wold
295	Problems in Art Education (ar) .....	Wold

## Institute of Child Development and Welfare

### First Term

80	Child Psychology (3) .....	Moore
83	Development and Guidance of Children's Activities (3) .....	Richards
130	Development of Skill, Language, and Thought in the Child (3) .....	Templin
132	Adolescent Development (3) .....	Hurst
140	Behavior Problems (3) .....	Robinson
142	Psychology of Atypical Children (3) .....	Templin
143	Problems of Mental Deficiency (3) .....	Hurst
144	Psychology of the Gifted Child (3) .....	Robinson
250	Practicum in Clinical Child Psychology (3) .....	Hafner
270	Readings and Research in Child Development (ar) .....	Staff

### Second Term

131	Development of Personality and Social Behavior in the Child (3) .....	Palermo
132	Adolescent Development (3) .....	Palermo
140	Behavior Problems (3) .....	Grams
142	Psychology of Atypical Children (3) .....	Grams
220	Seminar in Current Research: Mental Deficiency (3) .....	Sarason
237	Seminar in Human Development (2) .....	Stevenson
270	Readings and Research in Child Development (ar) .....	Staff

## Curriculum and Instruction

### First Term

#### General Courses

100	Teaching Methods in Labor Education (2)	Uphoff
101	Driver Education (3)	Gebhard
105	Audio-Visual Materials in Education (3)	Pearson
106	Co-ordinating an Audio-Visual Education Program (3)	Pearson
115	Introduction to Education of Visually Handi- capped Children (3)	Kenmore, Sibert
116	Braille I (3)	George
117	Braille II (3)	George
145	Reading Difficulties (3)	Bond
151	Diagnosis and Treatment of Learning Difficulties (3)	Balow, Wesenberg
174-175-176	Clinical Methods and Practice in Speech Pathology (3 each)	Ar.
178	Structure and Function of the Eye—Educational Implications (3)	Sibert, Kantar
182	Education of Partially Seeing Children (3)	Sibert
205	Problems in Audio-Visual Education (ar)	Pearson
227	Problems in Rural Education (ar)	Archer
271	Problems in Curriculum Construction (ar)	Archer, Boeck, Bossing, Chase, Goossen, Curtin, Mullins, Odland, Winter
273	Problems in Reading (ar)	Bond, Balow, Chase, Odland

#### Elementary Education

61	The Teaching of the Social Studies in the Elementary School (3)	Mullins
62	Teaching of Arithmetic in the Elementary Schools (2 sec) (3)	Stochl, Capps
102	Teaching the Social Studies in the Elementary School (3)	Mullins
103	Teaching of Science in the Elementary School (2 sec) (3)	Boeck, Capps
118	Education of Blind Children in the Elementary Grades (3)	Kenmore
119	Elementary School Curriculum (2 sec) (3)	Goossen
121	Selecting Literature for the Elementary School (3)	Odland
143	Teaching and Supervision of Reading in the Elementary School (3)	Bond, ar.
149	Teaching and Supervision of Arithmetic in the Elementary School (3)	Stochl
150	Supervision and Improvement of Instruction (3)	Curtin
153	Supervision and Teaching of English in the Elementary Schools (3)	Chase
162	Laboratory in Nursery School and Kindergarten Instruction Practices (3)	Headley
164	Play Materials, Rhythms and Nature Study for Young Children (3)	Headley
186	Laboratory in Elementary Instructional Practices (2)	Jensen

261	Special Problems in the Improvement of Instruction (ar) .....	Archer, Curtin, Goossen, Mullins
-----	--	-------------------------------------

**Secondary Education**

113	High School Curriculum (3) .....	Bossing
114	Development of the Core Curriculum (3) .....	Bossing
120	Education of Blind Children in the Secondary Schools (3) .....	Kenmore
122	Literature for Adolescents (3) .....	Kegler
125	Occupational Information Laboratory (3) .....	Soldahl
134	Materials and Methods in Consumer Education (3) .....	Price
135	Group Procedures in Guidance (3) .....	Soldahl
137A	Materials and Methods in Co-operative Part-Time Classes (3) .....	Meyer
139	Co-ordination Techniques (3) .....	Meyer
140	Teaching of Speech (3) .....	Smith
144	Teaching of Reading in Secondary Schools (3) .....	Chase
147	Workshop in Teaching Display (3) .....	Ar.
161	Curriculum Construction in Business Education (3) .....	Price
168	Current Developments in the Social Studies (3) .....	Stovall
171	Curriculum Laboratory Practice (0-3) .....	Bossing
192	Advanced Course in the Teaching and Supervision of Secondary Mathematics (3) .....	Jackson
199E	Internship (ar) .....	Fitzgerald
201	Problems in Teaching the Social Studies (ar) .....	McCune
225	Special Problems in Supervision of Instruction in Secondary Schools (ar) .....	Bossing, Keller, Lane
238	Problems in Distributive Education (ar) .....	Meyer
239	Problems in Business Education (ar) .....	Price
266	Supervision of High School Instruction (3) .....	Winter
287	Advanced Course in the Teaching of Science (3) .....	Boeck
294	Advanced Course in Curriculum and Methods in Secondary School English (3) .....	Kegler
296	Special Problems in Teaching English (ar) .....	Kegler

**Higher Education**

228	Workshop: Problems of Higher Education and Teacher Education (June 13-July 9) (6) .....	Kreider, Cooper, McCune, and consultants
250	Higher Education in the United States (3) .....	Eckert
252	Effective College Teaching (3) .....	McCune

**Second Term**

**General Courses**

101	Driver Education (3) .....	Gebhard
105	Audio-Visual Materials in Education (3) .....	Pearson
109	Audio-Visual Materials and Equipment Laboratory (3) .....	Pearson
145	Reading Difficulties (3) .....	Clymer

174-175-176	Clinical Methods and Practice in Speech Pathology (3 each).....Ar.	
205	Problems in Audio-Visual Education (ar) .....	Pearson
271	Problems in Curriculum Construction (3-6) .....	Boeck, Bossing, Winter Clymer,
273	Problems in Reading (ar) .....	Curtin, Goossen, Balow, Mullins, Odland

### Elementary Education

102	Teaching the Social Studies in the Elementary School (3) .....	Mullins
103	Teaching of Science in the Elementary School (3) .....	Goossen
119	Elementary School Curriculum (3) .....	Goossen
121	Selecting Literature for the Elementary School (3) .....	Odland
143	Teaching and Supervision of Reading in the Elementary School (3) .....	Clymer
149	Teaching and Supervision of Arithmetic in the Elementary School (3) .....	Stochl
150	Supervision and Improvement of Instruction (3) .....	Curtin
261	Special Problems in the Improvement of Instruction (ar) .....	Curtin, Goossen, Mullins
263	Research in Arithmetic Instruction (3) .....	Stochl

### Secondary Education

113	High School Curriculum (3) .....	Winter
122	Literature for Adolescents (3) .....	Kegler
125	Occupational Information Laboratory (3) .....	Soldahl
133	Consumer Education in the Schools (3) .....	Price
135	Group Procedures in Guidance (3) .....	Soldahl
136	Organization and Administration of Distributive Education (3) .....	Meyer
141	Co-operative Part-Time Work Experience Programs (3) .....	Meyer
144	Teaching of Reading in Secondary Schools (3) .....	Kegler
155	Materials Laboratory for Social Studies Teachers (3) .....	Gardner
169	Extracurricular Activities (3) .....	Bossing
170B	Curriculum and Course of Study Construction (3) .....	Bossing
171	Curriculum Laboratory Practice (0-3) .....	Bossing
199E	Internship (ar) .....	Fitzgerald
200	Organization and Supervision of Business Education (3) .....	Price
225	Special Problems in Supervision of Instruction in Secondary Schools (ar) .....	Lane
238	Problems in Distributive Education (ar) .....	Meyer
239	Problems in Business Education (ar) .....	Price
266	Supervision of High School Instruction (3) .....	Lane
296	Special Problems in Teaching English (ar) .....	Kegler

### Higher Education

228	Workshop: Problems of Higher Education and Teacher Education (July 25-August 20) (6).....	Davies, Edson, Elkins, Morse, and consultants
-----	---	---

## Educational Administration

### First Term

#### General Courses

101	Public School Administration for Teachers (3)	Popper
201-202	Foundations in Educational Administration (6)	Hooker
210	Financial Aspects of Public School Business Administration (3)	Domian
225	Pupil Personnel Administration (3)	Ar.
226	School Plant Planning and Management (3)	Ar.
227	Teacher and Employee Administration (3)	Lane
228	Special Problems in Educational Administration (1-3)	Domian, Hooker, Keller, Lane, Popper
230	Public Relations for Schools (3)	Popper
234	Problems in State School Administration (4)	Lane, ar.
236	Field Study in Educational Administration (0-10)	Domian, Hooker, Lane, Popper

#### Elementary Education

118	The Community School (3)	Archer
200	Seminar in Elementary School Administration (3)	Archer
215	The Elementary School Principalship (3)	Curtin

#### Secondary Education

167	The Junior High School (3)	Winter
218	Recent Literature in Secondary Education (ar)	Bossing, Keller, Lane
264	Administration of Instructional Activities in the Secondary School (3)	Thompson
265	Administration of Noninstructional Activities in the Secondary School (3)	Thompson
270A	Special Problems in Elementary Education (ar)	Archer, Curtin, Goossen
270B	Special Problems in Secondary Education (ar)	Bossing, Hooker, Keller, Lane, Popper
274	The Junior College (3)	Keller

### Second Term

#### General Courses

201-202	Foundations in Educational Administration (6)	Popper
210	Financial Aspects of Public School Business Administration (3)	Hooker
225	Pupil Personnel Administration (3)	Lane
226	School Plant Planning and Management (3)	Hooker
227	Teacher and Employee Administration (3)	Lane
228	Special Problems in Educational Administration (1-3)	Domian, Hooker, Lane, Popper

- 236 Field Study in Educational Administration (0-10) ..... Domian,  
Hooker, Lane,  
Popper

**Elementary Education**

- 215 The Elementary School Principalship (3) ..... Curtin

**Secondary Education**

- 167 The Junior High School (3) ..... Winter  
264 Administration of Instructional Activities (3) ..... Ar.  
270A Special Problems in Elementary Education (ar) ..... Archer,  
Curtin, Goossen  
270B Special Problems in Secondary Education (ar) ..... Hooker,  
Lane, Popper

**Educational Psychology**

**First Term**

**General Courses**

- 60 Introduction to Measurement and Statistics (3) ..... Schunert  
110 Measurement in the Classroom (3) ..... Schunert  
116 Introduction to Statistical Methods in  
Education (2 sec) (3) ..... Collier, Stecklein  
116A Introduction to Statistical Methods in  
Education—Laboratory (2 sec) (2) ..... D. Meyer  
117 Basic Principles of Measurement (3) ..... Corcoran  
140 Instruments and Techniques of Measurement (3) ..... Glotzbach  
150 Clinical Practice in Remedial Teaching (3) ..... Balow  
151 Clinical Practice in Educational Diagnosis (3) ..... Balow, Hodges  
152 Introduction to School Psychological Services (3) ..... Hodges  
159 Personality Development and Mental Hygiene (3) ..... Torrance  
181 Home and Hospital Instruction for Exceptional  
Children (3) ..... Force  
182 Education of Exceptional Children (3) ..... Force  
183 Education of Gifted Children (3) ..... Reynolds  
184 Education of the Slow Learning Child (3) ..... Capobianco  
191 Education of the Mentally Retarded in the  
Secondary School (3) ..... Capobianco  
193 Psychology of Human Learning (3) ..... Mork, Neale  
216 Statistical Methods in Education (3) ..... Collier  
216A Statistical Methods in Education—Laboratory (2) ..... D. Meyer  
233 Problems in Guidance and Personnel Work (ar) ..... Dugan,  
Tennyson, Wrenn  
243 Problems in Statistics for Students in Education  
and Psychology (3) ..... Collier  
253 Research Problems (ar) ..... Dugan, Mork,  
Reynolds, Wrenn,  
Balow, Capobianco,  
Collier, Force, Hodges,  
Tennyson, Torrance  
293 Psychology of Learning (3) ..... Mork



## Secondary Education

133	Basic Procedures in Student Personnel Work (3)	R. Johnson
134	School Counseling Procedures (3)	Blockler
200	Seminar Institute in Guidance (9) (To be scheduled on the Duluth Campus)	Dugan, Gladstein, and consultant staff
282	Supervised Practicum in Counseling (3)	Tennyson, Winfrey
290	Seminar and Practicum in Counseling (9)	Dugan, Wrenn, Swan, and consultant staff

## Second Term

### General Courses

110	Measurement in the Classroom (2 sec) (3)	Schunert
116	Introduction to Statistical Methods in Education (3)	MacEachern
116A	Introduction to Statistical Methods in Education—Laboratory (2 sec) (2)	D. Meyer
117	Basic Principles of Measurement (3)	Lathrop
143	Advanced Individual Mental Testing (3)	Hodges
148	Clinical Diagnosis of Reading Difficulties (3)	Balow
150	Clinical Practice in Remedial Teaching (3)	Balow
151	Clinical Practice in Educational Diagnosis (3)	Balow, Hodges
159	Personality Development and Mental Hygiene (3)	Gladstein
182	Education of Exceptional Children (3)	Capobianco
184	Education of the Slow Learning Child (3)	Capobianco
185	Education of the Auditorially Handicapped Child (3)	Ar.
193	Psychology of Human Learning (3)	Neale
217	Statistical Methods in Education (3)	MacEachern
217A	Statistical Methods in Education—Laboratory (2)	D. Meyer
225-226	Diagnosis as a Phase of Counseling (6)	Borow
233	Problems in Guidance and Personnel Work (ar)	Borow, Tennyson
253	Research Problems (ar)	Borow, Balow, Capobianco, Hodges, Tennyson

## Secondary Education

133	Basic Procedures in Student Personnel Work (3)	Tennyson
134	School Counseling Procedures (3)	Gladstein

## General Education

### First Term

55A	Introduction to Secondary School Teaching (5)	Neale, Olstad
75A	Introduction to Elementary School Teaching (5)	Balzer, Dykstra
75B	Introduction to Elementary School Teaching (5)	Odland, Balzer, Barrett
81	Introduction to Education for Public Health Nurses (3)	Grout

## Second Term

55B	Introduction to Secondary School Teaching (5).....	Neale, Olstad
75B	Introduction to Elementary School Teaching (5) .....	Odland, Barrett, Dykstra

## History and Philosophy of Education

### First Term

101	Historical Foundations of Modern Education (3) .....	Penner
141	Critical Issues in Contemporary Education (3) .....	Penner
180	The School and Society (2 sec) (3) .....	C. Beck
241	Problems in the History and Philosophy of Education (ar) .....	C. Beck

### Second Term

101	Historical Foundations of Modern Education (3) .....	Penner
141	Critical Issues in Contemporary Education (3) .....	Penner
180	The School and Society (2 sec) (3) .....	C. Beck
241	Problems in the History and Philosophy of Education (ar) .....	C. Beck

## Home Economics Education

### First Term

190	Readings in Home Economics Education: Supervision (3) .....	Holmblade
196	Home Experience and Extended Program (3) .....	Brown
293	Problems in Home Economics Education (1-9) .....	Holmblade
294	Research Methods: Home Economics Education (3) .....	Brown

### Second Term

190	Readings in Home Economics Education (1-3) .....	Brown, Holmblade
191	Advanced Course in Teaching of Home Economics (3) .....	Holmblade
293	Problems in Home Economics Education (1-9) .....	Brown

## Industrial Education

### First Term

106	Sec 1: Industrial Education Workshop—Production and Automation Practices for Industrial Arts Classes (3-6) .....	Kavanaugh
	Sec 2: Industrial Education Workshop—Administration and Supervision of Area Vocational-Technical Programs (July 5-15) (3) .....	Ar.

109	Conference Leading for Industry (3) .....	Widdowson
110	Vocational Guidance (3) .....	Nelson
112	Instructional Materials Laboratory for Non-Majors— General Woodwork (3) .....	Flug
125	Philosophy and Practices of Vocational Education (3) .....	Widdowson
200	Research Problems (3-6-9) .....	Nelson, Kavanaugh
250	Literature (3) .....	Nelson

## Second Term

100	Industrial Instruction (3) .....	Nelson
101	Tests in Industrial Subjects (3) .....	Kavanaugh
103	Instructional Aids (3) .....	Kavanaugh
200	Research Problems (3-6-9) .....	Nelson

## Methods and Student Teaching

### First Term

#### **Nursing Education**

51A	The Teaching of Nursing (2) .....	Dunning, Weise
-----	-----------------------------------	----------------

#### **Elementary Education**

53A*	Teaching Handicapped Children (6) .....	Ar.
77*	Student Teaching in the Nursery School (3) .....	Moore
78*	Student Teaching in the Kindergarten (3) .....	Headley

#### **Secondary Education**

52*	Student Teaching (ar) .....	Davies
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

#### **Nursing Education**

51A	The Teaching of Nursing (2) .....	Dunning, Weise
-----	-----------------------------------	----------------

\* Student teaching open only to students in our regular degree programs. Application must be made prior to June 1. Forms and instructions are available in the Student Teaching office, 227 Burton Hall.

### Secondary Education

84A-B-C	Practice and Field Work in Recreation	
	Leadership (2)	Fitzgerald
85A-B-C	Practice and Field Work in Recreation (2)	Fitzgerald

### Music Education \*

#### First Term

51	Teaching Music (Kindergarten-Primary grades) (2)	Abelson
52	Teaching Music (Intermediate grades) (2)	Abelson
60-61-62	Supervision and Teaching of Music (3)	Ivory
104	Advanced Topics: Vocal Music (3)	Caswell
105	Advanced Topics: Instrumental Music (3)	Ivory
160	Organization, Supervision of Vocal-Instrumental Music in Secondary Schools (3)	Caswell, Ivory
224	Research Problems (3-9)	Caswell, Ivory

#### Second Term

51	Teaching Music (Kindergarten-Primary grades) (2)	Caswell
52	Teaching Music (Intermediate grades) (2)	Ivory
100	Principles (3)	Caswell
170	Recent Research and Literature (3)	Ivory
224	Research Problems (3-9)	Caswell, Ivory

### Physical Education for Men

#### First Term

1A	Beginning and Intermediate Swimming (1)	Piper
1B	Intermediate Swimming (1)	Novak
2A	Beginning Golf (1)	Bolstad
5C	Stunts, Contests, Softball (1)	Novak
6A	Soccer, Speedball, Volleyball (1)	Lewis
7C	Recreational Games (1)	Lewis
8	Tennis and Golf (1)	Bolstad, Lewis
9A	Fundamental Rhythms (1)	Lampe
9B	Square, Ballroom Dancing (1)	Piper
50	Anatomy (3)	Osell
66	Officiating Football and Basketball (3)	Mueller
68	Basketball Coaching (2)	Kundla
73-74-75†	Directed Teaching (2)	Piper
101	Principles of Physical Education (3)	Heusner
135	Tests and Measurements in Physical Education (3)	Heusner

\* See also Department of Music, College of Science, Literature, and the Arts.

† Student teaching open only to students in our regular degree programs. Application must be made prior to June 1. Forms and instructions are available in the Student Teaching office, 227 Burton Hall.

224	Research Problems in School Health Education, Physical Education, and Recreation (ar).....	Fitzgerald, Heusner, Piper, Stish
233	The Administration of Physical Education in Schools (3).....	Stish
236	Introduction to Research Methods in Physical Education and Recreation (3) .....	Stish
241	The Administration and Supervision of Public Recreation (3) .....	Fitzgerald

## Second Term

1A	Tennis (1) .....	Novak
1B	Intermediate Swimming (1) .....	Novak
1C	Beginning Golf (1) .....	Bolstad
2C	Intermediate Golf (1) .....	Bolstad
51	Mechanics of Movement (3) .....	Osell
67	Football Coaching (2) .....	Warnath and staff
69	Track Coaching (2) .....	Kelly
73-74-75*	Directed Teaching (2) .....	Piper
110	Recreation Surveys (3) .....	Fitzgerald
155	Instructional Aids in Health, Physical Education, and Recreation (3) .....	Piper
224	Research Problems in School Health Education, Physical Education, and Recreation (ar) .....	Donnelly, Fitzgerald, Piper
234	The Curriculum in Physical Education (3) .....	Donnelly
238	The Administration of Physical Education in Colleges and Universities (3) .....	Donnelly

## Physical Education for Women

### First Term

5	Methods of Conducting Organized Games for Junior and Senior High School (2) .....	Hauptfuehrer
7	Tennis for Beginners (3 sec) (1) .....	Eibner, Reiter
8	Golf for Beginners (4 sec) (1) .....	Reiter
12	Social Recreation (1) .....	Ar.
13	Tumbling, Stunts, and Methods (2) .....	Hauptfuehrer
18	Elementary Folk Dancing, Games, and Methods (2) .....	Lampe
25	American Red Cross First Aid Standard (2) .....	Wells
32	Swimming (Sec 1, Elem.; sec 2, Adv.Beg.) (1) .....	Eibner
45	Introduction to the Elementary Physical Education Program (2) .....	Jaeger
62	The Teaching of Physical Education Activities (3) .....	Hauptfuehrer
102	The Physical Education Program for the Elementary and Secondary School (3) .....	Jaeger
115	Advanced Kinesiology (3) .....	Wells
118E	Problems in Teacher Education in Health, Physical Education, and Recreation (3) .....	Staff

\* Student teaching open only to students in our regular degree programs. Application must be made prior to June 1. Forms and instructions are available in the Student Teaching office, 227 Burton Hall.

124	Supervision of Physical Education (3)	Baker
224	Research Problems in School Health, Physical Education, and Recreation (ar)	Staff

### Second Term

7	Tennis for Beginners (2 sec) (1)	Hauptfuehrer
114	Administration of the School Health Program (3)	Slocum
118E	Problems in Teacher Education in Health, Physical Education, and Recreation (3)	Staff
224	Research Problems in School Health, Physical Education, and Recreation (ar)	Staff

## General College

The General College two-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: Elements of Geology (3)	M. Harris
8A	Applied Mathematics (3)	Rassweiler
10A	Human Biology: Fundamental Similarities in Living World (3)	Dearden
23A	Art Laboratory (3)	Safer



29A	World Literature I (3)	Sheldon
31A	Writing Laboratory: Personal Writing (3)	Rathburn
37	Social Trends and Problems (3)	F. Harris
46D	Problems of International Relations (3)	Jones

**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)	Stockdale
31D	Writing Laboratory: Business Writing (3)	Kurak
43C	The Far East (3)	Matsumoto
44B	Current History (3)	F. Harris

---

**Law School**

Courses in the Law School Summer Session are open only to students who have completed at least one 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.

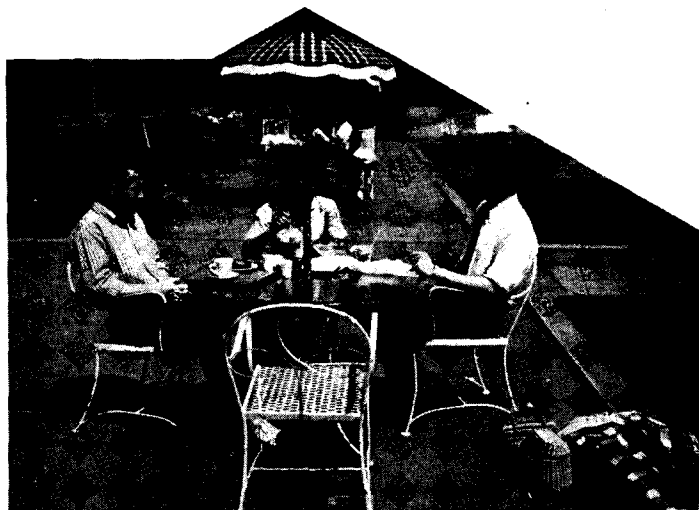
**First and Second Terms (Combined)**

123	Corporations (6)	Gradwohl
128	Taxation I (6)	Waterbury
180	Federal Jurisdiction (3)	Levy
184	Unfair Competition (3)	McCoid
186	Family Law (3)	Levy
187	Legal Medicine (3)	McCoid

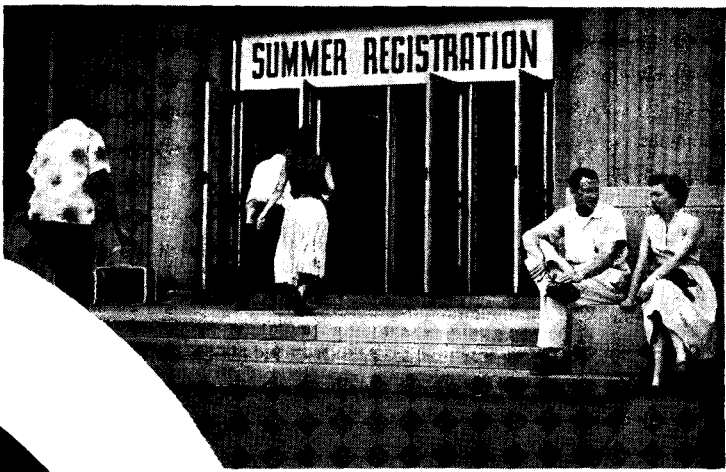
---

**Medical School**

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.

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, University of Minnesota Medical School, 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 and Second Term**

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

## **Anesthesiology**

### **First and Second Terms (Combined)**

99	Fundamentals of Postanesthetic Care (4).....	VanBergen and staff
101*	Principles of Anesthesia (1) .....	VanBergen and staff
169	Research in Anesthesia (ar) .....	VanBergen and staff
265	General Anesthesia (12) .....	VanBergen and staff
266	Regional Anesthesia (4) .....	VanBergen and staff
267	Pre- and Postanesthetic Evaluation (2) .....	VanBergen and staff
268	Seminar in Anesthesia (2) .....	VanBergen and staff
269	Research in Anesthesia (ar) .....	VanBergen and staff

## **Bacteriology**

### **First Term**

53	General Bacteriology (5) .....	Deal
201	Research (ar) .....	Syverson

### **Second Term**

116	Immunology (4) .....	Watson
201	Research (ar) .....	Watson

## **Laboratory Medicine**

### **First Term and Second Term**

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

\* This course given first term only.

## Medicine

### First Term

104	Introduction to Internal Medicine (6)	Watson and staff
111	Junior Medicine Clerkship (6)	Watson, Hoffbauer, and staff
112	Senior Medical Clerkship	Murray and staff
123	Dermatology (3)	Lynch
157	Clinics in Dermatology (ar)	Lynch
165	Seminar in Dermatology (ar)	Lynch
201	Clinical Medicine (ar)	Watson, Hoffbauer, Kennedy
203	Research in Medicine (ar)	Watson, Hoffbauer, Kennedy
206	Clinical Conference (1)	Watson, Hoffbauer
207	Clinical Pathological Conference (1)	Dawson
226	Clinical Dermatology (ar)	Lynch

### Second Term

111	Junior Medicine Clerkship (6)	Spink and staff
112	Senior Medical Clerkship	Murray and staff
157	Clinics in Dermatology (ar)	Fisher, Rukavina
165	Seminar in Dermatology (ar)	Fisher, Rukavina
201	Clinical Medicine (ar)	Hoffbauer, Tobian, Spink
202	Diseases of the Cardiovascular Apparatus (ar)	Tobian
203	Research in Medicine (ar)	Hoffbauer, Tobian, Spink
206	Clinical Conference (1)	Spink and staff

## Obstetrics and Gynecology

### First Term

201	Advanced Obstetrics and Gynecology, Part I (ar)	McKelvey, Prem, Goodlin, Makowski, and staff
205	Advanced Obstetrics and Gynecology, Part II (ar)	McKelvey, Prem, Goodlin, Makowski, and staff
209	Advanced Obstetrics and Gynecology, Part III (ar)	McKelvey, Prem, Goodlin, Makowski, and staff
216	Research (ar)	McKelvey, Prem, Goodlin, Makowski, and staff
301	Externship (6)	McKelvey, Prem, Goodlin, Makowski, and staff

### Second Term

204	Advanced Obstetrics and Gynecology, Part I (ar)	McKelvey, Prem, Goodlin, Makowski, and staff
208	Advanced Obstetrics and Gynecology, Part II (ar)	McKelvey, Prem, Goodlin, Makowski, and staff

212	Advanced Obstetrics and Gynecology, Part III (ar) .....	McKelvey, Prem, Goodlin, Makowski, and staff
219	Research (ar) .....	McKelvey, Prem, Goodlin, Makowski, and staff
302	Externship (6) .....	McKelvey, Prem, Goodlin, Makowski, and staff

## Ophthalmology

### First and Second Terms

201	Clinical Ophthalmology (6) .....	Harris and staff
204	Surgery of the Eye (3) .....	Harris and staff
220	Basic and Applied Ophthalmology (2) .....	Harris

## Otolaryngology

### First and Second Terms

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
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
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 Term**

169	Special Interests in Pediatrics (ar).....	J. A. Anderson and staff
174A	Dispensary Externship in Pediatrics (4).....	J. A. Anderson, Good, Stoesser, Raile, and senior staff
174B	In-Patient Externship in Pediatrics (4½).....	J. A. Anderson, Good, Raile, and junior staff
200	Graduate Seminar in Pediatrics (1½) .....	J. A. Anderson and junior staff
202	Pediatric Clinic (5) .....	J. A. Anderson and junior staff
204	Three-Month Residence in Pediatrics (7) .....	J. A. Anderson and staff
206	Pediatric Special Interest (ar) .....	J. A. Anderson and staff
208	Pediatric Research (ar) .....	J. A. Anderson, Good, Raile

### **Second Term**

120	The Normal Child (1) .....	J. A. Anderson and staff
124	Junior Clinical Clerkship (8) .....	J. A. Anderson and staff
169	Special Interests in Pediatrics (ar).....	J. A. Anderson and staff
174A	Dispensary Externship in Pediatrics (4).....	J. A. Anderson, Good, Stoesser, Raile, and senior staff
174B	In-Patient Externship in Pediatrics (4½).....	J. A. Anderson, Good, Raile, and junior staff
200	Graduate Seminar in Pediatrics (1½) .....	J. A. Anderson and junior staff
202	Pediatric Clinic (5) .....	J. A. Anderson and junior staff
204	Three-Month Residence in Pediatrics (7) .....	J. A. Anderson and staff
206	Pediatric Special Interest (ar) .....	J. A. Anderson and staff
208	Pediatric Research (ar) .....	J. A. Anderson, Good, and Raile

## **Pharmacology**

### **First Term and Second Term**

9	Pharmacology for Nurses (1) .....	Vick
109	Pharmacological Problems (ar) .....	Bieter
203	Research in Pharmacology (ar) .....	Bieter

## **Physical Medicine and Rehabilitation**

### **First and Second Terms**

103	Physical Therapy Clinic (ar) .....	Gullickson
122	Physical Medicine and Rehabilitation Lectures: Junior and Senior Medical Students (1) .....	Staff
200	Physical Medicine Service (ar) .....	Staff
205	Readings (1) .....	Kottke
210	Research in Physical Medicine (ar) .....	Kottke, Kubick

## Physiological Chemistry

### First Term

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

### Second Term

101	Physiological Chemistry (7)	Barnum, Carr, Ungar
153	Problems in Physiological Chemistry (ar)	Barnum, Carr, Ungar
205	Research in Physiological Chemistry (ar)	Barnum, Carr, Ungar

## Physiology

### First Term

4	Human Physiology (4)	Brown, Lifson
203	Research in Physiology (ar)	Visscher and staff
223	Physiology of the Kidney and Water and Electrolyte Balance (2)	Brown, Lifson

### Second Term

51	Human Physiology for Nursing, Physical Therapy Students (6)	King, Trank
203	Research in Physiology (ar)	Visscher and staff
211	Topics: Heart and Circulation (2)	Visscher, Cavert

## Psychiatry and Neurology

### First Term and Second Term

103	Junior Clinical Clerkship (8)	Staff
145	Readings in Psychiatry (ar)	Staff
145X	Readings in Neurology (ar)	Staff
155	Therapeutics in Neurology (2)	Staff
202	Case Conference for Psychologists (ar)	Staff
203	Psychometric Clerkship (ar)	Staff
208	Clinical Neurology (ar)	Staff
209	Research in Neurology (ar)	Staff
212	Survey of Neuropathology (1)	Staff
226	X-Ray Conference (1)	Staff
228	Research in Neuropathology (ar)	Staff
231	Applied Electroencephalography (1)	Staff
233	Applied Neuropathology (1)	Staff
251	Clinical In-Patient Psychiatry (ar)	Staff
252	Clinical Out-Patient Psychiatry (ar)	Staff
253	Clinical Child Psychiatry (ar)	Staff
254	Advanced Clinical In-Patient Psychiatry (ar)	Staff
255	Advanced Clinical Out-Patient Psychiatry (ar)	Staff
256	Advanced Clinical Child Psychiatry (ar)	Staff

257	Special Assignments in Psychiatry (1)	Staff
258	Research in Psychiatry (ar)	Staff
260	Orientation to Clinical Psychiatry (1)	Staff
291	Seminar in Current Literature (1)	Staff
292	Specialized Supervised Psychotherapy (1)	Staff
293	Problems in Teaching Psychiatry (ar)	Staff

## Radiology

### First Term

111	Medical Roentgenologic Conference (1)	Peterson and staff
121	Roentgen Diagnosis, Radium Therapy, for Junior Medical Students (cont.)	Peterson and staff
124	Pediatric Roentgenologic Conference (1)	Lester and staff
135C	Surgery Roentgenologic Conference (1)	Carey and staff
163A	Neurosurgery Roentgenologic Conference (1)	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

### Second Term

109	Externship in Roentgen Diagnosis and Radiation Therapy (4)	Staff
111	Medical Roentgenologic Conference (1)	Peterson and staff
124	Pediatric Roentgenologic Conference (1)	Lester and staff
135C	Surgery Roentgenologic Conference (1)	Carey and staff
163A	Neurosurgery Roentgenologic Conference (1)	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

### First Term

121	Principles of Surgery (3)	Wangensteen and staff
123	Cardiovascular Surgery (ar)	C. W. Lillehei
129	Surgical Clinics for Juniors (3)	Wangensteen and staff
135	Junior Clinical Clerkship (8)	Wangensteen and staff



152	Problems in Clinical Investigation (ar).....	Wangensteen and staff
167	Problems in Experimental Surgery (ar).....	Wangensteen and staff
200	Out-Patient 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

## Second Term

152	Problems in Clinical Investigation (ar).....	Wangensteen and staff
167	Problems in Experimental Surgery (ar).....	Wangensteen and staff
200	Out-Patient Clinic in Surgery (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
215	Roentgenological-Surgery Conference (1) .....	Wangensteen and staff
216	Surgical Research (1) .....	Wangensteen and staff
218	Medical and Surgical Pathology Conference (1) .....	Wangensteen and staff

## Neurosurgery

### First Term

127	Surgical Diseases of the Nervous System (1).....	Peyton, French
-----	--	----------------

### First and Second Terms

308	Neurosurgical Service (4) .....	Peyton, French
316	Neurosurgical Research (3) .....	Peyton, French
318	Neurosurgical Conference (1) .....	Peyton

## Orthopedic Surgery

### First and Second Terms

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**

250	Urological Surgery (4) .....	Creevy and staff
252	Urological Conference (4) .....	Creevy and staff
253	Urological Research (4) .....	Creevy 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 twelve-month certificate course for medical laboratory assistants begins in July or in September.

### **First Term**

110	Advanced Clinical Laboratory Techniques (5).....	Hovde and staff
-----	--	-----------------

### **Second Term**

111	Advanced Clinical Laboratory Techniques (5).....	Hovde and staff
-----	--	-----------------

## **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

\* See also Methods and Student Teaching 51A, The Teaching of Nursing, College of Education.

programs leading to the bachelor of science degree in nursing education and in nursing administration. A four-quarter certificate program in practical nursing begins in the fall quarter. Programs leading to the degree of master of education in nursing education and master of nursing administration in nursing service administration are available for qualified professional nurses.

For graduate nurses there are courses in ward administration, methods of teaching, personnel work, the survey in nursing education, and nursing service administration.

### **Nursing School Fees**

Students in the School of Nursing working toward the bachelor of science degree in professional nursing and students registered in the practical nursing curriculum will pay the same fees as charged during the academic year; graduate nurses will register in the College of Education or the School of Nursing and pay Summer Session fees.

#### **First Term**

##### **Nursing Administration**

160	Ward Administration (3) .....	Grainger
167A	Studies and Experience in Ward Administration (1½).....	Grainger
170	Foundations of Nursing Service Administration (3) .....	Harris, Walseth
173	Fundamentals of Education in Nursing (3) .....	Dunning
175	Elements of Administration in Nursing (5) .....	Harris, Walseth
176	Elements of Administration in Nursing (5) .....	Harris, Walseth

##### **Nursing Education**

162	Personnel Work in Nursing (3) .....	Holm
190	The Survey in Nursing Education (3) .....	Harrington

#### **Second Term**

##### **Nursing Administration**

167A	Studies and Experience in Ward Administration (1½).....	Grainger
193	Principles of Administration Applied to Nursing Service Administration (6) .....	Harris

During the Summer Session the School of Public Health makes available a group of public health nursing and related courses which will enable nurses already employed in public health to meet present certification or merit system requirements in various states. These courses are arranged in sequence over a period of two or three summers and include full- or part-time field practice.

Unless a nurse who wishes to enroll in these courses has completed approximately a year and a half of acceptable general academic credits, she is admitted to the Summer Session as a special student, and is not a candidate for a degree. See *Special Students*, under Admission and Registration section. Transfer from special to degree status is possible only under very unusual conditions and may involve considerable repetition of courses. If a nurse has a degree program as her goal, she should not enroll in the above sequence as a special student.

It is possible, however, to begin a program of study leading to a bachelor of science degree in the Summer Session. Such students should submit applications and transcripts at least two months in advance of the opening of the first term. When admitted as a degree candidate, the student is expected to follow a planned sequence of courses, completing lower division general academic requirements in advance of professional course work.

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

The special summer program in Statistics in the Health Sciences will be offered June 16 to July 30. The program on Ground Water Development, conducted in the summer of 1959 at the request of the International Cooperation Administration and the World Health Organization, will be repeated during the 1960 sessions. (See Special Programs section)

## First Term

50	Personal and Community Health (3)	Thomson
58	Maternal and Child Health (2)	Stocking
62B	Public Health Nursing I (2)	Cline
63A	Public Health Nursing II (3)	Murphy, E. Anderson
65	Field Practice in Public Health Nursing (ar)	E. Anderson, Blanchard, Cline, Fredlund
69	The Nurse in the School (2)	Stocking
95	Human Nutrition (3)	Stief
133	Mental Health (3)	Cline
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 and staff
231*	Ground Water Supplies (ar)	Bosch, staff, and visiting lecturers

## Biostatistics

110	Biometric Principles (3)	Brown
111	Biostatistics Laboratory (2)	Iversen
270**	Statistical Methods in Public Health (5)	Ar.
271**	Management of Health Agency Records (5)	Hemphill
272**	Biostatistics in the Health Sciences (5)	Harshbarger
273**	Demographic Methods in Public Health (5)	Reed
274**	Registration and Vital Records (5)	Bailey, Erhardt
275**	Advanced Biostatistics in the Health Sciences (5)	Chiang
276**	Statistical Methods in Epidemiology (5)	Greenberg
277**	Sampling Techniques in the Health Sciences (5)	Thompson
278**	Statistical Methods in Biological Assay (5)	Johnson
279**	Lecture Series (1)	Ar.

## Second Term

53	Introduction to Public Health (5)	G. Anderson
63B	Public Health Nursing II (4)	Murphy, E. Anderson
65	Field Practice in Public Health Nursing (ar)	E. Anderson, Blanchard, Cline, Fredlund
75	Introduction to Environmental Sanitation (3)	Bosch
100A	Elements of Public Health I (3)	G. Anderson
133	Mental Health (3)	Cline
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
230*	Field Practice in Environmental Sanitation (ar)	Bosch
232*	Field Work in Ground Water Development (ar)	Bosch, Staff, and visiting lecturers

\* Special fee, consult department.

\*\* Special Program in Statistics in the Health Sciences, June 16-July 30, 1960,  
consult department.

### **Biostatistics**

120	Biostatistics II (3)	Brown
121	Biostatistics Laboratory II (2)	Iversen
180	Introduction to Biostatistics (5)	Bearman

## **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 1960 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**

11	Introduction to Mortuary Management (2)	Thorsell
12	Introduction to Embalming (3)	Slater
13	Mortuary Law (3)	Grayson

## **College of Science, Literature, and the Arts**

---

The College of Science, Literature, and the Arts, the largest undergraduate college of the University, offers instruction leading to the Bachelor's degree in the liberal arts and science subjects. A broad and varied program of general education offered in the first two years prepares students for further liberal education, for professional or vocational curriculums, or for taking their place



in society without further formal education. In addition to programs for a major in most of the subjects of a liberal arts college, students may elect in the college preprofessional curriculums, or professional curriculums in journalism, librarianship, or social work.

Summer courses offered by the College are chosen from the College's regular curriculums to provide students a wide variety of programs in general education, liberal arts and sciences, and vocational or professional studies. This selection of courses, made from the offerings of twenty-seven departments, includes many courses suitable for interdepartmental majors.

The list of courses in departments of the College includes introductory, intermediate, and advanced work. A few of the programs of the College are discussed in the following paragraphs.

### **Art**

Professional training in the Department of Art includes professional studio work and industrial art as well as graduate work. The departmental library and galleries will be open for historical and creative research.

### **English**

A variety of courses useful either for the student interested in literature and literary history and criticism or for the student seeking special competence for graduate, professional work, or teaching is provided by the Department of English.

### **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, and medieval history.

## **Interdepartmental Courses**

These courses cut across departmental lines and are designed particularly for the student specializing in other subjects who wants 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 five years of study beyond secondary school, including one year of professional content. The Master's degree program in the Library School meets this requirement. Inquiries concerning admission to this program should be addressed to Dean of Summer Session, 650 Johnston Hall, University of Minnesota, Minneapolis 14.

## **Music**

Courses of interest to the non-music major on the undergraduate as well as graduate level will be offered both terms. These include: Introduction to Music, American Music, History of Church Music, Chorus, Theory, and the various phases of applied music. Liberal Arts credit is given for instrumental or vocal instruction.

Graduate courses as well as undergraduate courses of interest to music majors will be given both terms, including: Applied Music, Theory, History and Literature of Music, Composition.





Of special interest to choral musicians will be courses in: History of Vocal Art, History of Church Music, Realization and Interpretation of Choral Masterpieces, and a special course dealing with the music of Heinrich Schütz. There will be a Summer Session chorus, also.

Courses in applied music will be 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.

Artist-performer teachers will be available for graduate as well as undergraduate instruction in all phases of applied music: piano, voice, organ, violin, and all instruments of the orchestra and band. First-chair men of the Minneapolis Symphony Orchestra are members of the regular staff.

Organists will be interested in the Organ Workshop, dealing primarily with the works of Johann Sebastian Bach.

## **Philosophy**

Courses in the Philosophy Department 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 courses designed for nonspecialists, there are more advanced courses in the history of western philosophy and such special subjects as contemporary philosophy, theory of knowledge, and philosophy of religion.

## **Psychology**

Specialized courses in the fields of experimental psychology, human and animal behavior, differential psychology, and social and political psychology are available in the Psychology Department. Included are courses for the nonpsychology major as well as professional courses for those for whom psychology will be essentially a "tool subject," such as the psychology of individual differences, clinical psychology, abnormal psychology, psychology of advertising, and psychology in personnel work.

## Sociology

Sequences in general sociology, social problems and social policy, and social research are among the offerings in the Sociology Department. 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 21	American Life I (3)	Hiner
251	Readings in American Civilization (ar)	Ar.

### Second Term

Hum 22	American Life II (3)	Albrecht
202	Introduction to American Studies (3)	Ward
252	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)	Gibbs
165	Personality and Culture (3)	Gibbs
190	Directed Research (ar)	Gibbs

### Second Term

2A	Introduction to Anthropology: Cultural Anthropology (3)	Gibbs
120	Peoples and Cultures of Africa (3)	Gibbs
140	Field Research in Archaeology (6)	Johnson
191	Directed Research (ar)	Gibbs

## Art

### First Term

#### *Introductory and General*

1	Principles of Art (3)	Waldfoegel
---	-----------------------	------------

**History and Criticism**

59	Traveling Summer Course in European Art (5)	Eitner
68	Modern Art: Contemporary Art in Europe and America (3)	Waldfogel
111	Art of China (3)	Mather
158	European and American Painting: 1900 to present (3)	Waldfogel
196-197-198	Readings in Chinese Art (3)	Mather
236-237-238	Seminar: Problems in Art History and Criticism (ar)	Staff

**Design**

23-24-25	Drawing and Design (3)	Myers, Quirt
63	Drawing, Painting, and Design (3)	Downs

**Painting**

70-71-72	Oil Painting (3)	Quirt
70B-71B-72B	Oil Painting (for general students) (3)	Quirt
150-151-152	Problems in Painting (ar)	Quirt
150B-151B- 152B	Problems in Painting (for general students) (ar)	Quirt
200-201-202	Advanced Problems in Studio Work (ar)	Quirt

**Photography**

10	Photography (3)	Downs
----	-----------------	-------

**Printmaking**

32	Elements of Printmaking (3)	Myers
90-91-92	Printmaking (3)	Myers
190-191-192	Problems in Printmaking (3)	Myers
200-201-202	Advanced Problems in Studio Work (ar)	Myers

**Sculpture and Jewelry**

40-41-42	Sculpture I (3)	Morton
113-114-115	Design in Jewelry (3)	Morton
200-201-202	Advanced Problems in Studio Work: Sculpture (ar)	Morton

**Second Term**

**Introductory and General**

1	Principles of Art (3)	Torbert
2	Principles of Ancient and Medieval Art (3)	Eitner

### **History and Criticism**

100	Art in Ancient Egypt, Mesopotamia and Greece (3)	Eitner
112	Art of Japan (3)	Copeland
136	Art in the United States (3)	Torbert
236	Seminar: Problems in Art History and Criticism (ar)	Staff

### **Design**

23-24-25	Drawing and Design (3)	Liebling
----------	------------------------	----------

### **Drawing and Painting**

52-53	Drawing II (3)	Rollins
54-55	Life Drawing (3)	Rollins
70-71-72	Oil Painting (3)	Rollins
150-151-152	Problems in Painting (3)	Rollins

### **Photography**

10	Photography (3)	Liebling
----	-----------------	----------

### **Astronomy**

#### **First Term**

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

### **Botany**

#### **First Term\***

1-2(Part I)	General Biology (5)	Olson
-------------	---------------------	-------

#### **Second Term**

2(Part II)-3	General Biology (5)	Roshal
195	Problems (1-5)	Staff

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

## Classics

### First Term

24	Technical Terms of Science, Medicine, and the Humanities (3) .....	D. C. Swanson
45	Greek and Roman Mythology (3) .....	R. A. Swanson
124	Technical Terminology (3) .....	D. C. Swanson
145	Greek and Roman Mythology (3) .....	R. A. Swanson

### Second Term

#### Latin\*

171	Advanced Reading (3) .....	Forbes
-----	----------------------------	--------

## Communication

See Interdepartmental Courses.

## Economics

See index.

