

SUMMER SESSION 1986

Twin Cities Campus

Term I

June 17-July 18

Term II

July 21-August 22



## Where to call for information

**Summer Session Office** .....(612) 373-2925  
**(New telephone number effective May 24)** .....(612) 624-3555

If the number you need is not listed below or if you need personal assistance, please call the Summer Session office directly, or write: Summer Session, 135 Johnston Hall, University of Minnesota, 101 Pleasant Street S.E., Minneapolis, MN 55455. Office hours are Monday through Friday, 8:00 a.m. to 4:30 p.m. Beginning Monday, April 14, the office will stay open on all Mondays until 6:30 p.m.

University Information Service	
from off-campus telephone	373-2851
from on-campus telephone	3-2002
<b>Advisers</b>	
CLA summer-only students	373-2880
College of Education	373-2268
Extension and Summer Session Counseling	373-3905
<b>Admissions</b>	
Adult Special, advanced standing, and transfer students within the University	373-1382
Master of Business Administration Office	373-5505
<b>Bookstores</b>	
Minnesota Book Center, East Bank	373-3688
Books Underground, St. Paul	373-0800
Smith Bookstore, West Bank	373-4450
<b>Bus Information</b>	
Car-Pool	373-0374
<b>Certifications</b>	
	376-1680
<b>College Offices</b>	
Agriculture, 277 Coffey Hall (St. Paul)	373-0921
Biological Sciences, 223 Snyder Hall (St. Paul)	373-3648
Dental Hygiene, 5-164 Moos Health Sciences Tower	373-3271
Dentistry, 15-106 Moos Health Sciences Tower	373-3454
Education, 1425 University Avenue S.E.	373-2257
Forestry, 10 Green Hall (St. Paul)	373-0842
General College, 10 Nicholson Hall	376-2950
Graduate School, 307 Johnson Hall	373-5542
(Students registered in the Graduate School spring quarter may obtain registration materials in the office of their major department.)	
Home Economics, 32 McNeal Hall (St. Paul)	373-0933
<b>Liberal Arts</b>	
Regular (currently enrolled or previously registered) students: college offices	
High school students: 49 Johnston Hall	376-3950
Summer-only students: B18 Johnston Hall	373-2880
<b>School of Management, 225 Management/Economics (West Bank)</b>	373-3701
School of Management Graduate Studies, 334 Management/Economics (West Bank)	373-5505
<b>Medical Technology, 15-170 Phillips-Wangensteen Building</b>	373-9670
<b>Medicine, 3-105 Owre Hall</b>	373-7690
<b>Military Science, 108 Armory Building</b>	373-2212
<b>Mortuary Science, 400 Botany</b>	373-3870
<b>Nursing, 5-140 Health Sciences Unit F</b>	373-8208, 373-3462
<b>Pharmacy, 5-110 Health Sciences Unit F</b>	373-7997
<b>Physical and Occupational Therapy, 271 Children's Rehabilitation Center</b>	373-9024
<b>Humphrey Institute of Public Affairs, Hubert H. Humphrey Center</b>	373-2653
<b>Public Health, 1250 Mayo Memorial Building</b>	373-8060
<b>Institute of Technology, 105 Lind Hall</b>	373-3227, 373-3228
<b>University College, Inter-College Program, 213 Temporary North of Appleby</b>	376-1253
<b>University Without Walls, 201 Wesbrook</b>	373-3919
<b>Veterinary Medicine, 460 Veterinary Teaching Hospitals (St. Paul)</b>	376-3886
<b>Extension Classes Information</b>	373-3195
<b>Financial Aid</b>	376-2424
<b>Graduate School</b>	373-5542
<b>Handicapped Services</b>	376-2727
<b>Independent Study</b>	373-3256
<b>Housing</b>	373-7542
<b>Lost and Found</b>	
Info Desk, CMU	373-2403
100 WBU Skyway	376-4864
70 CotH (StP)	373-1612
<b>Medical Services</b>	
Boynton Health Service	373-3141
Emergency Room, U Hosp (24 hour)	373-8542, 373-8000
<b>Parking Office</b>	373-4190
<b>Recreational Sports</b>	373-4200
<b>Student Employment</b>	373-3674
<b>Transcripts</b>	376-1680
<b>Veteran's Information</b>	376-1670
<b>BULLETIN REQUESTS</b>	
Graduate School	373-5542
Continuing Education and Extension	376-3000
Summer Session (day courses)	373-2925
Other College Bulletins	373-2153