## English

### First Term

#### Freshman English

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

#### Literature

21	Introduction to Literature (6) .....	Buckley
54	English Novel (3) .....	Wright
55	Shakespeare (3) .....	Wright
56	Shakespeare (3) .....	Hurrell
74	American Literature (3) .....	Sutton
75	Chaucer (3) .....	Clark
121	Interpretation of Poetry (3) .....	Blum
154	American Novel (3) .....	Sutton
158	American Poetry (3) .....	Levenson
162	Milton (3) .....	Unger
165	Introduction to Modern English (3) .....	Weber
184	Form and Idea in Dramatic Literature (3) .....	Hurrell
198	Seventeenth-Century Literature (3) .....	Unger

\* For high school teachers of Latin. (See Latin, under Special Programs)

## Second Term

### Freshman English

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

### Literature

23	Introduction to Literature (6)	R. Foster
55	Shakespeare (3)	Youngblood
56	Shakespeare (3)	Montgomery
72	American Literature (3)	Turpie
100	Old English (6)	Allen
109	Romantic Poets of the Early Nineteenth Century: Wordsworth, Coleridge, Scott, etc.	Ehrenpreis
112A	Henry James and Stephen Crane (3)	Berryman
113	American Short Story (3)	Turpie
137	Nineteenth-Century Literature (3)	Stange
143	Twentieth-Century Literature, Emphasis on American Authors	Ward
189	Eighteenth-Century Literature (3)	Ehrenpreis
213	Bibliography (3)	Stange

### Family Life

See Interdepartmental Courses.

### Foreign Study Seminar

See Interdepartmental Courses.

### Geography

#### First Term

4	Human Geography (5)	Webb
114	Historical Geography of North America (3)	Lukermann
117	The Middle East (3)	Lukermann
120	South Asia (3)	Broek
143	Political Geography (3)	Broek
301	Research Problems (ar)	Webb

#### Second Term

1	Geography of Natural Resources (5)	Barrett
67	Geography of Minnesota (3)	Borchert
301	Research Problems (ar)	Barrett

## Geology and Mineralogy

### First Term

1	General Geology (5)	Thiel
100	Field Work in Northern Minnesota (3)	Zoltai
115	Field Work in Southeastern Minnesota (3)	Sloan
150	Black Hills Field Course (6)	Craddock, Phinney
170	Geologic Problems (3)	Thiel

### Second Term

2	Historical Geology (5)	Swain
170	Geologic Problems (3)	Swain

## German

### First Term

1	Beginning German (5)	Menze
3	Beginning German (5)	Weiss
4	Intermediate German (5)	Weiss
142	Drama in Translation (3)	Menze
159	Directed Readings (3)	Ramras
185	Expressionism (3)	Wood

A Deutsches Haus is being planned. (See index)

### Second Term

2	Beginning German (5)	Menze
159	Directed Readings (3)	Menze
181	Thomas Mann (3)	Ramras

## History

### First Term

1	Civilization of the Modern World, Part 1 (3)	Wright
2	Civilization of the Modern World, Part 2 (3)	Wright
16	Ancient Civilization, Part 3 (3)	Jones
20	American History, Part 1 (3)	Noble
21	American History, Part 2 (3)	Loehr
52	Ancient Civilization, Part 3 (3)	Jones
99	Minnesota and the Northwest, Part 3 (3)	Jordan
102A	History of Greece, Part 3 (3)	Jones
103	Europe in the Middle Ages, Part 1 (3)	Hoyt
111	Europe in the Twentieth Century, Part 3 (3)	Deutsch
134	World War II, Part 1 (3)	Deutsch
139A	American History, 1880-1900, Part 3 (3)	Loehr
148A	History of the South, Part 3 (3)	Noble
162	Cultural History of China, Part 1 (3)	Mather

173	Readings in Medieval and Renaissance History, Part 1 (3) .....	Hoyt
187D	Readings in Nineteenth-Century American History, Part 3 (3) .....	Jordan

### Second Term

2	Civilization of the Modern World, Part 2 (3) .....	Ar.
3	Civilization of the Modern World, Part 3 (3) .....	McNeal
17	History of Asia, Part 1 (3) .....	Ar.
21	American History, Part 2 (3) .....	Beatty
22	American History, Part 3 (3) .....	Rutman
59	History of Asia, Part 1 (3) .....	Ar.
81	United States in the Twentieth Century, Part 3 (3).....	Chambers
86	American Colonies, Part 1 (3) .....	Rutman
91	The American West, Part 2 (3) .....	Murphy
94	American Diplomatic History, Part 2 (3) .....	Beatty
127	Russia, Part 3 (3) .....	McNeal
142	History of Germany, Part 3 (3) .....	Ar.
151A	American Constitutional History, Part 3 (3) .....	Murphy
155B	History of South Asia, Especially India, Part 2 (3) .....	Ar.
186C	Readings in Twentieth-Century American History, Part 2 (3) .....	Chambers

### How to Study

See Interdepartmental Courses.

### Humanities

See Interdepartmental Courses.

### Interdepartmental Courses

#### First Term

##### Communication

3	Communication (3) .....	Bryan
---	-------------------------	-------

##### Family Life

1	Preparation for Marriage (3) .....	Torbett
1A	Preparation for Marriage (3) .....	Torbett
15	The Home and Its Furnishing (3) .....	Ludwig

##### Foreign Study

161	Seminar for Foreign Study I (6).....	Amram, Armajani, Landa, Vane
-----	--------------------------------------	---------------------------------



**Humanities**

1	Humanities in the Modern World I (3)	Bryan
1A	Age of the Enlightenment (3)	Carr
2	Humanities in the Modern World II (3)	Blum
3	Humanities in the Modern World III (3)	Ludwig
24	American Humanities (3)	Carr
51	Humanities in the Modern World (3)	Ludwig
54	Humanities in the Modern World (3)	Vogelbaum
61	The Greek Heritage (3)	Ross
63	The Renaissance and Reformation (3)	Vogelbaum
133	Humanities Proseminar (3)	Ross

**Natural Science**

165	Science in World Affairs (3)	Craubard
175	Survey of Science History (3)	Craubard

**Personal Orientation**

1	How to Study (2)	Carlson
---	------------------	---------

**Social Science**

1	Introduction to Social Science (3)	Engelbourg
3	Introduction to Social Science (3)	Cooperman

**Second Term****Family Life**

1	Preparation for Marriage (3)	Hill
---	------------------------------	------

**Foreign Study**

162	Seminar in Foreign Study II (6)	Amram, Armajani, Landa, Vane
-----	---------------------------------	---------------------------------

**Humanities**

1	Humanities in the Modern World I (3)	Siegelman
4	Humanities in the Modern World IV (3)	Siegelman
52	Humanities in the Modern World (3)	Amberg
62	Roman and Medieval Heritage (3)	Ames

**Personal Orientation**

1	How to Study (2)	Carlson
---	------------------	---------

### **Social Science**

2	Introduction to Social Science (3)	Kanun
---	------------------------------------	-------

### **School of Journalism**

#### **First Term**

65	Graphic Arts (3)	Wilson
73	Magazine Writing (3)	Charnley
103	Literary Aspects of Journalism (3)	Hage
109	History of Journalism (3)	Hage
121	The Press in a Dynamic Society (3)	Gerald
140	Interpretation of Contemporary Affairs (3)	Gerald
182	Supervision of School Publications: Workshop for Journalism Teachers and Advisers (3)	Wilson and others
290	Special Problems in Mass Communications (3)	Staff

#### **Second Term**

11	Reporting for Nonmajors (3)	Sim
51	News Editing (3)	Sim
78	Public Relations Methods (3)	Bowe
90	Mass Communications and the News (3)	Nixon
120	Development of Radio and Television Communications (3)	Charnley
124	International Communications and Foreign Affairs (3)	Nixon
130	Propaganda and Public Opinion (3)	Carter
290	Special Problems in Mass Communications (3)	Staff

### **Library School**

#### **First Term**

55	Library Administration (3)	Rohlf
70	Selection of Library Materials (3)	Rohlf
74	Library Materials in the Classroom (3)	Zimmerman
83	Cataloging and Classification (3)	Lee
153	History of Books and Printing (3)	Lee
161	Literature of the Humanities (3)	Shove
165	Advanced Bibliography (3)	Shove
171	Reading Guidance for Children (3)	Zimmerman

#### **Second Term**

50	History of Libraries and Librarianship (3)	Shove
53	School Library Management (3)	Marfell
62	Reference I (3)	Quenzel
160	Literature of the Social Sciences (3)	Quenzel
162	Literature of the Natural Sciences (3)	Shove
172	Reading Guidance for Adolescents (3)	Marfell

## Mathematics\*

### First Term

H	Higher Algebra (3 or 5)	Ar.
T	Trigonometry (3)	Ar.
10	College Algebra (5)	Ar.
40	Mathematical Analysis I (5)	Fillmore
54	Mathematical Analysis III (5)	Harper
106	Differential Equations (3)	Gil de Lamadrid
112	Elementary Set Theory (3)	Engeler
131A	Advanced Algebraic Theory (3)	Joichi
136	Solid Analytic Geometry (3)	Joichi
188	Topics in Topology (3)	Gil de Lamadrid

### 8-Week Term—June 13-August 5

160B	Summer Institute for High School Teachers: New Approaches in High School Mathematics (4)	Bzoch
------	--	-------

### Second Term

T	Trigonometry (3)	Ar.
10	College Algebra (5)	Ar.
40	Mathematical Analysis I (5)	Ar.
53	Mathematical Analysis II (5)	Ar.
55	Intermediate Calculus (3)	Harper
109	Theory of Numbers (3)	Miracle
131B	Advanced Algebraic Theory (3)	Harper
176	Intermediate Differential Equations (3)	Miracle
178	Probability (3)	Hatfield

## Music†

### First Term

A	Piano (no cr)	Weiser, Freed
D	Voice (no cr)	Schuessler, Knowles
1	Fundamentals of Music (2)	Abelson
7A	Ear Training (3)	Collins
7B	Ear Training (3)	Fetler
8A	Harmony (3)	Collins
8B	Harmony (3)	Fetler
11	Piano (2 or 4)	Weiser, Freed
12	Voice (2 or 4)	Schuessler, Knowles
13	Violin (2 or 4)	Ar.
14	Viola (2 or 4)	Ar.
15	Cello (2 or 4)	Ar.
16	Bass (2 or 4)	Fitch
17	Flute (2 or 4)	Niosi

\* See also Department of Mathematics, College of Engineering, Institute of Technology.

† See also Department of Music Education, College of Education.

18	Oboe (2 or 4)	Angelucci
19	Clarinet, Saxophone (2 or 4)	Fitch, Handlon, Williams
20	Bassoon (2 or 4)	Ar.
21	Trumpet (2 or 4)	Adelstein
22	French Horn (2 or 4)	Speyer
23	Trombone (2 or 4)	Ar.
24	Tuba (2 or 4)	Ar.
25	Percussion (2 or 4)	Dahlgren
26	Harp (2 or 4)	Miller
27	Organ (2 or 4)	Fleischer
43	Chorus (1)	Collins
50	Introduction to Music (5)	Oberg
97-98-99	Counterpoint (2)	Fetler
100	Advanced Applied Music (2 or 4)	Staff
104A	American Music (3)	Ar.
112	History of Vocal Art (2)	Schuessler
127-128-129	Composition (2)	Fetler
134	History of Church Music (2)	Fleischer
140	Choral Masters (3)	Collins, Herford
177	Analysis of Contemporary Music (3)	Fetler
204	Graduate Applied Music (3)	Staff
212	Special Problems (3-9)	Oberg
227-228-229	Seminar in Composition and Orchestration (3)	Fetler

### Second Term

A	Piano (no cr)	Weiser, Freed
D	Voice (no cr)	Schuessler, Knowles
1	Fundamentals of Music (2)	Fetler
11	Piano (2 or 4)	Weiser, Freed
12	Voice (2 or 4)	Schuessler, Knowles
13	Violin (2 or 4)	Ar.
14	Viola (2 or 4)	Ar.
15	Cello (2 or 4)	Ar.
16	Bass (2 or 4)	Ar.
17	Flute (2 or 4)	Opava, Niosi
18	Oboe (2 or 4)	Angelucci
19	Clarinet, Saxophone (2 or 4)	Fitch, Handlon, Williams
20	Bassoon (2 or 4)	Ar.
21	Trumpet (2 or 4)	Adelstein
22	French Horn (2 or 4)	Speyer
23	Trombone (2 or 4)	Ar.
24	Tuba (2 or 4)	Ar.
25	Percussion (2 or 4)	Dahlgren
26	Harp (2 or 4)	Miller
27	Organ (2 or 4)	Fleischer
52	History of Musical Styles, II (2)	Fetler
100	Advanced Applied Music (2 or 4)	Staff
106A	American Music (3)	Riedel
127-128-129	Composition (2)	Fetler
108	Henrich Schütz: Life and Works (3)	Riedel
110	Music Bibliography (3)	Riedel
204	Graduate Applied Music (3)	Staff
212	Special Problems (3-9)	Riedel
227-228-229	Seminar in Composition and Orchestration (3)	Fetler

## Natural Science

See Interdepartmental Courses.

## Personal Orientation

See Interdepartmental Courses.

## Philosophy

### First Term

1	Problems of Philosophy (3)	Brodbeck
2	Logic (3)	Raab
3	Ethics (3)	Raab
50	History of Philosophy (Ancient and Medieval) (3)	Donagan
140	Contemporary Philosophy (3)	Brodbeck
151	Aesthetics (3)	Donagan
160	Philosophy of Science (3)	Feigl
190	Seminar (ar)	Staff

### Second Term

1	Problems of Philosophy (3)	Holmer
2	Logic (3)	Potter
3	Ethics (3)	Mason
52	History of Philosophy (Modern) (3)	Mason
170	Philosophies of India (3)	Potter
182	Philosophy of Religion (3)	Holmer
191	Seminar (ar)	Staff

## Political Science

### First Term

A	The State in the Modern World (3)	Kalleberg
1	American Government and Politics (3)	Chase
26	American Foreign Policy (3)	Dudhaker
131	Public Administration (3)	Chase
141	Comparative European Government (3)	Turner
143	Government of the U.S.S.R. and Adjacent States (3)	Turner
160	American Political Thought (3)	Cooperman
187	Problems of European Politics (3)	Levi
194	International Politics of Asia (3)	Levi

### Second Term

B	The State in the Modern World (3)	Bonn
2	American Government and Politics (3)	Christensen
25	World Politics (3)	McLaughlin



108	Legislative Organization and Procedure (3)	Backstrom
117	Local Government (3)	Backstrom
124	Recent Social Legislation (3)	Warp
137	American Political Parties (3)	Christensen
176	Conduct of United States Foreign Relations (3)	McLaughlin

## Psychology

### First Term

1-2	General Psychology (6)	Horton
4-5	Introductory Laboratory Psychology (4)	Koplin
125-126	Psychology of Individual Differences (6)	O'Neil
144-145	Abnormal Psychology (6)	Rosen
155	Industrial Psychology (3)	Dunnette

### Second Term

1-2	General Psychology (6)	Hakes
4-5	Introductory Laboratory Psychology (4)	Martin
138	Psychology of Motivation and Conflict (3)	Russell
156	Psychology of Advertising (3)	Longstaff
160	Psychology in Personnel Work (3)	Longstaff
243	Experimental Psychodynamics (3)	Russell

## Romance Languages

### First Term

#### French

1	Beginning French (5)	Falk
3	Beginning French (5)	Renaud
4	Intermediate French (5)	Renaud
54	French Conversation and Pronunciation (3)	Burks
128	La Fontaine and La Bruyère (2)	Renaud
161	The Novel of the Twentieth Century: Sartre and Camus (2)	Falk
259	Directed Readings (1-3)	Falk, Renaud

A Maison Française is being planned. (See index)

#### Spanish

1	Beginning Spanish (5)	Grismer
3	Beginning Spanish (5)	Rundorff
20	Intermediate Spanish (5)	Rundorff
120	The Ballad (2)	Grismer
130	Cervantes: Don Quijote (2)	Mallo
177	Unamuno and Ortega y Gasset (2)	Mallo
259	Directed Readings (1-3)	Grismer

A study group in Mexico is being planned. (See index)

## Second Term

### **French**

2 Beginning French (5) ..... Ar.

### **Spanish**

2 Beginning Spanish (5) ..... Ar.

## Scandinavian

### First Term

162 Twentieth-Century Scandinavian Novel (3) .....Gustafson  
172 Strindberg and the Drama in Revolt and  
Transition (3) .....Gustafson

### Second Term

161 Nineteenth-Century Scandinavian Novel (3) .....Naess  
171 Ibsen and the Beginnings of the Modern Drama (3) .....Naess

## Slavic and Oriental Languages

### First Term

#### **Japanese**

110 Japanese Literature in Translation (3) ..... Copeland

#### **Oriental**

77 Asian Civilizations: Japan .....Copeland

#### **Russian**

1 Beginning Russian (5) ..... Niemi  
24 Scientific Russian (5) ..... Nice  
56 Conversation (3) ..... Alexeev and staff

### Second Term

#### **Japanese**

111 Japanese Literature in Translation (3) .....Copeland

## Russian

2	Beginning Russian (5)	Niemi
24	Scientific Russian (5)	Staff

## Social Science

See Interdepartmental Courses.

## 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)	Wahlstedt
202	Special Topic—Research in Family Centered Social Work (3)	Crane
203	Management of Children with Social Emotional Problems (3)	Merl
245	Child Welfare Programs (3)	Newhouse
275	Social Group Work (3)	Konopka
285	Special Studies in Social Work (1-9)	Francel

### Second Term

CD 140*	Behavior Problems (3)	Grams
201	Special Topic—The Deprived Child (3)	Hovda
202	Special Topic—Family Centered Social Work	Compton
260	Principles of Administration in Social Work (3)	Kidneigh

## Sociology

### First Term

1	Man in Modern Society (3)	Forster
3	Social Problems (3)	Johnson
111	Population Trends (3)	Johnson
140	Social Organization (3)	Forster
180	Methods of Social Research (3)	Monachesi

### Second Term

1	Man in Modern Society (3)	Rose
2	The American Community (3)	Francis
118	Delinquent Behavior (3)	Monachesi
123	Minority Group Relations (3)	Rose

\* See College of Education, Institute of Child Development and Welfare.



126	Family Development (3)	Hill
170	Analytical Social Theory (3)	Francis

## Speech and Theater Arts

### First Term

5X	Fundamentals of Speech (3)	Smith and staff
6	Fundamentals of Speech (3)	Smith and staff
32	Beginning Acting: Creative Approach (3)	Ar.
51	Advanced Public Speaking (3)	Smith
67	Phonetics (3)	Fletcher
91	Scene Design (3)	Josal
112	Stage Direction (3)	Ballet
126	History and Criticism of Public Address (3)	Scott
131	Creative Dramatics (3)	Graham
150	Organic Speech Disorders: Aphasia (6)	Starr and staff
152	Hearing Disorders (3)	Lassman
157	Clinical Practices in Audiology (3)	Lassman
161	Introduction to Speech Correction (3)	Fletcher
164-165-166	Clinical Methods and Practice in Speech Pathology (6)	Henrikson, Starr
178	Theater on Tour (3-6)	Whiting
181	Reading in Speech (ar)	Staff
235	Physiology of the Ear (3)	Lawrence
236	Theories of Hearing (3)	Lawrence
261-262-263	Seminar in Speech Pathology (9)	Henrikson
267	Seminar in Experimental Phonetics (3)	Fletcher
270	Advanced Clinical Audiology (3)	Lassman
275	Seminar in Rhetoric (3)	Smith, Scott
281-282-283	Seminar in Organic Disorders of Speech (6)	Henrikson
291-292-293	Research (ar)	Staff

For the teaching of speech, see College of Education, Curriculum and Instruction 140.

### Second Term

5X	Fundamentals of Speech (3)	Howell and staff
6	Fundamentals of Speech (3)	Howell and staff
34	Stagecraft: Construction and Painting (3)	Ar.
65	Radio and Television Speech (3)	Bormann
66	Radio and Television Drama (3)	Ar.
78	Advanced Acting (3)	Moulton
81	Interpretative Reading (3)	Thompson
101	Argumentation and Persuasion (3)	Howell
105	Theory of Reading and Acting (3)	Thompson
106	Discussion (3)	Howell
122	Introduction to Research (3)	Bormann
127	Language Training for the Deaf (3)	Magner
153	Audiometry and Hearing Aids (3)	Lassman, Stark
155	Lip Reading and Lip Reading Methods (3)	Lassman, Stassen
156	Auditory Training (3)	Magner
161	Introduction to Speech Correction (3)	Ar.
162	Speech Pathology (3)	Ar.
164-165-166	Clinical Methods and Practice in Speech Pathology (9)	Henrikson, Starr

178	Theater on Tour (3-6)	Whiting
181-182-183	Readings in Speech (ar)	Staff
251	Seminar in Listening Comprehension (2)	Nichols
291-292-293	Research (ar)	Staff

For the education of the auditorially handicapped child, see College of Education, Educational Psychology 185.

### Statistics (Interdisciplinary)

#### Second Term

Econ 121A	Introduction to the Theory of Statistics (3)	Buehler
Stat 281A	Topics in Statistics (3)	Buehler

### Zoology

#### First Term\*

1-2(Part I)	General Biology (5)	Olson
83	Introduction to Genetics and Eugenics (3)	Ar.
100	Zoological Techniques (ar)	Staff
197	Problems (ar)	Ar.

#### Second Term

2(Part II)-3	General Biology (5)	Roshal
101	Zoological Techniques (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, the School of Mines and Metallurgy, and the School of Physics.

A limited number of courses in civil, electrical, and mechanical engineering; engineering graphics; mathematics; mechanics and materials; metallurgy; and physics are listed. The School of

\* For zoology courses given at the Biology Session at the Lake Itasca Station, see index.

Mines and Metallurgy offers a few problems and research courses open only to students previously registered at the University of Minnesota.

In the School of Chemistry, inorganic, analytical, organic, and physical chemistry will be given. Students are able to acquire a Master's degree in chemistry by attendance at Summer Sessions only.

**Aeronautical Engineering**

***Mechanics and Materials***

**First Term**

27	Rigid-Body Mechanics I (3) .....	Warner
28	Rigid-Body Mechanics II (3) .....	Warner
40	Deformable-Body Mechanics I (3) .....	Sethna

**Second Term**

27	Rigid-Body Mechanics I (3) .....	Blatherwick
28	Rigid-Body Mechanics II (3) .....	Goodman
29	Rigid-Body Mechanics III (3) .....	Warner
41	Deformable-Body Mechanics II (3) .....	Sethna

**Civil Engineering**

**First Term**

23	Surveying Camp (9).....	Kersten, Fant, Self, Idzorek, Pederson
----	-------------------------	--

**Electrical Engineering**

**First Term**

36	Elements of Electrical Engineering (3) .....	Caverley
----	--	----------

**Second Term**

37	Elements of Electrical Engineering (3) .....	Caverley
37A	Elements of Electrical Engineering Laboratory (1).....	Cartwright

## English (Engineering)

### First Term

85           Advanced Technical Communication (3) .....Haga

### Second Term

86           Advanced Technical Communication (3) .....Guthrie

English 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) .....Palmer

### Second Term

70           Slide Rule (1) .....Clausen

## Industrial Engineering

See Mechanical Engineering, Industrial Engineering Division.

## Mathematics\*

### First Term

12	College Algebra and Trigonometry II (5) .....	Dolid
13A	Calculus I: Analytic Geometry and Calculus (5) .....	Loye
24A	Calculus II: Analytic Geometry and Calculus (5) .....	J. Sather
25A	Calculus III: Analytic Geometry and Calculus (5) .....	Serbyn
26A	Calculus IV: Differential Equations and Calculus (5) .....	Burgstahler
90	Elementary Engineering Statistics (3) .....	Faulkner
147	Vector Analysis (3) .....	Thompson
151A†	Calculus V: Intermediate Calculus (3) .....	Thompson
165A	Introduction to Programming Modern Digital Calculators (3) .....	Pope
184	Elementary Numerical Analysis in Engineering (3) .....	Pope

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

† 152 and 153 may be taken simultaneously; 151A, 152, 153 form a 9-credit sequence regularly taught during the academic year.

## Second Term

13A	Calculus I: Analytic Geometry and Calculus (5)	Vannelli
24A	Calculus II: Analytic Geometry and Calculus (5)	Polansky
25A	Calculus III: Analytic Geometry and Calculus (5)	Faulkner
26A	Calculus IV: Differential Equations and Calculus (5)	Munro
152*	Calculus VI: Advanced Calculus (3)	Lindgren
153*	Calculus VII: Advanced Calculus (3)	Lindgren

## Mechanical Engineering

### First Term

32	Thermodynamics (3)	Ibele
90	Industrial Assignment (2)	Algren
91	Industrial Assignment (2)	Algren
92	Industrial Assignment (2)	Algren
93	Industrial Assignment (2)	Algren
133	Heat Transmission (3)	Ibele
146	Introduction to Combustion (3)	Murphy

### Second Term

24	Elements of Machine Design (3)	LaJoy
90	Industrial Assignment (2)	Algren
91	Industrial Assignment (2)	Algren
92	Industrial Assignment (2)	Algren
93	Industrial Assignment (2)	Algren
134	Thermodynamics of Fluid Flow (3)	Ibele
143	Turbomachinery (3)	Murphy

## Engineering Graphics

### First Term

14	Engineering Graphics (3)	Palmer
16	Engineering Graphics (3)	Springer

### Second Term

15	Engineering Graphics (3)	Clausen
----	--------------------------	---------

## Mechanics and Materials

See Aeronautical Engineering.

\* 152 and 153 may be taken simultaneously; 151A, 152, 153 form a 9-credit sequence regularly taught during the academic year.

## Analytical Chemistry

### First Term

51	Quantitative Analysis (Gravimetric) Lecture (2)	Herr
53	Quantitative Analysis (Gravimetric) Laboratory (3)	Herr
54	Quantitative Analysis (Volumetric) Laboratory (3)	Herr
57	Quantitative Analysis (Premedic) (4)	Herr
58	Quantitative Analysis (Chemical Engineers) Laboratory (3)	Herr
301	Research in Quantitative Analysis (ar)	Staff

## Inorganic Chemistry

### First Term

4	General Inorganic Chemistry (5)	Conroy
11	Semimicro Qualitative Analysis (4)	Tobias
24	Chemical Principles (5)	Conroy
26	Chemical Principles (5)	Tobias
301	Research in Inorganic Chemistry (ar)	Tobias and Conroy

### 8-Week Term—June 13-August 6

160A	Summer Institute for High School Teachers. Fundamentals of General and Inorganic Chemistry (4)	Brasted
------	--	---------

### Second Term

5	General Inorganic Chemistry (5)	Johnson
25	Chemical Principles (5)	Johnson
103	Atomic Structure, Properties of Elements Based Thereon (3)	Hugus
107	Oxidation-Reduction Systematics (3)	Hugus
302	Research in Inorganic Chemistry (ar)	Hugus and Johnson

## Organic Chemistry

### First Term

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

### Second Term

62	Elementary Organic Chemistry (4)	Moulton
302	Research in Organic Chemistry (ar)	Moulton
	Graduate Thesis Work in Organic Chemistry (0)	Moulton

## Physical Chemistry

### First Term

104, 105	Physical Chemistry Laboratory (1 or 2)	Raw
107*	Physical Chemistry for Premedical Students (3)	Raw
199	Selected Topics in Physical Chemistry (3)	Longuet-Higgins
301	Research in Physical Chemistry (ar)	Staff

### Second Term

105, 106	Physical Chemistry Laboratory (1 or 2)	Person
108*	Physical Chemistry for Premedical Students (3)	Raw
118	Advanced Physical Chemistry (3)	Person
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
---------	--	---------

**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

\* Course 108 is a continuation of 107. The entire course 107-108 must be completed before credit can be assigned (6 credits). Grades will not be sent in at the end of the first term.

† Graduate students may prepare required Plan B papers.

## Mining Engineering

### First Term

15A	Mine Surveying Field Work (6)	Lacabanne, Yardley
15B	Mine Surveying Field Work (5)	Lacabanne, Yardley
151-152-153	Special Mining Engineering Problems (ar)	Ar.
212-213-214	Mining Research Problems (ar)	Ar.

### Second Term

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

### Third Term

139	Inspection Trip (3)	Pfleider, Yardley
-----	---------------------	-------------------

## Petroleum Engineering

### First Term and Second Term

155-156-157	Special Problems in Petroleum Engineering (ar)	Ar.
-------------	--	-----

## SCHOOL OF PHYSICS

---

### First Term

1	Introduction to Physical Science (Mechanics) (3)	Ar.
1A	Introduction to Physical Science Laboratory (1)	Ar.
13	General Physics—Third Quarter, Part I (Sound and Light) (2½)	Ar.
50	Intermediate General Physics (Modern Physics) Part I (2)	Ar.
50A	Intermediate General Physics Laboratory, Part I (Parallel to Physics 50) (½)	Ar.

### 8-Week Term—June 13-August 6

155	Summer Institute for High School Teachers of Physics (8)	Verbrugge, Wertz, and visiting staff
159C	Summer Institute for High School Teachers (4)	Wall, Likely



## Second Term

2	Introduction to Physical Science (Electricity and Magnetism) (3) .....	Ar.
2A	Introduction to Physical Science Laboratory (1) .....	Ar.
13	General Physics—Third Quarter, Part II (Sound and Light) (2½) .....	Ar.
50	Intermediate General Physics (Modern Physics) Part II (2) .....	Ar.
50A	Intermediate General Physics Laboratory, Part II (Parallel to Physics 50) (½) .....	Ar.

---

## College of Veterinary Medicine

Regular courses of the four-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 division offers a number of advanced courses for graduate veterinarians and other qualified students.

### Summer Institute in Radiation Biology

A six-week course (June 13-July 23) 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 Francis A. Spurrell, Director, 120 Veterinary Clinic, University of Minnesota, St. Paul 1, Minnesota.

## First and Second Terms

128*	Problems in Veterinary Bacteriology and Public Health (ar) .....	Pomeroy, Anderson, Lindorfer
130†	Problems in Animal Physiology (ar) .....	Sellers, Good
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, Fenstermacher
201‡	Special Problems in Animal Reproduction (ar) .....	Zemjanis
202¶	Advanced Studies in Diagnosis and Therapeutics of Animal Diseases (ar) .....	Hoyt, Mather, Sorensen
203‡	Neoplasms of Domestic Animals (ar) .....	Sautter
205*	Advanced Veterinary Bacteriology (ar) .....	Pomeroy, Fenstermacher, Lindorfer
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

The Duluth Campus offers undergraduate work in thirty-six fields leading to the A.A., B.A., or B.S. degrees and graduate work in a number of fields. The M.A. degree with majors in education and in curriculum and instruction is offered.

Being developed on a 196-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 1960 UMD Summer Session student will discover a new excitement in Duluth and on the campus. The dramatic opening of the St. Lawrence Seaway last year linked Duluth to the seven seas of the world. During the 1959 season, alone, 235 foreign vessels from 20 countries 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.

Since its conversion from Duluth State Teachers College in 1947, approximately \$8,500,000 has been expended in new buildings and other improvements on the new campus.

Facilities include a science group of two 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, social sciences building, a student health center, the new Tweed Art Gallery, and 18 residence units accommodating a total of 174 persons.



## General Information

## Facilities



### **Master of Arts Degree**

On the lower campus are a snack bar in Washburn Hall, the news and information service in Old Main, the print shop, campus radio station KUMD-FM and a Laboratory School which during the regular year has classes from kindergarten through the eighth grade.

At 910 West Third Street, Darling Observatory, a popular community and campus facility in summer, opens for regular lecture and observation periods. A nine-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 majors in education and in curriculum and instruction. The master of arts program is designed especially to serve elementary school teachers and principals, secondary school teachers, and rural teachers. 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 four weeks in advance of the term they wish to enter. (See section on Graduate School.) If the student wants to take all of his graduate work at the Duluth Campus, he should write for information to the Academic Dean, 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 will find it convenient to take summer courses toward the bachelor of science degree.

**Bachelor of  
Science  
Program**

Opportunity is provided for observation at the eighth annual clinic for children with speech and hearing disorders, held June 20 to August 12. Supervised clinical experience with University credit also may be attained, based upon teaching experience and course background. Those interested in such an experience may obtain details from the clinic director.

**Speech  
Clinic**

Experienced teachers will find an opportunity for work in the field of remedial reading during the first term. Two courses are specifically designed to help them become more effective teachers of reading. Reading Difficulties (Curriculum and Instruction 145) will deal directly with the analysis of difficulties and procedures for their correction. A second course, Clinical Practice in Remedial Teaching (Educational Psychology 150), will give opportunity for intensive study and work with children in the Reading Clinic of the Duluth Public Schools. Enrollment for these courses will be limited. Persons wishing to enter them should write: Division of Education and Psychology, University of Minnesota, Duluth, Duluth 12.

**Remedial  
Reading**

During the week of July 25-30, this workshop will concern itself with the improvement in the use of audio-visual techniques and with new teaching procedures in physical education.

**Workshop for  
Elementary  
School  
Teachers**

**Teaching of  
the Gifted**

Teachers will have an opportunity to enroll in Educational Psychology 183, Education of Gifted Children. This course is concerned with the abilities, characteristics, and education of the intellectually gifted.

**Counseling  
and Guidance  
Institute**

The University of Minnesota has been granted funds for a Counseling and Guidance Institute by the United States Office of Education, under authorization of the National Defense Education Act of 1958. The Institute will focus on identification of talent and the role of the counselor in improving the educational and vocational planning of superior students.

The Institute will consist of a Basic Group to be held on the Duluth Campus and an Advanced Group to be held on the Minneapolis Campus. It is scheduled for five weeks, June 13 to July 16. Public-secondary-school participants admitted to the Institute will be eligible for a stipend of \$75 per week and \$15 a week for each dependent.

Individuals desiring further information and application forms concerning either the Basic or Advanced Groups, should write: Dean of Summer Session, 650 Johnston Hall, University of Minnesota, Minneapolis 14.

**Institute on  
Junior High  
School**

Another institute on problems of the junior high school will be conducted on the campus, July 6-8, and is designed to succeed the one held during the previous summer. Director of the institute will be Dr. Roscoe Cramer, a recognized leader in the field. Teachers, administrators, and other interested persons are invited to participate. Certificates of attendance will be awarded at the close of the institute. For further information write: Junior High School Institute, Division of Education and Psychology, University of Minnesota, Duluth, Duluth 12.

This is a social science study and tour course emphasizing the mining industry, transportation on the St. Lawrence Seaway, timber resources, the wood products industry, peat production, the oil industry, the vacation and resort industry, and other industries important in the Lake Superior region. The courses (Social Science 91, 92, first term, 6 credits; and Social Science 93, 94, second term, 6 credits) are intended for teachers and for business persons desiring a better understanding of the region. For complete information write: Division of Social Sciences, University of Minnesota, Duluth, Duluth 12.

**Lake Superior  
Region**

The summer workshop in advanced painting, conducted for the past 11 years at Duluth, has become nationally known in art circles. In 1960, Jean Charlot, professor in the department of art at the University of Hawaii, Honolulu, will conduct the workshop. Charlot is known as a painter, graphics expert, educator, illustrator, writer and lecturer. His works have been exhibited at major American, Mexican, and Hawaiian galleries. He was a Ryerson Lecturer at Yale University in 1948, a Guggenheim Fellow, and has received honorary degrees from Grinnell College and St. Mary's College.

**Workshop in  
Advanced  
Painting**

The workshop, which will be conducted during the second term, has previously featured such artists as Will Barnet, Charles Burchfield, the late Yasuo Kuniyoshi, Max Weber and Arnold Blanch.



This workshop, carrying six graduate credits, is for those persons now teaching geography and those planning to teach it. Intensive consideration will be given to subject matter and methods in the teaching of physical and cultural geography.

**Geography  
Workshop**

During the second term, teachers may take work enabling them to teach courses in driver education in the secondary schools. For details write: Department of Health and Physical Education for Men, University of Minnesota, Duluth, Duluth 12.

**Driver  
Education**





EdCI 135	Group Procedures in Guidance (3)	.....Gum
EdCI 150	Supervision and Improvement of Instruction (3)	.....H. Johnson
EdCI 271	Problems in Curriculum Construction (ar)	.....House, H. Johnson, Lindquist, Plumb, A. Smith
EPsy 116	Statistical Methods in Education (3)	.....Tamminen
EPsy 133	Basic Procedures in Student Personnel Work (3)	.....R. Johnson
EPsy 134	School Counseling Procedures (3)	.....R. Johnson
EPsy 182	Education of Exceptional Children (3)	.....Reynolds
EPsy 183	Education of Gifted Children (3)	.....Reynolds

## Health Education

### First Term

55	Safety Education (3)	.....Bowne
----	----------------------	------------

### Second Term

3	Personal Health (2)	.....Peterson
5	First Aid and Safety (1)	.....Peterson
83	Methods and Materials in School Health Education (3)	.....Rickert

## Industrial Education

### First Term

19	Art Metal Work (3)	.....Voss
106	Industrial Education Workshop (3)	.....Voss
107	Co-ordination (3)	.....Voss

## Physical Education for Men

### First Term

M6C	Swimming (1)	.....Richards
M16C	Volleyball (open to women) (1)	.....Wells
M18B	Intermediate Swimming (1)	.....Richards

### Second Term

M30C	Softball (1)	.....Peterson
------	--------------	---------------

## Physical Education for Women

### First Term

W18B	Intermediate Swimming (1)	.....Richards
------	---------------------------	---------------

## Physical Education for Men and Women

### First Term

7A	Elementary and Lead-up Games (1)	Richards
9A	Folk Dance (1)	Richards
9B	American Country and Square Dance (1)	Richards
17D	Archery (1)	Richards
21B	Square Dance (1)	Richards
21C	Folk Dance (1)	Richards
31B	Golf (1)	Wells
33A	Life Saving (1)	Bowne
40	Elementary and Lead-up Games (1)	Richards
42	Rhythms for Elementary Grades (1)	Richards
51	Mechanics of Movement (3)	Bowne
52	The Teaching of Physical Education in the Elementary School (2)	Richards
54	Methods and Materials in Physical Education (2)	Richards
58	Recreational Leadership (3)	Wells
63	Organization and Administration of Physical Education (3)	Bowne
115	Advanced Kinesiology (3)	Bowne

### Second Term

8C	Tennis and Golf (2)	Rickert, Peterson
17D	Archery (1)	Peterson
31A	Tennis (1)	Peterson
31B	Golf (1)	Rickert
32	Badminton (1)	Rickert
114	Administration of School Health Education Program (3)	Rickert

## Psychology

### First Term

1	General Psychology (3)	Wright
---	------------------------	--------

### Second Term

2	General Psychology (3)	Verrill
74	Psychology in Personnel Work (3)	Tamminen

**Art**

**First Term**

5	Introduction to Art (3)	A. Smith
50-51	Crafts (Workshop) (6)	Schauer
or		
51-52	Crafts (Workshop) (6)	Schauer
56	Art in Elementary Education (3)	A. Smith
110	Problems in Crafts (6)	Schauer
ArtEd 171	Implementing the Instructional Program in Art (3)	A. Smith
ArtEd 295	Problems in Art Education (ar)	A. Smith

**Second Term**

96	Problems in Drawing or Painting (6)	Charlot
177	Workshop in Advanced Painting (6)	Charlot
ArtEd 190	Development of Art Education in the Twentieth Century (3)	A. Smith
ArtEd 295	Problems in Art Education (ar)	A. Smith

**English**

**First Term**

23	Introduction to Literature (5)	Rosenthal
58	Shakespeare (3)	Rosenthal
73	American Literature (3)	W. Glick
105	Hawthorne and Melville (3)	W. Glick
106	Whitman and Mark Twain (3)	W. Glick
162	Milton (3)	Rosenthal

**Second Term**

74	American Literature (3)	Hart
75	Chaucer (3)	Sturgeon
84	The Development of Dramatic Literature, Modern Drama (3)	Sturgeon
165	Introduction to Modern English (3)	Sturgeon

**Humanities**

**First Term**

4	Appreciation of the Arts (3)	Miller
---	------------------------------	--------

## Second Term

5	Appreciation of the Arts (3)	Miller
7	Arts in America (3)	Miller

## Music

### First Term

13	Piano (1)	Andrews
15	Strings (1)	House
17	Woodwinds (1)	Beverley
19	Brass (1)	Murphy
21	Introduction to Music (3)	House
40	Organ (1-2)	Andrews
177	Analysis of Contemporary Music (3)	Miller
204	Graduate Applied Music (2)	Beverley, House, Murphy

### Second Term

15	Strings (1)	House
19	Brass (1)	Murphy
196	Opera Production (3)	Herz
204	Graduate Applied Music (2)	House, Murphy
MuEd 150	Organization and Supervision of Vocal-Instrumental Music in the Elementary Schools (3)	House

## Philosophy

### First Term

3	Ethics (3)	Ehlers
---	------------	--------

## Speech

### First Term

1	Fundamentals of Speech (3)	Hayes
8	Art of the Theater (3)	Hayes
67	Phonetics (3)	Pierce
105	Theory of Reading and Acting (3)	Hayes
119	Introduction to Speech Correction (3)	Pierce
181	Independent Study in Speech and Drama (1-3)	Pierce, Hayes

**Astronomy**

**First Term**

1 Elementary Astronomy (3) ..... Lepp

**Biology**

**First Term**

1 General Biology (5) ..... Odlaug

**Second Term**

2 General Biology (5) ..... Flaccus

**Chemistry**

**First Term**

3 General Chemistry (5) ..... Cowles

6 General Chemistry (5) ..... Cowles

12 Semimicro Qualitative Analysis (5) ..... F. Glick

58 Organic Chemistry (3) ..... F. Glick

58A Organic Chemistry Lab (1) ..... F. Glick

**Second Term**

4 General Chemistry (5) ..... Thompson

7 General Chemistry (5) ..... Thompson

59 Organic Chemistry (3) ..... Passer

59A Organic Chemistry Lab (1) ..... Passer

**Mathematics**

**First Term**

1 Higher Algebra (5) ..... McEwen

11 College Algebra and Trigonometry I (5) ..... McEwen, Hafstrom

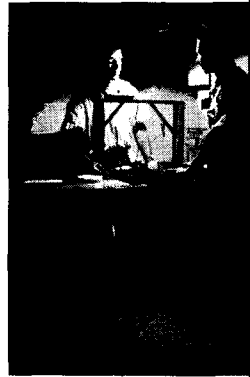
49 Analytic Geometry and Calculus I (5) ..... Hafstrom

**Second Term**

5 Modern Basic Mathematics (5) ..... Dorff

12 College Algebra and Trigonometry II (5) ..... McEwen

62 Introduction to Modern Algebra (3) ..... McEwen, Dorff



## Natural Science

### First Term

2A	Fundamentals of Mathematics (3)	H. Hanson
10	Conservation of Natural Resources (3)	Carlson

### Second Term

2B	Physical Science (3)	D. Olson
2C	Physical Science (3)	D. Olson

## Physics

### First Term

13	General Physics for Engineers (5)	H. Hanson
----	-----------------------------------	-----------

## Science

### First Term

101	Mathematics for High School Teachers I (3)	Hafstrom
106	Biology for High School Teachers I (3)	Odlaug
113	Chemistry for High School Teachers III (3)	F. Glick

### Second Term

102	Mathematics for High School Teachers II (3)	Dorff, McEwen
114	Chemistry for High School Teachers IV (3)	Passer

## Division of Social Sciences

---

## Anthropology

### First Term

6	Prehistoric Man and Culture (3)	Schmidt
50	Indians of the Americas (3)	Schmidt

### Second Term

7	Cultural Anthropology (3)	Schmidt
52	Indians of the United States (3)	Schmidt

## Business and Economics

### First Term

1	Principles of Economics (5)	Davidson
34	Elementary Accounting (4)	Friest
44	Elementary Statistics (3)	Meyers
58	Foreign Trade (3)	Jones
67	Property and Liability Insurance (3)	Meyers
71	Financial Accounting (3)	Friest
81	Labor Economics (3)	Davidson
94	Intermediate Economic Analysis: The Firm (3)	Meyers
97	Current Economic Problems (1)	Jones
105A	Intermediate Accounting I (3)	Sielaff

### Second Term

3	Principles of Economics (5)	Davidson
35	Elementary Accounting (5)	Friest
45	Elementary Statistics (3)	Meyers
61	Economics of Land Transportation (3)	Roulston
65	Business Organization and Finance (3)	Roulston
66	Life and Disability Insurance (3)	Meyers
72	Financial Accounting (3)	Friest
82	Social and Labor Legislation (3)	Davidson
95	Intermediate Economic Analysis: National Income (3)	Meyers
97	Current Economic Problems (3)	Roulston
105B	Intermediate Accounting II (3)	Sielaff

## Economics

### First Term

165	Economic Analysis: The Firm (3)	Meyers
-----	---------------------------------	--------

### Second Term

166	Economic Analysis: Income and Employment (3)	Meyers
-----	--	--------

## Geography

### First Term

10	Principles of Physical Geography (3)	Hoag
11	Principles of Cultural Geography (3)	Witzig
20	Weather and Climate (3)	Hoag
51	Economic Geography (3)	Hoag
52	Economic Geography (3)	Witzig
102	Central Europe (3)	Witzig
107	Soviet Union (3)	Chamberlin

## Second Term

10	Principles of Physical Geography (3)	Belthuis
11	Principles of Cultural Geography (3)	Belthuis
112	Western Anglo-America (3)	Belthuis
115	Geography Workshop for Teachers (6)	Witzig, Hoag

## History

### First Term

20	American History (3)	Lindquist
21	American History (3)	Larsen
65	Twentieth-Century Europe (3)	Larsen
76	American History in the Nineteenth Century, 1789-1824 (3)	Larsen
131	Minnesota and the Northwest (3)	Lindquist

### Second Term

22	American History (3)	Livingston
68	American History in the Twentieth Century (3)	Livingston
85	American Economic and Social History (3)	Crawford
141D	American Diplomatic History (3)	Livingston

## Political Science

### First Term

1	American National Government (3)	Wolff
2	American State Government (3)	von Glahn
3	American Municipal Government (3)	von Glahn
137	American Political Parties (3)	Wolff
160	American Political Thought (3)	Wolff
163	Political Theory and Utopia (3)	von Glahn

### Second Term

1	American National Government (3)	Lease
2	American State Government (3)	von Glahn
3	American Municipal Government (3)	Lease
25	International Relations (3)	von Glahn
71	Public Opinion and Propaganda (3)	Lease
162	Recent Political Thought (3)	von Glahn

## Social Science

### First Term

91	The Great Lakes-St. Lawrence Region (3)	Sielaff
92	The Great Lakes-St. Lawrence Region (3)	Sielaff



## Second Term

93	The Great Lakes-St. Lawrence Region (3)	Sielaff
94	The Great Lakes-St. Lawrence Region (3)	Sielaff

## Sociology

### First Term

1	Introduction to Sociology (5)	Pearson
49	Social Problems (3)	Stub
60	Population Trends (3)	Stub
71	Social Mobility (3)	Stub
81	Marriage and the Family (3)	Pearson
145	Urban Sociology (3)	Schmidt

### Second Term

1	Introduction to Sociology (5)	Pearson
70	Minority Group Relations (3)	Schmidt
81	Marriage and the Family (3)	Pearson
151	Sociology of Education (3)	Stub



## INDEX

- Admission and Registration ..... 20-25
- Biological Session, Lake Itasca Forestry  
and Biological Station ..... 37-38
- Colleges and Schools
- College of Agriculture, Forestry,  
and Home Economics ..... 32-36
  - School of Business Administration ..... 38-41
    - Business Administration ..... 39-40
    - Economics ..... 41
  - School of Dentistry ..... 42
  - Duluth Campus ..... 106-115
  - College of Education ..... 42-58
  - General College ..... 58-59
  - Graduate School ..... 31-32
  - Law School ..... 59
  - Medical School ..... 59-68
  - Medical Technology ..... 68
  - Mortuary Science ..... 72
  - School of Nursing ..... 68-69
  - School of Public Health ..... 70-72
  - College of Science, Literature,  
and the Arts ..... 72-92
  - Institute of Technology ..... 92-99
    - College of Engineering ..... 93-95
    - School of Chemistry ..... 96-97
    - School of Mines and Metallurgy ..... 97-98
    - School of Physics ..... 98-99
  - College of Veterinary Medicine ..... 99-100
- Credits, Maximum (Amount of Work) ..... 25
- Dates ..... 15-16, 21
- Degrec Candidacy ..... 21, UMD—102-103
- Deutsches Haus (Modern Language  
Institute) ..... 3-4
- Dormitories ..... 17-18
- Examinations ..... 25
- Fees ..... 23-25, 69
- General Information ..... 15-16, UMD—101-102
- Health Service ..... 16
- Housing and Food Service ..... 17-19
- Institutes (See Special  
Programs) ..... 3-14, UMD—103-105
- Libraries ..... 16, 30
- Maison Française (Modern  
Language Institute) ..... 3-4
- Recreation ..... 26-30, 44
- Registration ..... 21-23
- Special Programs ..... 3-14, UMD—103-105
- Workshops (See Special  
Programs) ..... 3-14, UMD—103-105

*Summer Session*

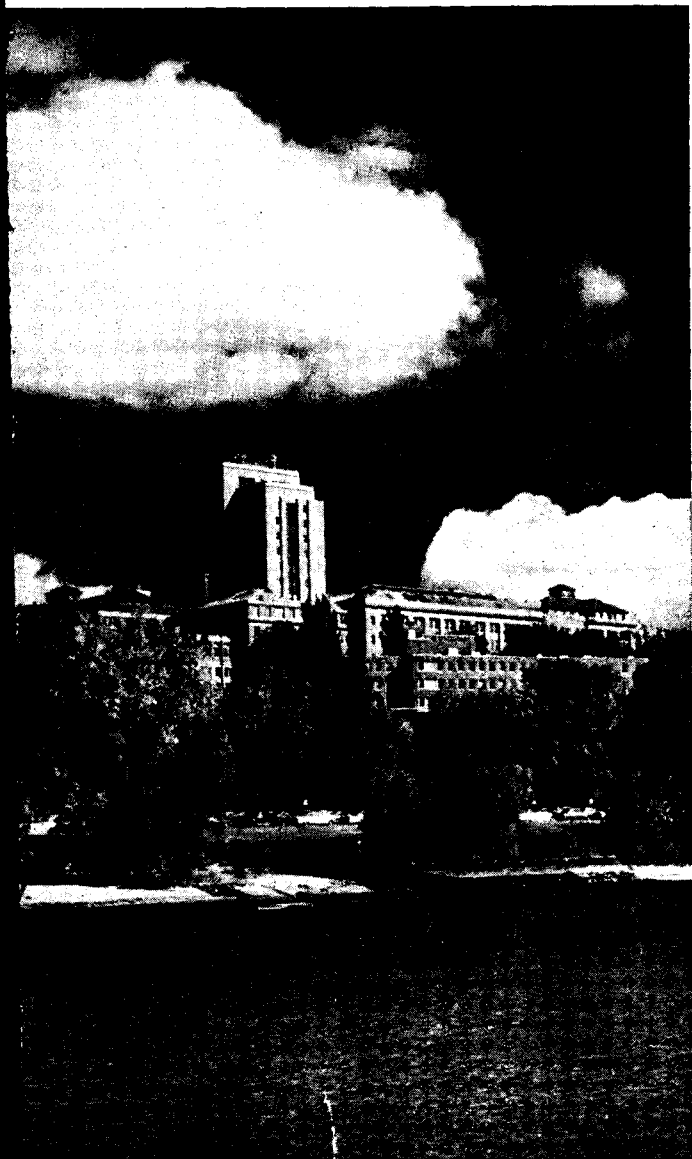
1960

**FIRST TERM:**

June 13-July 16

**SECOND TERM:**

July 18-August 20



**Bulletin**

*of the UNIVERSITY of MINNESOTA*

# UNIVERSITY OF MINNESOTA

## Board of Regents

The Board of Regents is composed of The Honorable Ray J. Quinlivan, St. Cloud, First Vice President and Chairman; The Honorable Charles W. Mayo, M.D., Rochester, Second Vice President; The Honorable James F. Bell, Minneapolis; The Honorable Edward B. Cosgrove, Le Sueur; The Honorable Daniel C. Gainey, Owatonna; The Honorable Richard L. Griggs, Duluth; The Honorable Robert E. Hess, White Bear Lake; The Honorable Marjorie J. Howard (Mrs. C. Edward), Excelsior; The Honorable A. I. Johnson, Benson; The Honorable Lester A. Malkerson, Minneapolis; The Honorable A. J. Olson, Renville; and The Honorable Herman F. Skyberg, Fisher.

## Administrative Committee

O. Meredith Wilson, President  
Malcolm M. Willey, Vice President, Academic Administration  
Laurence R. Lunden, Vice President, Business Administration  
Stanley Wenberg, Vice President and Administrative Assistant  
E. W. Ziebarth, Dean of the Summer Session  
Ray M. Amberg, Director, University Hospitals  
Ike J. Armstrong, Director of Athletics  
Robert O. Bowen, Colonel, USMC, ROTC Representative  
Ruth E. Boynton, Director of University Health Service  
Rodney A. Briggs, Acting Dean, University of Minnesota, Morris  
J. William Buchta, Chairman, University College Committee  
Walter W. Cook, Dean of the College of Education  
Bryce L. Crawford, Dean of the Graduate School  
William H. Crawford, Dean of the School of Dentistry  
Raymond W. Darland, Provost, University of Minnesota, Duluth  
George P. Hager, Dean of the College of Pharmacy  
Edwin L. Haislet, Director of Alumni Relations  
Robert B. Howard, Dean of the College of Medical Sciences  
Richard L. Kozelka, Dean of the School of Business Administration  
William B. Lockhart, Dean of the Law School  
Harold Macy, Dean of the Institute of Agriculture  
Errett W. McDiarmid, Dean of the College of Science, Literature, and the Arts  
Keith N. McFarland, Assistant Dean, College of Agriculture, Forestry, and Home Economics  
Horace T. Morse, Dean of the General College  
Julius M. Nolte, Dean of University Extension  
William L. Nunn, Director of University Relations  
Athelstan F. Spilhaus, Dean of the Institute of Technology  
Edward B. Stanford, Director of Libraries  
Robert Edward Summers, Dean of Admissions and Records  
William T. S. Thorp, Dean of the College of Veterinary Medicine  
Edmund G. Williamson, Dean of Students

## 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:

Hour	I	II	III	IV	V	VI	VII	VIII	IX	X
Minneapolis	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00
St. Paul	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30

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

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

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

**Building Name Abbreviations**—See back cover.

**Campus Maps**—See inside back cover.

### College and Department Abbreviation Code

Aero, Aeronautical Engineering	Ent, Entomology and Economic Zoology
AgBi, Agricultural Biochemistry	EPsy, Educational Psychology
AgEc, Agricultural Economics	FL, Family Life
AgEd, Agricultural Education	For, Forestry
AgEn, Agricultural Engineering	Fren, French
Agro, Agronomy and Plant Genetics	FS, Foreign Study
AmSt, American Studies	GC, General College
Anat, Anatomy	GE, General Engineering
AnCh, Analytical Chemistry	Geog, Geography
Anes, Anesthesiology	Geol, Geology and Mineralogy
AnHu, Animal Husbandry	Ger, German
Anth, Anthropology	Grk, Greek
Arch, Architecture	HE, Home Economics
ArEd, Art Education	HED, History and Philosophy of Education
Art, Art	HEEd, Home Economics Education
Ast, Astronomy	Hist, History
BA, Business Administration	Hort, Horticulture
Bact, Bacteriology and Immunology	Hum, Humanities
Biol, Biology	Hydr, Hydromechanics
Bot, Botany	IE, Industrial Engineering
CD, Child Development and Welfare	InCh, Inorganic Chemistry
CE, Civil Engineering	Ind, Industrial Education
ChEn, Chemical Engineering	Ital, Italian
Clas, Classics	ITM, Mathematics (Institute of Technology)
Comm, Communication	Jour, Journalism
Comp, Composition	Lat, Latin
DInd, Dairy Industries	Law, Law School
DyHu, Dairy Husbandry	Lib, Library School
Econ, Economics	Math, Mathematics (SLA)
Ed, General Education	ME, Mechanical Engineering
EdAd, Educational Administration	Med, Medicine
EdCI, Curriculum and Instruction	MedT, Medical Technology
EdT, Methods and Student Teaching	MetE, Metallurgical Engineering
EE, Electrical Engineering	
Engl, English	

MinE, Mining Engineering  
MM, Mechanics and Materials  
Mort, Mortuary Science  
MuEd, Music Education  
Mus, Music  
  
NPsy, Psychiatry and Neurology  
NSci, Natural Science  
NuAd, Nursing Administration  
NuEd, Nursing Education  
Nurs, Nursing  
  
Obst, Obstetrics and Gynecology  
Oph, Ophthalmology  
OrCh, Organic Chemistry  
Otol, Otolaryngology  
  
Path, Pathology  
PCh, Physical Chemistry  
Ped, Pediatrics  
PE M, Physical Education for Men  
PetE, Petroleum Engineering  
PE W, Physical Education for Women  
PhCh, Physiological Chemistry  
Phcl, Pharmacology  
Phil, Philosophy  
Phsl, Physiology  
Phys, Physics  
PIPa, Plant Pathology and Botany

PMed, Physical Medicine and Rehabilitation  
PO, Personal Orientation  
PoHu, Poultry Husbandry  
Pol, Political Science  
Psy, Psychology  
PubH, Public Health  
  
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  
  
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

## Calendar

### *First Term*

June	13	Monday	Orientation and registration
June	14	Tuesday	First term classes begin; fees due for students in all colleges
July	4	Monday	Independence Day, holiday
July	14	Thursday	Commencement, 8 p.m.
July	16	Saturday	First term closes

### *Second Term*

July	18	Monday	Registration and payment of fees
July	19	Tuesday	Second term classes begin
August	18	Thursday	Commencement, 8 p.m.
August	20	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 1960 Summer Session only. See section on Admission and Registration for further details.



# SUMMER SESSION 1960

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 and tuition 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 and in curriculum and instruction.

Preprofessional, professional, and liberal arts curriculums are offered in 50 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.

Advanced students in art will have an opportunity to work with Jean Charlot, internationally famous painter. Geography teachers may enroll in a workshop which will consider new methods and materials in their field. An institute in guidance and counseling will be held. Other featured courses will be concerned with the exceptional child, the gifted child, remedial reading, driver education, and studies of the Lake Superior-St. Lawrence Seaway region. Numerous courses will be available to teachers of science and mathematics—courses which reflect a nation-wide interest in strengthening these fields. A special institute will consider the problems of improving the program of the junior high school.

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

## 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, 690 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.

Instead of the traditional Casa Hispánica the department is co-operating with a group which will study at the University of Guadalajara, Mexico. There, for a moderate expenditure, students will participate in a program of university courses under professors both from Guadalajara and from various American institutions. They will also have

numerous opportunities for using Spanish in everyday situations. For details write to: Dean of Summer Session, 690 Johnston Hall, University of Minnesota, Minneapolis 14.

The directors will be Professor Herman Ramras 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. (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.

### A Summer Travel Course in European Art

The summer travel course in European art again will be conducted by the Department of Art under the auspices of the Summer Session. Five credits will be earned by students completing the course. Cost: \$1,295 including University fees. (See Art 59)

### Scandinavian Area Studies

The Scandinavian Studies program, held alternate summers at the University of Wisconsin and the University of Minnesota, is scheduled at the University of Minnesota for the summer of 1960. For detailed information consult Professor Alrik Gustafson, Department of Scandinavian, 13 Folwell Hall, University of Minnesota, Minneapolis 14.

### American Studies

During the summer of 1960, visiting professors in history and literature will offer courses in various aspects of American culture, as will members of the University of Minnesota staff in these and other departments (sociology, anthropology, economics, education, art, journalism, music, philosophy, and political science).

The American Studies summer program is designed for candidates for the B.A., the M.A., and the Ph.D. degrees. Candidates for these degrees enroll in courses conducted by the participating departments listed above and in American Studies seminars designed to integrate these courses. Knowledge of a foreign civilization is also required of all candidates.

### Latin

In recognition of the increasing use of laboratories in language teaching, the Department of Classics will offer Latin 171, Advanced Reading, in the second term as an aid to teachers who are interested in new linguistic methods. The course will present the fundamentals of descriptive linguistics in relation to the teaching of Latin, with emphasis

on the basic differences between English and Latin linguistic patterns. The relationships between descriptive linguistics and traditional grammar and syntax will also be explored; and the modification of Latin reading techniques will be studied in the light of recent laboratory experience.

### **Scientific 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 Scientific Russian 24 (Slavic and Oriental Languages) 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 scientific fields.

### **Journalism and Communications**

The School of Journalism program includes courses for both undergraduate and graduate students interested in professional training. This year it provides a special workshop course for advisers of student publications in high schools, junior colleges, and colleges. Fitted around the workshop are special courses in graphic arts and magazine writing.

The School also offers courses on the Upper Division-Graduate level in the area of mass communications. Among courses that carry Upper Division and graduate credit are Literary Aspects of Journalism, International Communications and Foreign Affairs, Development of Radio and Television Communications, Interpretation of Contemporary Affairs, Propaganda and Public Opinion, and The Press in a Dynamic Society.

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.

### **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**

City and state supervisors of home economics education and supervising homemaking teachers in secondary schools will be interested in Home Economics Education 190, Readings in Supervision, which will be offered first term.

### **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 (Extension 6654 or 6816).

### **Speech Pathology**

During the Summer Session, the Department of Speech and Theater Arts offers an expanded program in speech pathology at both the graduate and undergraduate

levels. Students interested in continuing their training or working toward graduate degrees may do this through the summer offerings. A special feature of the 1960 Summer Session will be a 6-credit course in aphasia, which will bring to Minnesota national authorities in the study of aphasia and the behavior of brain damaged children and adults.

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, Minneapolis 14.

### **Audiology (Hearing)**

Professional audiology continues to offer opportunities for specialists in communication disorders to cope with clinical problems of measurement, diagnosis, and guidance; and to carry out educational and rehabilitative programs with the acoustically handicapped. An expanded program of courses in audiology with opportunities for supervised clinical experience will be available in both terms.

An important feature of the 1960 Summer Session will be the offering of courses in the Physiology of the Ear and Theories of Hearing by Professor Merle Lawrence of the University of Michigan.

Students can work toward graduate degrees with specialization in audiology during the summer terms. Those concerned with certification in the American Speech and Hearing Association or with a degree program should plan an early conference with Professor Frank M. Lassman, Room D-311, University of Minnesota Hospitals, Minneapolis 14.

### **Workshops in the College of Education**

The College of Education section of this bulletin includes announcements of workshops for school administrators, industrial arts teachers, Special Guidance Institute, as well as information about the higher education workshops offered both terms.

### **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.

### **Music**

Courses of interest to the nonmusic major on the undergraduate as well as graduate level will be offered both terms. These include: Introduction to Music, American Music, History of Church Music, Chorus, Theory, and the various phases of applied music. Liberal Arts credit is given for instrumental or vocal instruction.

Graduate courses as well as undergraduate courses of interest to music majors will be given both terms, including: Applied Music, Theory, History and Literature of Music, Composition. Of special interest to choral musicians will be courses in: History of Vocal Art, History of Church Music, Realization and Interpretation of Choral Masterpieces, and a special course dealing with the music of Heinrich Schütz. There will be a Summer Session chorus, also.

Courses in applied music will be 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.

Artist-performer teachers will be available for graduate as well as undergraduate instruction in all phases of applied music: piano, voice, organ, violin, and all instruments of the orchestra and band. First-chair men of the Minneapolis Symphony Orchestra are members of the regular staff.

Organists will be interested in the Organ Workshop, dealing primarily with the works of Johann Sebastian Bach.

### **Driver Education**

The course in driver education (EdCI 101) will provide the special background required for high school instructors in driver training. This course will be offered both terms on the Minneapolis Campus, and second term on the Duluth Campus. Because registration is limited, interested students must apply in advance for this work.

### **Introduction to Elementary Education**

Introductory courses for prospective elementary school teachers, not ordinarily available in Summer Session, will be given this year. These courses (Ed 75A and B, first term, and 75B, second term) have been planned particularly for persons with Bachelor's degree who wish to prepare themselves for teaching in the elementary schools. Admission to the College of Education as a regular student is prerequisite for registration in these courses.

### **Introduction to Secondary Education**

Introduction to Secondary School Teaching (Ed 55A, first term, and 55B, second term) will be offered for students registered in the Bachelor's 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—Program and Scholarships**

Both terms will include a series of courses in all fields of special education—speech correction, the educable retarded, the deaf and hard-of-hearing, the blind, crippled, and gifted 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 Children for information on applying for scholarships in this area.)

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

### **Homebound and Hospitalized Children**

A special course will be offered in the first summer term on education of homebound and hospitalized children. Field trips and demonstrations will be included. The course (EPsy 181) is specially designed for instructors of the homebound and is scheduled so that other related courses may be taken by students in this field.

### **Teaching the Deaf and Hard-of-Hearing**

The University staff will be augmented by visiting instructors in the area of education of the deaf. This program is designed for teachers in the field and for those who are working to meet the requirements of Minnesota and of other states for the State Department of Education certification in teaching the deaf.

First term courses from which the student may choose are Hearing Disorders (Spch 152), Audiometry and Hearing Aids (Spch 153), and Clinical Practice in Audiology (Spch 157). In the second term the work will include Education of the Auditorially Handicapped Child (EPsy 185), Language Training for the Deaf (Spch 127), Auditory Training (Spch 156), Clinical Practice in Audiology (Spch 157), Advanced Clinical Audiology (Spch 270), Seminar in Hearing (Spch 271-272-273), and a demonstration class of deaf children. There are also related courses in speech correction, psychology, child development and welfare, education, and audiology.

### Teaching the Educable Mentally Retarded

Full sequences of courses for teachers of mentally retarded children will be offered in both terms. Teachers who hold regular teaching certificates and who have at least 2 years' teaching experience in regular classes may earn provisional certificates to teach the retarded by attending either one or both of the 1960 summer terms.

### Education of Blind and Partially Seeing Children

Seven courses for teachers and administrators on the education of blind and partially seeing children will be offered first term. The courses will include one which is an introduction to the education of visually handicapped children (Curriculum and Instruction 115), and one on the structure and function of the eye with educational implications of visual impairment (Curriculum and Instruction 178). A beginning course in Braille (Curriculum and Instruction 116) and an advanced one (117), will include instruction in the Braille codes and in the preparation of various types of school materials in Braille. Three methods courses will emphasize special materials and equipment, instructional procedures, and use of related resources. Curriculum and Instruction 182 is concerned with the child who is partially seeing, 118 with the blind child in the elementary grades, and 120 with the blind student in the secondary schools. A demonstration resource room for blind and partially seeing children will be in operation at the Tuttle Demonstration School. 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.

### Institutes for High School Teachers of Science

**Mathematics, Physics and Chemistry**—An Institute for high school teachers of mathematics, physics and chemistry, supported by the National Science Foundation will be held on the Minneapolis Campus from June 13 to August 5. 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 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 13 to July 23 for high school teachers of biology. Stipends for the participants, dependency and travel allowances are available.

Teaching personnel are associated with the Departments of Agronomy and Plant Genetics, Zoology, Divisions of Radiation Therapy, and Veterinary Surgery and Radiology. (See College of Veterinary Medicine.)

### Research and Training Stipends—Biology

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

### Biostatistics

The third Graduate Summer Session of Statistics in the Health Sciences will be held this year at the University of Minnesota, June 16-July 30, under the auspices of the School of Public Health. This program, supported by a training grant from the National Institutes of Health, is designed to meet some of the educational and training needs of

persons engaged in work in health and health-related agencies or those preparing themselves for such work. A special announcement is available upon request to the Dean of Summer Session, 690 Johnston Hall, University of Minnesota, Minneapolis 14.

### **Ground Water Development**

For the second successive year, the School of Public Health will offer a special intensive program on Development of Ground Water Supplies. This program, conducted at the request and with the assistance of the International Cooperation Administration, will place special emphasis on the public health aspects of such supplies. While designed primarily for engineers employed in foreign areas, the content will be applicable to those engaged in water supply programs in state health departments in the United States. The course will be limited in registration and will continue through both terms. For further information write the School of Public Health.

### **Archaeological Field Session**

An intensive 5-week course, Anthropology 140, in archaeological field research under the direction of the Department of Anthropology will be given at the Northwest School and Experiment Station at Crookston during the second term of the Summer Session. Research will center upon archaic habitations and burial sites in the Glacial Lake Agassiz basin.

### **3M Distinguished Lectures in Chemistry**

Again in 1960 the 3M Visiting Lectureship, sponsored by Minnesota Mining and Manufacturing Company, will bring an outstanding chemist to the campus during the first term, to discuss current advances of significance in chemistry. Professor H. C. Longuet-Higgins, F.R.S., of the University of Cambridge, England, will present a series of lectures on recent progress in the understanding of valence and of molecular structure. (See Physical Chemistry)

### **Statistics**

Courses in statistics will be offered during both terms in the School of Public Health, School of Business Administration, Department of Statistics, Department of Mathematics (College of Science, Literature, and the Arts), and Educational Psychology. In addition, special programs in Statistics in the Health Sciences (See Biostatistics under Special Programs) and undergraduate research training in Statistics are planned.

### **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.

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 Union Post Office on the ground floor of Coffman Memorial Union. Graduate student passes will be issued in 108 Westbrook Hall, 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 at Summer Session rates for either or both terms. Reservations may be made in advance by writing to the Department of Protection and Safety, 520 Johnston Hall, 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 the Administration Building 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 nearly 2 million volumes and a wide variety of periodicals and pamphlets. Large, comfortable reading rooms provide an excellent atmosphere for study.

Departmental libraries on both campuses contain special collections of value to students.

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.



### University Post Offices

The University post offices are located on the ground floor of the 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.

Post-office boxes are provided only for those students registered on the Minneapolis Campus 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.*

### University Health Service

The University Health Service conducts a dispensary and infirmary during the Summer Session on a similar basis to 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, physical examinations, health consultations, and hospitalization. General service is provided free of charge. For services which are specialized and individual in character, such as dentistry, out-patient calls, drugs, prolonged hospitalization, etc., special fees are charged. Surgical care for pre-existing conditions is not provided.

### Housing and Food Service

**Living Expenses**—The living expenses for students at the University are never very high, and this is true especially of the Summer Session. In addition to the University-maintained cafeterias on campus, several good restaurants are to be found in the immediate vicinity of the University. Except in the case of reservations at the residence halls, it is generally more satisfactory to engage accommodations after arrival than to make reservations in advance.

**Minneapolis Campus Residence Halls**—*Ada Comstock Hall*, a residence hall for women, situated along the Mississippi River close to the center of University life, will be open for room and board for the first and second terms this summer. This hall offers comfortable living in large double and single rooms, with well-planned healthful meals served under the direction of a trained dietitian. Applications will be filled in order of date received. To assure a choice of rooms, application should be made as early as possible. Write for applications and additional information to the Director of Comstock Hall, University of Minnesota, Minneapolis 14.

*Sanford Hall*, another residence hall for women, is situated on University Avenue near the entrance to the campus. Sanford Hall will offer rooms only for the first summer term and for the second term provided there is a sufficient number of residents. This hall has spacious 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 meals may be obtained in a University cafeteria adjacent to the building. For application forms and additional information, write to Director of Bailey Hall, University of Minnesota, St. Paul.

**Private Residences**—A considerable number of rooms in private homes, rooming houses, fraternities, and sororities is available. 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 215 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. The St. Paul Campus Cafeteria provides food service for students during the first term. Lunchroom and soda fountain facilities are offered in the St. Paul Campus Union. 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 13, 8 a.m. to 4 p.m.

Fee Payment, last day without penalty—Tuesday, June 14.

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

Wednesday, June 15 .....	\$2.00
Thursday, June 16 .....	3.00
Friday, June 17 .....	4.00
Monday, June 20 .....	5.00

No registrations will be accepted for the first term later than Thursday, June 16, without the special permission of the dean of the school or college concerned.

#### *Second Term*

Registration and Fee Payment—Monday, July 18, 8 a.m. to 4 p.m.

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

Tuesday, July 19 .....	\$2.00
Wednesday, July 20 .....	3.00
Thursday, July 21 .....	4.00
Friday, July 22 .....	5.00

No registrations will be accepted for the second term later than Thursday, July 21, 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 13: 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 13, should begin registration at the Office of Admissions and Records, Minneapolis or St. Paul Campus as appropriate.

### Second Term

July 18: Information Booth, first floor, Administration Building (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, Administration Building, Minneapolis Campus, for registration materials and instructions.

### Courses Tallied in College Offices

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 at the appropriate college tally office indicated. These class reservation cards must be attached to the student's registration blank when it is turned in to obtain statement of fees.

#### Agricultural Engineering

130—CofH 220

#### Analytical Chemistry

51, 53, 54—E 136 for IT, and JohH 210†† for other students  
57—JohH 210††  
All other courses under 200—E 136

#### Art

All courses under 196 *except* 59, 63, 100, 113, 114, 115, 158—JohH 210††

#### Art Education

17, 18, 153, 184—Bu 206††

#### Botany

112, 116, 135, 155—CofH 220

#### Business Administration

5, 24, 25, 26—JohH 210††  
All other courses under 200—VH 107††

#### Civil Engineering

23—E 136

#### Communication

3—JohH 210††

#### Curriculum and Instruction

62, 101, 103, 109, 119, 125, 135—  
Bu 206††

#### Economics

1, 2—JohH 210††  
All other courses under 190—VH 107†† for BA, and JohH 210†† for other students

#### Education

55A, 55B, 75A, 75B—Bu 206††

#### Educational Psychology

110, 116, 116A, 134, 143, 150, 216A, 217A—Bu 206††

#### Electrical Engineering

All courses under 200—E 136

#### Engineering Graphics

All courses—E 136

#### English (IT)

85, 86—E 136

#### English (SLA)

1B, 2B, 3B, 54, 55, 56—JohH 210††

†† These courses will be tallied in the Main Ballroom, Coffman Memorial Union, on the regular registration day, June 13.

**Entomology and Economic Zoology**

59, 124, 162—CofH 220

**Family Life**

1, 1A, 15—JohH 210††

**General College**

All courses—NH 106

**General Engineering**

70—E 136

**History and Philosophy of Education**

180—Bu 206††

**Home Economics**

31—CofH 220 for AFHE, and JohH 210†† for other students

All other courses under 200 *except* 137—CofH 220**Humanities**All courses *except* 1A, 24—JohH 210††**Industrial Education**

106—Bu 206††

**Inorganic Chemistry**

4, 5—CofH 220 for AFHE, E 136 for IT, and JohH 210†† for other students

11, 24, 25, 26—E 136 for IT, and JohH 210†† for other students

All other courses under 200—E 136

**Mathematics (IT)**

All courses—E 136

**Mechanical Engineering**

All courses—E 136

**Mechanics and Materials**

All courses—E 136

**Metallurgy**

All courses—E 136

**Metallurgical Engineering**

All courses under 200—E 136

**Methods and Student Teaching**

52—Bu 206††

**Mining Engineering**

All courses under 200—E 136

**Mortuary Science**

All courses—NH 156

**Natural Science**

All courses—JohH 210††

**Organic Chemistry**

61, 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††

**Petroleum Engineering**

All courses—E 136

**Physical Chemistry**

107, 108—JohH 210††

All other courses under 200—E 136

**Physical Education for Men**

1A, 1B, 1C, 2A, 2C, 8—JohH 210††

**Physical Education for Women**

7, 8, 32—JohH 210††

**Physics**

1A, 2A—JohH 210††

13, 50A—E 136

**Plant Pathology and Botany**

56, 156—CofH 220

**Rhetoric**

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

**Social Science**

All courses—JohH 210††

**Speech and Theater Arts**

5A, 6, 32, 51, 65, 81, 91, 112, 131, 153—JohH 210††

**Zoology**

55, 115, 119, 135—CofH 220

†† These courses will be tallied in the Main Ballroom, Coffman Memorial Union, on the regular registration day, June 13.

### 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) .....	\$57.50
Incidental fee <sup>††</sup> (per term) .....	9.50
Total fee (per term) .....	\$67.00

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) .....	\$45.00
Incidental fee <sup>††</sup> (per term) .....	9.50
Total fee (per term) .....	\$54.50

NOTE—Regular tuition fees as provided during the academic year will be charged all students in Nursing. In Law, Veterinary Medicine, Medicine, and Dentistry, residents pay the regular Summer Session tuition fee, nonresidents 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 \$30.00 tuition per term and the incidental fee.

Eligible Summer Session staff members pay at the following rates: more than 3 credits, \$35.50 per term; 3 credits or less or thesis only, \$17.75 per term; plus incidental fee.

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

- Medical School
- School of Dentistry
- Itasca Forestry and Biological Station
- Law School
- School of Nursing
- College of Veterinary Medicine

<sup>††</sup> The incidental fee of \$9.50 per term is charged each student for which the student receives the privileges of the Coffman Memorial Union, the Health Service, and the recreation program including the *Minnesota Daily*.

### Course Fees

*All fees are per term unless otherwise indicated.*

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

#### Civil Engineering

\$35.00—23 (summer camp)

#### Composition (SLA)

††\$21.00—X Preparatory Composition

#### English (Duluth)

††\$21.00—X Preparatory English

#### Itasca Biological Station

\$10.00—Laboratory fee

††\$25.00—Research Table fee

#### Mathematics (IT)

††\$21.00—8 Solid Geometry

#### Mathematics (SLA)

††\$35.00—X Preparatory Mathematics

#### Modern Language Institute (Summer Session)

\$40.00 per term—French (22, 58, 108);  
or German (22, 66, 107)

#### Music

\$25.00—60B, 61B, 62B

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

50.00—13B

70.00—204

10.00—Piano for children, ages 6-16

Students paying \$25.00 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.

#### Music Education

225E—Same as Music 11-27, 100

#### 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, 12, 32)

#### Public Health

\$100.00—169, 190

\$200.00—230 (September field course)

\$185.50—231, 232

\$ 60.00 for one or more of the following courses—270, 271, 272, 273, 274, 275, 276, 277, 278, 279

#### Rhetoric (AFHE)

††\$7.00 per credit for more than 6 credits in Rhet I

### 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  
.20 per hour—small organ  
.40 per hour—large organ

#### Speech and Hearing Clinic—

##### Non-students

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

†† 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; Agricultural Biochemistry, Art, Pharmacy, and Physiological Chemistry 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) completed in Minneapolis, St. Paul, or Duluth 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 14, 8 p.m.
- Second term ..... Thursday, August 18, 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 .....	\$5.00
Institute of Technology .....	\$2.50
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.

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 considered by the Graduate School as such and by graduate advisers in the departments in which the applicants propose to carry major work and 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, the Miller Analogies Test, or the Ohio Psychological Examination.

### Admission

Students must make application for admission at least 4 weeks before the opening of the Summer Session which they expect to attend in order to avoid delay and last-minute disappointment as well as possible penalty for late registration. Applicants who do not hold a degree from the University of Minnesota must present a transcript in duplicate of their undergraduate work. Applicants who hold a degree from the University of Minnesota are expected to present a certified copy of their scholastic record. Applications should be sent to the Dean of the Graduate School, University of Minnesota, Minneapolis 14.

### 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 the 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 should apply for admission to candidacy for that degree on a blank provided for the purpose. This application should be submitted as soon as a student has earned sufficient credits to be eligible for candidacy. The *application for candidacy* will be reviewed by an appropriate committee normally from the major department, division, or college. This committee will recommend to the dean, through the appropriate graduate group committee, the acceptance or rejection of the application for candidacy. The dean or the reviewing committee may require any evidence which is thought pertinent to the consideration of the application.

Transfer from one plan to the other may be made only with the approval of the adviser and the appropriate graduate group committee.

### Master's Degree, Plan A

The *course work* for the Master's degree according to Plan A may be completed in 4 separate summer terms of 5 weeks each. In this case, the candidate will be expected

to register for thesis work either in residence or *in absentia* to complete the equivalent of 3 quarters. All requirements for the Master's degree under Plan A must be completed within 6 years after the initiation of the degree program.

The Master's degree under Plan A may be earned by qualified students who complete a minimum of 27 quarter credits, 18 in the major and 9 in the minor, who meet special requirements such as that of a reading knowledge of a foreign language, and who present a satisfactory thesis and pass the required final written and/or oral examinations.

Theses of Summer Session students must be complete and registered in the Graduate School office at least 6 weeks before the end of the term in which they take the degree (first term: Thursday, June 2, 1960; second term: Thursday, July 7, 1960).

### Master's Degree, Plan B

The requirements under this plan in matters of admission, residence, and language requirements follow Plan A. Plan B differs in substituting for the thesis a heavier course requirement which, if met in Summer Sessions, means more than the minimum 4 sessions of course work possible under Plan A. All requirements for the Master's degree under Plan B must be completed within 7 years after the initiation of the degree program.

Under Plan B, candidates for the Master's degree must complete, with an average of B, a minimum of 45 quarter credits in courses listed in the *Bulletin of the Graduate School*. At least 21 credits shall be in a single field of concentration. At least 18 credits shall be in related fields, and it is understood that this work shall include at least 2 *fields other than the major* (with not less than 6 credits in each). The Master's degree under Plan B, as compared with Plan A, is somewhat less a test of research interest and is more adapted to those who, for example, as teachers or school administrators, will profit by a broader range of knowledge in the fields with which they are professionally concerned. The requirements under Plan B are meant to forward the students' advanced education, not on a different level but for a somewhat different purpose than in the case of the requirements for Plan A.

Under Plan B, at least 9 quarter credits either in the field of concentration or in related fields must be in advanced courses, seminars, or independent work under faculty supervision and requiring the preparation of written reports representing the quality but not the range of a Master's thesis. *Courses which offer an opportunity to meet this 9-hour requirement are marked in this bulletin with one asterisk (\*).*

Full statements of the requirements for advanced degrees may be found in the Graduate School bulletins.

Students must register in the Graduate School if their work is to count toward an advanced degree.

All requests for information concerning graduate work, including admission to the Graduate School, should be addressed to the Dean of the Graduate School, 316 Johnston Hall, University of Minnesota, Minneapolis 14.

## 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 BIOCHEMISTRY (AgBi)

#### *First Term and Second Term*

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

### AGRICULTURAL ECONOMICS (AgEc)

#### *First Term*

109. **Agribusiness.** Intensive study of the character, extent and economic implications of the existing interrelationships between agriculture and the industries which supply agriculture and which process and distribute the products of agriculture. Meets for first three weeks only. (3 cr; VII-VIII MTWThF; HH 210) Goldberg
200. **General Seminar in Agricultural Economics.** Special problems for individual work by qualified students. (3 cr; prereq # in advance of registration; ar) Staff
205. **Special Seminar for Foreign Graduate Students in Agricultural Economics.** Application of learning in the universities of the United States to the needs and problems of the home countries of Far Eastern graduate students in agricultural economics. (6 cr; prereq #; II-VI MTWThF; HH 210) Berg and staff

#### *Second Term*

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

### AGRICULTURAL EDUCATION

See index

**AGRICULTURAL ENGINEERING**

*First Term*

**MECHANIZED AGRICULTURE (MeAg)**

130. **Farm Shop Management.** Planning high school farm shops including building layouts, equipment organization, tool and supply selection, and storage methods. Administering shop programs, demonstrations, job records and shop problems relating to the student's farming program. (3 cr; prereq AgEd majors, AgEd 91, 4 and 3 addtl cr in Mechanized Agriculture or #; I-II MTWThF; AgEn 35) Marvin
131. **Problems and Field Studies in Advanced Farm Mechanics.** Farm Mechanics principles and skills necessary for efficient operation, maintenance and service of modern mechanical farm equipment. (3-9 cr; prereq 130; III-IV MTWThF; AgEn 35) Marvin

**AGRONOMY AND PLANT GENETICS (Agro)**

*First Term and Second Term*

**AGRONOMY**

- 201.\* **Research in Farm Crops.** Problems in physiology, production and classification of crop plants. (Cr ar; prereq 121, 123; ar) Behrens, Schmid

**PLANT GENETICS**

- 241.\* **Research in Plant Genetics.** (Cr ar; ar) Myers, Burnham, Rinke, Lambert, Thomas, Snyder, Caldecott, Sentz
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*

164. **Sheep Production.** Adaptability, breeding, feeding, management, marketing and economic consideration of commercial sheep production. (3 cr; prereq 37, 37A, 62 or #) Jordan
- 213.\* **Research in Animal Husbandry.** Special problems assigned to students to be worked out under the supervision of a faculty member. (3 to 5 cr; ar) Comstock, Hanson, Harvey, Jordan, Meade

*Second Term*

- 213.\* **Research in Animal Husbandry.** (See first term) (3 to 5 cr; ar) Comstock, Hanson, Harvey, Jordan, Meade

**DAIRY HUSBANDRY (DyHu)**

*First Term and Second Term*

- 208.\* **Research in Dairy Production.** Facilities for study and investigation of subjects pertaining to dairy cattle. (Cr ar; prereq prelim grad work; ar) Cole, Donker, Graham, Williams

**DAIRY INDUSTRIES (DInd)***First Term and Second Term*

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

**ENTOMOLOGY AND ECONOMIC ZOOLOGY (Ent)††***First Term*

- 197.° **Introduction to Research.** Preparation for investigational work in lines of entomology and economic zoology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. (Cr ar; prereq 9 hrs entomology and other prescribed work; ar) Hodson, Holdaway, Marshall, Richards, Smith, Beer, Cook, Cutkomp, Haydak, Peterson, Brooks, Price, Waters
- 204.° **Research in Entomology and Economic Zoology.** Research work in various phases of entomology and economic zoology for qualified students. Students who plan to undertake special problems should correspond with the department in advance. (Cr ar; ar) Hodson, Holdaway, Marshall, Richards, Smith, Beer, Cook, Cutkomp, Haydak, Peterson, Brooks, Price, Waters

*Second Term*

- 197.° **Introduction to Research.** (See first term)
- 204.° **Research in Entomology.** (See first term)

**FORESTRY (For)****OFFERED ON THE ST. PAUL CAMPUS***First Term and Second Term*

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

---

†† For additional courses in the first term see Lake Itasca Forestry and Biological Station.

OFFERED AT ITASCA FORESTRY AND BIOLOGICAL STATION

*Second Term*

August 1 to September 9

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 including transfer students in the Forest Resources Management curriculum.

2. **Important Forest Plants.** Identification and classification of the important forest plants of Itasca State Park, with emphasis of forest site and type, plant indicators. (2 cr) Rees
  5. **Field Forest Ecology.** Forest laboratory exercises designed to give student basic information on forest types, ecological succession, tolerance, reproduction factors, and relative growth and longevity of important native forest tree species. (4 cr) Hansen, Bakuzis
  6. **Field Measurements.** Largely field work. Includes use of compass, pacing, and mapping; elementary work in tree measurements; timber cruising, 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*

- FL 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, and cr must be added to SLA graduation requirement; II MTWThF; JohH 205) Ludwig
3. **Clothing Construction A.** Cutting, fitting, pressing, and construction of selected garments using a variety of fabrics; commercial pattern interpretation and fitting, garment alteration, and sewing machine maintenance. (3 cr; prereq 1; VI-VII MTWThF; McNH 327) Williams
24. **Problems in Home Planning and Furnishing.** Exteriors and interiors of houses studied for their design and suitability to family and locality. Problems in planning and furnishing a home worked out on the basis of family living. Class work in combining fabrics, furniture, and accessories in rooms. Field trips. (5 cr, §GC 3D, FL 15; prereq 20, 21 and 49 recommended; VI-VII MTWThF; McNH 359) Esteros
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 433) Abell
49. **Household Equipment.** The principles that should guide in the selection, operation, care, and convenient arrangement of equipment in the home. (3 cr; prereq AgEn 35 or #; VIII-IX MTThF; McNH 124, 128) Hocraffer
66. **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; ar) Hitchcock
76. **Nutrition of the Family.** Principles of nutrition and the problems of food selection most commonly met in everyday living. (4 cr, §HE 170 and 171; prereq 31, 40, physiology or human biology; IV MTWThF, V 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 managing and sharing the various activities and responsibilities involved in the group living of the students in residence. (4 cr; prereq 85 or ¶, 40, 41 recommended; deposit of \$10 required) Nielsen, Turney
126. **Special Problems in Crafts.** Advanced study in weaving, enameling, leatherwork, metalwork, or other crafts. 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 433) Abell
127. **Purchasing Home Furnishings.** Detailed study of home furnishings in terms of use, cost, and appearance. Includes furniture, dinnerware, floor and wall coverings, fabrics, and accessories. Actual materials, slides, and references used. Field trips. (3 cr; prereq 24, 50; VII-IX TTh, VII-VIII MWF; McNH 360) Ludwig
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; V MTWThF; McNH 125) Gordon
154. **Pattern Design and Alteration.** Principles of flat pattern designing, pattern alteration, modification of commercial patterns, and principles of fitting. Course is designed to develop versatility in use of commercial patterns as well as to give experience in designing original garments. Includes development of individual master pattern. (3 cr; prereq 4 or equiv, 22 or equiv, or #; VI-VII MTWThF; McNH 328) Carlson
165. **Workshop in Administrative and Therapeutic Dietetics.** (June 15-July 1) A refresher course in administrative and therapeutic dietetics for hospital dietitians. Includes quantity food cost control, purchasing, equipment, and diet therapy. (3 cr; prereq #; morning and afternoon 8:30-4:30 MTWThF; McNH 227) Gormican, Hitchcock
184. **Home Management Principles.** A study and discussion of managerial aspects of homemaking; work simplification of household activities; financial records and budget-making for the individual and the family. (3 cr; prereq 40, 41 advised; III MTWThF; McNH 201) Turney
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 #; ar) Esteros
249. **Seminar in Foods.** Review and interpretation of the literature. (1-2 cr; prereq #; ar) Noble
- 295-296. **Home Economics Problems: Family Relationships, Foods, Household Equipment, Nutrition, Related Art, and Textiles.** Independent study and written reports. (1-5 cr; prereq #; ar) Davison, Ehrenkranz, Esteros, Noble, Morse

### *Second Term*

31. **Introduction to Nutrition.** Application of nutrition principles to the food selection of college students. Includes information on the relation of food to the promotion and maintenance of health. (3 cr, §GC 3B or HE 30; IV MTWThF; McNH 125) Hitchcock



49. **Household Equipment.** (See first term) (VI-VII MTThF; McNH 124, 128) Ehrenkranz
86. **Home Management Laboratory.** (See first term) Nielsen, Turney
89. **Special Problems in Household Equipment.** An intensive study of various phases of household equipment by means of individual laboratory problems. (2-4 cr; prereq 49 with grade of B, AgEn 35, #; I-III MTThF; McNH 124, 128) Ehrenkranz
185. **Family Relationships.** Factors that promote satisfaction in family living, and inter-relationships of the family and the community. (3 cr; prereq 17, HEED 90 or #; ar) Ar.
- 295-296. **Home Economics Problems.** (See first term) Davison, Ehrenkranz, Esteros, Noble, Morse

## HOME ECONOMICS EDUCATION

See index

### HORTICULTURE (Hort)

#### *First Term and Second Term*

- 190-191-192. **Special Problems.** Problems based upon work given in preceding courses. (2-4 cr; prereq #; ar) Staff
- 247.\* **Reports on Special Horticultural Topics.** (Cr ar, maximum 9) Staff
- 249.\* **Research in Horticultural Crop Breeding.** (Cr ar, maximum 9) Currence, Hutchins, Wilcox

### PLANT PATHOLOGY AND BOTANY (PIPa)§§

#### *First Term and Second Term*

- 206.\* **Research in Plant Pathology.** Special assignment of work in laboratory and field problems in pathological research. (Cr ar; PP) J J Christensen, C M Christensen, Eide, Hart, King, French, Kommedahl, Rowell
- 210.\* **Problems in Mycology.** Research along such lines as taxonomy of natural groups, fungus flora of particular regions, localities, or habitats; investigation of fungi involved in industrial or natural processes; morphology or physiology of special forms. (Cr ar; prereq 105-106-107; PP) J J Christensen, C M Christensen
- 254.\* **Research Problems in Applied Plant Physiology.** Special assignment of work in applied plant physiology. (Cr ar; AgBot) Rowell, Linck, Landon
- 260.\* **Research Problems in Agricultural Botany.** Special assignment of problems in agricultural botany. (Cr ar; AgBot) J J Christensen, Kommedahl, Linck

### POULTRY HUSBANDRY (PoHu)

#### *First Term and Second Term*

- 214.\* **Research in Poultry Husbandry.** 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

§§ For additional courses in the first term see index, Lake Itasca Forestry and Biological Station.

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. (3 cr; prereq satisfaction of freshman communication requirements; IV MTWThF; AgEng 307) Cashman

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) Brown, Mixon, Price

Sec 1, I MTWThF, ForH 15

Sec 3, III MTWThF, ForH 15

Sec 2, II MTWThF, ForH 15

Sec 4, IV MTWThF, ForH 15

51. **Exposition.** Essays and articles, technical writing, application letters, review of English usage. (3 cr; prereq satisfaction of freshman communication requirements; III MTWThF; AgEng 307) Price

**Hum 1A. Age of the Enlightenment.** The 18th century: Age of the Enlightenment and Age of Revolution. Readings in Voltaire, Locke, Rousseau, Tolstoy. The art of the 18th century. (3 cr; II MTWThF; AgEng 108) Carr

**Hum 24. American Humanities.** Impact of European ideas on American thought. The agrarian myth. Pragmatism, protestantism and laissez-faire. America and the world. (3 cr; V MTWThF; AgEng 108) Carr

### *Second Term*

22. **Public Speaking.** (See first term) (IV MTWThF; AgEng 307) Nichols

47. **Efficient Reading.** (See first term) Wright, Whipp

Sec 1, I MTWThF, ForH 15

Sec 3, III MTWThF, ForH 15

Sec 2, II MTWThF, ForH 15

Sec 4, IV MTWThF, ForH 15

**Spch 251. Seminar: Listening Comprehension.** Research problems and methods in this field. Evaluation of published research. (2 cr; III MTWThF; AgEng 221) Nichols

## SOILS (Soil)

### *First Term and 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 13-July 16*

During the *first 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 13, ending July 16.

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, 690 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 Biology Session Bulletin)

### 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 students wishing to apply credits toward a degree at Minnesota must complete regular admission procedures with the Dean of the Graduate School, University of Minnesota, Minneapolis 14. Graduate students in good standing at another recognized graduate school should complete Transient Graduate Student Form No. 218. Applications must be made at least 4 weeks before the opening of the Itasca Biology Session. (See also information under Graduate School)

---

†† See section on Admission and Registration.

Graduate work taken at the Itasca Biology Session may be considered for resident requirement at the University of Wisconsin upon application to the Dean of 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 bring their Request for Reservation found on the back cover of the Itasca Biology Session Bulletin 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 Dean of the Summer Session, 690 Johnston Hall, University of Minnesota, Minneapolis 14. 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 14 if class space is available.

The following fees are payable by each registrant on or before June 14 and must be paid before registration is completed:

Tuition fee .....	\$63.00
Incidental fee .....	9.50
Laboratory fee .....	10.00
Total fees for the term .....	<u>\$82.50</u>

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 \$30.00 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 \$25.

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 \$70 for the 5 weeks. A charge of \$13.75 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 \$167 for the 5-week session does not include traveling expenses, clothing, laundry, and minor incidental personal expenses.

Tuition and fees are payable on or before June 14. After that date the late fee will be charged according to the following schedule:

Wednesday, June 15 .....	\$2.00
Thursday, June 16 .....	3.00
Friday, June 17 .....	4.00
Monday, June 20 .....	5.00

No registration will be accepted after Thursday, June 16 without the approval of the director in charge.

### First Term

#### BOTANY (Bot)

PIPa 56. Introduction to the Study of Fungi. See Plant Pathology.