# University of Minnesota

## SUMMER SESSION 1986

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## UNIVERSITY OF MINNESOTA

### University Regents

Charles F. McGuiggan, Marshall, Chair  
 David M. Lebedoff, Minneapolis, Vice Chair  
 Wendell R. Anderson, Wayzata  
 Charles H. Casey, West Concord  
 Willis K. Drake, Edina  
 Erwin L. Goldfine, Duluth  
 Wally Hilke, St. Paul  
 Verne E. Long, Pipestone  
 Wenda W. Moore, Minneapolis  
 David K. Roe, Minneapolis  
 Stanley D. Sahlstrom, Crookston  
 Mary T. Schertler, St. Paul

### Administrative Officers

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 Stephen S. Dunham, Vice President and General Counsel  
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Harold A. Miller, Dean, Continuing Education and Extension

Steven F. Schomberg, Director of Summer Session and Assistant Dean, Continuing Education and Extension

### Equal Opportunity

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, handicap, age, or veteran status. In adhering to this policy, the University abides by the requirements of Title IX of the Education Amendments of 1972; by Sections 503 and 504 of the Rehabilitation Act of 1973; by Executive Order 11246, as amended; 38 U.S.C. 2012; by the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity.

Inquiries regarding compliance may be addressed to Patricia Mullen, Director, Office of Equal Opportunity and Affirmative Action, 419 Morrill Hall, 100 Church Street S.E., University of Minnesota, Minneapolis, MN 55455, (612/373-7969) or the Director of the Office of Civil Rights, Department of Education, Washington, DC 20202, or to the Director of the Office of Federal Contract Compliance Programs, Department of Labor, Washington, DC 20210.

### Bulletin Use

The contents of this bulletin and other University bulletins, publications, or announcements are subject to change without notice. University offices can provide current information about possible changes.

Advance registration for both terms begins for academic year students<sup>1</sup> May 12

Registration for both terms for summer-only students<sup>1</sup>; continuing registration for academic year students May 15- June 16 M-F only

Early fall registration begins; summer registration continues May 22

First term classes begin **Tuesday, June 17**

Independence Day (holiday) Friday, July 4

Last class meeting Friday, July 18

**Term I**  
**June 17**  
**to**  
**July 18**

**Term II**  
**July 21**  
**to**  
**August 22**

Advance registration for academic year students<sup>1</sup> begins May 12

Registration for summer-only students<sup>1</sup>; continuing registration for academic year students May 15-July 18 M-F only

Second term classes begin **Monday, July 21**

Last class meeting Friday, August 22

<sup>1</sup>Read the definitions for academic year and summer-only students on page 105.

### Access to Student Educational Records

In accordance with regents' policy on access to student records, information about a student generally may not be released to a third party without the student's permission. The policy also permits student to review their educational records and to challenge the contents of those records.

Some student information—name, address, telephone number, dates of enrollment and enrollment termination, college and class, major, adviser, and degrees earned—is considered public or directory information. To prevent release of such information outside

the University while in attendance at the University, that student must notify the record office on his or her campus.

Students are notified annually of their right to review their educational records. The regents' policy, including a directory of student records, is available for review at the information center in Williamson Hall, Minneapolis, and at records offices on other campuses of the University. Questions may be directed to the Office of Registration, Student Records, and Scheduling, 150 Williamson Hall (612/376-1680).



## A Guide to the Summer Session Bulletin

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

- \* Courses in which graduate students may prepare Plan projects.
- † All courses preceding this symbol must be completed before credit will be granted for any quarter of the sequence.
- § Credit will not be granted if the equivalent course listed after this symbol has been taken for credit.
- ¶ Concurrent registration is required (or allowed) in the course listed after this symbol.
- # Registration Override Permit, completed and signed by the instructor, is required for registration.
- △ Registration Override Permit, completed and signed by the department offering the course, is required for registration.
- Registration Override Permit, completed and signed by the college offering the course, is required for registration.
- \*\* A special fee is charged. See section on Course Fees.
- R The letter **R** preceding a course number indicates limited enrollment.