112. Aquatic Flowering Plants. (4 cr; prereq 10 cr in botany or zoology, or #; WS) Monson

116. Summer Flora of Minnesota. (2-4 cr; prereq 10 cr in botany or zoology, or #; TF) Morley

135. Ecology of the Itasca Region. (4 cr; prereq Bot 50 or 130 or For 4; MTh) Martin
155. Fresh-Water Algae. (4 cr; prereq 10 cr in botany, biology, or zoology, or #; TF) Thompson
- PIPa 156. Advanced Study of Fungi. See Plant Pathology.
- 196.\* Problems in Ecology, Taxonomy, Bryology, or Algology. (Cr ar; prereq #) Martin, Monson, Morley, Thompson
- 208.\* Research Problems in Taxonomy. (Cr ar; prereq #) Monson, Morley
- 224.\* Research Problems in Ecology. (Cr ar; prereq #) Martin
- 236.\* Research Problems in Cryptogams. (Cr ar; prereq #) Thompson

## ENTOMOLOGY AND ECONOMIC ZOOLOGY (Ent)

59. Field Entomology. (4 cr; prereq jr, sr, Zool 1-2-3 or equiv; TF) Berner
124. The Biology of Immature Insects. (4 cr; prereq 15 cr in zoology and Ent 52 or equiv or  $\Delta$ ; WS) Berner
162. Ecology of Terrestrial Vertebrates. (4 cr; prereq Zool 57-58 and Ent 63, or equiv and Bot 50; MTh) (There will be a "cost basis charge" for mileage on field trips) Marshall, Frenzel
- 196.\* Special Problems in Entomology and Economic Zoology. (Cr ar; prereq #) Marshall, Berner, Frenzel

## PLANT PATHOLOGY AND BOTANY (PIPa)

56. Introduction to the Study of Fungi. (4 cr; prereq jr, sr, 9 cr in botany, or #; MTh) French
156. Advanced Study of Fungi. (4 cr; prereq 9 cr in botany, or #; MTh) French
- 210.\* Special Problems in Mycology. (Cr ar; prereq grad, Myc 105-106-107) French

## ZOOLOGY (Zool)

55. Natural History of Invertebrates and Fishes. (4 cr; prereq Zool 1-2-3, NSci 7-8-9, or equiv; WS) Underhill
115. Advanced Natural History of Invertebrates and Fishes. (4 cr; prereq 15 cr in zoology; WS) Underhill
119. Limnology. (4 cr; prereq 15 cr in zoology; MTh) Underhill
135. Field Ornithology. (4 cr; prereq 15 cr in zoology; TF) Warner
- 197.\* Problems in Ornithology, Ecology, and Limnology. (Cr ar; prereq Zool 1-2-3 or NSci 7-8-9 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, the College of Agriculture, Forestry, and Home Economics, or the Institute of Technology. These requirements may be completed at another institution. A student must have a minimum of 90 credits, with 2 grade points per credit.

## *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 dean 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.

## BUSINESS ADMINISTRATION (BA)

### *First Term*

5. **Elements of Statistics.** Elementary concepts in statistical methods. 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; prereq Math 10 or equiv; III MTWThF; VH 2) Hastings
24. **Principles of Accounting.** Methods of recording, reporting, and interpreting business events. Use of accounting as a tool of business management. (Students who have high school course or experience in bookkeeping may be admitted to BA 25 by passing placement test.) (3 cr, §55A; prereq 3rd qtr fr; I MTWThF; VH 6) Ar.
26. **Principles of Accounting.** (3rd qtr, see 24) (3 cr, §55B; prereq 25; II MTWThF; VH 307) Ar.
50. **Production Management.** Introduction to the management of the production function. The techniques, the managerial problems, and the decision-making processes in planning and controlling the production activity. Emphasis is on production as a function of the enterprise rather than as a strictly manufacturing activity. Research

- and development, the role of standards, physical facilities, systems and procedures analysis, work measurement, materials control, quality control, and production planning and control. (3 cr, §150; prereq Econ 2 or equiv; III MTWThF; VH 1) Meier
51. **Business Statistics.** Basic concepts of regression and correlation; statistical estimation and decision-making, with applications to such fields as survey sampling, acceptance sampling and statistical quality control; introduction to time series analysis and index numbers. (3 cr, §161; prereq soph with #, 5 or equiv; IV MTWThF; VH 1) Hastings
52. **Modern Industrial Relations: Labor Marketing.** An introduction to current employment relationships, emphasizing an economic approach and analysis. Fundamentals of the application and conservation of human resources in employment with consideration of 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; V MTWThF; VH 1) Mohr
53. **Insurance Principles.** Risk and its adverse economic effects; methods of handling risk; theory of insurance and insurable risks; insurable personal, property, and liability risks; risk management; personal, property, and liability insurance contracts; types of insurers; production, underwriting, actuarial, finance, and claims functions of insurers; industry and government regulation; social insurance. (3 cr, §153; prereq Econ 2 or equiv; IV MTWThF; VH 2) Williams
54. **Transportation I: Principles.** Introduction to the roles, interests, and relationships of users of the service, carriers, and regulatory agencies in the transportation field, emphasizing the 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 and evaluation of national transportation policy. (3 cr, §154; prereq Econ 2 or equiv; I MTWThF; VH 1) Nightingale
- 55A. **Elementary Accounting.** The equivalent of 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 College of SLA; prereq soph [summer only]; IV MTWThF, VI TTh; VH 306) Ar.
- 55D. **Analysis of Financial Statements.** Interpretation and analysis of financial statements for credit, investment, and managerial purposes. (3 cr, §105C or 265B; prereq 26 or equiv; II MTWThF; VH 306) Ar.
56. **Corporation Finance.** The corporation in comparison with other types of business units. Organization and capital structure, raising fixed and circulating capital, treatment of corporate earnings, incentives to and forms of combination, trusteeship, and reorganization. (3 cr, §156; II MTWThF; VH 207) Olson
57. **Principles of Marketing.** Marketing functions and institutions. Channels of distribution. Retail and wholesale trade. Pricing policies and practices. Marketing policies and methods for consumers' goods, producers' goods, and raw materials. (3 cr, §157; prereq Econ 2 or equiv; II MTWThF; VH 6) Holloway
58. **Business Law: Contracts.** Law of contracts. Case method. (3 cr, §158; prereq Econ 2 or equiv; I MTWThF; VH 2) Wright
60. **Business Policy and Management Control.** An evaluation of the areas of managerial authority and responsibilities, organizational relationships, and effective executive action. Presents managerial problems of policy formulation involving decisions based

- upon a knowledge of all the major functions in the firm. (3 cr, §160; prereq 3rd qtr sr; II MTWThF; VH 1) Meier
72. **Modern Industrial Relations: Manpower Management.** Introduction to the field of personnel management and labor relations, emphasizing 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; prereq 52 or 152; V MTWThF; VH 6) England
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; I MTWThF; VH 113) Williams
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; IV MTWThF; VH 113) Holloway
- 105A. **Intermediate Accounting I.** Review of accounting processes, measurement of income accounting treatment of inventories and plant assets. (3 cr; prereq 26 or equiv; III MTWThF; VH 306) Bentley
- 115A. **Cost Accounting.** Practices, principles, and procedures of handling production costs for use in inventory valuation and income determination. An examination of job order, process, and standard cost systems. A brief introduction to standard cost as a tool of cost control. (3 cr, §55C; prereq 26 or equiv; II MTWThF; VH 2) Bentley
150. **Administration of Production.** (See 50) (3 cr, §50; prereq grad; III MTWThF; VH 1) Meier
151. **Elements of Statistics.** (See 5) (3 cr, §5, Soc 45; prereq grad, Math 10 or equiv; III MTWThF; VH 2) Hastings
152. **Principles of Industrial Relations: Labor Marketing.** (See 52) (3 cr, §52; prereq grad, Econ 2 or equiv; V MTWThF; VH 1) Mohr
153. **Insurable Risks and Insurance.** (See 53) (3 cr, §53; prereq grad, Econ 2; IV MTWThF; VH 2) Williams
154. **Transportation I: Principles.** (See 54) (3 cr, §54; prereq grad, Econ 2 or equiv; I MTWThF; VH 1) Nightingale
- 155A. **Introduction to Managerial Accounting.** (See 55A) (3 cr, §24 or 55A; prereq grad; IV MTWThF, VI TTh; VH 306) Ar.
156. **The Modern Corporation.** (See 56) (3 cr, §56; prereq grad; II MTWThF; VH 207) Olson
157. **Marketing Management.** (See 57) (3 cr, §57; prereq grad, Econ 2 or equiv; II MTWThF; VH 6) Holloway
158. **Business Law: Contracts.** (See 58) (3 cr, §58; prereq grad; I MTWThF; VH 2) Wright
160. **Management Organization and Business Policy.** (See 60) (3 cr, §60; prereq grad; II MTWThF; VH 1) Meier
161. **Business Statistics.** (See 51) (3 cr, §51; prereq grad, 151 or equiv; IV MTWThF; VH 1) Hastings



- 172. Principles of Industrial Relations: Manpower Management.** (See 72) (3 cr, §72; prereq 52 or 152; V MTWThF; VH 6) England
- 174. Transportation II: Traffic Management.** Principles of transport control and their application within the industrial (noncarrier) firm; carrier traffic management. Principles governing construction, interpretation, and application of rail, motor, water, express, pipeline, freight forwarder, and air freight classifications and tariffs. Problems involving determination of charges on typical movements within and between major freight-rate territories. (3 cr; prereq 54 or 154; III MTWThF; VH 205) Nightingale
- 176. Investments.** General or "cross cut" survey of external and internal factors influencing prices of securities, and of principles of an investment policy for the individual investor. Objective analysis from source materials of factors explaining price differentiation. (3 cr; prereq 56 or 156; IV MTWThF; VH 6) Olson
- 185A. Advanced Accounting.** Consolidated statements, fiduciary and fund accounting, partnership accounting. (3 cr; prereq 105C or ¶105C; III MTWThF; VH 113) Lund
- 212. Employee Development and Training.** Determination of development and training goals, implementation and evaluation of programs for improved development and training from the standpoint of professional manpower management. (3 cr; prereq 72 or 172; IV MTWThF; VH 210) Ar.
- 217. Market Analysis and Research.** (See 97) (3 cr, §97; prereq 51 or 151 and 57 or 157; IV MTWThF; VH 113) Holloway
- 265B. Corporate Statements.** (See 55D) (3 cr, §55D or 105C; prereq 26 or equiv; II MTWThF; VH 306) Ar.
- 272. Graduate Topics in Industrial Relations.** Designed to develop familiarity with concepts, practices, and ethics of professional competence and standards in industrial relations. Emphasis upon group and organized research, advisory and service functions. (3 cr; prereq sr #, 72 or 172; III MTWThF; VH 210) Ar.

**NOTE—Graduate Readings and Research in Business Administration** by the Staff. Available in the following areas: Industrial Management and Administration (BA 290A, B); Statistics (BA 291A, B); Manpower Economics and Industrial Relations (BA 292A, B); Insurance (BA 293A, B); Transportation (BA 294A, B); Accounting (BA 295A, B); Finance (BA 296A, B); Marketing (BA 297A, B).

### Second Term

- 5. Elements of Statistics.** (See first term) (III MTWThF; VH 306) Willis
- 25. Principles of Accounting.** (Continuation of 24) (Students who have had a high school course or experience in bookkeeping may be admitted to 25 by passing a placement test) (3 cr, §55B; prereq 24; IV MTWThF; VH 6) Berryman
- 51. Business Statistics.** (See first term) (I MTWThF; VH 1) Willis
- 52. Modern Industrial Relations: Labor Marketing.** (See first term) (II MTWThF; VH 1) Mohr
- 55B. Elementary Accounting.** (Combined course—continuation of BA 55A) The equivalent of 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 the College of Science, Literature, and the Arts; prereq soph [summer only], 55A; IV MTWThF, VI TTh; VH 2) Meyers

- 55C. Managerial Costs.** General survey of cost accounting from point of view of the executive who must use cost information in conduct of his business. (3 cr, §115A or 115B, 265A; prereq 26 or equiv; III MTWThF; VH 2) Nelson
- 56. Corporation Finance.** (See first term) (V MTWThF; VH 1) Nilsen
- 57. Principles of Marketing.** (See first term) (III MTWThF; VH 1) Lewis
- 76. Finance Management.** Duties of the financial manager of a modern business, various sources from which capital may be secured, best use of a company's funds, and special financial problems which arise in the typical business. (3 cr, §276; prereq 56 or 156; IV MTWThF; VH 1) Nilsen
- 105B. Intermediate Accounting II.** Accounting treatment of cash, receivables, investments, intangible assets, and applications of actuarial mathematics. (3 cr; prereq 105A; III MTWThF; VH 6) Berryman
- 115B. Cost Accounting.** An analysis of the use of cost information in managerial decision making. (3 cr, §55C; prereq 115A; II MTWThF; VH 2) Nelson
- 117. Sales Management I.** Management of selling activities including sales policies and planning, sales promotion, sales organization and channels of distribution, selection, training and compensation of salesmen, control of sales performance, sales budgets, and cost control. Case materials. (3 cr, §237; prereq 57; II MTWThF; VH 6) Lewis
- 151. Elements of Statistics.** (See first term) (III MTWThF; VH 306) Willis
- 152. Principles of Industrial Relations: Labor Marketing.** (See first term) (II MTWThF; VH 1) Mohr
- 155B. Introduction to Managerial Accounting.** (Combined course—continuation of BA 155A) (See 55B) (3 cr, §25-26 or 55B; prereq grad, 155A; IV MTWThF, VI TTh; VH 2) Meyers
- 156. The Modern Corporation.** (See first term) (V MTWThF; VH 1) Nilsen
- 157. Marketing Management.** (See first term) (III MTWThF; VH 1) Lewis
- 161. Business Statistics.** (See first term) (I MTWThF; VH 1) Willis
- 175B. Data Processing.** Fundamentals underlying processing of data within a business organization; application of such fundamentals in manual, tabulating, and electronic data-processing systems, including programming of such activities as billing, payroll, inventory control, and costing. (3 cr; prereq 115B; I MTWThF; VH 2) Meyers
- 182B. Intermediate Manpower Management.** Manpower policy development, application and evaluation within union and company managements; manpower research and auditing. (3 cr; prereq 72 or 172; VI-VII TW; VH 6) Yoder
- 237. Sales Management.** (See 117) (3 cr, §117; prereq 57; II MTWThF; VH 6) Lewis
- 265A. Managerial Cost Accounting.** (See 55C) (3 cr, §55C or 115A or 115B; prereq 26 or equiv; III MTWThF; VH 2) Nelson
- 276. Finance Management.** (See 76) (3 cr, §76; prereq 56 or 156 and 55D or 105A and 105C; IV MTWThF; VH 1) Nilsen
- 282. Graduate Topics in Industrial Relations.** Designed to develop familiarity with concepts, practices, and ethics of professional competence and standards in industrial relations. Emphasis upon group and organized research, advisory and service functions. (3 cr; prereq sr #, 72 or 172; VI-VII MTh; VH 210) Ar.

NOTE—Graduate Readings and Research in Business Administration, by the Staff. Available in the following areas: Statistics (BA 291A,B); Manpower Economics and Industrial Relations (BA 292A,B); Accounting (BA 295A,B); Marketing (BA 297A,B).

## ECONOMICS (Econ)

*First Term*

1. **Principles of Economics.** A study of the principles underlying economic activity and of 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, §C or 1T or 50A; prereq 3rd qtr fr)  
     Sec 1, III MTWThF, VH 6. Ar.                      Sec 2, V MTWThF, VH 2, Bonifield
2. **Principles of Economics.** A continuation of 1 including study of national income, money and banking, business cycles, and international trade. (3 cr, §C or 2T or 50B; prereq 1; II MTWThF; VH 113) Hadjiyanis
65. **Intermediate Economic Analysis: The Firm.** Examination of the behavior of firms under competitive and monopolistic conditions, with particular attention to factors influencing the firm's decisions regarding production, output, and prices. (3 cr, §165; prereq 2 or equiv; I MTWThF; VH 207) Richter
66. **Intermediate Economic Analysis: Income and Employment.** Determinants of national income, employment, and price level, with particular attention to aggregate consumption and investment. (3 cr, §166; prereq 2 or equiv or #; V MTWThF; VH 207) Coen
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; III MTWThF; VH 301) Coen
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; prereq 65 or 165 for bus or econ maj, law or pol sci or # for others; IV MTWThF; VH 207) Simler
104. **International Economics.** An introductory treatment of the 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; VH 205) Krueger
162. **Union Government and Policies.** Internal administration and government of unions; economic and social issues; hours, wages, and other conditions of employment. (3 cr, prereq BA 52 or 152; III MTWThF; VH 211) Simler
165. **Economic Analysis: The Firm.** (See 65) (3 cr, §65; prereq grad, 2 or equiv; I MTWThF; VH 207) Richter
166. **Economic Analysis: Income and Employment.** (See 66) (3 cr, §66; prereq grad, 2 or equiv or #; V MTWThF; VH 207) Coen
167. **Economics of Money and Banking.** (See 67) (3 cr, §67; prereq grad, 2 or equiv; III MTWThF; VH 301) Coen
169. **Government Regulation of Market Behavior.** (See 69) (3 cr, §69; prereq grad, 65 or 165 for bus or econ maj, law or pol sci or # for others; IV MTWThF; VH 207) Simler
- 178A. **Public Finance.** Government expenditures and budgeting, fiscal policy, public debt, and selected aspects of taxation. Emphasis is on economic effects, fiscal process,

- social policy. Credit may be received for 178A without 178B and may be substituted for 168 in the MBA program or for 68 in the Core Group (3 cr, §68, 168; prereq 2 or equiv; II MTWThF; VH 205) Richter
- 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; IV MTWThF; VH 301) Boddy
- 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 instructor in field covered) Staff
- 280B. The History of Economic Thought: After 1870.** Econ 280A and 280B acquaint the student with the principal economic writings of the past so that contemporary theory may be seen in perspective. Particular theories are related to the problems and policies of the times. Traces the development of neoclassical economics and the origins of macro-theory. (3 cr; III MTWThF; VH 207) Krueger
- 290. Graduate Research.** Economic theory workshop. (Cr ar; ar) Boddy

### *Second Term*

- 1. Principles of Economics.** (See first term) (I MTWThF; VH 207) Kasper
- 2. Principles of Economics.** (See first term) (V MTWThF; VH 6) L. Andersen
- 65. Intermediate Economic Analysis: The Firm.** (See first term) (II MTWThF; VH 207) Bronfenbrenner
- 66. Intermediate Economic Analysis: Income and Employment.** (See first term) (III MTWThF; VH 207) Smith
- 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-178B; prereq 2; IV MTWThF; VH 207) L. Andersen
- 69. Government Regulation of Business.** (See first term) (I MTWThF; VH 6) Maynes
- 103. Economic Development.** Conditions necessary for increasing income, capital formation, measurement of economic growth, and problems of "underdeveloped" areas. (3 cr, prereq 65, 66 or equiv or #; I MTWThF; VH 113) Tsuru
- 121A. Introduction to the Theory of Statistics.** Acquaints the nonspecialist with some of the basic concepts and methods of classical statistics. Serves as a preparation for the more systematic and intensive treatment in Econ 121B-121C. Focuses on problems of hypothesis testing and estimation. (3 cr, §121; prereq Math 7 or 10 or #; II MTWThF; VH 205) Buehler
- 150A. Current Economic Issues.** Current controversies over economic policy and the problems that underlie the controversies. Special study of selected topics. (3 cr [course may be taken more than once with #]; prereq 65, 66 or equiv; V MTWThF; VH 2) Smith
- 165. Economic Analysis: The Firm.** (See first term) (II MTWThF; VH 207) Bronfenbrenner
- 166. Economic Analysis: Income and Employment.** (See first term) (III MTWThF; VH 205) Maynes
- 169. Government Regulation of Market Behavior.** (See first term) (I MTWThF; VH 6) Maynes

- 
- 182. Economic Security.** Origins and development of economic and social problems of the individual worker; public and private attempts to deal with these issues; economic and social implications. (3 cr, prereq BA 52 or 152; IV MTWThF; VH 113) Turnbull
- 184. Economic Problems of the Far East.** Economic development of the Far East following contact with Western civilization. Some present problems: population, growth, capital formation, international economic relations, choice between types of economic organization. (3 cr; prereq 2 or equiv; IV MTWThF; VH 306) Tsuru
- 185C. Income Distribution.** Statistics of personal and functional income distribution. Wages, rent, interest, and profit under pure and imperfect competition. Aggregative theories of distribution as a whole. (3 cr; prereq 65, 66; III MTWThF; VH 113) Bronfenbrenner
- 190. Readings in Economics.** (See first term)

## 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: Anderson, Bartholdi, Chaudhry, Clark, Gorlin, Hall, Holland, Jensen, Meyer, Petersen, Serr, Wakely, Wittich, Yock.

Dentistry fees during the summer quarter are: full-time tuition, resident \$115, non-resident \$255; 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 \$19.

## 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 fields. Under each of the four divisions, courses of general interest are listed *General Courses* and these are followed by the offerings in *Elementary Education*, *Secondary Education*, and *Higher Education*.

For all general matters relating to admission, advanced standing, credits, honor points, curriculums, and requirements for graduation, students should consult the *Bulletin of the College of Education*, 1958-60.

Summer Session students who are not candidates for a degree do not need to make application for admission nor present credentials (see section on Admission and Registration). Students expecting to become candidates for a Bachelor's degree, however, 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.

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 and 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 fields.

### 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 13-July 9 for the study of problems in the liberal arts related to teacher education. In the second term, the workshop, scheduled from July 25-August 20, has been planned for teachers college staff members studying the problems of teacher education. Appli-

cants for either workshop should write to Dean of the College of Education, University of Minnesota, Minneapolis 14. (See EdCI 228)

**Workshops for Industrial Arts Teachers**—Two workshops are available in Industrial Education in the first term. The first one is concerned with production and automation practices for industrial arts, and the second one (July 5-15) involves administration and supervision of area vocational technical programs. (See Ind 106)

**Workshop for School Administrators**—As a part of the advanced graduate program (one year beyond the Master's degree) leading to the certificate of Specialist in Education—School Administration, a workshop is scheduled for the first term: Problems in State School Administration (Educational Administration 234). This workshop will require half-time work from the participants for the full term of 5 weeks. The group will be limited in size, and the completion of the Master's degree program for school superintendents is required for enrollment.

A special announcement concerning the Specialist in Education program for school administrators will be sent to those who request it.

**Institute on Counseling and Guidance**—Under a grant from the United States Office of Education, authorized by the 1958 Defense Education Act, an institute in counseling and guidance will be scheduled in the first term, the basic in Duluth and the advanced section in Minneapolis. (See EPsy 200 and 290) All applications for the institute are due April 1, and those selected as registrants will be notified May 1.

### 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 June 1 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 the language arts, mathematics, modern languages, social studies, science, and typing. Individual and group work in remedial reading and arithmetic will be provided. The summer program will emphasize 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, University of Minnesota, Minneapolis 14.

Students registered in Student Teaching (EdT 52) will be assigned to observation and student teaching in the classes of the high school. The facilities of the high school are available to the college classes in special methods and to other 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 from June 20 through July 22. A special resource classroom for blind children will be conducted in



this elementary school. 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 by a co-operative agreement with the Board of Education of the city of Minneapolis. The school, conducted on an activity basis, may be observed by students of elementary school methods and supervision. A laboratory course in elementary school practices is available. (See EdCI 186) (I, II, III, IV MTWThF; Tuttle School, Talmadge and 18th Ave SE)

### 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 to 11 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 from the state 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 Co-ordinator, Psycho-Educational Clinic, Pattee Hall, University of Minnesota, Minneapolis 14.

### Preschool

The Institute of Child Development and Welfare maintains a preschool in the first term. This school is available for demonstration and observation. Courses offered by the Institute are given for teachers who wish nursery school training and for others interested in child development.

### Minimum Fee for Graduate Students

Graduate students who have completed all their graduate work with the exception of the thesis will be allowed to register for the Summer Session for *thesis work only*, upon the payment of a fee of \$30.00 per term plus incidental fee.

### Detailed Description of Courses

For detailed description of courses and curriculums in education see the *Bulletin of the College of Education*, 1958-60.

### Notice Concerning Starred Courses

Graduate students who wish to work on individual problems to count toward the 9 credits in problems courses required for the Master's degree under Plan B may register for this credit in any course starred (\*) in the following list. Other students taking these courses will not be held to the same quality of individual problems work, nor will written reports always be required of them. (See section on Graduate School)

## AGRICULTURAL EDUCATION (AgEd)

### First Term

81. Teaching Agriculture in the Secondary School. Fundamentals of teaching agriculture to high school students; use of the home, farm, and community in structuring courses of study; Future Farmers of America; Vo-Ag Planning and Summary Book; building

- and utilizing teaching units. (4 cr; prereq Psy 2; VI-VII MTWThF first 3 wks; ar second 2 wks; Hr 301) Kitts
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 sr, or #; III-IV MTWThF first 3 wks; ar second 2 wks; Hr 302) Peterson
- 156.\* **Rural Education through Extension Methods.** Role of the Agricultural Extension Service in rural education; methods and techniques of instruction in nonschool educational programs. (3 cr; I-II MTWThF first 3 wks; ar second 2 wks; Hr 301) Christensen
221. **Field Problems.** The development and study of special problems in the field of the individual student's choice. (3 cr; ar) Kitts, Peterson
- 232.\* **Research in Agricultural Education.** Investigation in problems of education for farm people. Selecting research problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts. (3-9 cr; ar) Kitts, Peterson
250. **Supervision of Vocational Agriculture.** Objectives, functions, responsibilities of state and local supervision at the secondary level; role in teaching-learning process; organizing supervisory activities; aids to effective supervision. (1-3 cr; prereq #; VI-VII MTWThF first 3 wks; ar second 2 wks; Hr 302) Peterson

### Second Term

91. **Supervised Student Teaching.** Observation and participation in the learning-teaching process. Teaching experience and program analysis under supervision of selected teachers for minimum of 6 weeks' off-campus residence. Organization and execution of activities necessary to successful teaching of agriculture in Minnesota high schools. (6 cr; prereq 82, C+ avg in major; ar) Kitts, Christensen
221. **Field Problems.** (See first term) Kitts, Peterson
- 232.\* **Research in Agricultural Education.** (See first term) Kitts, Peterson

### 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 non-specialist 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

17. **Pictorial Expression for Elementary Education.** Provides a background 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 35) (3 cr; I-II MTWThF; TSF 259) Cherry
18. **Design Activities for Elementary Education.** (See ArEd 17) Relationships between art and nature. Problems in invention, arrangement and decoration, color, lettering, posters, bulletin board displays, etc. (Limited to 35) (3 cr; III-IV MTWThF; TSF 256) Cherry

153. **Curriculum Building in Art Education.** Child growth and development in art related to selection, evaluation, and organization of art teaching units for exceptional children. Emphasis on groups including educationally gifted, mentally retarded, and art gifted. (Limited to 45) (3 cr; II MTWThF; J 109) Hastie
184. **Improving Art Programs in the Elementary School.** Improving current practices through critical 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 45) (3 cr; prereq teaching experience or #; IV MTWThF; J 109) Gayne
189. **Application of Aesthetic Theory in Education.** Contemporary theories of art, their psychological and philosophical foundations with experimental evidence. Open to teachers, supervisors, and administrators concerned with making art function in general education at all levels. (Limited to 45) (3 cr; V MTWThF; J 109) Hastie
284. **Research in Art Education.** Research techniques; locating, defining, and studying basic problems. (Limited to 45) (3 cr; III MTWThF; J 109) Gayne
295. **Problems in Art Education.** Independent projects under staff guidance; may include advanced studio practice or technical problems requiring experimental or library research. (Cr ar; registration by special consent of major adviser; ar) Gayne, Hastie
296. **Seminar in Art Education.** Reports, evaluation of problems, recent literature. Participation by art education staff and guest specialists from related departments and from off campus. Open to advanced students in education. (1 cr; VI Th; J 105) Gayne and staff

### *Second Term*

17. **Pictorial Expression for Elementary Education.** (See first term) (I-II MTWThF; TSF 259) Hegg
18. **Design Activities for Elementary Education.** (See first term) (III-IV MTWThF; TSF 256) Hegg
184. **Improving Art Programs in the Elementary School.** (See first term) (II MTWThF; J 109) Wold
295. **Problems in Art Education.** (See first term) Wold

## EDUCATIONAL ADMINISTRATION (EdAd)

### *First Term*

#### GENERAL COURSES

101. **Public School Administration for Teachers.** Organization, administration and general support of public schools in state and local school districts. (3 cr; prereq sr, non-educational administration majors, 9 cr in education; I MTWThF; JobH 306) Popper
- 201-202. **Foundations in Educational Administration.** A foundation course for all students preparing for public school administrative positions. Emphasis is placed on aspects of administration as they relate to the co-ordination, operation, and organization of the elementary and secondary schools in a local district. Includes a study of the historical, philosophical, and sociological foundations of administration; organizational relationships within districts, relationships with intermediate state and federal agencies; legal status of administrators, teachers, and children; leadership role of administrators in improvement of instruction, relating education to the community, providing and development of teaching personnel, administration of pupil personnel;

providing and management of funds and facilities, and evaluation of the educational enterprise. (6 cr; II, IV MTWThF; Bu 211) Hooker

- 210. Financial Aspects of Public School Business Administration.** Financial program planning, budgeting, accounting, cost findings, income and expenditure control; and the preparation and analysis of financial reports. (3 cr; prereq 227; II MTWThF; JohH 105) Domian
- 225. Pupil Personnel Administration.** Child accounting records and reports, attendance department, school census, pupil adjustment and progress, pupil health and safety, and legal aspects of pupil personnel administration. (3 cr; prereq 124; III MTWThF; JohH 313) Ar.
- 226. School Plant Planning and Management.** Plant program planning and financing, including operation and maintenance of public school buildings. (3 cr; prereq 227; I MTWThF; FolH 103) Ar.
- 227. Teacher and Employee Administration.** Selection and placement of school employees, salary schedules, conditions of service, records and reports, and legal aspects of teacher and employee personnel administration. (3 cr; prereq 225; IV MTWThF; JohH 105) Lane
- 228.\* Special Problems in Educational Administration.** Designed primarily for superintendents and principals qualified to make intensive studies of specific problems related to the administration of a school system. (1-3 cr; prereq 225; VII-VIII T; CW 206) Domian, Hooker, Keller, Lane, Popper
- 230. Public Relations for Schools.** Theory and practice of educational interpretation. Principles involved; machinery and personnel, techniques of working with groups; the teacher's contacts with the community; the role of the pupil; professional and lay organization. (3 cr; prereq 225; IV MTWThF; Bu 123) Popper
- 234. Problems in State School Administration.** State legislative program; state aid; district reorganization; transportation; area vocational schools; and other problems of state school administration. A practicum intended primarily for school superintendents who have completed the work for a Master's degree with a major in school administration. (4 cr; I-II MTWThF; JohH 309) Lane and ar
- 236. Field Study in Educational Administration.** Part of the requirements for the certificate, Specialist in Education. The 10 credits which may be earned in this course will be given on the basis of a written report covering an approved field study. Students may register for the general planning and organization of their field study without credit. (0-10 cr; prereq #; VII-VIII M; JohH 106) Domian, Hooker, Lane, Popper

#### ELEMENTARY EDUCATION

- 118. The Community School.** Philosophy, purposes, organization, and functioning of the community school, including a study of its relationships with the area it serves. (3 cr; prereq sr, grad; III MTWThF; FolH 6) Archer
- 200. Seminar in Elementary School Administration.** (3 cr; II MTWThF; FolH 6) Archer
- 215. The Elementary School Principalship.** Especially designed for people interested in the elementary school principalship. It treats the specific problems in elementary school administration and the unique role of the principal with regard to his leadership function in elementary education. This course will emphasize particularly the administrative problems arising from current issues and practices in elementary education. Attention will be given to the characteristics of a sound administrative program in the elementary school. (3 cr; II MTWThF; Pt 202) Curtin

## SECONDARY EDUCATION

167. **The Junior High School.** Sources of the movement; purposes, functions, and limitations; types of reorganization; fundamental problems of reorganization; reorganization of subject matter. (3 cr; prereq sr, grad, 9 cr in education; I MTWThF; JohH 313) Winter
218. **Recent Literature in Secondary Education.** (Cr ar; VII-VIII T; JohH 106) Bossing, Keller, Lane
264. **Administration of Instructional Activities in the Secondary School.** (3 cr; II MTWThF; NH 207) Thompson
265. **Administration of Noninstructional Activities in the Secondary School.** (3 cr; III MTWThF; NH 207) Thompson
- 270A.\* **Special Problems in Elementary Education.** (Cr ar; prereq #; VII-VIII T; JohH 105) Archer, Curtin, Goossen
- 270B.\* **Special Problems in Secondary Education.** (Cr ar; prereq #; VII-VIII T; JohH 307) Bossing, Hooker, Keller, Lane, Popper
274. **The Junior College.** (3 cr; II MTWThF; CW 206) Keller

*Second Term*

## GENERAL COURSES

- 201-202. **Foundations in Educational Administration.** (See first term) (II, IV MTWThF; Bu 211) Popper
210. **Financial Aspects of Public School Business Administration.** (See first term) (II MTWThF; FolH 110) Hooker
225. **Pupil Personnel Administration.** (See first term) (III MTWThF; Bu 211) Lane
226. **School Plant Planning and Management.** (See first term) (I MTWThF; Bu 211) Hooker
227. **Teacher and Employee Administration.** (See first term) (IV MTWThF; Bu 123) Lane
- 228.\* **Special Problems in Educational Administration.** (See first term) (VII-VIII T; CW 206) Domian, Hooker, Lane, Popper
236. **Field Study in Educational Administration.** (See first term) (VII-VIII M; CW 206) Domian, Hooker, Lane, Popper

## ELEMENTARY EDUCATION

215. **The Elementary School Principalship.** (See first term) (III MTWThF; Pt 202) Curtin

## SECONDARY EDUCATION

167. **The Junior High School.** (See first term) (I MTWThF; JohH 114) Winter
264. **Administration of Instructional Activities.** (See first term) (III MTWThF; PeikH 145) Ar.
- 270A.\* **Special Problems in Elementary Education.** (See first term) (VII-VIII T; FolH 103) Archer, Curtin, Goossen, Clymer
- 270B.\* **Special Problems in Secondary Education.** (See first term) (VII-VIII T; FolH 108) Hooker, Lane, Popper

## INSTITUTE OF CHILD DEVELOPMENT AND WELFARE (CD)

The Institute of Child Development and Welfare was organized for three purposes: research in child development; training future workers with children; and bringing information to parents on the care and training of children. The Institute offers graduate and undergraduate courses and conducts a preschool for demonstration and research purposes.

### Preschool

The Preschool will be in session from 8:30 a.m. to 11 a.m., beginning June 14 and closing July 15. Applications for the enrollment of children will be received at the office of the Institute. The fee will be \$28 for tuition, which includes a midmorning snack. Parents are responsible for the transportation of their children to and from the school.

### First Term

- 80. **Child Psychology.** Science of child development and its applications. (3 cr; prereq Psy 2; VI MTWThF; CW 218) Moore
- 83. **Development and Guidance of Children's Activities.** Development of interests and activities. (3 cr; prereq 80; V MTWThF; CW 218) Richards
- 130. **Development of Skill, Language and Thought in the Child.** Interpretation of the scientific literature. (3 cr; prereq 12 cr in psychology, educational psychology, or equiv; I MTWThF; CW 222) Templin
- 132. **Adolescent Development.** Growth, mental, social, emotional, and personality development. (3 cr; prereq sr, 12 cr in psychology; II MTWThF; CW 222) Hurst
- 140. **Behavior Problems.** Types, origin, development and treatment of behavior problems in children and adolescents. (3 cr; prereq 12 cr in psychology, educational psychology, or sociology; I MTWThF; CW 218) Robinson
- 142. **Psychology of Atypical Children.** Physical, sensory, and mental deviations and handicaps. Personal, social and vocational adjustment. (3 cr; prereq 12 cr in psychology or equiv; IV MTWThF; CW 222) Templin
- 143. **Problems of Mental Deficiency.** Diagnosis, care, training; social and vocational problems; legal aspects. (3 cr; prereq 12 cr in psychology or equiv; IV MTWThF; CW 218) Hurst
- 144. **Psychology of the Gifted Child.** Psychology and development of high intellectual ability and of special talents. (3 cr; prereq 80 or equiv; III MTWThF; CW 222) Robinson
- 250. **Practicum in Clinical Child Psychology.** Supervised experience in application of diagnostic and remedial procedures to children's adjustment problems. (Cr ar; prereq #; hrs ar) Hafner
- 270.\* **Readings and Research in Child Development.** Independent readings and reports in any field such as physical growth, mental development, social behavior, nursery school, theory, parent education, etc., which meets the approval of instructor. (Cr ar; prereq Δ; hrs ar) Staff

### Second Term

- 131. **Development of Personality and Social Behavior in the Child.** (3 cr; prereq 12 cr in psychology, educational psychology, or equiv; III MTWThF; CW 222) Palermo
- 132. **Adolescent Development.** Growth; mental, social, emotional, and personality development. (3 cr; prereq sr, 12 cr in psychology; I MTWThF; CW 222) Palermo

140. **Behavior Problems.** Types, origin, development and treatment of behavior problems in children and adolescents. (3 cr; prereq 12 cr in psychology, educational psychology, or sociology; II MTWThF; CW 222) Grams
142. **Psychology of Atypical Children.** (See first term) (IV MTWThF; CW 218) Grams
220. **Seminar in Current Research: Mental Deficiency.** Discussion of current studies in mental deficiency. (3 cr; prereq 12 cr in psychology or equiv; II MTWThF; CW 218) Sarason
237. **Seminar in Human Development.** Behavior of children in probabilistic situations. (3 cr; prereq grad cr in psychology, educational psychology, sociology, or child development; hrs ar) Stevenson
- 270.\* **Readings and Research in Child Development.** (See first term) Staff

## CURRICULUM AND INSTRUCTION (EdCI)††

### *First Term*

#### GENERAL COURSES

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; VI-VII MTWThF; ForH 20, 30) Gebhard
105. **Audio-Visual Materials in Education.** (3 cr; prereq sr, grad; I MTWThF; NH 211) Pearson
106. **Co-ordinating an Audio-Visual Education Program.** (3 cr; prereq 105 or #; III MTWThF; WeH 206) Pearson
115. **Introduction to Education of Visually Handicapped Children.** Introduction to educational programs, services, and resources for blind and partially seeing children; exploration of historical background, philosophy, sociological and psychological problems in providing service in this area. (3 cr; VI MTWThF; Tuttle School) Kenmore, 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 EdCI 115 or #; VII MTWThF; Tuttle School) George
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 EdCI 116; I MTWThF; Tuttle School) George
145. **Reading Difficulties.** (3 cr; prereq course in reading or basic training in counseling or school psychological work; 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 in teaching; following up a testing program. (3 cr; I MTWThF; Bu 120) Balow and ar

†† See Latin 171, Department of Classics, College of Science, Literature, and the Arts. For high school teachers of Latin. (See Latin under Special Programs)

- 174-175-176. **Clinical Methods and Practice in Speech Pathology.** (9 cr; prereq #; I MTWThF; FolH 409) Ar.
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 #; I 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 EdCI 115 and 178; 9:15-11:00 a.m. MTWThF; Tuttle School) Sibert
- 205.° **Problems in Audio-Visual Education.** (Cr ar; prereq #; ar) Pearson
- 227.° **Problems in Rural Education.** (Cr ar; prereq EdAd 117; ar) Archer
- 271.° **Problems in Curriculum Construction.** (Cr ar; prereq #; ar) Archer, Boeck, Bossing, Chase, Goossen, Curtin, Mullins, Odland, Winter
- 273.° **Problems in Reading.** (Cr ar; prereq 143 or 144 or #; V T; Bu 103) Bond, Balow, Chase, Odland

#### ELEMENTARY EDUCATION

61. **The Teaching of the Social Studies in the Elementary School.** (3 cr; prereq Ed 75B or equiv; VI MTWThF; JohH 106) Mullins
62. **Teaching of Arithmetic in the Elementary Schools.** (3 cr; prereq Ed 75A)  
 Sec 1, I MTWThF, Pt 202, Capps      Sec 2, II MTWThF, FolH 2, Stochl
102. **Teaching the Social Studies in the Elementary School.** (3 cr; prereq Ed 75B or equiv; II MTWThF; CW 218) Mullins
103. **Teaching of Science in the Elementary School.** Emphasis on resources and materials and their application to the elementary grades. (3 cr; prereq sr, grad, Ed 75A-B or teaching experience)  
 Sec 1, II MTWThF, P 110, Boeck      Sec 2, III MTWThF, P 110, Capps
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 EdCI 115, 116 and #; 9:15-11:00 MTWThF; Tuttle School) Kenmore
119. **Elementary School Curriculum.** (3 cr; prereq Ed 75B or equiv) Goossen  
 Sec 1, II MTWThF, FolH 11      Sec 2, III MTWThF, Bu 211
121. **Selecting Literature for the Elementary School.** Research background in curriculum units, children's interests in reading, difficulty of reading materials, and principles of selection and use of books in the elementary school. Opportunity will be given to survey books available and to apply the principles and information learned. Recommended for majors in reading, for elementary teachers with degrees who want to go beyond mere acquaintance with the field of children's books; and for those who have already graduated without needed background in children's literature. (3 cr; I MTWThF; JohH 205) Odland
143. **Teaching and Supervision of Reading in the Elementary School.** (3 cr; prereq 9 cr in education; III MTWThF; Bu 120) Bond and ar
149. **Teaching and Supervision of Arithmetic in the Elementary School.** (3 cr, §62A or B; prereq Ed 75B or equiv; IV MTWThF; JohH 115) Stochl



150. **Supervision and Improvement of Instruction.** (3 cr; prereq Ed 75B or equiv; IV MTWThF; JohH 306) Curtin
153. **Supervision and Teaching of English in the Elementary Schools.** (3 cr; prereq Ed 75A-B or equiv; III MTWThF; NH 209) Chase
162. **Laboratory in Nursery School and Kindergarten Instruction Practices.** (3 cr; open to experienced teachers [other professional workers admitted by #]; IV MWF and hrs ar; CW 206) Headley
164. **Play Materials, Rhythms and Science for Young Children.** (3 cr; open to experienced teachers [other professional workers admitted by #]; VI MWF and hrs ar; CW 206) Headley
186. **Laboratory in Elementary Instructional Practices.** Daily observation of elementary classes with discussion of techniques, emphasis on activity units, visual aids, enriched materials, individual differences, and socialized situations. 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 weekly ar MTWThF, Tuttle School; lect VI WTh, NH 216) Jensen
- 261.\* **Special Problems in the Improvement of Instruction.** (Cr ar; prereq #; ar) Archer, Curtin, Goossen, Mullins

## SECONDARY EDUCATION

113. **High School Curriculum.** (3 cr; prereq Ed 55A-B or equiv; II MTWThF; Bu 120) Bossing
114. **Development of the Core Curriculum.** (3 cr; I MTWThF; Bu 211) Bossing
120. **Education of Blind Children in the Secondary Schools.** Adaptation of curriculum of junior-senior high school for blind children. Preparation of educational materials. Consideration of reader service, orientation and mobility, specialized equipment; utilization of guidance and counseling services, local, state, and national resources. (3 cr; VII MTWThF; Tuttle School) Kenmore
122. **Literature for Adolescents.** (3 cr; prereq Ed 55B or jr-sr high school teaching experience; IV MTWThF; JohH 114) Kegler
125. **Occupational Information Laboratory.** (Limited to 25) (3 cr; prereq #; IV MTWThF; Bu 125) Soldahl
134. **Materials and Methods in Consumer Education.** Development of teaching units; teaching methods; recent aids and materials. (3 cr; prereq #; III MTWThF; Bu 103) Price
135. **Group Procedures in Guidance.** (Limited to 35) (3 cr; prereq 9 cr in education, EPsy 133, or #; II MTWThF; Bu 125) Soldahl
- 137A. **Materials and Methods in Co-operative Part-Time Classes.** (3 cr; IV MTWThF; Bu 103) Meyer
139. **Co-ordination Techniques.** (3 cr; II MTWThF; Bu 103) Meyer
140. **Teaching of Speech.** (3 cr; prereq Spch 1-2-3 or 5-6 or equiv or #; I MTWThF; FolH 307) Smith
144. **Teaching of Reading in Secondary Schools.** (3 cr; prereq 9 cr in education; II MTWThF; NH 209) Chase
147. **Workshop in Teaching Display.** Materials and methods in teaching. Practice in using equipment. (3 cr; prereq #; I MTWThF; Bu 103) Ar.
161. **Curriculum Construction in Business Education.** (3 cr; prereq 113; I MTWThF; NH 209) Price

168. **Current Developments in the Social Studies.** (3 cr; prereq grad; III MTWThF; JohH 205) F Johnson
171. **Curriculum Laboratory Practice.** (0-3 cr; prereq 170A or 170B, #; ar) Bossing
192. **Advanced Course in the Teaching and Supervision of Secondary Mathematics.** (3 cr; prereq grad or tchg exper; III-IV MTWThF; FolH 103) Jackson
- 199E. **Internship.** (Cr ar; available for Master of Education students in recreation; ar) Fitzgerald
- 201.\* **Problems in Teaching the Social Studies.** (Cr ar; prereq 168, 204, or #; ar) McCune
- 225.\* **Special Problems in Supervision of Instruction in Secondary Schools.** (Cr ar; prereq #; VII-VIII T; Bu 103) Bossing, Keller, Lane
- 238.\* **Problems in Distributive Education.** (Cr ar; prereq #; ar) Meyer
- 239.\* **Problems in Business Education.** (Cr ar; prereq #; ar) Price
266. **Supervision of High School Instruction.** (3 cr; prereq EPsy 293 or #; IV MTWThF; FolH 209) Winter
287. **Advanced Course in the Teaching of Science.** (3 cr; I MTWThF; P 110) Boeck
- 294.\* **Advanced Course in Curriculum and Methods in Secondary School English.** (3 cr; prereq EdT 75A-B-C or equiv; II MTWThF; JohH 307) Kegler
- 296.\* **Special Problems in Teaching English.** (Cr ar; ar) Kegler

#### HIGHER EDUCATION

- 228.\*†† **Workshop: Problems of Higher Education and Teacher Education.** (6 cr; ar MTWThF, June 13-July 9; ar) Kreider, Cooper, McCune, and consultants
250. **Higher Education in the United States.** (3 cr; VI MTWThF; Bu 125) Eckert
252. **Effective College Teaching.** (3 cr; prereq yr of grad study in any field or 18 cr in education; I MTWThF; JohH 105) McCune

#### Second Term

##### GENERAL COURSES

101. **Driver Education.** (See first term) (Limited to 32) (VI-VII MTWThF; ForH 20, 30) Gebhard
105. **Audio-Visual Materials in Education.** (See first term) (I MTWThF; NH 211) Pearson
109. **Audio-Visual Materials and Equipment Laboratory.** Planning and making materials for audio-visual education; use of machines and equipment. (Limited to 30) (3 cr; prereq 105 or #105 or #; III MTWThF plus III-IV MW or III-IV TTh; WeH 202) Pearson
- Sec 1, III-IV MW, WeH 202                      Sec 2, III-IV TTh, WeH 202
145. **Reading Difficulties.** (See first term) (IV MTWThF; Bu 120) Clymer
- 174-175-176. **Clinical Methods and Practice in Speech Pathology.** (See first term) (I MTWThF; FolH 409) Ar.
- 205.\* **Problems in Audio-Visual Education.** (See first term) Pearson
- 271.\* **Problems in Curriculum Construction.** (See first term) Boeck, Bossing, Winter

†† 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.

- 273.\* **Problems in Reading.** (See first term) (V T; Bu 103) Clymer, Curtin, Goossen, Balow, Odland

#### ELEMENTARY EDUCATION

102. **Teaching the Social Studies in the Elementary School.** (See first term) (IV MTWThF; Pt 202) Mullins
103. **Teaching of Science in the Elementary School.** (See first term) (I MTWThF; NH 207) Goossen
119. **Elementary School Curriculum.** (See first term) (II MTWThF; NH 209) Goossen
121. **Selecting Literature for the Elementary School.** (See first term) (IV MTWThF; FraH 20) Odland
143. **Teaching and Supervision of Reading in the Elementary School.** (See first term) (III MTWThF; Bu 120) Clymer
149. **Teaching and Supervision of Arithmetic in the Elementary School.** (See first term) (II MTWThF; Pt 202) Stochl
150. **Supervision and Improvement of Instruction.** (See first term) (IV MTWThF; PcikH 175) Curtin
- 261.\* **Special Problems in the Improvement of Instruction.** (See first term) Curtin, Goossen, Mullins
263. **Research in Arithmetic Instruction.** (3 cr; I MTWThF; Pt 202) Stochl

#### SECONDARY EDUCATION

113. **High School Curriculum.** (See first term) (II MTWThF; Bu 123) Winter
122. **Literature for Adolescents.** (See first term) (I MTWThF; Bu 120) Kegler
125. **Occupational Information Laboratory.** (See first term) (Limited to 25) (III MTWThF; CW 206) Soldahl
133. **Consumer Education in the Schools.** (3 cr; II MTWThF; Bu 103) Price
135. **Group Procedures in Guidance.** (See first term) (Limited to 35) (IV MTWThF, V TTh; CW 206) Soldahl
136. **Organization and Administration of Distributive Education.** (3 cr; III MTWThF; Bu 103) Meyer
141. **Co-operative Part-Time Work Experience Programs.** (3 cr; I MTWThF; Bu 103) Meyer
144. **Teaching of Reading in Secondary Schools.** (See first term) (II MTWThF; Bu 120) Kegler
155. **Materials Laboratory for Social Studies Teachers.** Seminar in the study of printed and audio-visual materials, with reference to their use in social studies classes. (3 cr; prereq #; III MTWThF; PeikH 175) Gardner
169. **Extracurricular Activities.** (3 cr; prereq Ed 55A-B or equiv; II MTWThF; JohH 313) Bossing
- 170B. **Curriculum and Course of Study Construction.** Principles and methods for selection and organization of units, courses of study, and curriculums. (3 cr; prereq 113 or 119 or #; I MTWThF; JohH 115) Bossing
171. **Curriculum Laboratory Practice.** (See first term) Bossing
- 199E. **Internship.** (See first term) Fitzgerald

200. **Organization and Supervision of Business Education.** (3 cr; IV MTWThF; Bu 103) Price
- 225.\* **Special Problems in Supervision of Instruction in Secondary Schools.** (See first term) (VII-VIII TTh; JohH 313) Lane
- 238.\* **Problems in Distributive Education.** (See first term) Meyer
- 239.\* **Problems in Business Education.** (See first term) Price
266. **Supervision of High School Instruction.** (See first term) (IV MTWThF; FraH B1) Lane
- 296.\* **Special Problems in Teaching English.** (See first term) Kegler

### HIGHER EDUCATION

- 228.\*†† **Workshop: Problems of Higher Education and Teacher Education.** (See first term) (Ar MTWThF; July 25-August 20) Davies, Elkins, Morse, Edson, and consultants

## EDUCATIONAL PSYCHOLOGY (EPsy)

### First Term

#### GENERAL COURSES

60. **Introduction to Measurement and Statistics.** (3 cr; prereq 6 cr in psychology; VI MTWThF; Bu 123) Schunert
110. **Measurement in the Classroom.** Principles and methods for construction, evaluation, and improvement of educational measurement in classroom instruction. (3 cr; VII MTWThF; Bu 120) Schunert
116. **Introduction to Statistical Methods in Education.** (Not equivalent to 216, 216A) Simple statistical techniques in educational work. Comprehension of literature using elementary statistical concepts and methods. (3 cr; not open to Master's or Ph.D. degree candidates who will take more than 1 quarter of statistics; prereq ¶116A or #)  
 Sec 1, III MTWThF, FraH B1, Collier      Sec 2, I MTWThF, NH 213, Stecklein
- 116A. **Introduction to Statistical Methods in Education—Laboratory.** (Limited to 16 each sec) (2 cr; prereq ¶116) D Meyer  
 Sec 1, V-VI MWF, Bu 251      Sec 2, VI-VIII TTh, Bu 251
117. **Basic Principles of Measurement.** (3 cr; prereq 116 or 216 or Psy 70 or equiv; VI MTWThF; Bu 103) Corcoran
140. **Instruments and Techniques of Measurement.** (3 cr; prereq sr, grad, 110 or 117 or equiv; IV MTWThF, V TTh; FolH 3) Glotzbach
150. **Clinical Practice in Remedial Teaching.** Practice in remedial tutoring of individual children who have experienced difficulty in school learning. (Limited to 30 each sec) (3 cr; prereq EdCI 145 or 151 and #) Balow  
 Sec 1, II MTWThF and 2 hrs ar,      Sec 2, III MTWThF and 2 hrs ar, Pt 108  
 Pt 108
151. **Clinical Practices in Educational Diagnosis.** Practice in diagnosis of school learning problems. Includes measurement, interview technique, preparation of case reports,

†† 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.

- etc. Work with children referred to the Psycho-Educational Clinic. (3 cr; prereq 142, EdCI 145 and #; VI-VIII MTWThF; Pt 108) Balow, Hodges
152. **Introduction to School Psychological Services.** Psychological services to children in public schools. Problems of 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 123) Hodges
159. **Personality Development and Mental Hygiene.** (3 cr; IV MTWThF; NH 213) Torrance
181. **Home and Hospital Instruction for Exceptional Children.** Organization of learning experiences for homebound and/or hospitalized children. Study of disabilities causing confinement, referral agencies, adaptations of teaching materials and techniques. Course will proceed by lectures, group discussions, and demonstrations. (3 cr; prereq #; VI-VII MTWThF; Pt 202) Force
182. **Education of Exceptional Children.** Overview of the field of special education. Especially for classroom teachers, counselors, supervisors, and administrators; also the initial course for students working for special class certificates. Reports on individual work equivalent to 1 cr. (3 cr; prereq Ed 55B or 75B or equiv; I MTWThF; FraH 20) Force
183. **Education of Gifted Children.** Abilities, characteristics, and education of intellectually gifted children and adults. (3 cr; prereq Ed 55B or 75B or equiv; IV MTWThF; Pt 202) Reynolds
184. **Education of the Slow Learning Child.** (3 cr; prereq 182; III MTWThF; CW 218) Capobianco
191. **Education of the Mentally Retarded in the Secondary School.** Curriculum, materials and methods of instruction for educable mentally retarded students in secondary schools. Philosophy, administration, vocational and personal guidance, parent consultation, and work programs also considered. Field trips when possible. (3 cr; prereq 182 or #; V MTWThF; Pt 202) Capobianco
193. **Psychology of Human Learning.** (3 cr; prereq sr, grad; VI MTWThF; FraH 20) Mork, Neale
216. **Statistical Methods in Education.** Designed to lay the foundations of statistical theory and to give practice applying the theories in the solution of educational and psychological problems. (3 cr; I MTWThF; Bu 123) Collier
- 216A. **Statistical Methods in Education—Laboratory.** (Limited to 16) (2 cr; VII-VIII MWF; Bu 251) D Meyer
- 233.\* **Problems in Guidance and Personnel Work.** (Cr ar; ar) Dugan, Tennyson, Wrenn
- 243.\* **Problems in Statistics for Students in Education and Psychology.** (3 cr; ar) Collier
- 253.\* **Research Problems.** (Cr ar; prereq #; ar) Dugan, Mork, Reynolds, Wrenn, Balow, Capobianco, Collier, Force, Hodges, Tennyson, Torrance
- 293.\* **Psychology of Learning.** (3 cr; prereq 12 cr in psychology and educational psychology; III MTWThF; JohH 114) Mork

## SECONDARY EDUCATION

133. **Basic Procedures in Student Personnel Work.** (3 cr; prereq 9 cr in education; I MTWThF; Ph 166) R Johnson

134. **School Counseling Procedures.** (Limited to 30) (3 cr; prereq 110 or 117 or equiv, 133 and #; I MTWThF; FolH 2) Blocher
200. **Seminar Institute in Guidance.** Open only to a limited number of participants selected in advance. Applications close April 1. (9 cr; to be scheduled on the Duluth Campus) Dugan, Gladstein, and consultant staff
282. **Supervised Practicum in Counseling.** (3 cr; prereq #; II-IV MTWThF; University High School) Tennyson, Winfrey
290. **Seminar and Practicum in Counseling.** Open only to students selected for **Advanced Institute** provided under the National Defense Education Act. Applications close April 1. Emphasis on identification of talent and counseling of superior students. (9 cr; prereq #; I MTWThF; Bu 125; addtl hrs ar) Dugan, Wrenn, Swan, and consultant staff

### Second Term

#### GENERAL COURSES

110. **Measurement in the Classroom.** (See first term) Schunert  
 Sec 1, III MTWThF, NH 209                      Sec 2, IV MTWThF, NH 209
116. **Introduction to Statistical Methods in Education.** (See first term) (IV MTWThF; NH 207) MacEachern
- 116A. **Introduction to Statistical Methods in Education—Laboratory.** (See first term) D Meyer  
 Sec 1, V-VI MWF, Bu 251                      Sec 2, VI-VIII TTh, Bu 251
117. **Basic Principles of Measurement.** (See first term) (III MTWThF; Bu 123) Lathrop
143. **Advanced Individual Mental Testing.** Development of proficiency in administering and interpreting 3 or 4 selected individual mental tests. (Limited to 15) (3 cr; prereq 142 and #; IV MTWThF; FolH 107) Hodges
148. **Clinical Diagnosis of Reading Difficulties.** Psychology of reading difficulties, clinical diagnosis of reading problems, their relationship to psychological factors, and their clinical remedial correction. (3 cr; prereq EdCI 145; I MTWThF; CW 218) Balow
150. **Clinical Practice in Remedial Teaching.** (See first term) Balow  
 Sec 1, II MTWThF, Pt 108                      Sec 2, III MTWThF, Pt 108
151. **Clinical Practice in Educational Diagnosis.** (See first term) (VI-VIII MTWThF; Pt 108) Balow, Hodges
159. **Personality Development and Mental Hygiene.** (See first term) (I MTWThF; FraH 20) Gladstein
182. **Education of Exceptional Children.** (See first term) (II MTWThF; FraH B1) Capobianco
184. **Education of the Slow Learning Child.** (See first term) (III MTWThF; NH 213) Capobianco
185. **Education of the Auditorially Handicapped Child.** Workshop techniques, including observation of laboratory class for hearing handicapped children, and individual and small group conferences. (3 cr; II-III MTWThF; Pt 108) Ar.
193. **Psychology of Human Learning.** (See first term) (VI MTWThF; Bu 120) Neale
217. **Statistical Methods in Education.** (3 cr; I MTWThF; Bu 123) MacEachern

- 217A. **Statistical Methods in Education—Laboratory.** (Limited to 16) (VII-VIII MWF; Bu 251) D Meyer
- 225-226. **Diagnosis as a Phase of Counseling.** Personality concepts involved in diagnosis, principles of diagnosis, and practice in essential diagnostic skills and in recognition of common diagnostic errors. Various approaches in counseling, practice in interviewing skills, concepts of therapy, analysis of student and counselor attitudes in counseling. (6 cr; prereq 140 or ¶140, and one of the following: 133, 250, or Psy 130; III-IV MTWThF; FolH 103) Borow
- 233.° **Problems in Guidance and Personnel Work.** (See first term) Borow, Tennyson
- 253.° **Research Problems.** (See first term) Borow, Balow, Capobianco, Hodges, Tennyson

#### SECONDARY EDUCATION

133. **Basic Procedures in Student Personnel Work.** (See first term) (II MTWThF; Ph 170) Tennyson
134. **School Counseling Procedures.** (See first term) (II MTWThF; CW 206) Gladstein

#### GENERAL EDUCATION (Ed)

##### *First Term*

- 55A. **Introduction to Secondary School Teaching.** Open only to regular students accepted for the Bachelor's 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 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. Anyone who has failed a previous section of Ed 55A may not register in this section as a make-up. (Limited to 35) (5 cr; prereq Psy 1-2, #; I MTWThF, II MWF; PeikH 175) Neale, Olstad
- 75A. **Introduction to Elementary School Teaching.** Limited to students entering the major in elementary education in the College of Education. (Limited to 60) (5 cr; prereq Psy 2, Δ; II-III MTWThF; FolH 9 and FolH 108) Dykstra, Balzer
- 75B. **Introduction to Elementary School Teaching.** Limited to students entering the major in elementary education in the College of Education. (Limited to 60) (5 cr; prereq 75A; III-IV MTWThF; FolH 8 and FolH 11) Odland, Balzer, Barrett
81. **Introduction to Education for Public Health Nurses.** Principles, methods and materials in education as applied to public health nursing situations. Group work emphasized. (3 cr; not open to candidates for degree in College of Education; prereq PubH 62, 100, and 133; VI-VII TTh; Mayo 1210) Grout

##### *Second Term*

- 55B. **Introduction to Secondary School Teaching.** Continuation of Ed 55A. Students taking this second term course are expected to have completed Ed 55A during the first term. The course is not designed for students who have taken Ed 55A in a quarter of the regular year. (Limited to 35) (5 cr; prereq Ed 55A first term; #; I MTWThF, II MWF; PeikH 175) Neale, Olstad
- 75B. **Introduction to Elementary School Teaching.** (See first term) (Limited to 60) (5 cr; prereq 75A; I-II MTWThF; FolH 104 and FolH 105) Odland, Barrett, Dykstra

## HISTORY AND PHILOSOPHY OF EDUCATION (HEd)

### *First Term*

101. **Historical Foundations of Modern Education.** Historical analysis and interpretation of important elements in modern education derived from the Greeks, Romans, Middle Ages, and Renaissance. (3 cr; I MTWThF; FraH B1) Penner
141. **Critical Issues in Contemporary Education.** (3 cr; III MTWThF; FraH 101) Penner
180. **The School and Society.** (Limited to 100 each section) (3 cr; prereq sr, Ed 55A-B or 75A-B)  
 Sec 1, I MTWThF, FraH 101, C Beck    Sec 2, IV MTWThF, NH 211, C Beck
- 241.° **Problems in the History and Philosophy of Education.** (Cr ar; prereq #; ar) C Beck

### *Second Term*

101. **Historical Foundations of Modern Education.** (See first term) (III MTWThF; PeikH 175) Penner
141. **Critical Issues in Contemporary Education.** (See first term) (I MTWThF; PeikH 175) Penner
180. **The School and Society.** (See first term) (Limited to 80 each section)  
 Sec 1, II MTWThF, NH 211, C Beck    Sec 2, IV MTWThF, NH 211, C Beck
- 241.° **Problems in the History and Philosophy of Education.** (See first term) C Beck

## HOME ECONOMICS EDUCATION (HEEd)

### *First Term*

190. **Readings in Home Economics Education.** To be centered on supervision. (1-3 cr; prereq #; II MTWThF; McNH 103) Holmblade
- 196F. **Home Experience and Extended Employment.** Methods of using the extended period of employment effectively; techniques for the selection, execution, and evaluation of home experiences; group or individual problems to meet special interests and needs of experienced teachers. (3 cr; prereq grad; IV MTWThF; McNH 102) Brown
293. **Problems in Home Economics Education.** Designed to meet the needs of advanced students for independent study of current educational problems. (1-9 cr; prereq 294 recommended, #; ar) Holmblade
294. **Research Methods.** Collection, treatment, and interpretation of data in areas of home economics. (3-6 cr; prereq 192, #; VI MTWThF; McNH 102) Brown

### *Second Term*

190. **Readings in Home Economics Education.** Independent study under tutorial guidance. (1-3 cr; prereq consent of adviser and instructor; ar) Brown, Holmblade
191. **Advanced Course in the Teaching of Home Economics.** A study of materials, equipment, and teaching procedures based on newer concepts of learning and changing social and economic needs of families. The course offers the teacher an opportunity to study problems related to her own situation at the secondary or higher educational level. (3 cr; prereq 91, 93 or #; IV MTWThF; McNH 103) Holmblade



293. **Problems in Home Economics Education.** (See first term) Brown

## INDUSTRIAL EDUCATION (Ind)

### *First Term*

#### 106. **Industrial Education Workshop**

**Sec 1—Production and Automation Practices for Industrial Arts Classes.** Production problems will be studied through laboratory experiences; numerous experiments will be carried out to develop ways of automating production projects in an industrial arts shop. Instructional materials will be developed by the group for use in their individual teaching. (3-6 cr; prereq teaching experience or #; III-IV and/or VI-VII MTWThF; TNCW 1 and 15) Kavanaugh

**Sec 2—Administration and Supervision of Area Vocational-Technical Programs.** (July 5 through 15) A special 2-week workshop for qualified directors, coordinators, and instructors of vocational education. (3 cr; prereq #; II-VIII MTWThF; TNCW 116) Ar.

109. **Conference Leading for Industry.** Purposes, advantages, and limitations of conference method. Techniques of conference procedure. Experience in planning, leading, and evaluating conferences and in writing summaries. (3 cr; prereq #; III MTWThF; TNCW 116) Widdowson

110. **Vocational Guidance.** History of educational and vocational guidance movement; typical public school means and methods; types and uses of occupational information; duties of the counselor; organization and relationships. (3 cr; prereq Ed 55B; II MTWThF; TNCW 113) Nelson

112. **Instructional Materials Laboratory for Nonmajors—General Woodwork.** For experienced elementary teachers, recreational leaders, and others needing manipulative experience in woodworking and allied activities; individual and group projects. (3 cr; prereq teaching experience or #; VI-VII MTWThF; TNCW 218) Flug

125. **Philosophy and Practices of Vocational Education.** History, objectives, development, and current practices of the field. (3 cr, §35, §60, §61; I MTWThF; TNCW 116) Widdowson

200. **Research Problems.** (3, 6, or 9 cr; prereq approval of candidacy for Master's degree; individual conferences with adviser; ar MTWThF; TNCW 103) Nelson, Kavanaugh

250. **Literature.** Professional literature, organizations, leaders, and movements in the field. (3 cr; prereq #; IV MTWThF; TNCW 113) 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, §55, §70; prereq 40, Ed 55B; II MTWThF; TNCW 113) Nelson

101. **Tests in Industrial Subjects.** Application of principles of evaluation to shop and drawing subjects. (3 cr, prereq Ed 55B; I MTWThF; TNCW 113) Kavanaugh

103. **Instructional Aids.** Planning, construction, use. (3 cr; prereq Ind 55 or equiv, #; III MTWThF; TNCW 113) Kavanaugh

200.\* **Research Problems.** (See first term) Nelson

## METHODS AND STUDENT TEACHING (EdT)

### *First Term*

#### NURSING EDUCATION

- 51A. **The Teaching of Nursing.** (2 cr; open only to students who will also be registered for 2 cr in this course in 2nd term; prereq Ed 55B or Ed 55N; VI MWF; MH 128) Dunning, Weise

#### ELEMENTARY EDUCATION

- 53A. **Teaching Handicapped Children.** Observing work with special classes; teaching under direction. Conducted in co-operation with the public schools of Minneapolis and St. Paul. (6 cr; prereq #; ar) Ar.
- 77.†† **Student Teaching in the Nursery School.** Five half-days each week spent in classroom participation under supervision. (3 cr; prereq sr, 55, 56, 57, and 58 plus #; ar) Moore
- 78.†† **Student Teaching in the Kindergarten.** Five half-days each week spent in classroom participation under supervision. (3 cr; prereq sr, 55, 57, 58, and 59 plus #; ar) Headley

#### SECONDARY EDUCATION

- 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 ar; ar; PeikH) Davies
- 84A-B-C. **Practice and Field Work in Recreation Leadership.** (2 cr; prereq recreation major; ar) Fitzgerald
- 85A-B-C. **Practice and Field Work in Recreation.** (2 cr for majors, 1 cr for minors; prereq recreation majors or minors; ar) Fitzgerald

### *Second Term*

#### NURSING EDUCATION

- 51A. **The Teaching of Nursing.** (See first term) (VI MWF; MH 128) Dunning, Weise

#### SECONDARY EDUCATION

- 84A-B-C. **Practice and Field Work in Recreation Leadership.** (See first term) Fitzgerald
- 85A-B-C. **Practice and Field Work in Recreation.** (See first term) Fitzgerald

## MUSIC EDUCATION (MuEd)

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

### *First Term*

51. **Teaching Music.** For nonmusic majors. Appreciation, music history, methods, materials. (2 cr; prereq Mus 1; III MTWThF; ScH 104) Abelson

---

†† Students registering for this course must make out the application required for methods courses and student teaching. Forms are available in the office of the director of student teaching, 227 Burton Hall.

52. **Teaching Music.** For nonmusic majors. Appreciation, music history, methods, materials. (2 cr; prereq 51, #; I MTWThF; ScH 104) Abelson
- 60††-61-62. **Supervision and Teaching of Music.** (3 cr each; prereq sr, 50B, 53, Ed 55B, #; VIII W; ScH 104) Ivory
104. **Advanced Topics: Vocal Music.** Objective and empirical research and literature on voice development in individual, class, and choral work. Individual surveys of performance practices and organization of school vocal groups; selection of vocal music. (3 cr; prereq sr, #; III MTWThF; ScH 3) Caswell
105. **Advanced Topics: Instrumental Music.** Individual selection of topics for intensive study. Bibliographical methods, library resources. (3 cr; prereq sr, #; II MTWThF; ScH 3) Ivory
160. **Organization, Supervision of Vocal-Instrumental Music in Secondary Schools.** Practical problems in school music; individual projects; group activities; classroom management, supervisory techniques, scheduling, unit construction, instruments, repertory. (3 cr; prereq 6 cr in music education, 9 cr in music, and 6 cr in general education; I MTWThF; ScH 3) Caswell, Ivory
- 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) (I MTWThF; ScH 104) Caswell
52. **Teaching Music.** (See first term) (I MTWThF; ScH 103) Ivory
100. **Principles.** Place of music in education; philosophy, objectives, trends, content, evaluation of school music programs. (3 cr; prereq sr, #; III MTWThF; ScH 104) Caswell
170. **Recent Research and Literature.** Current research; evaluation of teaching materials; appraisal of research techniques. (3 cr; prereq sr, #; IV MTWThF; ScH 103) Ivory
- 224.° **Research Problems.** (See first term) (V T; ScH 104) Caswell, Ivory

## PHYSICAL EDUCATION FOR MEN (PEM)

### First Term

- 1A. **Beginning and Intermediate Swimming.** (Limited to 40) (1 cr; V MTWThF; CH Pool) Piper
- 1B. **Intermediate Swimming.** (Limited to 40) (1 cr; VIII MTWThF; CH Pool) Novak
- 2A. **Beginning Golf.** (Limited to 40) (1 cr; VI-VII MW; Golf Course) Bolstad
- 5C. **Stunts, Contests, Softball.** (1 cr; IV MTWThF; CH) Novak
- 6A. **Soccer, Speedball, Volleyball.** (1 cr; II MTWThF; CH) Lewis
- 7C. **Recreational Games.** Badminton, aerial darts, deck tennis, paddle tennis, table tennis, bowling, horseshoes, and archery. (1 cr; I MTWThF; CH) Lewis
8. **Tennis and Golf.** (Limited to 40) (1 cr; III MTWThF; CH) Lewis, Bolstad
- 9A. **Fundamental Rhythms.** Basic steps and folk dances. (1 cr; V MTWThF; NGW) Lampe

†† Students registering for this course must make out the application required for methods courses and student teaching. Forms are available in the office of the director of student teaching, 227 Burton Hall.

- 9B. Square, Ballroom Dancing.** Instruction in circle, line, square, mixer, couple dances; square dance calling. (1 cr; VI MTWThF; NGW) Piper
- 50. Human Anatomy.** A study of the human body with emphasis on the bones, nerves, and muscles and their significance in physical education. (3 cr; I MTWThF; CH 206) Osell
- 66. Officiating Football and Basketball.** Qualifications of officials, officiating ethics, discussion of rules, and officiating techniques. Four hours per week in theory and practice under supervision. (3 cr; prereq 4A-B; VI MTWThF and ar; CH 215) Mueller
- 68. Basketball Coaching.** Theory, styles of offense and defense, the conditioning and handling of players. (2 cr; prereq 4B; III MTWThF; CH 215) Kundla
- 73††-74-75. Student Teaching.** Actual practice in teaching physical education activities. (2 cr each; prereq 55, Ed 55B; 10-12 hrs per wk ar; CH 220) Piper
- 101. Principles of Physical Education.** A study of the aims, scope, and biological aspects of physical education with special consideration of the place of physical activity in education. (3 cr; prereq 32, 55 and 9 cr in activity courses; II MTWThF; CH 215) Heusner
- 135. Tests, 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 sr, grad, EPsy 60, 116 or #; IV MTWThF; CH 215) Heusner
- 224.\* Research Problems in School Health Education, Physical Education, and Recreation.** Independent study on problems selected by students and approved by instructor. Conferences of individual students with instructor. (Cr ar; prereq #; CH 220) Fitzgerald, Heusner, Piper, Stish
- 233. The Administration of Physical Education in Schools.** Staff, organization, and supervision required in programs of physical education; intramural and interscholastic athletic problems; legal aspects; professional and public relations. (3 cr; prereq 63, 101 or equiv; III MTWThF; CH 206) Stish
- 236. Recent Literature and Research in Physical Education and Recreation.** Research methods applied to physical education and recreation; preparation of designs for research problems. (3 cr; I MTWThF; CH 215) Stish
- 241. The Administration and Supervision of Public Recreation.** Organization for recreation; policies and procedures relating to finance, program, facilities, office management, legislation, and public relations. (3 cr; II MTWThF; CH 206) Fitzgerald

### *Second Term*

- 1A. Tennis.** (Limited to 40) (1 cr; VI MTWThF; Tennis Courts) Novak, Piper
- 1B. Intermediate Swimming.** (Limited to 40) (1 cr; VII MTWThF; CH Pool) Novak
- 1C. Beginning Golf.** (Limited to 40) (1 cr; V-VI MW; Golf Course) Bolstad
- 2C. Intermediate Golf.** (Limited to 40) (1 cr; V-VI TTh; Golf Course) Bolstad

---

†† Students registering for this course must make out the application required for methods courses and student teaching. Forms are available in the office of the director of student teaching, 227 Burton Hall.

51. **Mechanics of Movement.** A study of the structure of the body and the principles and mechanics of bodily movements. (3 cr; prereq 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 men. (2 cr; prereq 4A or experience on squad; V MTWThF; CH 215) Warmath and staff
69. **Track Coaching.** Techniques of performance in all of the standard track and field events; methods of coaching; organization of track meets; study of rules; officiating methods and practice. (2 cr; prereq 4C; III MTWThF; CH 206) Kelly
- 73††-74-75. **Student Teaching.** (See first term) Piper
110. **Recreation Surveys.** Methods and techniques of conducting recreation surveys. (3 cr; prereq sr, grad; I MTWThF; CH 214) Fitzgerald
155. **Instructional Aids in Health, Physical Education, and Recreation.** Evaluation, construction, and use of instructional materials stressing audio-visual aids. (3 cr; prereq sr, grad; II-III MTWThF; CH 215) Piper
- 224.\* **Research Problems in School Health Education, Physical Education, and Recreation.** (See first term) Donnelly, Fitzgerald, Piper
234. **The Curriculum in Physical Education.** Theory and principles of curriculum construction applied to physical education; practical application in construction of a curriculum. (3 cr; I MTWThF; CH 215) Donnelly
238. **The 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 ‡; IV MTWThF; CH 206) Donnelly

## PHYSICAL EDUCATION FOR WOMEN (PE W)

### Physical Examination

It is recommended that every woman student avail herself of the opportunity offered by the University Health Service for a physical examination. Everyone, but especially a teacher, should know her health status. 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 2 to 3:30 p.m. during the first term and from 1 to 2:30 p.m. 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 a piece. 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.

---

†† Students registering for this course must make out the application required for methods courses and student teaching. Forms are available in the office of the director of student teaching, 227 Burton Hall.

## Teaching Qualifications

Those interested in teaching physical education in the state of Minnesota must qualify in one of the following professional programs:

1. Courses applying this summer to the minor in physical education are: PE W 13, 18, 25, 32, 62, 81, 102, 114.
2. Courses applying this summer to the undergraduate major in physical education are: PE W 5, 18, 25, 81, 102, 117B, 135.
3. Courses applying to advanced and graduate degrees with a major in physical education are: PE W 102, 114, 118, 124, 224.

## Required Physical Education

Those interested in meeting a college requirement in physical education may register for PE W 7, 8, 12, 32.

## Elementary School Majors

PE W 45 is being offered this summer to accommodate elementary school majors and also classroom teachers wishing help with practical experience with graded activities for elementary school children.

### First Term

- 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. (Limited to 20 per section) (1 cr) Eibner, Reiter

Sec 1, IV MTWTh, NGW 151  
Sec 2, IV MTWTh, NGW 151

Sec 3, V MTWTh, NGW 151

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. (Limited to 20 per section) (1 cr) Reiter

Sec 1, 7:00 a.m. MTWTh, NGW 60    Sec 3, II MTWTh, NGW 60  
Sec 2, I MTWTh, NGW 60

- 12.†† **Social Recreation.** Ballroom and American country dance. Ballroom dance skills and country dances selected for use in high school teaching. Simple mixers for social groups will be included. (1 cr; VI MTWTh; NGW 151) Ar.

13. **Tumbling, Stunts, and Methods.** Instruction and practice in technique of individual, companion, and group tumbling and stunts with progression from elementary through high school level. Discussion and application of principles underlying pyramid building. Teaching methods appropriate to this activity area will be discussed and experienced. (2 cr; I MTWThF; NGW 153) Hauptfuehrer

- 18.†† **Elementary Folk Dancing, Games, and Methods.** Graded folk dances and games usable at the elementary and secondary levels; teaching methods suited to the different age levels and the content will be discussed and experienced. (2 cr; V MTWThF; NGW 153) Lampe

25. **American Red Cross First Aid Standard.** Lectures, demonstrations, and practice in emergencies and first aid treatment. American Red Cross Standard Certificate in

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

First Aid received upon successful completion of course. (2 cr; IV MTWThF; NGW 3) Wells

- 32.†† **Beginning and Advanced Beginning Swimming.** Instruction includes orientation activities, crawl, side stroke, backstroke, diving, and water safety skills. (Limited to 20 per section) (1 cr) Eibner

Sec 1, Bgn Swim, V MTWTh, NGW 58      Sec 2, Adv Bgn Swim, VI MTWTh, NGW 58

- 45.†† **Introduction to the Elementary Physical Education Program.** Experience with graded activities for the elementary school child. Problems of organization and teaching progressions considered. (2 cr; prereq elementary education majors only; II MTWThF; NGW 153) Jaeger

- 62.†† **The Teaching of Physical Education Activities.** For students minoring in physical education. Methods in team and individual sports, rhythms, and self-testing in the junior-senior high school program. (3 cr; prereq #, physical education minors and recreation majors; III MTWThF; NGW 153) Hauptfuehrer

102. **The Physical Education Program for the Elementary and Secondary School.** Deals with the philosophy, objectives, trends, content, and evaluation in relation to the physical education curriculum at both the elementary and secondary levels. Provision made for the study of curricular problems of special interest to the individual. (3 cr; IV MTWThF; NGW 3) Jaeger

115. **Advanced Kinesiology.** Techniques of mechanics and kinesiology of movement skills; evaluation of pertinent research methods and devices; application to individual projects. (3 cr; II MTWThF; NGW 3) Wells

- 118E.§§ **Problems in 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 consent of grad advisers) Staff

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 qualifications of supervisors; problems peculiar to supervision of physical education. (3 cr; III MTWThF; NGW 3) Baker

- 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 consent of grad advisers) Staff

### Second Term

- 7.†† **Tennis for Beginners.** (See first term) (1 cr) Hauptfuehrer

Sec 1, II MTWTh, NGW 151

Sec 2, III MTWTh, NGW 151

114. **Administration of the School Health Education Program.** Co-ordination of total program; health supervision and guidance; relationships between the public schools and governmental health organizations and agencies; and evaluation. Guidance in the solution of individual professional problems. (3 cr; IV MTWThF; NGW 3) Slocum

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

§§ Courses marked "E" carry credit toward the degree of master of education.

- 118E.§§ **Problems in Teacher Education in Health, Physical Education, and Recreation.**  
(See first term) Staff
- 224.° **Research Problems in School Health Education, Physical Education, and Recreation.**  
(See first term) Staff

---

§§ 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) Anderson
- 7D. Physical Science: Elements of 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; P 218; field trips VI-VII M) 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 and 1 hr lab ar; NH 207) Rassweiler
- 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
- 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. Invitation to Literature I.** Seeks to integrate life and literature and to relate the student's experiences to certain universal themes. Readings are to be found in both

ancient and modern literature and are grouped according to the following thematic arrangement: Man and Woman, Man and Spiritual Values, Man and Nature, Man and Family. (3 cr; II MTWThF; NH 216) Sheldon

- 31A. Writing Laboratory: Personal Writing.** To see why and how he uses language, the student studies its history and development, levels of usage and style, and becomes familiar with the dictionary's resources. He will read and write descriptions, character sketches, incidents, autobiographies, and letters. (3 cr; III-IV MTWTh; NH 216) Rathburn
- 37. Social Trends and Problems.** Study of the major trends and areas of conflict in our social order designed to increase the student's understanding of his society and to develop skills necessary to analyze social situations and evaluate proposed courses of action in the light of democratic values. (3 cr; II MTWThF; NH 122) F Harris
- 46D. Problems of International Relations.** Problems such as war, defense, technological interdependence, international trade, foreign aid, ideological conflict, and international organization are studied. Emphasis is placed on the realization of the importance of these issues in the life of the individual citizen, and the development of mature judgments concerning them. (3 cr; I MTWThF; NH 122) Jones

### 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 216) 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. In the study and solution of practical problems, the 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, punctuation, and spelling; emphasis on such matters of style as subordination, parallel construction, tense consistency, and placement of modifiers. (3 cr; I MTWThF; NH 216) Stockdale
- 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) Kurak
- 43C. The Far East.** A study of the modern problems of Japan, Korea, China, India, Pakistan, and Southeast Asia, with historical background as an aid to understanding. (3 cr; I MTWThF; NH 213) Matsumoto
- 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; IV MTWThF; NH 213) F Harris

## LAW SCHOOL

### *First and Second Term*

Courses in the Law School Summer Session are open only to students who have completed at least one 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 and require attendance through both terms. Arrangements may be made to attend one or more of these courses.

123. **Corporations.** (6 cr; IV MTWThF; FraH 120) Cradwohl

128. **Taxation I.** (6 cr; I MTWThF; FraH 120) Waterbury

180. **Federal Jurisdiction.** (3 cr; III MWF; FraH 120) Levy

184. **Unfair Competition.** (3 cr; II MWF; FraH 120) McCoid

186. **Family Law.** (3 cr; II TTh, VI W; FraH 120) Levy

187. **Legal Medicine.** (3 cr; III TTh, VI M; FraH 120) McCoid

Law School tuition during the summer quarter is: 3 credits, \$45; 6 credits, \$90; 9 credits, \$115 (residents), \$135 (nonresidents); 12 or more credits, \$115 (residents), \$180 (nonresidents). In addition each student will pay the incidental fee of \$19.

## 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, 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, the Ancker Hospital, Glen Lake Sanatorium, and the Wilder Dispensary, 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 \$115 for residents of Minnesota, and \$255 for nonresidents. Less than a full program may be paid for at the summer rate or academic year rate, which-

ever is higher. In addition each student will pay the incidental fee of \$19. Students in certain courses are required to furnish microscopes.

The term fees, applicable primarily to students in the freshman, sophomore, and junior years of the University of Minnesota Medical School, are one half the quarter fees. Laboratory fees are not required under this plan. The schedule of total fees will be therefore:

	<i>Summer Quarter</i>	<i>Summer Term</i>
Tuition fee .....	\$115.00 (\$255.00)	\$57.50 (\$127.50)
Incidental fee .....	19.00	9.50

**Medical Students or Physicians Registering for Externships**—A tuition fee of \$57.50 *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 \$9.50 per term. In elective courses where a microscope is required this may be rented from the University.

**Nonmedical Summer Session Students**—Students who do not desire to register for time credit toward a medical degree, and who are ineligible to register for an externship or for a program of clinical subjects, may pay the regular Summer Session fees per term.

## ANATOMY (Anat)

### *First Term*

#### ELECTIVE COURSES

156. **Advanced Anatomy.** Individual problems in gross anatomy, histology or neurology. (Cr ar; prereq #; ar) Staff
204. **Research in Anatomy.** Gross anatomy, histology, hematology, or neurology. (Cr ar; prereq #; ar) Staff

### *Second Term*

#### ELECTIVE COURSES

156. **Advanced Anatomy.** (See first term) Staff
204. **Research in Anatomy.** (See first term) Staff

## ANESTHESIOLOGY (Anes)

### *First Term and Second Term*

#### ELECTIVE COURSES

99. **Fundamentals of Postanesthetic Care.** An introductory course in the fundamentals of postanesthetic care designed for the Graduate Nurse who wishes to gain knowledge in the field of Recovery Room Nursing. Four didactic lectures plus 6 hrs (ar) of concentrated postanesthetic nursing care weekly. (4 cr; prereq grad nurse) (Limited to 5) Van Bergen
169. **Research in Anesthesia.** Anesthesia problems in experimental laboratory or in hospital. (Cr and hrs ar) 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

## BACTERIOLOGY (Bact)

### *First Term*

- 53.†† **General Bacteriology.** Lectures, demonstrations, and laboratory exercises are employed for instruction in the morphology, physiology, taxonomy, and ecology of bacteria. The practical applications of these fundamental principles are emphasized. (5 cr; prereq soph with a C avg in the prereq courses, jr, sr, 10 cr in chemistry and 4 cr in biological sciences or ‡; lect II MTWThF, MMA 100; lab III-IV MTWThF, Mayo A205) Deal
201. **Research.** (Cr and hrs ar) Syverton

### *Second Term*

116. **Immunology.** Mechanisms of the interactions between host and parasite. Techniques and theories of serologic procedures; laws of hemolysis, quantitative relationship between antigen and antibody; opsonins, serums, vaccines, toxin, antitoxin, complement fixation, neutralization; precipitative and agglutination reactions, blood grouping, atopy, anaphylaxis. (4 cr; prereq 53; lect II MTWThF, MMA 100; lab III-IV MTWTh, Mayo A205) Watson
201. **Research.** (Cr and hrs ar) Watson

## MEDICINE (Med)

### *DIVISION OF INTERNAL MEDICINE*

#### *First Term and Second Term*

104. **Internal Medicine.** Watson and staff
111. **Junior Clerkship in Medicine.** Watson, Spink, Hoffbauer, and staff
112. **Senior Medical Clerkship.** Murray and staff

### **COURSES FOR GRADUATE STUDENTS**

201. **Clinical Medicine.** (Cr ar) Watson, Spink, Lowry, Flink, MacDonald, Hoffbauer, Kennedy, Hagen, Hall
203. **Research in Medicine.** Watson, Spink, Frantz, Flink, Hoffbauer, Schwartz, Tobian, Hall, Hagen, Kennedy, Zieve

†† Microscope required. Students may obtain use of microscope by purchasing \$3 microscope card from Bursar.

- 206. **Clinical Conference.** Presentation of problem cases. Discussion of diagnosis and treatment and consideration of pertinent literature. (1 cr; 9 am F) Watson, Spink, Hoffbauer, Lowry, Flink, and staff
- 207. **Clinical Pathological Conference.** Presentation of clinical features, necropsy findings, and discussion. Medical and surgical cases. (1 cr; 11 am W) Dawson and staff
- 208. **Clinical Radiological Conference.** Presentation and discussion of x-ray films, from the Medical Service, with clinical correlation. (1 cr; 9 am M) Peterson, Watson, and staff
- 213. **Cardiovascular Seminar.** Weekly conference on clinical cardiovascular problems, held jointly by the Departments of Medicine, Surgery, Radiology, and Pediatrics. (1 cr; hrs ar) Frantz, Tobian, Winchell, and others

**DIVISION OF DERMATOLOGY**

*First Term and Second Term*

**ELECTIVE COURSES**

- 158. **Clinics and Assistantship in Dermatology.** (Cr and hrs ar; prereq #) Lynch and staff
- 159. **Assistantship, Dermatology and Syphilis.** (Limited to 1) (Prereq jr med clerkship, #; Minneapolis General Hospital) Laymon and staff

**COURSES FOR GRADUATE STUDENTS**

- 225. **Clinical Dermatology and Syphilology.** (University Hospitals) Lynch and staff
- 226. **Clinical Dermatology and Syphilology.** (Minneapolis General Hospital) Laymon and staff
- 227. **Histopathology of the Skin.** Goltz and staff
- 228. **Research in Dermatology and Syphilology.** Lynch, Goltz, Rukavina

**LABORATORY MEDICINE (LMed)**

*First Term and Second Term*

**COURSES FOR GRADUATE STUDENTS**

- 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

**OBSTETRICS AND GYNECOLOGY (Obst)**

*First Term*

**REQUIRED COURSES**

- 120. **Obstetrics and Gynecology.** Physiology of pregnancy, labor, and the puerperium. (1 cr; prereq 124; 4:30-5:30 T) McKelvey and staff
- 121. **Obstetrics and Gynecology.** Pathology of pregnancy, labor, and the puerperium. (1 cr; prereq 120; 4:30-5:30 T) McKelvey and staff

123. **Obstetrics and Gynecology.** Diagnostic methods in diseases of women. (1 cr; prereq 121; 4:30-5:30 T) McKelvey and staff
135. **Clinical Clerkship in Obstetrics and Gynecology.** Includes clinics in obstetrics and gynecology. (6 cr; prereq regis Med) McKelvey and staff

#### ELECTIVE COURSES

- 160A. **Externship in Obstetrics and Gynecology.** (Limited to 10 students) 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. (6 cr) McKelvey and staff

#### COURSES FOR GRADUATE STUDENTS

201. **Advanced Obstetrics and Gynecology, Part I.** (Ar) McKelvey, Prem, Goodlin, Makowski, and staff
205. **Advanced Obstetrics and Gynecology, Part II.** (Ar) McKelvey, Prem, Goodlin, Makowski, and staff
209. **Advanced Obstetrics and Gynecology, Part III.** (Ar) McKelvey, Prem, Goodlin, Makowski, and staff
216. **Research.** Staff
301. **Externship.** (6 cr) McKelvey, Prem, Goodlin, Makowski, and staff

### *Second Term*

#### REQUIRED COURSES

120. **Obstetrics and Gynecology.** Physiology of pregnancy, labor, and the puerperium. (1 cr; prereq 124; 4:30-5:30 T) McKelvey and staff
121. **Obstetrics and Gynecology.** Pathology of pregnancy, labor, and the puerperium. (1 cr; prereq 120; 4:30-5:30 T) McKelvey and staff
123. **Obstetrics and Gynecology.** Diagnostic methods in diseases of women. (1 cr; prereq 121; 4:30-5:30 T) McKelvey and staff
135. **Clinical Clerkship in Obstetrics and Gynecology.** Includes clinics in obstetrics and gynecology. (6 cr; prereq regis Med) McKelvey and staff

#### ELECTIVE COURSES

- 160B. **Externship in Obstetrics and Gynecology.** (See 160A, first term) McKelvey and staff

#### COURSES FOR GRADUATE STUDENTS

204. **Advanced Obstetrics and Gynecology, Part I.** (Ar) Prem, Goodlin, Makowski
208. **Advanced Obstetrics and Gynecology, Part II.** (Ar) Prem, Goodlin, Makowski
212. **Advanced Obstetrics and Gynecology, Part III.** (Ar) Prem, Goodlin, Makowski
219. **Research.** (Ar) Staff



- 302. Externship. (6 cr) Prem, Goodlin, Makowski, and staff
- 303. Obstetric and Gynecologic Histology. (6 cr; hr ar) McKelvey and staff

**OPHTHALMOLOGY (Oph)**

*First Term and Second Term*

**COURSES FOR GRADUATE STUDENTS**

- 201. Clinical Ophthalmology. (6 cr; 10-5 MTWThF; Out-Patient Clinic) Harris and staff
- 204. Surgery of the Eye. (3 cr; 7:30-10 TWTh; Operating Room) Staff
- 220. Basic and Applied Ophthalmology. (2 cr; 9-12 S; Out-Patient Clinic) Harris

**OTOLARYNGOLOGY (Otol)**

*First Term and Second Term*

**COURSES FOR GRADUATE STUDENTS**

- 230. Clinical Otology. (3 cr; 9-12 MTWThF; Out-Patient Clinic and Operating Room) Boies and staff
- 231. Clinical Rhinology and Laryngology. (3 cr; 9-12 MTWThF; Out-Patient Clinic and Operating Room) Boies and staff
- 232. Surgery of the Ear, Nose and Throat. (3 cr; 9-12 MTWThF; Out-Patient Clinic and Operating Room) Boies and staff

**PATHOLOGY (Path)**

*First Term*

- 104. Autopsies. (Cr ar; prereq 102; hrs ar) Dawson
- 106. Diseases of the Heart. (2½ cr; prereq 102; VII-VIII TTh; JacH 104) Staff
- 111. Conference on Autopsies. (1 cr; prereq 102; 12:30-1:30 T; JacH 104) Dawson
- 112.†† Diagnosis of Tumors. (2½ cr; prereq 102; hrs ar) Hebbel
- 113.†† Surgical Pathology. (Cr ar; prereq 102; hrs ar) Hebbel
- 120. Diseases of the Lungs. (1 cr; prereq 102; hrs ar) Dawson
- 201. Research. Students with the necessary preliminary training may elect research either as a major or minor in pathology. (Cr ar; prereq #; hrs ar) Dawson

*Second Term*

- 104. Autopsies. (See first term) (Cr and hrs ar) Dawson, Hebbel
- 111. Conference on Autopsies. (See first term) (1 cr; 12:30-1:30 T; JacH 104) Dawson
- 112.†† Diagnosis of Tumors. (See first term) (2½ cr; hrs ar) Hebbel
- 113.†† Surgical Pathology. (See first term) (Cr ar; hrs ar) Hebbel

†† Second term 112 and 113 are not repetitions of the first term but rather continuations.