**Courses**—Following each course title are parenthetical statements; the first indicates the computer call number of the course, and the second specifies credits, class limits, prerequisites, hours and days of the week the class meets, location of the class, and course instructor.

**Prerequisites**—Entrance into certain courses requires completion of or concurrent enrollment in other specified courses, or possession of particular qualifications or class standing. If no prerequisites are listed, there are none, except insofar as the course number indicates a minimum class standing requirement.

Class standing is determined by the number of credits completed. The following breakdown may vary slightly by college; freshman, 0-45 credits; sophomore, 46-90 credits; junior, 91-135 credits; senior, 136 or more credits. Check with your college office for further information.

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

0000 to 0999	no credit
1000 to 1999	primarily for freshmen and sophomores
3000 to 3999	primarily for juniors, seniors, and fifth-year students
5000 to 5999	for juniors, seniors, fifth-year students, graduate students, and professional students
8000 to 8999	for graduate students only

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

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

Example: "prereq 1011 or 1017 and Psy 1002" indicates that you must have completed either course 1011 or 1017 in the same department and Psychology 1002.

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

**Hours and Days**—The starting and ending times for classes listed in the Course Descriptions section of this bulletin are indicated in 24-hour clock time. Refer to the table below for help in interpreting these times.

To convert any time between 1:00 p.m. and 12:00 midnight from standard time to the 24-hour clock, add 1200 (for example, 3:45 p.m. + 1200 = 1545). To convert from the 24-hour clock to standard time, subtract 1200 (for example, 1615 - 1200 = 4:15 p.m.).

Conversion Table

24-hour clock	0800	0900	1000	1100	1200
Standard Time	8:00 a.m.	9:00 a.m.	10:00 a.m.	11:00 a.m.	12:00 noon
24-hour clock	1300	1400	1500	1600	1700
Standard Time	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.

Classes generally last for 50 minutes, beginning and ending at the following times: 0800-0850; 0905-0955; 1010-1100; 1115-1205; 1220-1310; 1325-1415; 1430-1520; 1535-1625. Converting to standard time, a class meeting 1325-1415, for example, begins at 1:25 p.m. and ends at 2:15.

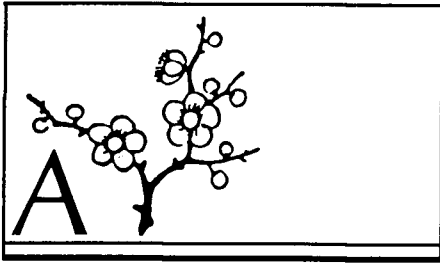
Many classes, especially those in the School of Management meet for more than 50 minutes; these extended class periods are indicated in the course descriptions. To avoid conflicts, check such listings carefully before registering.

Days of the week are abbreviated M, T, W, Th, F.

**Limited Enrollment Courses**—Course with limited enrollments are listed in the Course Descriptions section with an **R** before the course number. Check the Section Status Report (posted outside of 101 Fraser Hall, B18 Johnston hall, 4 Mechanical Engineering, 170 Anderson Hall, and 130 Coffey Hall) to see if space is available in your limited enrollment courses.

**Call Number**—This six-digit number follows the title or section number for each course. You must use the course numbers and *these specific call numbers* when you fill out your Course Request Form.

**Missing Information and Changes**—When hours, days, or places of meeting are not listed, consult the instructor or department offering the course. Changes made subsequent to the printing of this bulletin are published in the school newspaper *Minnesota Daily*. List of changes are also available in the Summer Session office, 135 Johnston Hall.



## Accounting (Acct)

625 Management/Economics. 373-2942  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### SPECIAL TERM: SEVEN-WEEK COURSES JUNE 17-JULY 31

**R 1024. PRINCIPLES OF ACCOUNTING.** (3 cr; each section limited to 42 students; prereq 3rd-qr fr; A-N only)  
Introduction to basic financial accounting concepts and their application to the recording and reporting of business events.