121. Diseases of the Alimentary Tract. (1 cr; prereq 102; hrs ar) Hebbel  
 201. Research. (See first term) (Cr ar; hrs ar) Dawson, Hebbel

## PEDIATRICS (Ped)

### *First Term and Second Term*

#### ELECTIVE COURSES

169. **Special Interests in Pediatrics.** Opportunities will be made in special areas according to specific interests for students desiring more intimate contact with some aspects of pediatrics such as child psychiatry, special clinical work in cardiology, endocrinology, allergy, metabolism, etc. Opportunities for highly qualified junior and senior students to pursue a research program related to the field of pediatrics is provided. (Cr ar; hrs ar; prereq #) J Anderson and staff
- 174A. **Dispensary Externship in Pediatrics.** Patients in Pediatric Dispensary are assigned to individual students for examination, treatment, and follow-up observation under supervision. Special clinics in well-baby care, allergy, heart, metabolism, endocrinology, convulsive disorders, cerebral palsy, and child psychiatry are attended weekly. (Limited to 10) (4 cr; II-IV and V-VII MTWThF; University Hospital and Minneapolis General Hospital) J Anderson and staff
- 174B. **In-Patient Externship in Pediatrics.** Patients in the pediatric wards at the University Hospitals and Minneapolis General Hospital are assigned to individual students for clinical history, physical and laboratory diagnosis, treatment and "follow-up" observation under supervision of the pediatric and consulting staff members. (4½ cr; II-IV and VI-IX MTWThF, I-IV S) J Anderson and staff

#### 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 Out-patient and In-patient Services of the University of Minnesota Hospitals and its affiliated hospitals. Research opportunities will be provided in either the basic science departments of the Medical School or in the laboratories of the Department of Pediatrics. (By arrangement)

200. **Graduate Seminar in Pediatrics.** (1½ cr; IX T; Mayo 1450) J Anderson and staff
202. **Pediatric Clinic.** (5 cr; II-IV MTWThF; Out-patient Departments of Minneapolis General and University Hospitals) J Anderson and staff
204. **Residency in Pediatrics.** Three-month residency in pediatrics at University Hospitals, Minneapolis General Hospital, Northwestern Hospital, 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 In-patient and Out-patient 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 ar; hrs ar; prereq #) Pediatric staff
208. **Pediatric Research.** Special problems. Students may collaborate with members of the staff or with other students. (Cr ar; hrs ar; Ped Labs) J Anderson and staff

**PHARMACOLOGY (Phcl)**

*First Term and Second Term*

- 10. Pharmacology for Nursing Students. (2 cr; lect 22 hrs 11:30 am T, lab 2:30-4:30 pm Th; MMA 125) Vick
- 109. Pharmacological Problems. (Cr and hrs ar) Bieter
- 203. Research in Pharmacology. (Cr and hrs ar) Bieter

**PHYSICAL MEDICINE AND REHABILITATION (PMed)**

*First Term and Second Term*

**ELECTIVE COURSES FOR MEDICAL STUDENTS**

- 122. Physical Medicine and Rehabilitation. Clinical lectures. (1 cr; prereq regis Med; Todd) Staff
- 181. Externship in Physical Medicine and Rehabilitation. (Cr and hrs ar; prereq regis Med)
- 190. Problems in Physical Medicine and Rehabilitation. (Cr and hrs ar; old 130; prereq regis Med)
- 195. Seminar in Rehabilitation Literature. (1 cr; I M; prereq regis Med)
- 200. Physical Medicine and Rehabilitation Service. (Cr and hrs ar) Staff
- 205. Physical Medicine and Rehabilitation Literature Conference. (1 cr; I M) Kottke
- 210. Research in Physical Medicine. (Cr and hrs ar) Kottke, Kubicek
- 211. Electronics in Physical Medicine. (Cr and hrs ar; 815 Mayo) Kubicek
- 212. Electromyography. (Cr and hrs ar; 815 Mayo) Kubicek

**OCCUPATIONAL THERAPY**

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

**PHYSIOLOGICAL CHEMISTRY (PhCh)**

*First Term*

**REQUIRED COURSES**

- 100. Physiological Chemistry. (7 cr; prereq organic and physical chemistry and physics; lect IV, VI MTWThF, Owre 12; lab I-III MTThF, MH 201) Barnum, Carr, Caster, Carlson

**ELECTIVE COURSES**

- 153. Problems in Physiological Chemistry. Special work arranged with qualified students. May be taken one or both terms. (Cr and hrs ar; prereq 100, 101) Barnum, Carr, Caster, Carlson
- 205. Research in Physiological Chemistry. (Cr and hrs ar) Barnum, Carr, Caster, Carlson

**Second Term****REQUIRED COURSES**

101. **Physiological Chemistry.** (7 cr; prereq 100; lect IV, VI MTWThF, Owre 12; lab I-III MTWTh, MH 201) Barnum, Ungar, Van Pilsum

**ELECTIVE COURSES**

153. **Problems in Physiological Chemistry.** (See first term) Barnum, Ungar, Van Pilsum  
 205. **Research in Physiological Chemistry.** (See first term) Barnum, Ungar, Van Pilsum

**PHYSIOLOGY (PhsI)****First Term****REQUIRED COURSES**

4. **Human Physiology.** An elementary course consisting of lectures and demonstrations for students desiring an introduction to the subject. (4 cr; prereq 1 qtr zool and 1 qtr chemistry; lect or dem II-III TWThF; Owre 111) Brown, Lifson

**ELECTIVE COURSES**

203. **Research in Physiology.** (Cr and hrs ar) Visscher and staff  
 223. **Physiology of the Kidney and Water and Electrolyte Balance.** Advanced lecture-seminar on acid-base and water balance. (2 cr; prereq 106-107 or equiv, #; IV TTh, VI TTh; Owre 113) Brown, Lifson

**Second Term****REQUIRED COURSES**

51. **Human Physiology.** (6 cr; prereq zool 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) King, Trank

**ELECTIVE COURSES**

203. **Research in Physiology** (Cr and hrs ar) Visscher and staff  
 211. **Selected Topics in Heart and Circulation.** Advanced lecture-seminar. (2 cr; prereq 106-107 or equiv, #; II TWThF, MH 424) Visscher, Cavert

**PSYCHIATRY AND NEUROLOGY (NPsy)****First Term and Second Term**

103. **Junior Clinical Clerkship.** (8 cr) Staff  
 145. **Readings in Psychiatry.** Supervised reading. (Cr ar) Staff  
 145X. **Readings in Neurology.** Supervised reading. (Cr ar) Staff  
 155. **Therapeutics in Neurology.** Supervised training in out-patient care of the chronic neurologic patient. (2 cr) Staff  
 202. **Case Conference for Psychologists.** (Cr ar; prereq #) Hathaway, Schofield, and staff  
 203. **Psychometric Clerkship.** (Cr ar; prereq #) Hathaway, Schofield, and staff

208. **Clinical Neurology.** (Cr ar) Baker, Cohen, and staff  
 212. **Survey of Neuropathology.** (1 cr) Cohen and staff  
 226. **Neurological-Neurosurgical Conference.** (1 cr, §Surg 318) Staff  
 228. **Research in Neuropathology.** (Cr ar) Baker and staff  
 231. **Applied Electroencephalography.** (1 cr) Staff  
 233. **Applied Neuropathology.** (1 cr) Cohen and staff  
 251. **Clinical In-Patient Psychiatry.** (Cr ar) Staff  
 252. **Clinical Out-Patient Psychiatry.** (Cr ar) Staff  
 253. **Clinical Child Psychiatry.** (Cr ar) Staff  
 254. **Advanced Clinical In-Patient Psychiatry.** (Cr ar) Staff  
 255. **Advanced Clinical Out-Patient Psychiatry.** (Cr ar) Staff  
 256. **Advanced Clinical Child Psychiatry.** (Cr ar) Staff  
 257. **Special Assignments in Psychiatry.** (Cr ar) Staff  
 258. **Research in Psychiatry.** (Cr ar) Staff  
 260. **Orientation to Clinical Psychiatry.** (1 cr) Staff  
 291. **Seminar in Current Literature.** (1 cr) Simon  
 292. **Specialized Supervised Psychotherapy.** (1 cr) Staff  
 293. **Problems in Teaching Psychiatry.** (Cr ar) Staff

## RADIOLOGY (Rad)

### *First Term*

#### ELECTIVE COURSES (UNDERGRADUATES)

185. **Interpretation of Roentgenograms.** (Limited to 6) (1 cr; prereq jr; VII-VIII TTH; Mayo B236) Peterson, Lester

### *Second Term*

#### ELECTIVE COURSES (UNDERGRADUATES)

109. **Externship in Roentgen Diagnosis and Radiation Therapy.** Participation in the work of the X-ray Department both in technique and in interpretation. The student will be given opportunity to observe some fluoroscopy, to assist in X-ray technique, and to observe X-ray interpretation. (Limited to 8) (4 cr; prereq sr medical students) Peterson, Mosser

### *First Term and Second Term*

#### 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; II M; Todd) 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 point of view. (1 cr; II T; Eustis) Lester, Feinberg

- 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) Peterson and staff
- 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) 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 M; Todd) 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)

### *First Term*

#### REQUIRED COURSES FOR UNDERGRADUATE STUDENTS

135. **Junior Clinical Clerkship.** (Externs) Wangenstein and staff

Courses 121, 127, and 129, which are required work for sophomore or junior medical students, are continued from the spring quarter through the first term of the Summer Session. Not open to students from other medical schools.

### *First Term and Second Term*

#### ELECTIVE COURSES (UNDERGRADUATES)

123. **Cardiovascular Surgery.** Clinical problems and participation in surgery. Seniors only. (Cr and hrs ar) C W Lillehei
139. **Operative Surgery.** Student is permitted to participate in surgical procedures on hospital patients in the operating room. (Cr and hrs ar) Wangenstein and staff
152. **Problems in Clinical Investigations.** Special case records correlated with literature study. (Cr and hrs ar) Wangenstein and staff

167. **Problems in Experimental Surgery.** Students under supervision will investigate problems assigned to them. As their experience increases, they are permitted to do the operations incident to their problems. (Cr and hrs ar) Wangenstein and staff

### **DIVISION OF GENERAL SURGERY**

#### ***First Term and Second Term***

#### **REQUIRED COURSES FOR GRADUATE STUDENTS**

200. **Out-Patient Clinic in Surgery.** Student is required to assist in the Out-Patient surgical clinic and to participate in diagnosis and treatment. University Hospitals surgical staff
202. **Applied Surgical Anatomy on the Cadaver.** Surgical fellows prepare dissections with staff supervision. Wangenstein and staff
203. **Proctoscopy and Sigmoidoscopy.** Diagnosis and treatment of lesions of the lower bowel. University Hospitals surgical staff
204. **Tumor Clinic.** Combined clinical and pathological consideration of tumors as seen by general surgeon. Staffs of Departments of Surgery and Biophysics. Wangenstein and staff
205. **Surgical Diagnosis.** Surgical fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in Out-Patient Department and in University Hospitals. Wangenstein and staff
208. **Surgical Service.** Surgical fellow acts as house surgeon at University Hospitals. 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. Wangenstein and staff
214. **Surgical Ward Conference.** Presentation of interesting cases by the students. University Hospitals surgical staff
215. **Roentgenological-Surgical Conference.** Weekly review of the films of all surgical patients. Staffs of the Departments of Radiology and Surgery
216. **Surgical Research.** Problems in experimental or clinical surgery. University Hospitals surgical staff
217. **Surgical Seminar.** Conferences for review of surgical literature, for presentation of cases, and as research. University Hospitals surgical staff
218. **Medical and Surgical Pathological Conference.** Review of interesting cases by the medical, surgical, and pathological staffs
219. **Surgical Literature Conference.** The leading surgical journals are assigned to the fellows who read and report on important articles at weekly conference. (1 cr) Wangenstein and staff
220. **Peripheral-Vascular Surgical Clinic-Conference.** Vascular clinic with conference following. (1 cr) Wangenstein and staff

### **DIVISION OF NEUROSURGERY**

#### ***First Term and Second Term***

#### **REQUIRED COURSES FOR GRADUATE STUDENTS**

305. **Neurosurgical Surgery.** Neurosurgical fellow assists in the instruction of clinical clerks and interns, and studies problems in diagnosis in Out-Patient Department and in University Hospitals. Peyton, French

308. **Neurosurgical Service.** Neurosurgical fellow acts as house surgeon at University Hospitals. Peyton, French
311. **Operative Neurosurgical Survey.** Neurosurgical fellow acts as first assistant at operations in University Hospitals, and later may be permitted to operate. Peyton, French
316. **Neurosurgical Research.** Problems in experimental or clinical surgery. University Hospitals surgical staff. Peyton, French
318. **Neurosurgical Conference.** Review of X-rays and case histories on Neurosurgical Service. (1 cr) Neurosurgery and Radiology staffs

### *DIVISION OF UROLOGY*

#### *First Term and Second Term*

#### REQUIRED COURSES

250. **Urological Surgery.** Urological fellow first assists at operations at the University Hospitals and later is permitted to operate under supervision of the staff. Creevy and staff
251. **Cystoscopy and Urological Diagnosis.** Urological fellow performs cystoscopies and other diagnostic procedures. Creevy and staff
252. **Urological Conference.** Three times a week. Problems in diagnosis and treatment are discussed. Creevy and staff
253. **Research in Urology.** Problems in experimental and clinical surgery. Creevy and staff
254. **Urological Seminar.** Presentation of urological subjects. Creevy and staff
255. **Urological Radiological Conference.** Review of roentgenograms of urological patients. Urology and Radiology staffs
256. **Urological Pathological Conference.** Review of microscopic and gross specimens from the urological service. Creevy and staff

### *DIVISION OF ORTHOPEDIC SURGERY*

Three- and four-year fellowships are offered to students working toward a graduate degree in orthopedic surgery. This work is carried on at the University Hospitals, Gillette State Hospital for Crippled Children, Shriners Hospital for Crippled Children, and the Minneapolis General Hospital. There is an interchange with the Orthopedic Department of the Mayo Foundation.

#### *First Term and Second Term*

405. **Orthopedic Diagnosis.** The orthopedic fellow assists in the instruction of the clinical clerks and interns, and studies problems in diagnosis in the Out-Patient Department and in the University Hospitals. (Cr ar) Moe and staff
408. **Orthopedic Service.** The orthopedic fellow acts as house surgeon at the University Hospitals. (Cr ar) 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. (Cr ar) Moe and staff



416. **Orthopedic Research.** Problems in experimental or clinical surgery. University Hospitals. (Cr ar) Moe and staff

## *Medical Technology*

### *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 (bacteriology, chemistry, hematology, histology, or immunology). (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 1960 Summer Session has been planned primarily to meet the needs of graduate nurses. The student may complete courses totaling up to 9 credits or two 5-credit courses in each term. Graduate nurses planning to register for Summer Session courses only register in the School of Nursing and pay Summer Session fees. The Summer Session may be used to supplement deficient basic nursing experience.

### **Curriculums for Graduate Nurses Leading to the Degrees of Master of Education in Nursing Education and Master of Nursing Administration**

Elective courses in these programs are available during the Summer Session. Students registering for these programs for the first time should complete their application prior to the beginning of the session. Qualified college graduates who have completed a basic professional program in nursing may begin this program in the Summer Session. Students planning to register for the academic year 1960-61 should consult the major adviser early, preferably during the first term. Students in education register in the College of Education. Students in administration register in the School of Nursing. Students pay Summer Session fees.

### **Curriculum 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.

College graduates who have completed a basic professional program in nursing may begin the nursing education or the nursing service administration major in Summer Session

Prerequisites for clinical nursing minors—medical, obstetric, operating room, nursing of children, psychiatric, rural, surgical, tuberculosis—may be taken in the Summer Session.

---

†† For courses in Public Health Nursing, see index.

Students in nursing education register in the College of Education and pay Summer Session fees. Students in nursing service administration register in the School of Nursing and pay Summer Session fees.

### 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, 1959-61*, page 18) Students register in the College of Science, Literature, and the Arts and pay Summer Session fees.

Students in the professional portion of the curriculum register in the School of Nursing and pay regular School of Nursing fees: residents \$71, nonresidents \$105.

### 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, 1959-61*, page 29. Students register in the School of Nursing and pay regular practical nursing fees: residents \$71, nonresidents \$105, plus \$19 incidental fee for the summer quarter.

For program in Practical Nursing and Home Management see *Bulletin of the School of Agriculture, 1958-60*, pages 25-26.

#### First Term

- NuAd 160. Ward Administration.** Hospital organization; principles of administration and application to ward management; analysis and maintenance of nursing service; selection, orientation, assignments, and motivation of personnel; planning and conducting clinical teaching programs. (3 cr; prereq 170 or #; II MTWThF; Owre 113) Grainger
- NuAd 167A. Studies and Experience in Ward Administration.** (1½ cr; prereq sr, grad, #; VII MWF; MH 128) Grainger
- NuAd 170. Foundations of Nursing Service Administration.** Principles of administration with application to nursing; current practice in nursing administration. (3 cr, cannot be taken for credit by students in master of nursing administration program; prereq jr, sr, grad, or grad nurse; III MTWThF; MH 128) Harris, Walseth
- NuAd 173. Fundamentals of Education in Nursing.** Identification of learning situations. Selection and planning of learning experiences. Consideration of methods of instruction for individuals and groups. Evaluation of learning. (3 cr; prereq 170, and nursing administration major, or #; VII M, VI-VII TTh; ForH 180) Dunning
- NuAd 175. Elements of Administration in Nursing.** Organization and role of nursing service in hospitals; planning and directing patient care; procurement and assignment of nursing personnel; in-service education. (5 cr; open only to majors in nursing administration; prereq 170; VI-VII MTWThF; MH 116) Harris, Walseth
- NuAd 176. Elements of Administration in Nursing.** Communication within hospital organization; hospital economics; legal aspects of nursing practice; human relations. (5 cr; prereq 177; II-III MTWThF; MH 214) Harris, Walseth
- NuEd 162. Personnel Work in Nursing.** Principles and techniques of personnel work applied to problems in nursing. Individual differences, human behavior, psychological tests, personnel records, orientation periods, remedial programs, counseling interviews. (3 cr; prereq sr, grad, or grad nurse; I MTWThF; Owre 113) Holm

**Nurs181. Research in Nursing.** Exploration of needs for research in nursing and discussion of possible ways in which selected research efforts might be undertaken. (3 cr; prereq sr, grad, or grad nurse; IV-V WF, IV Th; MMA 100) Ar.

**NuEd 190. The Survey in Nursing Education.** Survey techniques in making an educational field study. (3 cr; prereq sr, grad, #; II-III TTh, II F and ar; MH 116) Harrington

### *Second Term*

**NuAd 167A. Studies and Experience in Ward Administration.** (1½ cr; prereq sr, grad, #; VII MWF; MH 116) Grainger

**NuAd 193. Principles of Administration Applied to Nursing Service Administration.** Community resources and agencies; planning for emergency nursing; inservice education; human relations. (6 cr; open only to 4th qtr students in the master of nursing administration program; prereq 192; II-IV MWF, II Th; MH 116) Harris

NOTE—See also EdT 51A, The Teaching of Nursing, College of Education, Methods and Student Teaching.

## School of Public Health

During the Summer Session the School of Public Health makes available a group of public health nursing and related courses which will enable nurses already employed in public health to meet present certification or merit system requirements in various states. These courses are arranged in sequence over a period of 2 or 3 summers and include full- or part-time field practice.

Unless a nurse who wishes to enroll in these courses has completed approximately a year and a half of acceptable general academic credits, she is admitted to the Summer Session as a special student, and is not a candidate for a degree. Transfer from special to degree status is possible only under very unusual conditions and may involve considerable repetition of courses. If a nurse has a degree program as her goal, she should not enroll in the above sequence as a special student.

It is possible, however, to begin a program of study leading to a bachelor of science degree in the Summer Session. Such students should submit applications and transcripts at least 2 months in advance of the opening of the first term. When admitted as a degree candidate, the student is expected to follow a planned sequence of courses, completing Lower Division general academic requirements in advance of professional course work.

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

The special summer program in Statistics in the Health Sciences will be offered June 16 to July 30. The program on Ground Water Development, conducted in the summer of 1959 at the request of the International Cooperation Administration and the World Health Organization, will be repeated during the 1960 Summer Session.

### *First Term*

**50. Personal and Community Health.** Fundamental principles of health conservation and disease prevention. (3 cr, §2, 3, 3A, 3B, 4, 5, 51, 52, 100; III MTWThF; Owre 113) Thomson

**58. Maternal and Child Health.** Maternal health; health of the infant and preschool child; care of handicapped children. (2 cr; prereq nurses, 62, 133 or ¶; II MTThF; MMA 125) Stocking

- 62B. Public Health Nursing I.** Introduction to public health nursing; emphasis on understanding ways in which public health nursing services are given to patients and families in the community. (2 cr; prereq #, 58, 69, 133, or ¶; VI MTThF; MMA 100) Cline
- 63A. Public Health Nursing II.** Public health nursing services to adults; home, industry, community as operational areas; emphasis on chronic illness and rehabilitation; organization and administration of services. (3 cr; prereq public health nurses, 62A, 65; VI-VII MF, VII W; MMA 125) Murphy, 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) E Anderson, Blanchard, Cline, Fredlund
- 69. The Nurse in the School.** Organization and administration of school health programs; health in school curriculum; nursing functions. (2 cr; prereq 53, 58, 62, 133 or ¶ or #; III MTThF; MMA 100) 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) Stief
- 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) Cline
- 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 and faculty
- 231.\*\* Ground Water Supplies.** Ground water as a source of supply for communities in economically underdeveloped areas of the world. Special reference to public health problems involved. (Cr ar; prereq graduate engineer and #; ar) Bosch, staff, visiting lecturers

#### 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,  $t$ ,  $x^2$ ,  $F$ , binomial, Poisson; special distributions arising from nonparametric procedures. (3 cr; prereq ¶111; IV MTWThF; Owre 111) Brown
- 111. Biostatistics Laboratory.** Presentation of data; descriptive statistics; practice in practical application of principles and methods covered in 110. (2 cr; prereq ¶110; III TThF and 7 hrs per wk ar during morning, afternoon hrs by special ar only; Mayo 1220) Iversen

#### SPECIAL PROGRAM IN STATISTICS IN THE HEALTH SCIENCES

*June 16 to July 30*

NOTE—Courses 270-279 carry Special Fees. See section on Course Fees.

- 270. Statistical Methods in Public Health.** For those with interests primarily in public health and/or vital statistics. Sources of statistical data; development of basic tools for statistical analysis; vital statistics; measures of morbidity; life table; collection,

- classification and summarization of data; graphical presentation; survey of methods of sampling; estimation and tests of significance. (5 cr; prereq algebra or #; hrs ar; ME 110) Ar.
- 271. Management of Health Agency Records.** Collection of data; editing; coding; classifying; tabulating; records systems; mechanical processing of records; micro-filming; principles of records retirement. (5 cr; prereq #; hrs ar; ME 110) Hemphill
- 272. Biostatistics in the Health Sciences.** For those with interests primarily in laboratory sciences and small sample methods. Elementary probability; descriptive statistics; normal distribution; analysis of variance and covariance; linear regression and correlation; introduction to contingency chi-square; emphasis on applications of statistical methods and their limitations. (5 cr; prereq 1 yr college mathematics or equiv, #; hrs ar; ME 106) Harshbarger
- 273. Demographic Methods in Public Health.** Specialized methods for collection and analysis of data on morbidity, mortality, natality; population composition and changes; the life table as a research tool. (5 cr; prereq 1 course in statistics, #; hrs ar; ME 106) Reed
- 274. Registration and Vital Records.** Legal and regulatory bases for systems of vital records; role of vital records in affairs of persons and community organizations; dynamics of vital records systems including their structure, flow, reproduction, storage, reference, and retirement; principles underlying nosology and codes for morbidity and mortality data; legal status and responsibilities of registration executives; professional relationships with physicians, morticians, epidemiologists, statisticians, and representatives of health, social, and legal units of government. (5 cr; prereq #; hrs ar; ME 110) Bailey, Erhardt
- 275. Advanced Biostatistics in the Health Sciences.** For those with more than an elementary background in statistics. Analysis of proportions and rates in more complex situations; multiple regression and correlation; problems of classification and diagnosis; special topics. (5 cr; prereq 272 or equiv and, preferably, 1 yr of calculus or #; hrs ar; ME 102) Chiang
- 276. Statistical Methods in Epidemiology.** Analysis and theories of epidemics; secondary attack rates; design of epidemiological investigations. (5 cr; prereq 1 course in statistics and #; hrs ar; ME 106) Greenberg
- 277. Sampling Techniques in the Health Sciences.** Finite population correction factors; probability and nonprobability sampling; methods of estimation; variance of estimates. (5 cr; prereq 1 course in statistics and, preferably, college algebra and/or #; hrs ar; ME 102) Thompson
- 278. Statistical Methods in Biological Assay.** Logic of biological assay; dosage-response curves; graded and quantal responses; parallel line and slope-ratio assays; combinations of two or more responses; problems of design. (5 cr; prereq 272 or equiv or experience in performing biological assay, #; hrs ar; ME 102) Johnson
- 279. Lecture Series.** A series of lectures by a group of outstanding visitors invited specifically for this series. (1 cr; no prereq; all students registered in special program in Statistics in the Health Sciences are required to register for this course; VIII-IX TTh; MMA 100) Bearman, Visiting lecturers

### *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
- 63B. Public Health Nursing II.** (Continuation of 62B) Public health nursing services to adults; emphasis on chronic illness and rehabilitation; organization and administra-

- tion of services. (4 cr; prereq 58, 69, 62B, 133, ¶53; VI-VII MTWTh; MMA 100) Murphy, E Anderson
65. **Field Practice in Public Health Nursing.** (See first term) E Anderson, Blanchard, Cline, Fredlund
75. **Introduction to Environmental Sanitation.** Principles of urban and rural sanitation relating to water, food, wastes, housing, air, insects, rodents. (3 cr; prereq 3 cr in public health; IV MTWThF; MMA 100) Bosch
- 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 bacteriology; I-II MTWThF; MMA 125) G Anderson
133. **Mental Health.** (See first term) (III MTWThF; Owre 111) Cline
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
230. °° **Field Practice in Environmental Sanitation.** (Cr ar; prereq #) Bosch
232. °° **Field Work in Ground Water Development.** Development of ground water sources for communities in economically underdeveloped areas of the world. Special reference to public health problems involved. (Cr ar; prereq graduate engineer, 231; ar) Bosch, staff, visiting lecturers

#### BIOSTATISTICS

120. **Biostatistics II.** Continuation of 110. (3 cr; prereq 110 with grade not lower than C, ¶121; IV MTWThF; Owre 113) Brown
121. **Biostatistics Laboratory II.** Practice in application of principles and methods covered in 120. (2 cr; prereq ¶120; III TThF, and 7 hrs per wk ar during morning, afternoon hrs by special ar only; Mayo 1220) Iversen
180. **Introduction to Biostatistics.** Variation; frequency distribution; probability; estimation; significance tests; binomial, normal, Poisson distribution; serial dilutions; most probable number. (5 cr; prereq sanitation and sanitary engineering students only, others #; III MTWThF; Owre 113, plus 9 hrs per wk lab ar; Mayo 1220) Bearman

## 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 1960 for their final year in either Plan A or Plan B program for the associate degree in mortuary science. 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*

11. **Introduction to Mortuary Management.** Funeral service as a business profession. Current statistics and studies. (2 cr; prereq 10 or #; III MWF; NH 107) Thorsell
12. **Introduction to Embalming.** Techniques, history, licensure, and legal requirements. (3 cr; prereq 10 or #; II MTWThF; NH 107) Slater
13. **Mortuary Law.** Mortuary jurisprudence, probation of estates, administratorships, social security, life insurance forms, public and personal liability. (3 cr; I MTWThF; NH 107) Grayson

## COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

The *Bulletin of the College of Science, Literature, and the Arts*, obtainable from the Office of Admissions and Records or the college office, contains information on objectives, requirements, and courses of the college. The University's *Bulletin of General Information*, similarly available, contains information on admission as a regular student, costs, housing, and so forth. For admission to Summer Session see section on Admission and Registration in this bulletin.

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. See the complete bulletin of the college or consult a faculty adviser.

Some of the numbers given in the statement of prerequisites for courses in this bulletin refer to courses listed in the bulletin of the college.

Some of the courses scheduled in this *Bulletin of the Summer Session* 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 students of the College of Science, Literature, and the Arts under the same conditions that prevail during the regular college year. Such courses are listed in the *Bulletin of the College of Science, Literature, and the Arts*.

Students are invited to bring any questions or problems to the college offices, 214 and 223 Johnston Hall, or (on Monday, June 13) to the college desk in the Union Main Ballroom.

### AMERICAN STUDIES (AmSt)

(See section on Special Programs)

#### *First Term*

**Hum 21. American Life I.** Individualism as a concept in American life and thought. (3 cr; IV MTWThF; FolH 6) Hiner

**251. Readings in American Civilization.** Independent study of interdisciplinary aspects of American civilization under guidance of members of various departments. (Cr ar; prereq  $\Delta$ ; ar) Ar.

#### *Second Term*

**Hum 22. American Life II.** The role of religious and philosophic attitudes in formation of American beliefs. (3 cr; III MTWThF; FolH 6) Albrecht

**202. Introduction to American Studies.** The Jacksonian idea of individualism and its modern transformation. An interdisciplinary exploration in a variety of fields and in two periods (1830-1850 and 1890-1915). (3 cr; prereq MA candidate or  $\Delta$ ; IV-V MTh; FolH 6) Ward

**252. Readings in American Civilization.** (See 251 first term) (Cr ar; prereq  $\Delta$ ; ar) 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 cul-



tures 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]; II MTWThF; ForH 180) Gibbs

165. **Personality and Culture.** Role of cultures in the formation of personality. Problems of individual adjustment to the demands of various cultures. Integration of anthropology and psychology. (3 cr; prereq sr, grad; IV MTWThF; ForH 160) Gibbs
190. **Directed Research.** (Formerly Anth 122) (Cr ar; prereq sr, grad, Δ; ar) Gibbs

### 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]; II MTWThF; ForH 180) Gibbs
120. **Peoples and Cultures of Africa.** Racial groupings and tribes of Africa, excluding the Mediterranean civilizations. (3 cr; prereq 1A and 2A or 100; IV MTWThF; ForH 175) Gibbs
140. **Field Research in Archaeology.** Archaeological field excavation, survey, and research in prehistoric village and mound sites. Intensive training in excavation techniques, recordation, analysis, and interpretation of archaeological materials. (6 cr [may be taken for credit only once]; #) Johnson
191. **Directed Research.** (Formerly Anth 123) (Cr ar; prereq sr, grad, Δ; ar) Gibbs

## 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. This course, together with Mus 10, Spch 8, and Phil 4, forms a sequence in the Arts. (3 cr; II MTWThF; J 207b) Waldfogel
59. **Traveling Summer Course in European Art.** (See Section on Special Programs) Covers the main epochs in Western art history, from antiquity to the present, in a series of lectures at chief museums of Europe and in guided visits to important centers, archaeological excavations, monuments and churches in England, France, Italy, Spain, Greece, Austria, Germany, and Holland, with stops at Madrid, Toledo, Paris, London, Athens, Delphi, Corinth, Mycenae, Rome, Assisi, Siena, Florence, Ravenna, Venice, Salzburg, Innsbruck, Munich, Frankfurt, Cologne, and Amsterdam. Surveys Ancient, Medieval, Renaissance and Baroque art and will conclude in an intensive examination of contemporary postwar painting, architecture, and city planning. It will guide the student through several of the most important centers of art in Europe and will survey the main phases of Western art through selected master works of painting, sculpture, and architecture. (5 cr; prereq jr, sr, grad; by air from New York June 26 and return to New York August 5) Eitner
68. **Modern Art: Contemporary Art in Europe and America.** Development of painting, sculpture, and architecture in Europe and the United States during the 20th century. (3 cr; prereq 1 or 50 or Δ; IV MTWThF; J 207b) Waldfogel

111. **Art of China.** Development of painting, sculpture, and minor arts in China from earliest times to the present. (3 cr; prereq 9 cr in history of art or 9 cr in literature or history with  $\Delta$ ...Hist 62-63 recommended; III MTWThF; J 207b) Mather
158. **Modern Art: Contemporary Art in Europe and America.** Development of painting, sculpture, and architecture in Europe and the United States during the 20th century. (3 cr; prereq sr; 1 or 50 or 9 cr in history or literature with  $\Delta$ ; ar) Waldfoegel
196. **Readings in Chinese Art.** (3 cr; prereq sr,  $\Delta$ ; III MTWThF; J 207b) Mather

#### STUDIO COURSES

10. **Photography.** Introduction to the photographic medium, its background and meaning today. Lectures in contemporary and historical use of photography. Problems in the use of the camera, printing, and enlarging. (3 cr; I-II MTWThF; J 2) Downs
- 23-24-25. **Drawing and Design I.** Foundation sequence for future work in the Art Department. 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)  
 Sec 1, I-II MTWThF, J 104, Quirt      Sec 2, III-IV MTWThF, J 104, Myers
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)  
 Sec 1, I-II MTWThF, J 104, Quirt      Sec 2, III-IV MTWThF, J 104, Myers
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)  
 Sec 1, I-II MTWThF, J 104, Quirt      Sec 2, III-IV MTWThF, J 104, Myers
32. **Elements of Printmaking.** 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) Myers
- 40-41-42. **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 ¶1; I-II MTWThF; HolB 140) Morton
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) Morton
42. Design workshop. Free exploration of wood, metal, and ceramics. Emphasis is placed on abstract application of structural principles. Fundamental hand and machine tools are introduced. (3 cr; prereq 1; I-II MTWThF; HolB 140) Morton
63. **Drawing, Painting, and Design.** Introduces the student to the tools and materials and the basic problems of drawing, painting, and design. Studio work, discussion,

- and lecture. (3 cr; not open to art or art education majors...see suggested minor sequences; III-IV MTWThF; J 11) Downs
- 70-71-72. Oil Painting.** Introduction to medium of oil; individual projects and instruction. (3 cr each; prereq 54; III-IV MTWThF; J 200a) Quirt
- 70B-71B-72B. Oil Painting.** For general students (3 cr each, §70-71-72, no cr for art majors; prereq 20 or 23 or equiv, with §; III-IV MTWThF; J 200a) Quirt
- 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; I-II MTWThF; J 203) Myers
- 113. Design in Jewelry.** Problems of design as applied to jewelry. Basic techniques of soldering, forming, and forging. Lectures correlate the contemporary craft movement with modern art. (3 cr; prereq 25 and Δ; III-IV MTWThF; HolB 140) Morton
- 114. Advanced Design in Jewelry.** More complex problems of three-dimensional design are introduced and additional metal techniques are utilized; engraving, chasing, and repoussé. Exercises in drawing and rendering form the basis for experimental work in metal. (3 cr; prereq 113; III-IV MTWThF; HolB 140) Morton
- 115. Special Problems in Jewelry Design.** Special projects in jewelry and metal are assigned to students as means of developing skill in design. A wide range of problems give art education students a background for setting up or carrying on an adequate high school teaching program. (3 cr; prereq 114; III-IV MTWThF; HolB 140) Morton
- 150-151-152. Problems in Painting.** (Cr ar; prereq 72 and Δ; III-IV MTWThF; J 200a) Quirt
- 150B-151B-152B. Problems in Painting.** For general students. (3 cr [elective or for studio majors]; prereq 72B; III-IV MTWThF; J 200a) Quirt
- 190-191-192. Problems in Printmaking.** For advanced students. Work in black and white and color in metal, lithographs, and wood blocks. (Cr ar; prereq 92 or Δ; I-II MTWThF; J 203) Myers
- 200-201-202. Advanced Problems in Studio Work.** (Cr ar; prereq Δ; ar) Downs, Morton, Myers, Quirt

### *Second Term*

#### HISTORY OF ART

- 1. Principles of Art** (See first term) (II MTWThF; J 207b) Torbert
- 2. Principles of Ancient and Medieval Art.** Introduction to art criticism based on a number of selected monuments of ancient and medieval art. A broad critical analysis of Egyptian, Mesopotamian, Greek, Hellenistic, Roman, and Medieval art as separate but related expressions of the culture in the periods indicated. (3 cr; III MTWThF; J 207b) Thomas
- 100. Art in Ancient Egypt, Mesopotamia, and Greece.** Architecture, sculpture, and painting of the pre-Hellenic civilizations in Egypt, Mesopotamia, and the Aegean. Development of Greek art from its beginning to the Periclean age. (3 cr; prereq 9 cr in history of art or 9 cr in literature or history with Δ; I MTWThF; J 207a) Thomas
- 112. Art of Japan.** Development of painting, sculpture and minor arts in Japan from earliest times to the present. (3 cr; prereq 9 cr in history of art or 9 cr in literature or history with Δ; III MTWThF; J 207b) Copeland
- 136. Art in the United States.** Origins: painting, sculpture, and architecture from the beginnings through the Colonial and Revolutionary periods. Relations with England

and the European continent. Copley, Stuart, West, and their followers. Early weeks of the quarter are devoted to analysis of the means of visual expression common to architecture, sculpture, and painting. (3 cr; prereq 9 cr in history of art or 9 cr in literature or history with  $\Delta$ ; IV MTWThF; J 207b) Torbert

236. Seminar: Problems in Art History and Criticism. (Cr ar; hr ar) Staff

### STUDIO COURSES

10. **Photography.** (See first term) (3 cr; I-II MTWThF; J 2) Liebling
- 23-24-25. **Drawing and Design I.** (See first term) (III-IV MTWThF; J 4) Liebling
- 52-53. **Drawing II.** Drawing from model, still life, and nature. Principles of anatomy. (3 cr each; prereq 25 or equiv, with  $\Delta$ ; I-II MTWThF; J 11) Rollins
- 54-55. **Life Drawing.** (Continuation of 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  $\Delta$ ; I-II MTWThF; J 11) Rollins
- 70-71-72. **Oil Painting.** (See first term) (III-IV MTWThF; J 200a) Rollins
- 150-151-152. **Problems in Painting.** (See first term) (III-IV MTWThF; J 200a) Rollins
- 200-201-202. **Advanced Problems in Studio Work.** (Cr ar; prereq  $\Delta$ ; ar) Rollins

### 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. Course is completely nonmathematical. (3 cr; III MTWThF and 1 clear evening per wk for observations with telescope; Ph 166) Luyten
13. **Stellar and Practical Astronomy.** Description of the constellations and of the properties and motions of stars. (3 cr; IV MTWF and 2 clear evenings per wk for observation; Ph 166) Luyten

### 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 101A, B, C, D) Olson

#### *Second Term*

**Biol 2. General Biology.** (See 1, first term) (5 cr; prereq 1 or equiv; lect V MTWTh, V-VI F, Bo B6; lab VI-VIII MTWTh, Z 101A, B, C, D) Roshal

195.\* **Problems.** Advanced work in some specialized field of botany. (1-5 cr; prereq #; ar) Staff

NOTE—Biol 1-2su is the equivalent of Biol 1-2-3. No credit is given for 1 until the satisfactory completion of 2.

†† For additional courses in the first term see index, Lake Itasca Forestry and Biological Station.

CLASSICS (Clas)††

First Term

- 24.†† **Technical Terms of Science, Medicine, and the Humanities.** Presentation in English context of Greek and Latin prefixes, roots, and suffixes which comprise a very high proportion of modern technical vocabularies. (3 cr; prereq soph, jr, sr; I MTWThF; FolH 207) D Swanson
- 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 303) R Swanson
- 124.†† **Technical Terminology.** Semantic and derivation of modern technical vocabularies, with presentation with linguistic analysis in English of Greek and Latin prefixes, suffixes, and root words. (3 cr, §24; I MTWThF; FolH 207) D Swanson
- 145. **Greek and Roman Mythology.** Same class work as Classics 45 but with special independent reading and research assignments in consultation with the instructor. (3 cr, §42, 43, 45; I MTWThF; FolH 303) R Swanson

Second Term

LATIN

Lat 171. **Advanced Reading.** (See Special Programs) The fundamentals of structural linguistics in their relation to the teaching of Latin reading, with emphasis on the basic differences between English and Latin linguistic patterns. Advanced Latin reading materials will be studied in the light of newer linguistic methods. (3 cr; prereq 53 or #; I MTWThF; FolH 303) Forbes

COMMUNICATION

See Index

ECONOMICS

See School of Business Administration and Agricultural Economics

EFFICIENT READING

See Index

ENGLISH††

First Term

LITERATURE (Engl)

- 1B. **Freshman English.** (3 cr, §A or 1A or Comp 4 or Comm 1; prereq classif card 1 or 2 or 3; I MTWThF; FolH 107) Ar.
- 3B. **Freshman English.** (3 cr, §C or 3A or Comp 6 or Comm 3; prereq B or 2A or 2B or Comp 5 or Comm 2; I MTWThF; FolH 204) Ar.

†† Credit will be allowed in English for Clas 24 and Clas 45.

†† No knowledge of Latin or Greek required.

21. **Introduction to Literature.** Chaucer to Milton. Marlowe, Spenser, Bacon, Browne, and Bunyan. (6 cr; prereq ††; I-II MTWThF; FolH 206) Buckley
54. **English Novel.** Trollope, George Eliot, Meredith, Hardy, Conrad, and others. (3 cr; prereq ††; III MTWThF; FolH 107) Wright
55. **Shakespeare.** The reading of plays from Shakespeare's early and middle periods—*Richard II*, *A Midsummer Night's Dream*, *The Merchant of Venice*, *Much Ado About Nothing*, and 2 or 3 other plays selected by the instructor. (3 cr; prereq §§; II MTWThF; FolH 107) Wright
56. **Shakespeare.** The reading of plays from Shakespeare's middle and later periods—*Twelfth Night*, *Hamlet*, *Macbeth*, *The Tempest*, and 2 other plays selected by the instructor. (3 cr; prereq 55 or #; II MTWThF; FolH 207) Hurrell
74. **American Literature.** Henry Adams to the present. (3 cr; prereq §§ and 72 except for Ed minors...or #; III MTWThF; FolH 204) Sutton
75. **Chaucer.** The reading of selections from *The Canterbury Tales* with introduction dealing with the grammar and literary forms of 14th-century English. (3 cr; prereq §§; III MTWThF; FolH 206) Clark
121. **Interpretation of Poetry.** Certain technical aspects of poetry in relation to poetic meaning. Emphasis on Coleridge, Housman, Frost, and Eliot. (3 cr; prereq §§; IV MTWThF; FolH 205) Blum
154. **American Novel.** The American novel from the beginning to Howells. (3 cr; prereq §§; IV MTWThF; FolH 204) Sutton
158. **American Poetry.** Major figures of the late 19th and the 20th centuries. (3 cr; prereq ††; II MTWThF; FolH 204) Levenson
162. **Milton.** The minor poems, *Areopagitica*, *Paradise Lost*, and *Samson Agonistes*. (3 cr; prereq ††; IV MTWThF; FolH 207) 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 ††; I MTWThF; FolH 205) Weber
184. **Form and Idea in Dramatic Literature.** Tragic and religious drama (classical, medieval, Renaissance, and modern); theories of tragedy. (3 cr; prereq §§...55-56 recommended; IV MTWThF; FolH 206) Hurrell
198. **Seventeenth-Century Literature.** Prose and poetry of the mid-century. (3 cr; prereq §§; III MTWThF; FolH 207) Unger
298. **Independent Reading.** (3 cr; prereq MA degree or equiv) Ar.

### Second Term

#### LITERATURE (Engl)

- 1B. **Freshman English.** (3 cr, §A or 1A or Comp 4 or Comm 1; prereq classif card 1 or 2 or 3; I MTWThF; FolH 205) Ar.
- 2B. **Freshman English.** (3 cr, §B or 2A or Comp 5 or Comm 2; prereq A or 1A or 1B or Comp 4 or Comm 1; I MTWThF; FolH 204) Ar.

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

†† Engl A-B-C, or 1A-2A-3A, or 1B-2B-3B, or Comp 4-5-6, or Comm 1-2-3, or exemption from requirement.

§§ Five credits in literature in this department, exclusive of classics and Freshman English.

23. **Introduction to Literature.** The Romantic Movement and the Victorians. Wordsworth, Byron, Shelley, Keats, Lamb, Carlyle, Browning, and Arnold. (6 cr; prereq ††; III-IV MTWThF; FolH 206) R Foster
55. **Shakespeare.** (See first term) (3 cr; prereq §§; III MTWThF; FolH 107) Youngblood
56. **Shakespeare.** (See first term) (3 cr; prereq 55 or ‡; III MTWThF; FolH 207) Montgomery
72. **American Literature.** Notable authors from the Puritans to Melville. (3 cr; prereq §§; IV MTWThF; FolH 204) Turpie
100. **Old English (Anglo-Saxon).** Sounds and grammar with some prose readings. Relation to modern English stressed. (6 cr; prereq ††; I-II MTWThF; FolH 107) Allen
109. **Romantic Poets of the Early Nineteenth Century.** Wordsworth, Coleridge, Scott, etc. (3 cr; prereq ††; III MTWThF; FolH 205) Ehrenpreis
- 112A. **Henry James and Stephen Crane.** (3 cr; prereq ††; IV MTWThF; FolH 207) Berryman
113. **American Short Story.** A historical examination from the 18th century to the present. (3 cr; prereq ††; II MTWThF; FolH 204) Turpie
137. **Nineteenth-Century Literature.** Studies in early and mid-Victorian poetry and prose. (3 cr; prereq ††; II MTWThF; FolH 206) Stange
143. **Twentieth-Century Literature.** Emphasis on American authors. (3 cr; prereq ††; II MTWThF; FolH 207) Ward
189. **Eighteenth-Century Literature.** Poetry and prose of the later part of the century. (3 cr; prereq ††; II MTWThF; FolH 205) Ehrenpreis
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; III-IV TTh; FolH 302) Stange
299. **Independent Reading.** (3 cr; prereq MA degree or equiv) Ar.

### FAMILY LIFE

See Interdepartmental Courses

### FOREIGN STUDY SEMINAR

See Interdepartmental Courses

### GEOGRAPHY (Geog)

#### *First Term*

4. **Human Geography.** Geography of population and principal ways of life; capacity of the earth for future population. (5 cr; III-IV MTWThF; ForH 185) Webb
114. **Historical Geography of North America.** Sequential analysis of settlement and economy in the changing environment and resource patterns of North America. (3 cr; prereq 10 cr or ‡; I MTWThF; ForH 285) Lukermann

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

‡‡ Engl A-B-C, or 1A-2A-3A, or 1B-2B-3B, or Comp 4-5-6, or Comm 1-2-3, or exemption from requirement.

§§ Five credits in literature in this department, exclusive of classics and Freshman English.

117. **The Middle East.** A historical-geographical description of land and people in the changing environment of the Afro-Eurasian bridgelands with an analysis of the location and pattern of its present cultural and physical resources. (3 cr; prereq 10 cr or #; III MTWThF; ForH 285) Lukermann
120. **South Asia.** Physical and human geography of India, Pakistan, and Ceylon; geographic aspects of population pressure, development of resources, and international relations. (3 cr; prereq 10 cr or #; IV MTWThF; ForH 285) Broek
143. **Political Geography.** Scope and methods of political geography as exemplified by various writers; analysis of selected areas. (3 cr; prereq 4 or #; II MTWThF; ForH 285) Broek
301. **Research Problems.** (Cr ar) Webb

### *Second Term*

1. **Geography of Natural Resources.** Physical characteristics and geographic distribution of the world's natural resources; major regional differences in the problems of physical resource development. (5 cr; II-III MTWThF; ForH 285) Barrett
67. **Geography of Minnesota.** Geographical survey of physical resources, population, and commercial production of Minnesota. Field trips in eastern Minnesota. (3 cr; prereq 5 cr or #; IV MTWThF; ForH 285) Borchert
301. **Research Problems.** (Cr ar) Barrett

## GEOLOGY AND MINERALOGY (Geol)

### *First Term*

1. **General Geology (Geologic Processes and Their Results).** Varied aspects of our natural environment with special reference to the influence of geologic processes and structures on landscape development. Interpretation of natural scenery produced by glaciers, streams, ground water, geysers, oceans, volcanoes, etc. Lectures supplemented by laboratory work with minerals and rocks. Several field excursions. (5 cr; I-II MTWThF; P 210) Thiel
100. **Field Work in Northern Minnesota.** (July 15 to 30) Geologic field methods and study of selected areas on the iron ranges and other parts of northern Minnesota. Comprehensive report is required for Graduate School credit. (3 cr; prereq 25) Zoltai
115. **Field Work in Southeastern Minnesota.** (July 15 to 30, approximately) Stratigraphic methods and principles as illustrated by study of Cambrian and Ordovician rocks. (3 cr; prereq 25) Sloan
150. **Field Geology.** (June 16 to July 14) Detailed systematic field work. Preparation of geologic maps, structure sections, reports; genesis of ores and their relations to geologic structures. Field: Black Hills, South Dakota. (6 cr; prereq 125) Craddock, Phinney
170. **Geologic Problems.** (3 cr; prereq #; ar) Thiel

### *Second Term*

2. **Historical Geology.** Probable conditions of earth origin, antiquity of the earth, and evolution of the continents and of the life that inhabited the seas and land areas of past ages. (5 cr; prereq 1 or 8; I-II MTWThF; P 110) Swain
170. **Geologic Problems.** (See first term)



*In addition to the courses definitely offered, graduate students may register for Geol 211, 241, 243, or 245 and do their work under the supervision of the instructors in residence.*

NOTE—For further information consult with instructors.