Sec 1, (589863) 0800-0900 MTWTh, BlegH 110  
Sec 2, (389864) 0910-1010 MTWTh, BlegH 440  
Sec 3, (189865) 0910-1010 MTWTh, BlegH 110  
Sec 4, (089866) 1020-1120 MTWTh, BlegH 110

**R 1025. PRINCIPLES OF ACCOUNTING.** (3 cr; each section limited to 42 students; prereq 1024; A-N only)  
Introduction to the effects of generally accepted valuations and measurements upon financial statements.

Sec 1, (689868) 0800-0900 MTWTh, BlegH 220  
Sec 2, (489869) 0910-1010 MTWTh, BlegH 220  
Sec 3, (686713) 1020-1120 MTWTh, BlegH 220

**R 3001. MANAGERIAL ACCOUNTING.** (588647) (4 cr; limited to 42 students; prereq 1025; A-N only; 1015-1200 MWTh; BlegH 230)

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

**R 3101. ACCOUNTING THEORY AND PRACTICE I.** (889870) (4 cr; limited to 42 students; \$8101; prereq 1025; A-N only; 1215-1400 MWTh; BlegH 125)

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

**R 3102. ACCOUNTING THEORY AND PRACTICE II.** (689871) (4 cr; limited to 42 students; \$8101; prereq 3101; A-N only; 0800-0945 MWTh; BlegH 230)

Concepts and problems in accounting for specific assets and equities.

**R 3201. COST ACCOUNTING.** (489872) (4 cr; limited to 42 students; prereq 3001, MIS 3099, DSci 3055; A-N only; 0800-0945 MWTh; BlegH 240)

Process and standard costs, behavior of costs under varying conditions, cost allocations, variance analysis, capital budgeting.

**R 5125. AUDITING PRINCIPLES AND PROCEDURES.** (289873) (4 cr; limited to 42 students; prereq 3102 and 3201; A-N only; 0800-0945 MWTh; BlegH 420)

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

**R 5135. INCOME TAX ACCOUNTING.** (189874) (4 cr; limited to 42 students; prereq 1025; A-N only; 1015-1200 MWTh; BlegH 240)

Individual, partnership, and corporation taxation; emphasizes income tax planning.

**R 5180. ADVANCED ACCOUNTING.** (989875) (4 cr; limited to 42 students; prereq 3102; 1215-1400 MWTh; BlegH 220)  
Consolidated statements, partnerships, fiduciary, international and fund accounting.

<sup>1</sup>Common Final Exam, Thursday, July 31, 0800-1000, WilleyH 125/175.

## Adult and Teacher Education (Educ)

175 Peik Hall. 376-4837  
College of Education

### FIRST TERM

**5103. ADULT EDUCATION WORKSHOP: Community Education in the Year 2000—July 7-11.** (186450) (1-12 cr [max 12 cr]; prereq practicing adult educator or #; 1230-1900 MTWThF and 3 hrs ar; ClaOff B45; A-N only) Bruning

Study of a topic appropriate to the activities and interests of the participants. This 3-credit offering provides a look at what Community Education (CE) could be in the next decade: major societal trends; future of educational programs; evolving structure and relationship to K-12 education; legislative action; patterns of life-long learning; definition of "school" and "educational dreaming" and role in the teaching-learning process in CE. Meets jointly with EdAd 5128, section 1.

**5104. SURVEY OF ADULT EDUCATION—June 17-July 11.** (085686) (3 cr; prereq sr; 1010-1205 MWF; PeikH 315; A-N only) Copeland

General concepts in the field; literature, objectives, history, philosophy, research, institutions, issues, and problems.

**5205. FIELD EXPERIENCE IN ADULT EDUCATION.** (4-8 cr [max 8 cr]; prereq #; A-N only)

Sec 21, (488642) Bruning  
Sec 22, (288643) Copeland  
Sec 23, (885687) Williams  
Sec 24, (685688) Willie

**5401. ADULT LEARNING AND DEVELOPMENT THROUGH THE LIFE SPAN.** (485689) (3 cr; 1830-2030 TTh; PeikH 33; A-N only) Williams

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

**5411. STRATEGIES FOR TEACHING ADULTS.** (788646) (3 cr; 1600-1800 TTh; PeikH 27; A-N only) Willie

Identification, classification, and analysis of techniques used in teaching adults.

**5601. INTERNATIONAL EDUCATION: TOPICS IN CLASSROOM PRACTICES AND PROCEDURES.** (1-12 cr [max 12 cr]; prereq tchg license and #; A-N only)

Educational practices in a designated country, region, or cultural group; impact of social and cultural features; organization, school structures, classroom practices, and delivery of educational services; potential for implementation in the United States.

Sec 1, (885690) People's Republic of China Study Tour, June 15-July 4, Cogan  
Sec 2, (890842) Soviet Union Study Tour, July 2-24, Braun  
Sec 3, (690843) Eastern Europe Study Tour, July 27-August 8, Lewis

**8284. PROBLEMS: TEACHER EDUCATION.** (290845) (3-9 cr; prereq #) Howey

Research in supervision, organization, and administration; laboratory experiences at elementary and secondary levels.

Sec 21, (686534) Bruning  
Sec 22, (486535) Willie  
Sec 23, (991643) Howey

**8302. PROBLEMS: ADULT EDUCATION.** (1-9 cr; prereq #) Individual research in area of adult education.

Sec 21, (188644) Bruning  
Sec 22, (988645) Copeland  
Sec 23, (685691) Williams  
Sec 24, (485692) Willie

### SECOND TERM

**5103. ADULT EDUCATION WORKSHOP.** (1-12 cr [max 12 cr]; prereq practicing adult educator or #)  
See First Term

**Sec 1, Adult Literacy—Policy Issues and Practical Implementations, July 26-August 16,** (190846) 3 cr, 0900-1530 S, off campus, Park

This workshop, designed for noneducators who work with undereducated adults in a variety of settings, will include such issues as defining functional literacy, defining the population of functional illiterates, and implications for human service agencies; work readiness, devising pragmatic job training programs; issues of testing and evaluation; public policy implications.

**Sec 2, Adult Learners: Characteristics, Styles, and Preferences.** (790848) 3 cr, 1830-2030 TTh, PeikH 225, Williams

Content will cover characteristics and preferences of adult learners and learning styles of adults.

**5205. FIELD EXPERIENCES IN ADULT EDUCATION.** (4-8 cr [max 8 cr]; prereq #; A-N only)

Sec 21, (285001) Park  
Sec 22, (185002) Copeland  
Sec 23, (990847) Williams

**5301. DESIGNING THE ADULT EDUCATION PROGRAM—July 28-August 20.** (285693) (3 cr; 1500-1800 MW; PeikH 33; A-N only) Copeland  
Designing and implementing educational programs for adults; exploring concepts, theories; determining needs, educational objectives, learning experiences; and evaluating outcomes.

**8302. PROBLEMS: ADULT EDUCATION.** (3-9 cr; prereq #) See First Term.

Sec 21, (985003) Park  
Sec 22, (785004) Copeland  
Sec 23, (590849) Williams

## Adult Psychiatry (AdPy)

B-605 Mayo. 373-8869  
Medical School

### SPECIAL TERM: JUNE 23-SEPTEMBER 12

**5105. ADULT INPATIENT PSYCHIATRY FOR HEALTH CARE PSYCHOLOGY INTERNS.** (989715) (Cr ar; prereq #) Sines

**5107. HUMAN BEHAVIOR—June 17-July 23.** (089625) (4 cr; 1015-1100 T, MoosT 2620, 0915-1000 W, MoosT 2650) Kroll

**5109. ADULT PSYCHIATRY.** (886984) (9 cr per period; prereq med student) Olson

Clinical exposure to psychiatric problems in the general practice of psychiatry in acute care hospital and community settings. Experience in clinical evaluation and follow-up of patients with acute illness. Contact Arthur Auferheide, M.D., St. Luke's Hospital, 915 East First Street, Duluth (218/727-6636, ext. 660).