## GERMAN (Ger)

### First Term

1. **Beginning German.** (5 cr; I-II MTWThF; FolH 209½) Menze
3. **Beginning German.** (5 cr; prereq 2 or 2 years of high school German; I-II MTWThF; FolH 209) Weiss
4. **Intermediate German.** (5 cr; prereq 3 or 3A or 3B or 3 years of high school German; I-II MTWThF; FolH 209) Weiss
142. **Modern Drama.** (3 cr; VI-VII MF; FolH 208) Menze
159. **Directed Readings.** (3 cr; prereq sr, grad, or #; first meeting Wednesday, June 15, III; FolH 210. For the remainder of the course there will be only individual consultations) Ramras
- 185.\* **Expressionism.** (3 cr; prereq sr, grad, 14 cr above 69 or equiv; VI-VII TTh; FolH 208) Wood

### *Offered only in Deutsches Haus††*

22. **Intermediate Conversation and Oral Practice.** For students who understand German fairly well but who 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
66. **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 year of high school German; I-II MTWThF; FolH 209) Menze
159. **Directed Readings.** (See first term) (1st meeting V T, July 19; FolH 214) Menze
- 181.\* **Thomas Mann.** (3 cr; prereq sr, grad, 14 cr above 69 or equiv; VI-VII TTh; FolH 208) Ramras

†† See Modern Language Institute under Special Programs.

## 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; II MTWThF; ForH 115) Wright
- 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; III MTWThF; ForH 180) Wright
- 16.† **Ancient Civilization, Part 3.** Roman Civilization to A.D. 305. (3 cr; III MTWThF; ForH 130) Jones
- 20.† **American History, Part 1.** Colonial and early national period. (3 cr; I MTWThF; ForH 155) Noble
- 21.† **American History, Part 2.** Sectionalism and national development. (3 cr; II MTWThF; ForH 120) Loehr
- 52.† **Ancient Civilization, Part 3.** Roman Civilization to A.D. 305. (3 cr; III MTWThF; ForH 130) Jones
- 99.† **Minnesota and the Northwest, Part 3.** (3 cr; I MTWThF; ForH 120) Jordan
- 102A.† **History of Greece to 200 B.C., Part 3.** (3 cr; I MTWThF; ForH 115) Jones
- 103.† **Europe in the Middle Ages, Part 1.** Decline of Rome; Early Middle Ages. (3 cr; III MTWThF; ForH 160) Hoyt
- 111.† **Europe in the Twentieth Century, Part 3.** Fascist totalitarianism, origins and history of World War II. (3 cr; I MTWThF; ForH 55) Deutsch
- 134.† **World War II, Part 1.** Origins and Background. (3 cr; II MTWThF; ForH 55) Deutsch
- 139A.† **American History, Part 3.** From 1880 to 1900. (3 cr; III MTWThF; ForH 120) Loehr
- 148A.† **History of the South, Part 3.** 1890 to the present. (3 cr; III MTWThF; ForH 170) Noble
- 162.† **Cultural History of China, Part 1.** Prehistoric times to A.D. 600. (3 cr; IV MTWThF; ForH 170) Mather
- 173.† **Readings in Medieval and Renaissance History, Part 1.** (3 cr; VI MTWThF; ForH 244) Hoyt
- 187D.† **Readings in Nineteenth-Century American History, Part 3.** (3 cr; III MTWThF; ForH 244) Jordan

### *Second Term*

- 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; I MTWThF; ForH 115) Ar.
- 3.† **Civilization of the Modern World, Part 3.** Impact of industrialism upon Western and world civilization in the 20th century. (3 cr; II MTWThF; ForH 150) McNeal
- 17.† **History of Asia, Part 1.** Ancient history and culture of China, Japan, and India to A.D. 1200. (3 cr; III MTWThF; ForH 150) Taylor
- 21.† **American History, Part 2.** Sectionalism and national development. (3 cr; I MTWThF; ForH 185) Beatty

- 22.‡ **American History, Part 3. Modern America.** (3 cr; II MTWThF; ForH 185) Rutman
- 59.‡ **History of Asia, Part 1. Ancient history and culture of China, Japan, and India to A.D. 1200.** (3 cr; III MTWThF; ForH 150) Taylor
- 81.‡ **The United States in the Twentieth Century, Part 3. 1932 to present.** (3 cr; I MTWThF; ForH 155) Chambers
- 86.‡ **American Colonies, Part 1. In the 17th century.** (3 cr; III MTWThF; ForH 130) Rutman
- 91.‡ **The American West, Part 2. Mid-America.** (3 cr; II MTWThF; ForH 130) Murphy
- 94.‡ **American Diplomatic History, Part 2. Period of national development.** (3 cr; III MTWThF; ForH 185) Beatty
- 127.‡ **Russia, Part 3. From Alexander II to the present.** (3 cr; IV MTWThF; ForH 115) McNeal
- 142.‡ **History of Germany, Part 3. Since 1871.** (3 cr; III MTWThF; ForH 120) Ar.
- 151A.‡ **American Constitutional History, Part 3. Constitutional developments in an industrial age.** (3 cr; IV MTWThF; ForH 150) Murphy
- 163.‡ **Cultural History of China, Part 2. A.D. 600 to the present.** (3 cr; IV MTWThF; ForH 130) Taylor
- 186C.‡ **Readings in Twentieth-Century American History, Part 2.** (3 cr; III MTWThF; ForH 175) Chambers

## HOW TO STUDY

See Interdepartmental Courses

## HUMANITIES

See Interdepartmental Courses

## INTERDEPARTMENTAL COURSES

### *First Term*

#### COMMUNICATION (Comm)

3. **Communication.** (Continuation of 1-2) (3 cr; prereq 2; III MTWThF; TNM 114) Bryan

#### FAMILY LIFE (FL)

1. **Preparation for 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. **Preparation for Marriage.** Designed for Upper Division, older, or married students. (See FL 1) (3 cr, §1; III MTWThF; JohH 106) 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 requirement; II MTWThF; JohH 205) Ludwig

#### FOREIGN STUDY (FS)

161. **Seminar for Foreign Study I.** Directed field study in selected foreign countries, investigating the current economic, political, educational, cultural, and religious patterns of life. Each student will study the country carefully before embarking and write a comprehensive report of his findings upon returning. (6 cr; prereq

approval before December by a faculty selection committee [grad students must also have approval of adviser] Amram, Armajani, Lana, Vane

#### 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; JohH 115) Bryan
- 1A. **Age of the Enlightenment.** (See Rhetoric)
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; JohH 115) Blum
3. **Humanities in the Modern World III.** From about 1840 to about 1914. Authors: Darwin (*Evolution and Its Influence*), Nietzsche, Kierkegaard, and Mann. (3 cr; I MTWThF; JohH 113) Ludwig
21. **American Life I.** (See American Studies)
24. **American Humanities.** (See Rhetoric)
51. **Humanities in the Modern World.** (See description of Hum 1) (3 cr, §1; II MTWThF; JohH 113) Ludwig
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; II MTWThF; JohH 122) Vogelbaum
61. **The Greek Heritage.** The golden age of Athens—tragedy, concepts of goodness and beauty, struggle for the state. The age of reason—concepts of reason, justice, order. Selected readings in Aristotle, Plato, and the tragedians; longer readings in Homer. (3 cr, §11; III MTWThF; JohH 113) Ross
63. **The Renaissance and Reformation.** The city of Florence, birthplace of the Renaissance: development of the arts, the power of the Medici, the religious controversies, humanism, the ideal of the "universal man." Readings in Petrarch, Ficino, Machiavelli, Cellini. Studies in painting, sculpture, architecture. (3 cr, §13; III MTWThF; JohH 115) Vogelbaum
133. **Humanities Proseminar.** The concept of civilization. The place in civilizations of religion, art, government, science and education. Their relations to each other. What makes a civilization strong or weak. (3 cr; prereq sr, grad; IV MTWThF; JohH 113) Ross

#### NATURAL SCIENCE (NSci)

165. **Science in World Affairs.** An analysis of the impact of science on many aspects of man's social and political life. The following are considered: atomic energy in war and peace; race, its scientific, social, psychological and historical components and its relation to heredity, eugenics and evolution; population pressure and available natural resources in advanced and under-developed countries; problems of space travel in war and peace. The scientific principles behind each item are briefly studied, then the social ramifications examined. (3 cr; prereq 1 yr of biological and of physical science in high school or college, or §; III MTWThF; Ph 342) Graubard
175. **Survey of Science History.** An analysis of outstanding masterpieces of science of Antiquity, The Middle Ages and modern times with the object of gaining insight into the nature of science as a human pursuit. Attention is paid to cultural backgrounds, mode of approach and personality of each scientist as well as to impact of his findings upon his times. This is compared to his achievement in historical

perspective. Only original works in English translation are discussed and analyzed from Hippocrates to Einstein. (3 cr, §171, 172, 173; prereq 1 yr of biological and of physical science in high school or college, or #; IV MTWThF; Ph 342) Graubard

#### PERSONAL ORIENTATION (PO)

1. **How to Study.** Practical assistance to the student in developing efficient study habits, organizing materials, preparing for examinations, and improving the speed and comprehension of reading. (Limited to 30) (2 cr, but cr added to SLA grad requirement; I MTWThF; JohH 307) Carlson

#### SOCIAL SCIENCE (SSci)

1. **Introduction to Social Science.** Historical, political, economic, social, psychological, and cultural factors that influence man's behavior. Basic theme is the development of personality, and the impact of personality on culture. (3 cr; I MTWThF; JohH 122) Engelbourg
3. **Introduction to Social Science.** The integrating theme is the quest for community in modern society. (3 cr; II MTWThF; JohH 114) Cooperman

#### Second Term

#### FAMILY LIFE (FL)

1. **Preparation for Marriage.** (See first term) (IV MTWThF; JohH 114) Hill

#### FOREIGN STUDY (FS)

162. **Seminar for Foreign Study II.** (Continuation of 161, see first term) (6 cr) Amram, Armajani, Lana, Vane

#### HUMANITIES (Hum)

1. **Humanities in the Modern World I.** (See first term) (3 cr; II MTWThF; JohH 114) Siegelman
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, etc. (3 cr; III MTWThF; JohH 115) Siegelman
22. **American Life II.** (See American Studies)
52. **Humanities in the Modern World.** Industrial revolution; liberalism and socialism. Period from about 1776 to 1890. Authors: Ibsen, Dostoyevsky, Tolstoy, Flaubert, and the classical economists. (3 cr, §2; III MTWThF; JohH 122) Amberg
62. **Roman and Medieval Heritage.** Late Hellenistic philosophy: Stoicism, Epicureanism, Neo-Platonism. Jesus and the world of Christendom: Paleo-Christian anarchy, the conversion of Constantine, Augustinian synthesis, Gothic art, Scholasticism, the world of Dante. Readings in Lucretius, Marcus Aurelius, the New Testament, St. Augustine, Dante. (3 cr, §12; IV MTWThF; JohH 115) Ames

#### PERSONAL ORIENTATION (PO)

1. **How to Study.** (See first term) (Limited to 30) (II MTWThF; JohH 122) Carlson

#### SOCIAL SCIENCE (SSci)

2. **Introduction to Social Science.** Work as a central aspect of modern life. (3 cr; II MTWThF; JohH 115) Kanun

## SCHOOL OF JOURNALISM

See Section on Special Programs

### *First Term*

65. **Graphic Arts Processes.** Letterpress, offset lithography, and gravure printing processes; engravings and copy preparation; significant graphic arts developments. (3 cr; prereq jr or #; VI-VII MTWThF, June 27-July 15 only; MurH 207) Wilson
73. **Magazine Writing.** Planning and writing feature articles for general, class, and trade publications; marketing manuscripts; employee and industrial journal problems; problems of magazine editing. (3 cr; prereq 15 or #; II MTWThF; MurH 311) Charnley
- 103.° **Literary Aspects of Journalism.** The literary, creative aspects of journalism as exemplified in the works of English and American fiction writers, poets, critics, essayists, and humorists. Lectures, discussions, and papers. (3 cr; prereq #; I MTWThF; MurH 302) Hage
- 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; jr, sr, grad; III MTWThF; MurH 302) Hage
- 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 journalism majors, # for others; II MTWThF; MurH 302) Gerald
- 140.° **Interpretation of Contemporary Affairs.** Analysis of major political, economic, and social developments and their interpretation in the editorial, interpretative article, and commentary. (3 cr; prereq sr, grad, 51 and 15 cr in the social sciences; IV MTWThF; MurH 302) Gerald
- 182.° **Supervision of School Publications: Workshop for Journalism Teachers and Advisers.** Intensive study of the role of the high school and college newspaper and yearbook; analyses of content; advisory problems and policies; problems in publication production, makeup and typography. (3 cr; prereq grad or #; 1:00-4:30 pm MTWThF; June 13-24 only; MurH 311) Wilson, Kildow, 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*

11. **Reporting for Nonmajors.** (For journalism minors in the College of Agriculture, Forestry, and Home Economics, College of Education, Institute of Technology, and the School of Business Administration) Newspaper fact-gathering and news-writing; specialized reporting; fundamentals of press law. (3 cr; prereq soph, average of C, Engl C, 3A, 3B, or Comm 3 or Rhet 3 or exemption from English requirement; IV MTWThF; MurH 212) Sim
51. **News Editing.** Lectures and laboratory in basic copy editing problems and techniques. (3 cr; prereq 15, or B average in 13-14) Sim  
Lect VI MW, MurH 308                      Lab VI-VII TThF, MurH 206
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, 55, and 73, or 41, 54, and 69; IV MTWThF; MurH 302) Ar.
90. **Mass Communications and the News.** How the news gets to, and affects the public, in print, on the air, by film. Evaluation of news gathering and presentation methods. Contemporary influences on communication media. Individual news media and news commentators. (3 cr; not open to journalism majors; II MTWThF; MurH 308) Nixon
- 120.\* **Development of Radio and Television Communications.** Historical and economic development of aural broadcasting and television; government regulations; radio, TV, and the press; the electronic media as social factors. (3 cr; prereq 15 or 18 for journalism majors, # for others; I MTWThF; MurH 302) Charnley
- 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; IV MTWThF; MurH 308) Nixon
- 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. (3 cr; prereq 15 cr in social sciences; III MTWThF; MurH 308) Carter
- 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 Library School, in co-operation with the Graduate 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 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 requirements write to the Library School, 3 Walter Library, University of Minnesota, Minneapolis 14.

Students who expect to enroll in the Fall of 1960 for the Master's program with a major in library science and who do not meet the graduate library science course requirements for admission are urged to register for Lib 50, 55, 62, 70, and 83 this summer.

#### First Term

55. **Library Administration.** Introduction to principles of library administration, organization, and management. (3 cr; I MTWThF; Lib 4A) Rohlf
70. **Selection of Library Materials.** Techniques, standards for selection of books, magazines, pamphlets, phonograph records, films, etc. (3 cr; III MTWThF; Lib 4A) Rohlf
74. **Library Materials in the Classroom.** (3 cr; prereq school librarians on a certification program; II MTWThF; Lib 4A) Zimmerman
83. **Cataloguing and Classification.** (3 cr; IV MTWThF; Lib 4A) Lee
153. **History of Books and Printing.** Earliest times to the present. Evolution of the alphabet; the manuscript book; invention and spread of printing; design of the modern book. (3 cr; I MTWThF; JohH 114) Lee
161. **Literature of the Humanities.** (3 cr; prereq 62; IV MTWThF; Lib 4B) Shove
165. **Advanced Bibliography.** The national and trade bibliographies of the world with emphasis on those of the United States, Great Britain, France, Germany, and Russia. (3 cr; II MTWThF; Lib 4B) Shove

171. **Reading Guidance for Children.** (3 cr; prereq 70; III MTWThF; JohH 122) Zimmerman

### Second Term

50. **History of Libraries and Librarianship.** Social trends affecting libraries and their functions in society; librarianship as a profession. (3 cr; II MTWThF; Lib 4A) Shove
53. **School Library Management.** Primarily for students without previous experience in a school library. (3 cr; IV MTWThF; JohH 122) Marfell
62. **Reference I.** General reference tools and other sources of information; theory and practice of reference work. (3 cr; I MTWThF; Lib 4A) Quenzel
160. **Literature of the Social Sciences.** (3 cr; prereq 62; III MTWThF; Lib 4B) Quenzel
162. **Literature of the Natural Sciences.** (3 cr; prereq 62; IV MTWThF; Lib 4A) Shove
172. **Reading Guidance for Adolescents.** (3 cr; prereq 70; III MTWThF; Lib 4A) Marfell

## MATHEMATICS (Math)††

See also Department of Mathematics, Institute of Technology

### First Term

- H. **Higher Algebra.** Essentially the equivalent of the second year of high school algebra; included: 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. (5 cr for students who have no high school cr in higher algebra or 3 cr for students who have high school cr in higher algebra; prereq 1 yr elementary algebra; I-II MTWThF; FolH 105) Ar.
- T. **Trigonometry.** A course in analytic trigonometry emphasizing identities, equations, and properties of the functions; right and oblique triangles without logarithmic computation. (3 cr; prereq plane geometry and either H or high school higher algebra; open for credit if taken before 53, even to students with high school trigonometry; ¶10 or 40 allowed; II MTWThF; FolH 109) Ar.
10. **College Algebra.** Systems of quadratic equations, conics in simplest positions, progressions, permutations, combinations, probability, binomial theorem, mathematical induction, inequalities, theory of equations, determinants, logarithms, slope of a line. (5 cr; prereq plane geometry or  $\Delta$  and either H or high school higher algebra; III-IV MTWThF; FolH 109) Ar.
40. **Mathematical Analysis I.** Straight line; simple conics; derivatives of elementary functions; curve tracing; velocity, acceleration, and related rates; maxima and minima; differentials; introduction to integration with applications to area, volume, and work. (5 cr; prereq 10 and either T or ¶T or high school trigonometry; III-IV MTWThF; FolH 104) Fillmore
54. **Mathematical Analysis III.** Conics, translation, rotation, polar co-ordinates, length of arc, introduction to solid analytic geometry, multiple integrals including cylindrical co-ordinates, infinite series and expansion of functions. (5 cr; prereq 53; III-IV MTWThF; FolH 105) Harper
106. **Differential Equations.** Problem course, methods for solving ordinary differential equations of various types with the necessary theory for developing these methods. (3 cr; prereq 55; II MTWThF; FolH 101) Gil de Lamadrid

†† See statement concerning Institute for High School Teachers of Science and Mathematics in section on Special Programs.



- 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 54; V MTWThF; FolH 101) Engeler
- 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; I MTWThF; FolH 101) Joichi
- 136. Solid Analytic Geometry.** Algebraic treatment of planes and lines; direction cosines; systems of planes. Cylinders; surfaces of revolution. Quadric surfaces; tangent planes, ruled surfaces. Co-ordinate transformations, invariants. General equation of the second degree. Matrix methods used throughout. (3 cr; prereq 53 or §53; III MTWThF; FolH 101) Joichi
- 159B. Summer Institute for High School Teachers: Fundamentals of Analytic Geometry and Calculus.** (See Department of Mathematics, Institute of Technology)
- 160B. Summer Institute for High School Teachers: New Approaches in High School Mathematics.** (See section on Special Features) (June 13-August 5) An introduction and analysis of some of the new mathematical concepts that are being advocated for inclusion into the high school mathematical curriculum and some of the new approaches to traditional content. (4 cr; prereq admission to Summer Institute or §; IV MTWThF; C 100, afternoon hrs ar) Bzoch
- 188. Topics in Topology.** Elementary and intuitive concepts associated with typical curves and surfaces. Construction of models. Elements of homotopy. (3 cr; prereq 54; IV MTWThF; FolH 101) Gil de Lamadrid

### Second Term

- T. Trigonometry.** (See first term) (II MTWThF; FolH 109) Ar.
- 10. College Algebra.** (See first term) (III-IV MTWThF; FolH 109) Ar.
- 40. Mathematical Analysis I.** (See first term) (III-IV MTWThF; FolH 104) Ar.
- 53. Mathematical Analysis II.** Parametric representation and differentiation, inverse trigonometric functions, L'Hospital's rule, integration by standard forms and special methods, with applications, improper integrals. (5 cr; prereq 40; III-IV MTWThF; FolH 102) Ar.
- 55. Intermediate Calculus.** Direction cosines, lines, planes; partial differentiation and applications to curves, surfaces, directional derivatives, extrema, Taylor series; moments; spherical co-ordinates; hyperbolic functions. (3 cr; prereq 54; IV MTWThF; FolH 105) Harper
- 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; II MTWThF; FolH 101) Miracle
- 131B. Advanced Algebraic Theory.** Vector spaces and linear transformations; special matrices and canonical forms; characteristic values and vectors; diagonalization of quadratic and hermitian forms; examples and elementary properties of groups, rings, and fields. (3 cr; prereq 131A; I MTWThF; FolH 101) Harper
- 176. Intermediate Differential Equations.** Topics in differential equations not contained in a first course but not requiring a broad background of analysis. Emphasis on linear equations of second order of interest in physics. Normal form, adjoint equations, series solutions, equations of Fuchsian type. Hypergeometric, Bessel and Legendre equations. (3 cr; prereq 106; IV MTWThF; FolH 101) Miracle

178. **Probability.** Elementary principles of probability, total and compound probability, expectation, repeated trials, and as time permits topics chosen from the following: Stirling's formula, the probability integral, geometrical probability, probability of causes, Bayes' theorem, errors of observation, principle of least squares. (3 cr; prereq 54; III MTWThF; FolH 101) Hatfield

### MUSIC (Mus)

See also Music Education

#### First Term

- A.<sup>oo</sup> **Piano.** (No cr; for students without entrance requirements in piano; hrs ar; ScH 107) Weiser, Freed
- D.<sup>oo</sup> **Voice.** (No cr; for students without entrance requirements in voice; hrs ar; ScH 107) Schuessler, Knowles
1. **Fundamentals of Music.** (2 cr; for nonmusic majors—primarily child development and welfare students and elementary teachers; IV MTWThF; MusEd 103) Abelson
- 7A. **Ear Training.** Résumé of aural work included in Mus 1T-3T, with concentration on their application. (3 cr; prereq #; IV MTWThF; ScH 3) Collins
- 7B. **Ear Training.** Résumé of aural work included in Mus 4T-6T, with concentration on their application. (3 cr; prereq #; V MTWThF; ScH 103) Fetler
- 8A. **Harmony.** Résumé of part writing and harmonization of chorales which are included in Mus 1T-3T, with concentration on their application. (3 cr; prereq #; V MTWThF; ScH 103) Collins
- 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 #; IV MTWThF; ScH 103) Fetler
- 11.<sup>oo</sup> **Piano.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Weiser, Freed
- 12.<sup>oo</sup> **Voice.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Schuessler, Knowles
- 13.<sup>oo</sup> **Violin.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.
- 14.<sup>oo</sup> **Viola.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.
- 15.<sup>oo</sup> **Cello.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.
- 16.<sup>oo</sup> **Bass.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Fitch
- 17.<sup>oo</sup> **Flute.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Niosi
- 18.<sup>oo</sup> **Oboe.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Angelucci
- 19.<sup>oo</sup> **Clarinet, Saxophone.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Fitch, Handlon, Williams
- 20.<sup>oo</sup> **Bassoon.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.
- 21.<sup>oo</sup> **Trumpet.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Adelstein
- 22.<sup>oo</sup> **French Horn.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Speyer
- 23.<sup>oo</sup> **Trombone.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.
- 24.<sup>oo</sup> **Tuba.** Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Ar.

- 25.\*\* Percussion. Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Dahlgren
- 26.\*\* Harp. Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Miller
- 27.\*\* Organ. Individual lessons. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Fleischer
43. University Chorus. (1 cr; prereq #; VI MTWThF; NMA 4) Collins
50. **Introduction to Music.** Introduction to the music in the repertory of our culture, exploring selected forms and styles from the 16th through 20th centuries. Listening abilities are developed through aural analysis of musical textures, recognition of the articulation of phrases, periods, and sections leading to an understanding of the relationship of large units of musical form. These listening techniques, along with a discussion of aesthetic principles, are used to define musical styles. (5 cr; open to jr and sr nonmusic students; III-IV MTWThF; ScH 4) Oberg
- 97-98-99. **Counterpoint.** Strict, 16th-century and Bach-style counterpoint in 2 and 3 parts; writing of canons, motets, inventions, fugues. (2 cr each; prereq 6T; II MTWThF; ScH 2) Fetler
- 100.\*\* **Advanced Applied Music.** Advanced literature in piano, voice, organ, and orchestral instruments. (2 or 4 cr; prereq entr exam; hrs ar; ScH 107) Staff
- 104A.\* **American Music.** From colonial times to present through reading and record listening. American Indian music, European folk music on this continent, origin and development of jazz and contemporary American music. (3 cr; prereq 36, or 9 cr in American history or American studies; V MTWThF; ScH 4) Ar.
112. **History of Vocal Art.** Significant schools of singing from 1600 to the present. (2 cr; prereq 18 cr in Mus 12, or #; I MTWThF; ScH 4) Schuessler
- 127-128-129.\* **Composition.** (2 cr each; prereq 99 and 123; VI MTWThF; ScH 2) Fetler
134. **History of Church Music.** Trends. Relationship of music to various theologies and liturgies. (2 cr; prereq 34-35-36 or #; IV MTWThF; ScH 104) Fleischer
140. **Realization and Interpretation of Choral Masterpieces.** Musical and vocal techniques necessary for presentation of great choral compositions from the Renaissance to the 20th century. (3 cr; prereq 6T or #; II MTWThF; NMA 4) Collins
177. **Analysis of Contemporary Music.** Twentieth-century styles and techniques including works of Bartok, Hindemith, Stravinsky, Schönberg. (3 cr; prereq 6T; I MTWThF; ScH 2) 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) Oberg
- 227-228-229.\* **Seminar in Composition and Orchestration.** (3 cr each; prereq #; hrs ar; ScH 203) Fetler

### *Second Term*

- A.\*\* Piano. (See first term) Weiser, Freed
- D.\*\* Voice. (See first term) Schuessler, Knowles
1. **Fundamentals of Music.** (See first term) (III MTWThF; ScH 103) Fetler
- 11.\*\* Piano. (See first term) Weiser, Freed
- 12.\*\* Voice. (See first term) Schuessler, Knowles
- 13 through 27.\*\* (See first term)

52. **History of Musical Styles, II.** Classic, romantic, and modern. (2 cr; prereq 10 or 50, for nonmusic majors; I MTWThF; ScH 4) Fetler
- 100.°° **Advanced Applied Music.** (See first term) Ar.
- 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; IV MTWThF; ScH 4) Riedel
- 108.° **Heinrich Schütz: Life and Works.** Influenced by political events: Protestant hymn and psalm literature, its musical elaborations in his works; his importance in fields of madrigal and monody, sacred concerto and cantata, and passion; Schütz compared to Bach. (3 cr; prereq 6 cr in music history or history of art or German literature or political history to 1700, or #; II MTWThF; ScH 4) 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 #; I MTWThF; ScH 3) Riedel
- 127-128-129.° **Composition.** (See first term) (II MTWThF; ScH 3) Fetler
- 204.°° **Graduate Applied Music.** (See first term) Ar.
- 212.° **Special Problems.** (See first term) (V W; ScH 4) Riedel
- 227-228-229.° **Seminar in Composition and Orchestration.** (3 cr each; prereq #; hrs ar; ScH 203) Fetler

## NATURAL SCIENCE

See Interdepartmental Courses

## PERSONAL ORIENTATION

See Interdepartmental Courses

## PHILOSOPHY (Phil)

### *First Term*

- Problems of Philosophy.** Introduction to the subject; main fields of investigation; permanent problems; principal methods and schools of philosophy; historical and contemporary views. (3 cr; prereq soph, jr, sr; II MTWThF; WeH 202) Brodbeck
- Logic.** Difference between logical and fallacious reasoning; the functions and uses of language; rules of good definition and sound argument. (3 cr; prereq soph, jr, sr; IV MTWThF; FraH B1) Raab
- 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; prereq soph, jr, sr; III MTWThF; WeH 202) Raab
- History of Philosophy (Ancient and Medieval).** Greek philosophy from Thales to (and including) Aristotle. (3 cr; prereq soph, jr, sr; III MTWThF; JohH 306) Donagan
- Contemporary Philosophy.** Current systematic and critical philosophies, especially idealism, naturalism, pragmatism, positivism, and existentialism, as represented by their principal exponents. (3 cr; prereq 52 or #; III MTWThF; JohH 105) Brodbeck

151. **Principles of Aesthetics.** Nature of aesthetic experience; standards of aesthetic evaluation; beauty in art and beauty in nature; status of subject matter in the arts; relation of form and content; concepts of representation, expression, style, meaning, and truth in the arts; use of symbols in art; relation of the arts to knowledge, and to society; relation of aesthetics to ethics. (3 cr; prereq #; II MTWThF; JohH 306) Donagan
160. **Philosophy of Science.** An attempt to provide a clear understanding of the meaning, methods, and implications of modern science through the examination of basic concepts, presuppositions, and procedures. The topics include description, explanation, prediction, experimentation; space, time, number, matter, energy; causality, probability, statistics; organic life; evolution, mind. (3 cr; prereq 2 or #; II MTWThF; JohH 313) Feigl
190. **Seminar in Philosophy.** Topics to be arranged according to students' interests. (3 cr; prereq sr, grad, 9 cr, or #; ar) Staff

### Second Term

1. **Problems of Philosophy.** (See first term) (II MTWThF; WeH 202) Holmer
2. **Logic.** (See first term) (III MTWThF; JohH 114) Potter
3. **Ethics.** (See first term) (II MTWThF; JohH 306) Mason
52. **History of Philosophy (Modern).** (3 cr; III MTWThF; JohH 306) Mason
171. **Philosophies of India.** Introduction to problems of systematic philosophy in India, with special attention to Buddhist logic and epistemology, Vaisesika metaphysics, ethics of the *Bhagavadgita*, and Advaita Vedanta monism. (3 cr; prereq 5 cr, or #; II MTWThF; Psy 109) Potter
182. **Philosophy of Religion.** Discussion of the ground and sanctions of religion, according to various philosophies. (3 cr; prereq 6 cr; III MTWThF; JohH 313) Holmer
191. **Seminar in Philosophy.** Topics to be arranged according to students' interests. (3 cr; prereq sr, 9 cr, or #; ar) Staff

## PHYSICAL EDUCATION FOR WOMEN (PE W)

The following courses may be taken for elective credit in the College of Science, Literature, and the Arts:

First term: PE W 7, 8, 12, 32

Second term: PE W 7

## POLITICAL SCIENCE (Pol)

### First Term

- A. **The State in the Modern World.** (Part A of A-B-C) The development, principles, structure, and operation of the modern nation state. (3 cr; III MTWThF; ForH 85) Kalleberg
1. **American Government and Politics.** (Part 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; I MTWThF; ForH 185) Chase

26. **American Foreign Policy.** An introduction to the institutions and processes which determine American foreign policy. Traditional and postwar foreign policies. (3 cr; III MTWThF; ForH 155) Dudharkar
131. **Public Administration.** Organization and areas. Administrative responsibility. (3 cr; prereq 1-2, or 5; II MTWThF; ForH 185) Chase
141. **Comparative European Government.** Government and politics of Great Britain. Emphasis is on political customs, party system, elections, problems of administration, and crisis government. (3 cr; prereq A-B or 12 cr in social science or #; II MTWThF; ForH 150) Turner
143. **Government of the U.S.S.R. and Adjacent States.** An analysis of the government and politics of Soviet Russia that seeks to explain the rise of Bolshevism; the sources and nature of its ideology; the history of the Communist party; foreign, economic, and cultural policies; significance for Western civilization. (3 cr; prereq A-B, or 12 cr in social science or #; IV MTWThF; ForH 180) Turner
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 A-B or 9 cr in social science or #; IV MTWThF; ForH 120) Cooperman
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; I MTWThF; ForH 130) Levi
194. **International Politics of Asia.** Survey of Asian international relations; recent developments. (3 cr; III MTWThF; ForH 150) Levi

### *Second Term*

- B. **The State in the Modern World.** (Part B of A-B-C) (See A, first term) (3 cr; III MTWThF; ForH 160) Bonn
2. **American Government and Politics.** (Part 2 of 1-2-3) Organization of national, state, and local government: legislative, executive, and judicial branches and their procedures. (3 cr; II MTWThF; ForH 115) Christensen
25. **World Politics.** Introduction to the field of contemporary international relations, the policies of the great powers today, nationalism, internationalism, Europe and the postwar settlement. (3 cr; III MTWThF; ForH 155) McLaughlin
108. **Legislative Organization and Procedure.** Congress and the state legislatures at work. (3 cr; prereq 1-2 or 5 or #; II MTWThF; ForH 160) Backstrom
117. **Local Government.** Forms, politics and administration. (3 cr; IV MTWThF; ForH 185) Backstrom
124. **Recent Social Legislation.** Federal, state and local problems in field of public assistance and social security, with particular emphasis on major programs of Social Security Act, health insurance, and housing. (3 cr; prereq 6 cr; I MTWThF; ForH 150) Warp
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 1-2 or 5 or #; IV MTWThF; ForH 160) Christensen
176. **Conduct of United States Foreign Relations.** The Department of State and the Foreign Service; diplomatic and consular functions and problems; agencies and

economic and military assistance; relations with international organization; treaties and executive agreements. (3 cr; II MTWThF; ForH 55) McLaughlin

## PSYCHOLOGY (Psy)

### *First Term*

- 1-2.† **General Psychology.** Introductory survey of psychology; its materials, fundamental laws, applications, and relations to other sciences. (6 cr; prereq soph; III-IV MTWThF; WuH 202) Horton
- 4-5.† **Introductory Laboratory Psychology.** Experiments illustrating subject matter of contemporary psychology. Included are human and animal learning, problem solving, visual perception, measurement of general and special abilities and personality traits. (4 cr; prereq soph; II-IV MTWThF; Psy 211) Koplín
- 125-126. **Psychology of Individual Differences.** Quantitative studies of such factors as age, sex, race and nationality, physical traits, family heredity, and environment in the causation of individual differences in abilities and temperament. (6 cr; prereq for 125, sr, 1-2, 4-5 or 5 cr in statistics; for 126, 125; II-III MTWThF; Psy 115) O'Neil
- 144-145.† **Abnormal Psychology.** Normal and abnormal behavior contrasted. Dynamics, and particularly social determinants, of personality maladjustments. (6 cr; prereq 9 cr in psychology, or 6 cr in psychology with either Zool 1-2-3 or 12 cr in social science; II-III MTWThF; FraH 20) Rosen
155. **Industrial Psychology.** Psychological problems in industrial production, biomechanics (adaptation of the machine to the capacities and limitations of operator), work and effort, and role of communication in an industrial organization. (3 cr; prereq 1-2 and Math 10 or equiv or 10 cr of statistics; I MTWThF; Psy 115) Dunnette

### *Second Term*

- 1-2.† **General Psychology.** (See first term) (II-III MTWThF; FraH 101) Hakes
- 4-5.† **Introductory Laboratory Psychology.** (See first term) (II-IV MTWThF; Psy 211) Martin
138. **Psychology of Motivation and Conflict.** The drives and motives which underlie normal human behavior and the forms of adjustment which arise when motives conflict or encounter external frustration. Parallel observations in the field of animal behavior will be considered. (3 cr; prereq 1-2; I MTWThF; Psy 115) Russell
156. **Psychology of Advertising.** Psychological analysis of the basic principles underlying advertising and selling. Consumer research is stressed. Research techniques for investigating advertising problems and the analysis of consumer wants are considered in detail. (3 cr; prereq 1-2 and Principles of Economics; III MTWThF; FraH 20) Longstaff
160. **Psychology in Personnel Work.** Psychology as applied to 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. (3 cr; prereq 1-2, 4-5, or 3 cr in statistics, and Principles of Economics or #; II MTWThF; FraH 20) Longstaff
243. **Experimental Psychodynamics.** Application of experimental methods to problems emphasized by the rise of clinical psychology. Relation of certain clinical concepts to learning and motivational theory. (3 cr per qtr; prereq 145 and 129 or 117 [old 165] or #; II MTWThF; Psy 115) Russell

## ROMANCE LANGUAGES

### *First Term*

#### FRENCH (Fren)

1. **Beginning French.** (5 cr; III-IV MTWThF; FolH 201) Falk
3. **Beginning French.** (5 cr; prereq 2, or 2 yrs of high school French; I-II MTWThF; FolH 201) Renaud
4. **Intermediate French.** (5 cr; prereq 3, or 3 yrs of high school French; I-II MTWThF; FolH 201) Renaud
54. **French Conversation and Pronunciation.** In addition to regular conversation course, 2 hours per week (individually arranged) are devoted to practical phonetics and pronunciation drill. (3 cr; prereq 4; VI-VII MWF; FolH 201) Burks
128. **La Fontaine and La Bruyère.** (2 cr; IV TWThF; FolH 203) Renaud
161. **The Novel of the Twentieth Century: Sartre and Camus.** (2 cr; II TWThF; FolH 203) Falk
259. **Directed Readings in French.** (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 1-2 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; II-III MTWThF; FolH 202) Grismer
3. **Beginning Spanish.** (5 cr; prereq 2, or 2 yrs of high school Spanish; I-II MTWThF; FolH 226) Estelle
20. **Intermediate Spanish.** (5 cr; prereq 3, or 3 yrs of high school Spanish; I-II MTWThF; FolH 226) Estelle
120. **The Ballad.** (2 cr; prereq 65, 66, 67 or 68, 69; I TWThF; FolH 203) Grismer
130. **Cervantes: Don Quijote.** (2 cr; prereq 65, 66, 67 or 68, 69; III TWThF; FolH 203) Mallo
177. **Unamuno and Ortega y Gasset.** (2 cr; prereq 65, 66, 67 or 68, 69; IV TWThF; FolH 208) Mallo
259. **Directed Readings.** (1-3 cr; prereq #; ar) Staff

†† See Modern Language Institute in section on Special Programs.



NOTE—A study group in Spanish is being planned in Mexico. (See section on Special Programs, Modern Language Institute)

### *Second Term*

#### FRENCH (Fren)

2. **Beginning French.** (5 cr; prereq 1, or 1 yr of high school French; III-IV MTWThF; FolH 201) Green

#### SPANISH (Span)

2. **Beginning Spanish.** (5 cr; prereq 1, or 1 yr of high school Spanish; II-III MTWThF; FolH 202) Shamblin

### SCANDINAVIAN (Scan)

#### *First Term*

162. **Contemporary Trends in the Scandinavian Novel.** Characteristic trends in Scandinavian life and thought in the 20th century as expressed in the prose fiction of Sigrid Undset, Johannes V. Jensen, Olav Duun, Hjalmar Bergman, Pär Lagerkvist, Halldór Laxness, and others. (3 cr; prereq 6 or 12, or 8 cr in literature; knowledge of Scandinavian languages required for majors only; I MTWThF; FolH 12) Gustafson
172. **Strindberg and the Drama in Revolt and Transition.** Strindberg as a master of the naturalistic drama and as "father of modernity" in the European and American theater since his day. (3 cr; prereq 6 or 12, or 8 cr in literature; knowledge of Scandinavian languages required for majors only; III MTWThF; FolH 12) Gustafson

#### *Second Term*

161. **The Nineteenth-Century Scandinavian Novel.** Examination of "the great tradition" in the modern Scandinavian novel, together with the circumstances intellectual and political, social and economic out of which it grew. (3 cr; prereq 6 or 12, or 8 cr in literature; knowledge of Scandinavian languages required for majors only; II MTWThF; FolH 12) Naess
171. **Ibsen and the Beginnings of the Modern Drama.** Intensive examination of the plays of Ibsen, especially with reference to the role he has played as the "founder" of modern European drama. (3 cr; prereq 6 or 12, or 8 cr in literature; knowledge of Scandinavian languages required for majors only; IV MTWThF; FolH 12) Naess

### SLAVIC AND ORIENTAL LANGUAGES

#### *First Term*

#### JAPANESE (Jap)

110. **Japanese Literature in Translation.** Chronological survey of Japanese literature from the 8th century A.D. to 16th century. (3 cr; prereq 6 cr in literature; knowledge of Japanese not required; II MTWThF; FolH 302) Copeland

#### ORIENTAL (Ortl)

77. **Asian Civilization: Japan.** A general introduction to Japanese culture. (3 cr; knowledge of Japanese not required; IV MTWThF; FolH 302) Copeland

## RUSSIAN (Russ)

1. **Beginning Russian.** (5 cr; I-II MTWThF; FolH 305) Niemi
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; I-II MTWThF; FolH 301) Nice and staff
56. **Conversation.** (3 cr; prereq #; III MTWThF; FolH 302) Alexeev

*Second Term*

## JAPANESE (Jap)

111. **Japanese Literature in Translation.** Chronological survey of Japanese literature from the 16th century A.D. to present. (3 cr; prereq 6 cr in literature; knowledge of Japanese not required; II MTWThF; FolH 302) Copeland

## RUSSIAN (Russ)

2. **Beginning Russian.** (5 cr; I-II MTWThF; FolH 305) Niemi
24. **Scientific Russian.** (5 cr; I-II MTWThF; FolH 301) Alexeev and staff

## SOCIAL SCIENCE

See Interdepartmental Courses

## SCHOOL OF SOCIAL WORK (SW)

*First Term*

- Soc 50. **Introduction to the Theory and Practice of Social Work.** (See Sociology) Cohn
- Soc 91. **Case Method Applied to the Study of Human Problems.** (See Sociology) Cohn
- CD 140. **Behavior Problems.** (See College of Education, Institute of Child Development and Welfare) Robinson
202. **Special Topic—Research in Family-Centered Social Work.** A survey, analysis and comparison of a number of research studies in family-centered social work which emphasizes nature of problem studied. Conceptual approach, methodology and findings. Open to social workers, teachers, public health nurses, sociologists, psychologists, statisticians and other professionals. (3 cr; II MTWThF; ForH 175) Crane
203. **Management of Children with Social Emotional Problems.** Primarily for elementary and secondary school personnel interested in gaining further insight, skill, and understanding regarding children whose problems interfere with their adjustment and educational progress. Open to teachers, social workers, and counselors. (3 cr; VI MTWThF; ForH 170) Merl
245. **Child Welfare Programs.** A consideration of community agencies and public policies which are aimed at enhancing children's welfare and preventing or reducing problems of social and economic maladjustment. Designed for teachers, nurses and others concerned with or working with problems of children. Open also to social workers, guidance personnel, sociologists and other professionals. (3 cr; III MTWThF; ForH 175) Newhouse
275. **Social Group Work.** Introduction to social group work method. Analysis of the use of group processes in working with social, informal or therapeutic groups. Open to social workers, teachers, recreation workers, and others interested in the theory of group process. (3 cr; I MTWThF; ForH 180) Konopka

285. **Special Studies in Social Work.** Supervised experience in research on an independent project to be offered for fulfillment of degree project requirements for the MSW degree. (1-9 cr; prereq 45 grad cr in social work) France

### *Second Term*

- CD 140. **Behavior Problems.** (See College of Education, Institute of Child Development and Welfare) Grams
201. **Special Topic—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; I MTWThF; ForH 175) Hovda
202. **Special Topic—Family-Centered Social Work.** Technical and theoretical problems of working with a family as a unit of interacting members. Focus upon family diagnosis and treatment in the light of such factors as stress and intra-familial contagion, family membership in extra-familial groups and such socio-cultural factors as caste and class. Open to social workers, teachers, public health nurses, sociologists and other professionals. (3 cr; II MTWThF; ForH 175) Compton
260. **Principles of Administration in Social Work.** The process of transforming social policy into social services. Emphasis upon the theory of process. Useful to social workers, teachers, public health workers. (3 cr; III MTWThF; ForH 467) 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; IV MTWThF; ForH 155) Forster
3. **Social Problems.** Survey course in contemporary social problems with especial emphasis on personal demoralization and social disorganization. (3 cr; III MTWThF; ForH 55) Johnson
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; ForH 115) Cohn
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 3 or #; VI MTWThF; ForH 175) Cohn
111. **Population Trends.** 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 #; I MTWThF; ForH 150) Johnson
140. **Social Organization.** Organization and structure of social groups; basic culture patterns of economic, political, and social institutions. Integration and disintegration of social groups and institutions. Essentials of social dynamics. (3 cr; prereq 1 or #; II MTWThF; ForH 130) Forster
180. **Methods of Social Research.** Survey of major methods employed in social research, including a consideration of their advantages and limitations when applied to specific types of problems. (3 cr; prereq 45 or equiv; III MTWThF; ForH 115) Monachesi

### Second Term

1. **Introduction to Sociology: Man in Modern Society.** (See first term) (III MTWThF; ForH 55) Stryker
2. **The American Community.** Sociological analysis of modern American society. Topics emphasized include distribution of population, urban-rural differences, social factors in business systems, occupational groups, determination of social status, and minority group adjustment. Attempts to familiarize student with current research methods. (3 cr; prereq 1 or 1A or 3; II MTWThF; ForH 120) Francis
118. **Delinquent Behavior.** Critical analysis of the nature of delinquent behavior and its "causes" with consideration of the help that understanding of causes can give to its modification and its prevention. (3 cr; prereq 53, or teaching experience or #; III MTWThF; ForH 115) Monachesi
123. **Minority Group Relations.** Interaction of social and cultural groups in America. Processes leading to group contact; characteristics and contributions of ethnic groups in United States; mechanisms and problems of group adjustment. Democratic theory and practice; sources of prejudice; contemporary status of principal minority groups; international implications; trends and proposed solutions. (3 cr; prereq 1 or #; I MTWThF; ForH 130) Stryker
126. **Family Development.** Analysis of the natural history of families, how they form, function, and achieve distinctive identities. Focus on the developmental growth of children and parents in interaction in seven stages of the family life cycle, from engagement planning to family dissolution. (3 cr; prereq 1 and CD 80 or #; II MTWThF; ForH 170) Hill
170. **Analytical Social Theory.** Examination of major problems of sociological theory; survey of main types of sociological theory (positivistic, rationalistic, idealistic); major theoretical concepts. (3 cr; prereq 1 or #; IV MTWThF; ForH 170) Francis

### SPEECH AND THEATER ARTS (Spch)

See Program 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 E. H. Henrikson, director of the Speech and Hearing Clinic (Office of the Dean of Students), 205 Shevlin Hall.*

- 5X.†† **Fundamentals of Speech.** Development of basic skills in speech: voice and action, oral reading, discussion, extemporaneous speaking. (Each section limited to 25) (3 cr) Smith and staff

Sec 1, I MTWThF, FolH 306

Sec 2, II MTWThF, FolH 306

6. **Fundamentals of Speech.** Second quarter of 5-6. (Limited to 25) (3 cr; prereq 5; II MTWThF; FolH 307) Smith and staff
32. **Beginning Acting: Creative Approach.** Creation and presentation of original scenes and skits. Ability to respond to the imaginative situation with individuality and effectiveness is stressed. (Limited to 15) (3 cr; prereq soph, 31; II MTWThF; ScH 19) Ahart

†† Credit for Speech 5X without Speech 6 by petition only.

51. **Advanced Public Speaking.** Preparation and delivery of speeches on current public issues. (Limited to 25) (3 cr; prereq 5; II MTWThF; FolH 303) Scott
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, IV MTWThF; FolH 307) Fletcher
91. **Scene Design.** Theory and practice of designing scenery as a functional environment for the stage and television. (Limited to 20) (3 cr; prereq 5, 31, 34; VI MTWThF; ShH 110) Josal
- 112.\* **Stage Direction.** Rehearsal problems and direction of one-act play. (Limited to 20) (3 cr; prereq sr, 1-2 or 5, 31, 32, 33, 34, 90 or 92, 91 and  $\Delta$ ; III MTWThF; ShH 115) Ballet
- 126.\* **History and Criticism of Public Address.** Examination of historical and critical studies of oratory. Orators; education and training, style, speech composition, topics and issues, historical settings. (3 cr; prereq 5, Psy 1-2; I MTWThF; FolH 302) Scott
- 131.\* **Creative Dramatics.** Principles and methods of developing original dramatizations with children. Observation of children's classes in creative dramatics. Readings, projects, term papers. (Limited to 50) (3 cr; prereq 1-2 or 5, 31 or elementary education major, or # ... 32 recommended; IV MTWThF; NH 209) Graham
- 150.\* **Organic Speech Disorders: Aphasia.** An intensive summer session institute in the study of aphasia in adults and children. Consideration of etiology, symptomatology, diagnosis, and therapy. (6 cr; prereq 161, 162, 163 or #; VI-VII MTWThF; FolH 306) Henrikson, Starr, and visiting professors
- 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, including discovery programs, hearing aids, language development, lip reading, speech correction, auditory training, psychology of hard-of-hearing and deaf, vocational guidance, educational channels. (3 cr; prereq 1-2 or 5, 61, 67, Psy 1-2, or #; III MTWThF; Mayo A-675) Lassman
- 157.\* **Clinical Practice in Audiology.** Supervised practice with communication problems of deaf and hard-of-hearing persons, including lip reading, auditory training, language development, speech conservation, etc. (3 cr; prereq 152, 153, 155, or #; ar; Hosp D-311) 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 or  $\Delta$ ; II MTWThF; FolH 409) Fletcher
- 164-165-166.\* **Clinical Methods and Practice in Speech Pathology.** (9 cr; prereq sr, 1-2 or 5, 61, 67, 161, 162, 163; ar) Henrikson, Starr
- 178.\* **Theater on Tour.** Preparation, production, and touring of one or more full-length plays. (3-6 cr; prereq sr, 12 cr above 50 and approval of faculty committee; ar) Whiting and staff
- 181-182-183.\* **Readings in Speech.** Directed reading and preparation of reports on selected subjects. (Cr ar; prereq 5 and 6 addtl cr and #; ar) Staff
235. **Physiology of the Ear.** Analysis of the process of sound conduction and the transformation of vibratory energy into nerve impulses. Normal physiology of middle ear, cochlea, and retrocochlear structures. Effect of pathology upon the function of the various structures with consequent changes in hearing. (3 cr; prereq #; ar; Mayo A-675) Lawrence

236. **Theories of Hearing.** The dynamic history of theories of hearing. Relationship of theory to anatomy and physiology and the ability of structures to respond to the requirements of a theory. (3 cr; prereq #; IV MTWThF; Mayo A-675) Lawrence
- 261-262-263.° **Seminar in Speech Pathology.** Significant literature in speech pathology; evaluation of research methods. (9 cr; prereq 1-2-3 or 5-6, 61, 67, 122, 162-163, Psy 1-2 or #; ar) Henrikson
- 267.° **Seminar in Experimental Phonetics.** Critical analysis of significant research in physiologic and acoustic phonetics. Examination of theory, method, instrumentation, and data. (2 cr; prereq 67 and 142; ar) Fletcher
- 270.° **Advanced Clinical Audiology.** Theory of abnormal auditory function. Problems in description, measurement, integration, and interpretation including discrimination assessment, non-organic deafness, integrity of the sensory-neural system, galvanometric indicators, localization phenomena, etc. (3 cr; prereq 152, 153, 157 and #; ar; Hosp D-311) Lassman
- 275.° **Seminar in Rhetoric.** History and critical study of rhetorical theory. Examination of research in rhetoric. (3 cr; prereq 2 or 5, 109 or #) Smith
- 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. (6 cr, may be repeated with consent; prereq 261-262-263; or #; ar) Henrikson
- 291-292-293. **Research.** Open to graduate students engaged in research on special problems. (Cr ar; prereq 1-2 or 5 and #; ar) Staff

Speech courses listed under the College of Education:

*First term*

EdCI 140. Teaching of Speech. D K Smith

*Second Term*

EPsy 185. Education of the Auditorially Handicapped Child. Ar.

*Second Term*

- 5X.†† **Fundamentals of Speech.** (See first term) (I MTWThF; FolH 306) Howell and staff
6. **Fundamentals of Speech.** (See first term) (II MTWThF; FolH 306) Howell and staff
34. **Stagecraft: Construction and Painting.** Theory and practice in construction, painting, and shifting of stage scenery. (3 cr; prereq soph, 31; VI MTWThF; ShH 110) Struthers
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 1-2 or 5; II MTWThF; MurH 302) Bormann
66. **Radio and Television Drama.** Historical development of radio and television drama, including production, direction, and acting techniques. (3 cr; prereq 5, 32, 65; III MTWThF; MurH 302) von Szeliski
78. **Advanced Acting.** Characterization, styles of acting, and stage technique. Presentation of scenes from great plays. (3 cr; prereq 32; IV MTWThF; NH 304) Moulton

†† Credit for Speech 5X without Speech 6 by petition only.

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 1-2 or 5; IV MTWThF; WeH 302) Thompson
- 101.° **Argumentation and Persuasion.** Theories of modern motivational rhetoric. Analysis of persuasive speaking; practice in preparation and delivery of oral argument. (3 cr; prereq 1-2 or 5, Psy 1-2, 10 cr in social science; IV MTWThF; FolH 306) Howell
- 105.° **Theory of Reading and Acting.** Literature as an art; its various forms; psychology of creative imagination; speech elements in literature; origins and nature of speech symbols and technique of their use. Collateral readings, problems, reports, term papers. (3 cr; prereq 5, 81, 82, 83, and Psy 1-2; II MTWThF; WeH 302) Thompson
- 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. (3 cr; prereq 5; III MTWThF; FolH 306) Howell
- 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, 1-2 or 5, Psy 1-2; I MTWThF; FolH 307) Bormann
- 127.° **Language Training for the Deaf.** Language problems resulting from marked and/or early deafness. Methods of developing and teaching language to the deaf. Underlying theory and supervised practice with deaf individuals. (3 cr; prereq 152 or #; IV MTWThF; FolH 305) Ar.
- 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. (Limited to 15) (3 cr; prereq 1-2 or 5, 61, 67, 152, Psy 1-2 or #; VI MTWThF; Mayo A-675) Lassman, Stark
155. **Lipreading and Lipreading Methods.** Detailed examination of schools and methods of teaching lipreading. Supervised practice in teaching lipreading to hard-of-hearing persons. (3 cr; prereq 5, 61, 67, 152, Psy 1-2, or #; I MTWThF; Mayo A-675) Lassman, Stassen
- 156.° **Auditory Training.** Problems of auditory discrimination and of hearing aid usage in persons with hearing deficiencies. Methods of developing skills in listening with and without acoustic amplification. Supervised practice with acoustically handicapped children and adults. (3 cr; prereq 152 or #; I MTWThF; WeH 302) Ar.
- 161.° **Introduction to Speech Correction.** (See first term) (III MTWThF; FolH 305) Ar.
- 162.° **Speech Pathology.** Neurology of speech. Stuttering and its associated symptoms. Relation of sidedness and speech disorders, heredity, current theories of stuttering, types of treatment. (3 cr; prereq 1-2 or 5, 61, 67, 119; II MTWThF; FolH 307) Ar.
- 164-165-166.° **Clinical Methods and Practice in Speech Pathology.** (See first term) (Ar) Henrikson, Starr
- 178.° **Theater on Tour** (See first term) (Ar) Whiting and staff
- 181-182-183.° **Readings in Speech.** (See first term) (Ar) Staff
251. **Seminar in Listening Comprehension.** Research problems and methods in this field. Evaluation of published research. (2 cr; prereq #; ar) Nichols
- 291-292-293.° **Research.** (See first term) (Ar) Staff

**STATISTICS (Stat)***First Term*

**EPsy 216. Statistical Methods in Education.** (See Department of Educational Psychology)

*Second Term*

**Econ 121A. Introduction to the Theory of Statistics.** Acquaints the nonspecialist with some of the basic concepts and methods of classical statistics. For those interested in further study, serves as a preparation for the more systematic and intensive treatment in Econ 121B-121C. Focuses on problems of hypothesis testing and estimation. (3 cr, §old 121; prereq Math 7 or 10 or ‡; II MTWThF; VH 205) Buehler

**Math 178. Probability.** (See Department of Mathematics, College of Science, Literature, and the Arts)

**EPsy 217. Statistical Methods in Education.** (See Department of Educational Psychology)

**Stat 281. Advanced Topics in Statistics.** (3 cr; regis by ‡; IV MTWThF; JohH 313) Buehler

NOTE—See statements concerning Statistics and Biostatistics in the section on Special Programs and courses under Biostatistics, Business Administration, and Educational Psychology.

**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 101 ABCD) Olson

**83. 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 1-2-3 or Biol 1-2-3 or equiv or 10 cr in botany; II MTWThF; Bo B6) Ar.

**100. Zoological Techniques.** (Grad students only) (Cr and hrs ar) Staff

**197. Problems.** Advanced work in some special line. (3 cr or more; prereq 1-2-3 or Biol 1-2-3 and ‡; ar) Ar.

*Second Term*

**Biol 2. General Biology.** (Continuation of 1) (See first term) (5 cr; prereq 1 or equiv; lect V MTWTh, V-VI F, Bo B6; lab VI-VIII MTWTh, Z 101 ABCD) Roshal

**101. Zoological Techniques.** (Grad students only) (Cr and hrs ar) Staff

**198.<sup>o</sup> Problems.** Advanced work in some special line. (3 cr or more; prereq 1-2-3 or Biol 1-2-3 and ‡; ar) Ar.

†† For additional courses in the first term see index, Lake Itasca Forestry and Biological Station.

‡‡ The entire course in elementary biology includes both 1-2-3. No credit is given for 1 until the satisfactory completion of 2.



# INSTITUTE OF TECHNOLOGY

## College of Engineering††

### AERONAUTICAL ENGINEERING

#### 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; Ex 193) Warner
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; prereq 27 and ITM 26A; IV MTWThF and 1 hr ar; AE 309) Warner
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; AE 209) Sethna

##### Second Term

27. **Rigid-Body Mechanics I.** (See first term) (II MTWThF and 1 hr ar; AE 209) Sethna
28. **Rigid-Body Mechanics II.** (See first term) (III MTWThF and 1 hr ar; AE 209) De Silva
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 100; prereq 28; II MTWThF and 1 hr ar; AE 309) Warner
41. **Deformable-Body Mechanics II.** Stress, strain, and deformation analysis of beams, columns, rings, and cylindrical pressure vessels. (3 cr; prereq 40; I MTWThF and 1 hr ar; AE 309) De Silva

### CIVIL ENGINEERING (CE)

##### First Term

23. <sup>oo</sup> **Surveying Camp.** (Page 87) (9 cr; prereq 20; ar) Kersten, Fant, Self, Idzorek, Pederson

### ELECTRICAL ENGINEERING (EE)

##### First Term

36. **Elements of Electrical Engineering.** (First qtr of the sequence EE 36-37-38) (3 cr; prereq ITM 26A or 80; lect IV MTWThF, VI F; EE 237) Caverley
- Problem session 1, VI-IX T, EE 118      3, VI-IX Th, EE 118  
2, VI-IX W, EE 118

†† The page number in parentheses after the course title indicates the page in the *Bulletin of the Institute of Technology* for 1959-61 on which course description is given.

### Second Term

37. **Elements of Electrical Engineering.** (Second qtr of the sequence EE 36-37-38) (3 cr; prereq 36; lect IV MTWThF, VI F; EE 237) Caverley
- 37A. **Electrical Engineering Laboratory.** (1 cr; prereq ¶37) Cartwright
- |                        |                     |
|------------------------|---------------------|
| Lab 1, VI-IX T, EE 118 | 3, VI-IX Th, EE 118 |
| 2, VI-IX W, EE 118     |                     |

### ENGINEERING ENGLISH (Engl)

English 1B, 2B, and 3B are offered in the College of Science, Literature, and the Arts.

#### First Term

85. **Advanced Technical Communication.** (3 cr; prereq completion of Freshman English requirement) Haga and ar
- |                        |                         |
|------------------------|-------------------------|
| Sec 1, I MTWThF, E 215 | Sec 3, II MTWThF, E 215 |
| Sec 2, I MTWThF, E 4   | Sec 4, II MTWThF, E 4   |

#### Second Term

86. **Advanced Technical Communication.** (3 cr; prereq 85) Guthrie and ar
- |                        |                         |
|------------------------|-------------------------|
| Sec 1, I MTWThF, E 215 | Sec 3, II MTWThF, E 215 |
| Sec 2, I MTWThF, E 4   | Sec 4, II MTWThF, E 4   |

### ENGINEERING GRAPHICS

Formerly Drawing and Descriptive Geometry; see  
Department of Mechanical Engineering

### GENERAL ENGINEERING (GE)

#### First Term

70. **The Slide Rule.** (Page 96) (1 cr; prereq ITM 11 or ¶11; V TTh; E 205) Palmer

#### Second Term

70. **The Slide Rule.** (See first term) (V TTh; E 205) Clausen

### MATHEMATICS (ITM)

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

#### First Term

12. **College Algebra and Trigonometry II.** Progressions, logarithms. Trigonometric formulas and identities, trigonometric curves, inverse trigonometric functions, trigonometric equations, complex numbers. Theory of equations, permutations, combinations probability, partial fractions, hyperbolic functions. (5 cr; prereq 11; III-IV MTWThF; E 106) Vannelli
- 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, simple harmonic motion. (5 cr; prereq 8, 11, 12 or equiv; I-II MTWThF; E 106) Loye
- 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; E 205) J Sather
- 25A. Calculus III: Analytic Geometry and Calculus.** Improper integrals, numerical methods, vectors, parametric equations. Solid analytic geometry treated by vector methods, partial differentiation, geometry of surfaces, differentials, directional derivative, maxima and minima. Multiple integrals, volume, surface area, physical applications. (5 cr; prereq 24A; I-II MTWThF; E 205) Serbyn
- 26A. Calculus IV: Differential Equations and Calculus.** Infinite series; convergence tests, Taylor's formula and expansion of functions. Differential equations; equations of first order; standard methods of solutions; linear equations with constant coefficients, applications; simultaneous equations, integration by series, numerical methods. (5 cr, §80; prereq 25 or 25A; III-IV MTWThF; E 203) Burgstahler
- 90. Elementary Engineering Statistics.** Probability, permutations, and combinations. Frequency distributions. Introduction to sampling significance tests, regression charts. (3 cr; prereq 25 or 25A or §25A; I MTWThF; E 203) Faulkner
- 147. Vector Analysis.** (Formerly ITM 154) 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; E 104) Thompson
- 151.†† Calculus V: Advanced Calculus.** Limit concept, derivative, Riemann integral, numerical integration, partial differentiation, multiple integrals. (3 cr; prereq 26 or 26A or 80; I MTWThF; E 104) Thompson
- 159B. Summer Institute for High School Teachers: Fundamentals of Analytic Geometry and Calculus.** (See section on Special Features) (June 13-August 5) A course directed toward fundamental concepts, with applications relevant to the physical sciences. Topics will include: functions and their limits; derivatives; differentiation of algebraic functions; differentials and related approximations; Rolle's theorem; mean-value theorem for derivatives; definite and indefinite integrals; applications to area, volume. Relevant topics from analytic geometry will be interpolated throughout the course. (4 cr; prereq admission to Summer Institute or #: VI MTWThF; C 100, afternoon hrs ar) Indritz
- 160B. Summer Institute for High School Teachers: New Approaches in High School Mathematics.** (See Department of Mathematics, College of Science, Literature, and the Arts)
- 165A. Introduction to Programming Modern Digital Calculators.** Organization of a modern digital calculator. Binary number system. Instruction code, elementary coding, flow charts, techniques for avoiding errors, code checking, scaling, sub-routines, assembly techniques, interpretive programs. (3 cr, §165; prereq 25 or 25A; IV MTWThF; E 104) Pope
- 184. Elementary Numerical Analysis in Engineering.** Finite differences, interpolation, summation of series, numerical integration, Euler-McLaurin formula and asymptotic expansions. Numerical solutions of systems of algebraic and transcendental equations.

†† Note that 152 and 153 may be taken simultaneously in the second term; 151, 152 and 153 form a 9 credit sequence regularly taught during the academic year.

Newton's and Graeffe's method. (3 cr; prereq 26 or 26A or 80; II MTWThF; E 104) Pope

### *Second Term*

- 13A. **Calculus I: Analytic Geometry and Calculus.** (See first term) (I-II MTWThF; E 205) Dolid
- 24A. **Calculus II: Analytic Geometry and Calculus.** (See first term) (I-II MTWThF; E 203) Polansky
- 25A. **Calculus III: Analytic Geometry and Calculus.** (See first term) (III-IV MTWThF; E 205) Faulkner
- 26A. **Calculus IV: Differential Equations and Calculus.** (See first term) (III-IV MTWThF; E 203) Munro
- 152.†† **Calculus VI: Advanced Calculus.** (Formerly Calculus IV) Maxima and minima in several variables, vector algebra and calculus, Green's and Stokes' theorems, integrals depending upon a parameter. (3 cr, §147; prereq 151A; I MTWThF; E 227) Lindgren
- 153.†† **Calculus VII: Advanced Calculus.** (Formerly Calculus V) Infinite series, computation with series, series with variable terms, uniform convergence, power series, Fourier series and orthogonal functions, special functions. (3 cr; prereq 151A; II MTWThF; E 227) Lindgren

## MECHANICAL ENGINEERING

### *ENGINEERING GRAPHICS (EG)*

#### *First Term*

14. **Engineering Graphics.** (Page 105) (3 cr; prereq solid geometry; lect VI MTWTh; AE 215; lab VII-VIII MTWTh; E 18) Palmer
16. **Engineering Graphics.** (Page 105) (3 cr; prereq 15; lect VIII MTWTh; AE 215; lab VI-VII MTWTh; E 101) Springer

#### *Second Term*

15. **Engineering Graphics.** (Page 105) (3 cr; prereq 14; lect VI MTWTh; AE 215; lab VII-VIII MTWTh; E 101) Clausen

### *MECHANICAL ENGINEERING (ME)*

#### *First Term*

32. **Thermodynamics.** (Page 108) (3 cr; prereq ITM 26A or §26A, Phys 14; III MTWThF, V W; ME 202) Ibele
- 90.†† **Industrial Assignment, Part I.** (Page 108) (2 cr; prereq ¶work-study program; ar) Algren

†† Note that 152 and 153 may be taken simultaneously in the second term; 151, 152 and 153 form a 9 credit sequence regularly taught during the academic year.

†† ME 90-93 carry 4 credits each. These courses will be given on a quarter basis and credit will not be given for the first term unless course is completed second term.

- 91.†† Industrial Assignment, Part I. (Page 108) (2 cr; prereq ¶work-study program; ar) Algren
- 92.†† Industrial Assignment, Part I. (Page 108) (2 cr; prereq ¶work-study program; ar) Algren
- 93.†† Industrial Assignment, Part I. (Page 108) (2 cr; prereq ¶work-study program; ar) Algren
133. Heat Transmission. (Page 109) (3 cr; prereq 32, Hydr 101 or 103 or ¶Hydr 101 or 103; IV MTWThF, V Th; ME 208) Ibele
146. An Introduction to Combustion. (Page 109) (3 cr; prereq 133 or ¶133) Murphy  
Lect 1, II MTWThF, V T, ME 321      Lect 2, III MTWThF, V W, ME 321

### Second Term

24. Elements of Machine Design. (Page 108) (3 cr; prereq MM 41; lect IV TWThF; ME 321; lab VI-IX TW; ME 325) LaJoy
- 90.†† Industrial Assignment, Part II. (See first term) Algren
- 91.†† Industrial Assignment, Part II. (See first term) Algren
- 92.†† Industrial Assignment, Part II. (See first term) Algren
- 93.†† Industrial Assignment, Part II. (See first term) Algren
134. Thermodynamics of Fluid Flow. (Page 109) (3 cr; prereq 32, Hydr 103; I MTWThF, V Th; ME 321) Ibele
143. Turbomachinery. (Page 109) (3 cr; prereq 134 or ¶134) Murphy  
Lect 1, II MTWThF, V T, ME 321      Lect 2, III MTWThF, V W, ME 321

## MECHANICS AND MATERIALS

See Department of Aeronautical Engineering

## School of Chemistry

### ANALYTICAL CHEMISTRY (AnCh)

#### First Term

51. Quantitative Analysis. Introductory lecture course covering the general principles and theoretical foundations of gravimetric analysis. (2 cr; prereq InCh 26; lect, rec, quiz V-VI TTh, V F; C 325) Herr
53. Quantitative Analysis Laboratory. Introductory laboratory course covering the methods of gravimetric analysis. (3 cr; prereq 51 or ¶51; lab V-VIII MW, VII-VIII TTh, VI-VIII F; C 310) Herr
54. Quantitative Analysis Laboratory. Introductory laboratory course covering the methods of volumetric analysis. (3 cr; prereq 52; lab V-VIII MW, VII-VIII TTh, VI-VIII F; C 310) Herr

†† ME 90-93 carry 4 credits each. These courses will be given on a quarter basis and credit will not be given for the first term unless course is completed second 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 InCh 11 or 26; lect, rec, quiz V MWF, C 325; lab VI-VIII MWF, V-VIII TTh, C 310) Herr
58. **Quantitative Analysis.** Laboratory course for chemical engineers. (3 cr; prereq 52; lab V-VIII MW, VII-VIII TTh, VI-VIII F; C 310) Herr
- 301.\* **Research in Quantitative Analysis.** (Cr and hrs ar) Staff

## INORGANIC CHEMISTRY (InCh)

### *First Term*

4. **General Inorganic Chemistry.** General laws of chemistry and of the nonmetals and their compounds. (5 cr; for premedics, etc; lect I MTWThF, C 100; rec ar; lab V-VII MW, C ar) Conroy
11. **Semimicro Qualitative Analysis.** Laboratory work in systematic qualitative analysis of the cations with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. (4 cr; prereq 5, 15, or 25; lect II MTWThF, C 225; rec ar; lab V-VIII MW, C ar) Tobias
24. **Introduction to Chemical Principles.** Lectures deal primarily with basic theories of chemistry. Examples are drawn from all fields of chemistry. (5 cr; for chemistry and chemical engineering majors; lect I MTWThF, C 100; rec ar; lab V-VIII MWF, C ar) Conroy
26. **Introduction to Chemical Principles.** Laboratory work in systematic qualitative analysis of the cations with lectures on solutions, ionization, chemical and physical equilibria, oxidation and reduction, etc. (5 cr; prereq 5, 15 or 25; lect II MTWThF, C 225; rec ar; lab V-VIII MWF, C ar) Tobias
- 160A. **Summer Institute for High School Teachers. Fundamentals of General and Inorganic Chemistry.** (See section on Special Programs) (June 13-August 5) Course content uses the periodic table as a framework to discuss the elements in terms of their structure and size relationships. Emphasis is given to stoichiometry, equilibrium, electrochemistry and chemical equations. The laboratory emphasizes physical measurements, separation techniques and the preparation of demonstration equipment. (4 cr; prereq admission to Summer Institute or #; II MTWThF, C 100; lab and discussion periods ar) Brasted
- 301.\* **Research in Inorganic Chemistry.** (Cr and hrs ar) Conroy, Tobias, and staff

### *Second Term*

5. **General Inorganic Chemistry.** (See 4, first term) (5 cr; prereq 4; lect I MTWThF, C 100; rec ar; lab V-VII MW, C ar) Johnson
25. **Introduction to Chemical Principles.** (See 24, first term) (5 cr; prereq 24; lect I MTWThF, C 100; rec ar; lab V-VIII MWF, C ar) Johnson
- 103.\* **Atomic Structure and the Properties of the Elements Based Thereon.** (3 cr; prereq AnCh 1, 2, OrCh 62; lect II MTWThF, C 215; rec ar) Hugus
- 107.\* **Oxidation-Reduction Systematics.** (3 cr; prereq PCh 101; lect IV MTWThF, C 215; rec ar) Hugus
- 302.\* **Research in Inorganic Chemistry.** (Cr and hrs ar) Johnson, Hugus, and staff

## 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) Moulton
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) Noland
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) Noland
- 158A. **Summer Institute for High School Teachers. Organic Chemistry.** (June 13-August 5) (See section on Special Features) The discussions will include important classes of aliphatic and aromatic compounds with particular emphasis on those materials of industrial or biological importance. Isomerism, stereochemistry, and simple reaction mechanisms will be considered in some detail. (4 cr [8-week term], grad cr toward M.A. in education; prereq admission to Summer Institute or #, 1 yr college chemistry; III MTWThF, C 100, afternoon hrs ar) Schweizer
301. **Research in Organic Chemistry.** (Cr ar; prereq 102,  $\Delta$ ) Noland
- Graduate Thesis in Organic Chemistry. (0 cr; prereq  $\Delta$ ) Noland

*Second Term*

- 62.†† **Elementary Organic Chemistry.** (See 61, first term) (4 cr; prereq 61; lect I MTWThF, C 325; rec II TTh, C 325; lab II-IV MWF, C 390, lab conf III TTh, C 325) Moulton
302. **Research in Organic Chemistry.** (Cr ar; prereq 102 or equiv,  $\Delta$ ) Ar.
- Graduate Thesis in Organic Chemistry. (0 cr; prereq  $\Delta$ ) Ar.

## PHYSICAL CHEMISTRY (PCh)

*First Term*

- 104, 105. **Physical Chemistry Laboratory.** (1 or 2 cr; prereq 101 for 104, 102 for 105; VI-VIII MW; C 190) Raw
- 107.†† **Elementary Physical Chemistry.** Primarily for premed students. (3 cr; prereq 1 yr college chemistry, 1 yr college physics, Math 40; lect I MTWThF, C 225; lab VI-VIII MW, C 190) Raw
199. **Selected Topics in Physical Chemistry.** Recent progress in our understanding of valence and molecular structure. (3 cr; prereq #; VII MWF; C 100) Longuet-Higgins
301. **Research in Physical Chemistry.** (Cr and hrs ar) Staff

†† To receive credit for any part of this course, a student must complete both 61 and 62.

†† Course 108 is a continuation of 107. The entire course 107-108 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**

- 105, 106. **Physical Chemistry Laboratory.** (1 or 2 cr; prereq 102 for 105, 103 for 106; VI-VIII MW; C 190) Person
- 108.†† **Elementary Physical Chemistry.** Primarily for premed students. (3 cr; prereq 107; lect I MTWThF, C 225; lab VI-VIII MW, C 190) Raw
118. **Advanced Physical Chemistry.** Methods of determining molecular structure with simple applications. Chemical and physical properties in terms of nature of chemical bonds. (3 cr; prereq 103; I MTWThF, C 215) Person
301. **Research in Physical Chemistry.** (See first term) Staff

**METALLURGY (Met)††****First Term**

56. **Physical Metallurgy.** (ME, MinE, PetE, IndAdm) (Page 112) (3 cr; prereq 3rd yr [IndAdm see adviser]; I MTWThF, VI Th; MinMet 116) Jerabek
60. **Physical Metallurgy.** (ChE) (Page 112) (3 cr; prereq 3rd yr; I MTWThF, VI Th; MinMet 116) Jerabek
- 170-171.\*§§ **Special Problems in Physical Metallurgy.** (Page 113) (1, 2 or 3 cr) Jerabek

**Second Term**

- 170-171.\*§§ **Special Problems in Physical Metallurgy.** (See first term)

**School of Mines and Metallurgy††****METALLURGICAL ENGINEERING (MetE)****First Term and Second Term**

- 124.\*§§ **Special Problems in Mineral Dressing.** (Page 112) Detailed study of mineral dressing problems. (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**

- 15A.§§ **Mine Surveying Field Work.** (Page 114) (6 cr; prereq 13; 4 wks beginning about June 15) Lacabanne, Yardley
- 15B.§§ **Mine Surveying Field Work.** (Page 114) (5 cr; prereq 13; 3 wks beginning about June 15) Lacabanne, Yardley

†† The page number in parentheses after the course title indicates the page in the *Bulletin of the Institute of Technology* for 1959-61 on which course description is given.

†† Course 108 is a continuation of 107. The entire course 107-108 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.



151-152-153.°§§ Special Mining Engineering Problems. (Page 115) (Cr and hrs ar; prereq 113) Ar.

212-213-214.°† Mining Research Problems. (Cr and hrs ar) Ar.

### Second Term

151-152-153.°§§ Special Mining Engineering Problems. (See first term)

212-213-214.°† Mining Research Problems. (See first term)

### Third Term

139.§§ Inspection Trip. (Page 115) (3 cr; prereq #; 2 wks beginning about September 7) Pfeider, Yardley

## PETROLEUM ENGINEERING (PetE)

### First Term and Second Term

155-156-157.°§§ Special Problems in Petroleum Engineering. (Page 117) (Cr and hrs ar; prereq ¶144 or 145, or #) Lacabanne

## School of Physics (Phys)

### First Term

1. **Introduction to Physical Science.** Demonstration lectures on the principles of physics and physical phenomena underlying these principles. (3 cr per qtr; prereq high school algebra and plane geometry; lect I MTWThF; Ph 133) Ar.

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

Lab 1, III-IV TTh, ar

Lab 2, VI-VII MW, ar

13. **General Physics, Part I.** Third quarter of sequence. Sound and light. Lab (one 2-hr period) included. (2½ cr; prereq 12 and ¶analytical geometry) Ar.

Lect and quiz III MTWThF, Ph 133

Lab 1, I-II T, ar

2, I-II W, ar

Lab 3, VI-VII W, ar

4, VI-VII T, ar

50. **Intermediate General Physics, Part I.** Selected topics in modern physics. (2 cr; prereq 1-yr course in general physics, ¶integral calculus; III MTWThF; Ph 150) Ar.

50A. **Intermediate General Physics Laboratory, Part I.** Laboratory parallel to Phys 50. (½ cr; prereq 50 or ¶50) Ar.

Lab 1, I-II M, ar

2, VI-VII W, ar

Lab 3, VI-VII Th, ar

155. **The PSSC Course in Physics.** (June 13-August 5) A study and critical analysis of the high school physics course prepared by the Physical Science Study Committee; construction and analysis of laboratory materials for the high school physics course.

§§ Open only to students previously registered at the University of Minnesota. Advance arrangement necessary.

(8 cr; prereq admission to the Summer Institute or #) Verbrugge, Werntz, and visiting staff

Lect II-III MTWThF, Ph 170  
Discussion IV MTWThF, Ph 143, 145

Lab VI-VIII MTWTh, ar

- 159C. Principles of Atomic and Nuclear Physics.** (June 13-August 5) The conservation principles in classical mechanics; properties of electric and magnetic fields; analysis of wave motion, with particular reference to light waves; special theory of relativity; the nuclear theory of the atom; the hydrogen atom; quantum effects, particles and waves; the atomic nucleus; nuclear reactions; the elementary particles of physics. (4 cr; prereq admission to Summer Institute or #; I MTWThF; Ph 170; lab Monday afternoon; discussion periods ar) Wall, Likely

### *Second Term*

- 2. Introduction to Physical Science.** Electricity and magnetism. (See 1, first term) (3 cr; lect I MTWThF; Ph 133) Ar.

- 2A. Physical Science Laboratory.** (See 1A, first term) (1 cr; prereq §2) Ar.

Lab 1, III-IV TTh, ar

Lab 2, VI-VII MW, ar

- 13. General Physics, Part II.** (See first term) Ar.

Lect and quiz III MTWThF, Ph 133

Lab 1, I-II T, ar  
2, I-II W, ar

Lab 3, VI-VII W, ar  
4, VI-VII T, ar

- 50. Intermediate General Physics, Part II.** (See first term) (Lect III MTWThF; Ph 150) Ar.

- 50A. Intermediate General Physics Laboratory, Part II.** (See first term) Ar.

Lab 1, I-II M, ar  
2, VI-VII W, ar

Lab 3, VI-VII Th, ar

# 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, 120 Veterinary Clinic, University of Minnesota, St. Paul 1, Minnesota.

### *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; registration for more than 1 term permitted; prereq 151 or equiv, #) Kitchell, Weber, Stromberg

#### VETERINARY BACTERIOLOGY AND PUBLIC HEALTH (VBac)

128.\* **Problems in Veterinary Bacteriology and Public Health.** (Cr ar; prereq 103 or equiv, #) Pomeroy, Anderson, Lindorfer

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, Fenstermacher, 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

#### VETERINARY OBSTETRICS (VObs)

201.\* **Special Problems in Animal Reproduction.** (Cr ar; prereq #) Zemjanis

---

†† Tuition fees per term, in College of Veterinary Medicine are \$57.50 for resident and \$122.50 for nonresident students, and incidental fee per term is \$9.50. Students taking less than a full program will pay at the summer rate or academic year rate, whichever is higher.

**VETERINARY PATHOLOGY AND PARASITOLOGY (VPaP)**

157. **Veterinary 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, Fenstermacher
- 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, #) Sellers, 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 VSR 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 VSR 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 VSR 103 or equiv, #) Arnold, Usenik

# INDEX

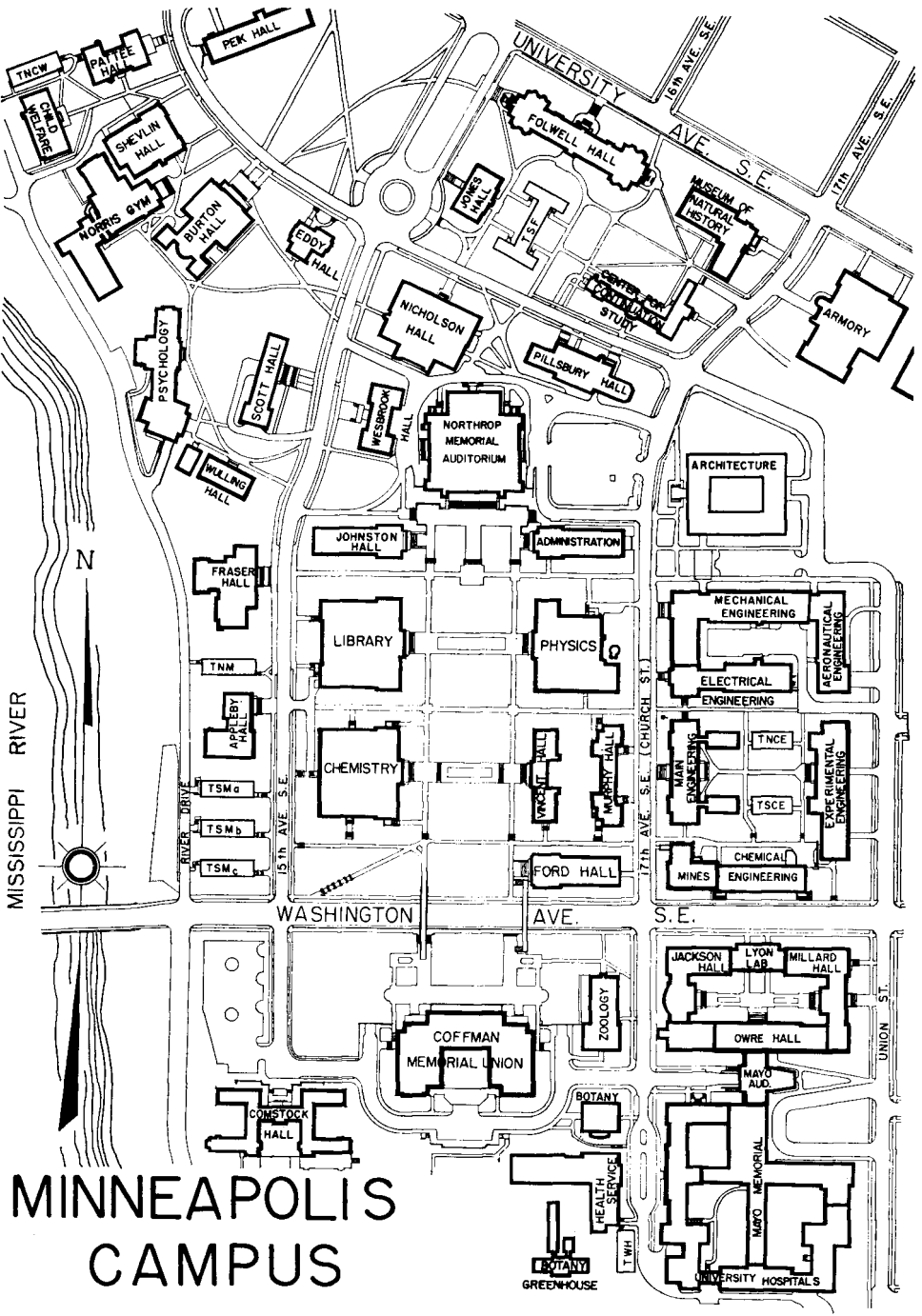
	Page	Page
Abbreviation Codes:		
Buildings	See back cover	
Colleges and Departments	4	
Administrative Committee	2	
Admission and Registration	16-23, 24, 33	
Aeronautical Engineering	127	
Agricultural Biochemistry	26	
Agricultural Economics	26	
Agricultural Education	47-48	
Agricultural Engineering	27	
Agriculture, Forestry, and Home Economics, College of	26-32	
Agriculture, Mechanized	27	
Agronomy and Plant Genetics	27	
American Studies	8, 94	
Analytical Chemistry	131-132	
Anatomy	75	
Anesthesiology	75-76	
Animal Husbandry	27	
Anthropology	94-95	
Archaeological Field Session	13, 95	
Art	95-98	
Art Education	48-49	
Astronomy	98	
Audiology	10	
Audio-Visual Education	53, 54, 56	
Auditors	22	
Bacteriology	76	
Biochemistry, Agricultural	26	
Biology, General	98, 126	
Biology Session, Lake Itasca Forestry and Biological Station	33-35	
Biostatistics	12-13, 90, 92	
Blind, Education of	12	
Board of Regents	2	
Botany	34-35, 98	
Botany, Plant Pathology and	31, 35	
Building Abbreviations	See back cover	
Bus, Intercampus	14	
Business Administration	36-40	
Business Administration, School of	36-43	
Calendar	6	
Chemistry, 3M Distinguished Lectures in	13	
Chemistry, School of	131-134	
Child Development and Welfare, Institute of	52-53	
Civil Engineering	127	
Classics	99	
Commencement, Attendance at, and Dates	23	
Communication	105	
Communications, Journalism and	9, 108-109	
Conference Leading	63	
Counseling and Guidance, Institute on	46	
Crafts	29-30	
Credits, Number of (Amount of Work)	22	
Curriculum and Instruction	53-58	
Dairy Husbandry	27	
Dairy Industries	28	
Dates of Registration	6, 17-18	
Deaf and Hard-of-Hearing, Teaching the	11	
Degree Candidates	17, 22, 24, 87-88	
Demonstration Facilities	46-47	
Dentistry, School of	44	
Dermatology	77	
Deutsches Haus	7-8, 103	
Dormitories (Residence Halls)	15-16	
Dramatics	122-125	
Driver Education	11, 53, 56	
Duluth Campus	6	
Economic Zoology, Entomology and	28, 35	
Economics	41-43	
Economics, Agricultural	26	
Educable Mentally Retarded, Education of	12, 59-60	
Education, College of	45-70	
Educational Administration	49-51	
Educational Psychology	58-61	
Efficient Reading	9, 32	
Electrical Engineering	127-128	
Elementary Education, Introduction to	11	
Elementary School, Summer Demonstration	46-47	
Engineering, College of	127-131	
English	99-101	
English, Engineering	128	
Entomology and Economic Zoology	28, 35	
Examinations	22	
Family Life	105, 107	
Fees:		
Auditors	22	
Biology Session, Lake Itasca Forestry and Biological Station	34	
Course	21	
Dentistry	44	
Deposit Cards	22	
Externships, Medical	75	
Graduation	23	
Incidental	20	
Late	17	
Law School	73	
Medical School	74-75	
Nursing, School of	87-88	
Placement Service	23	
Preschool	52	
Refund of	22	
Research Table (Itasca)	34	
Special	21	
Staff Members, Eligible	20	
Thesis Work Only	20	
Tuition	20	
Veterinary Medicine, College of	137	
Food Service, Housing and	15-16	
Foreign Study	105, 107	
Forestry	28-29	
French	7-8, 118, 119	
General College	71-72	
General Education	61	

	Page		Page
General Engineering .....	128	Mentally Retarded, Teaching the	
General Information .....	13-16	Educable .....	12, 59
Geography .....	101-102	Metallurgical Engineering .....	134
Geology and Mineralogy .....	102-103	Metallurgy .....	134
German .....	7-8, 103	Methods and Student Teaching .....	64
Graduate School .....	24-25	Mineralogy, Geology and .....	102-103
Graphics, Engineering .....	130	Mines and Metallurgy, School of .....	134-135
Guidance, Institute on Counseling and .....	46	Mining Engineering .....	134-135
Gynecology, Obstetrics and .....	77-79	Mortuary Science .....	93
Health Service, University .....	15	Music .....	10-11, 112-114
Hearing Clinic, Speech and .....	122	Music Education .....	10-11, 64-65
High School, Summer Demonstration .....	46	Natural Science .....	106-107
History .....	104-105	Neurology, Psychiatry and .....	82-83
History and Philosophy of Education .....	62	Neurosurgery .....	85-86
Home Economics .....	9, 29-31	Nursing Education .....	64, 87-88
Home Economics Education .....	62-63	Nursing, Public Health .....	89-92
Homebound and Hospitalized Children,		Nursing, School of .....	87-89
Education of .....	11, 59	Obstetrics and Gynecology .....	77-79
Horticulture .....	31	Occupational Therapy .....	81
Housing and Food Service .....	15-16	Offices, Summer Session and General .....	14
How to Study (Personal Orientation) .....	107	Ophthalmology .....	79
Humanities .....	106, 107	Organic Chemistry .....	133
Industrial Education .....	63	Oriental Languages, Slavic and .....	119-120
Information, General .....	13-16	Orthopedic Surgery .....	86-87
Inorganic Chemistry .....	132	Otolaryngology .....	79
Institute of Child Development		Parking Facilities .....	14
and Welfare .....	52-53	Pathology .....	79-80
Institute of Technology .....	127-136	Pediatrics .....	80
Institutes (see also Workshops):		Personal Orientation (How to Study) .....	107
Biology, High School Teachers of .....	33	Petroleum Engineering .....	135
Biology, Radiation .....	137	Pharmacology .....	81
Counseling and Guidance .....	46	Philosophy .....	114-115
Modern Language .....	7-8, 103, 118, 119	Photography .....	96
Science and Mathematics, High School		Physical Chemistry .....	133-134
Teachers of:		Physical Education for Men .....	65-67
Chemistry .....	12, 132, 133	Physical Education for Women .....	67-70, 115
Mathematics .....	111, 129	Physical Medicine and Rehabilitation .....	81
Physics .....	135, 136	Physics, School of .....	135-136
Statistics in the Health Sciences .....	12, 89, 90-91	Physiological Chemistry .....	81-82
Interdepartmental Courses .....	105-107	Physiology .....	82
Itasca Forestry and Biological Station:		Plant Genetics, Agronomy and .....	27
Biology Session .....	33-35	Plant Pathology and Botany .....	31, 35
Forestry Camp .....	29	Political Science .....	115-117
Japanese .....	119, 120	Post Offices, University .....	15
Journalism, School of .....	9, 108-109	Poultry Husbandry .....	31-32
Laboratory Medicine .....	77	Prerequisites, Course .....	3
Latin (for teachers) .....	8-9, 99	Preschool .....	47, 52
Law School .....	73	Programs, Special Features and .....	7-13
Libraries .....	14	Psychiatry and Neurology .....	82-83
Library School .....	109-110	Psycho-Educational Clinic .....	47
Literature .....	99-101	Psychology .....	117
Maison Française .....	7-8, 118	Psychology, Educational .....	58-61
Maps of the Campuses .....	142, 143	Public Health Nursing .....	61, 89-92
Mathematics .....	12, 110-112, 128-130	Public Health, School of .....	89-92
Mechanical Engineering .....	130-131	Radio and Television .....	124
Mechanics and Materials .....	127	Radiology .....	83-84
Mechanized Agriculture .....	27	Reading Difficulties .....	53, 56
Medical Practitioners, Opportunities for .....	74	Reading, Efficient .....	9, 32
Medical School .....	74-87	Registration, Admission and .....	16-23
Medical Sciences, College of .....	74-92	Rehabilitation, Physical Medicine and .....	81
Medical Technology .....	87	Religious Activities .....	9
Medicine .....	76-77	Residence Halls .....	15-16
		Residences, Private .....	16
		Rhetoric .....	32

	Page		Page
Romance Languages .....	7-8, 118-119	Tally Procedures .....	18-19
Russian .....	9, 120	Technical Terms of Science, Medicine, and the Humanities .....	99
Scandinavian .....	8, 119	Television .....	124
Science, Literature, and the Arts, College of .....	94-126	Theater Arts, Speech and .....	122-125
Scientific Russian .....	9, 120	Travel Course in European Art .....	8, 95
Secondary Education, Introduction to .....	11	Tuition and Fees .....	20-22
Slavic and Oriental Languages .....	9, 119-120	Urology .....	86
Slide Rule .....	128	Veterinary Medicine, College of .....	137-138
Social Science .....	107	Workshops (see also Institutes):	
Social Work, School of .....	120-121	Education, College of:	
Sociology .....	121-122	Graduate Credit for .....	45
Soils .....	32	Higher Education .....	45-46, 56, 58
Spanish .....	7-8, 118, 119	Industrial Education .....	45-46, 63
Special Education (Programs and Scholarships) .....	11	School Administrators .....	46, 50
Special Features and Programs .....	7-13	Teaching Display .....	55
Speech and Hearing Clinic .....	122	Home Economics—Dietetics, Admin- istration and Therapeutics .....	30
Speech and Theater Arts .....	122-125	Journalism—Supervision of School Publications (for Teachers and Advisers) .....	108
Speech Pathology .....	9-10	Zoology .....	35, 126
Statistics .....	13, 125-126	Zoology, Entomology and Economic .....	28, 35
Student Teaching .....	46		
Student Teaching, Methods and .....	64		
Surgery .....	84-87		
Symbols .....	3		







# MINNEAPOLIS CAMPUS

## Building Abbreviations

- A, Armory  
AE, Aeronautical Engineering  
AgBot(StP), Agricultural Botany  
AgEng(StP), Agricultural Engineering  
Agr(StP), Agronomy  
AH, Appleby Hall  
Bo, Botany  
BoG, Botany Greenhouse  
Bu, Burton Hall  
C, Chemistry  
CCS, Center for Continuation Study  
CH, Cooke Hall  
ChE, Chemical Engineering  
CofH(StP), Coffey Hall  
CW, Child Welfare  
DCB(StP), Dairy Cattle Barn  
DH(StP), Dining Hall  
DI(StP), Dairy Industries  
E, Main Engineering  
EdH, Eddy Hall  
EE, Electrical Engineering  
Ex, Experimental Engineering  
FieldHse, Fieldhouse  
FolH, Folwell Hall  
ForH, Ford Hall  
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  
J, Jones Hall  
JacH, Jackson Hall  
JohH, Johnston Hall  
Lib, Walter Library  
LsPav(StP), Livestock Pavilion  
LyonL, Lyon Laboratories  
Mayo, Mayo Memorial  
McNH(StP), McNeal Hall (Home Economics)  
MB(StP), Music Bldg  
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  
ShH, Shevlin Hall  
SnH(StP), Snyder Hall  
So(StP), Soils  
TEH(StP), Temporary, East of Haecker Hall  
TNCE, Temporary, North Court of Engineering  
TNCW, Temporary, North of Child Welfare  
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