# Study Tours to China, the USSR and Eastern Europe

**The People's Republic of China Study Tour, June 15-July 4**, will visit historical and cultural sites as well as schools throughout China. Itinerary includes Beijing, Inner Mongolia, Xian, Guilin, Suzhou, and Shanghai. If you want graduate level credit, register for Educ 5601<sup>1</sup>, section 1. For information, please write Professor John Cogan, Director, Global Education Center, 110 Pattee Hall, University of Minnesota, 150 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/376-4580). Deadline for application is May 10, 1986. Registration is limited to 25 students.

**USSR Study Tour, July 2-24**. In recent years educational reform has been a major discussion topic in the USSR. This tour will provide the opportunity to discuss both the process and the specific features of these changes with professors, researchers and teachers. Participants will visit nursery schools, kindergartens, youth summer camps, Pioneer camps, teacher training centers and research agencies. The tour also includes visits to historic sites, museums, galleries and economic exhibitions, in addition to the professional activities. Itinerary will include Moscow and Leningrad, Tashkent in Uzbekistan, Central Asia, Irkutsk in Eastern Siberia, and three days and nights on the famous Trans-Siberian railroad to Khabarovsk in the Soviet Far East. The tour will allow participants to focus on education in the USSR and also give a view of seldom visited parts of the USSR. Those wishing graduate level credit will register for Educ 5601, section 2.<sup>1</sup> For information, contact Professor Frank Braun, 110 Pattee Hall, University of Minnesota, 150 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-2266).

**Eastern Europe Study Tour, July 27-August 8**, is a unique tour for educators featuring West Germany, Czechoslovakia, Poland, Austria, Hungary, and Yugoslavia. Special arrangements include informal discussion with educators and seminars with government officials and resident university faculty. Tour director is Professor Darrell Lewis of the College of Education. Those wishing to register for graduate credit should register for Educ 5601, section 3.<sup>1</sup> Further details are available from White Bear Travel, 1310 Highway 96, White Bear Lake, MN 55110 (612/426-3238). Application should be made by June 10, 1986.

**5110. CONTEMPORARY HOSPITAL PSYCHIATRY.** (686985) (9 cr per period; prereq med student) Cowan  
Experience with evaluation and treatment techniques currently practiced in a general hospital mental health center. The student will be assigned two or three new patients per week, having primary responsibility for care under the supervision of the attending physician and working with the multidisciplinary treatment staff. Contact Arthur Aufderheide, M.D., at St. Luke's Hospital, 915 East First Street, Duluth (218/727-6636, ext. 660).

**5500. PSYCHIATRY EXTERNSHIP (Abbott-Northwestern; Anoka State Hospital; Hennepin County Medical Center; St. Paul-Ramsey Medical Center; University Hospitals; or Veterans Administration Hospital).** (886998) (9 cr per period; prereq regis med) Eckert

A requirement for all third-year medical students. Prepares

medical students to recognize, diagnose, and care for patients with psychiatric disorders encountered in most medical practices.

**5507. CLINICAL RESEARCH IN PSYCHIATRY (University Hospitals, Station 61).** (287010) (9 cr per period; prereq med student) Heston  
General adult psychiatry with emphasis on pharmacological treatment and research. Work with inpatients and outpatients.

**5511. PSYCHIATRY IN MEDICINE: CONSULTATION-LIAISON (University Hospitals).** (087020) (9 cr per period; prereq med student) Popkin  
Students assist in psychiatric consultation to other services in University Hospitals under direct supervision of staff.

**5514. SUBSTANCE ABUSE AND RELATED PSYCHIATRIC DISORDERS (University Hospitals).** (189719) (9 cr per period; prereq med student) Westermeyer  
Students will be involved with cases over a spectrum of services from inpatient, to an intensive outpatient program or partial hospitalization, to outpatient follow-up. Cases will involve both alcohol and drug abuse, and combinations of these two with their associated medical and psychiatric conditions.

**5515. NEUROPSYCHOLOGY (University Hospitals).** (787027) (9 cr per period; prereq med student) Meier  
Screening for impairments of higher cortical functions as a basis for differentiating functional from organic determinants of behavior change. Fundamental clinical competencies in application of screening battery established.

**5516. ST. MARY'S REHABILITATION CENTER—ADULT CHEMICAL DEPENDENCY PROGRAM (St. Mary's Rehabilitation Center).** (787030) (4.5 or 9 cr per period; prereq med student) Mann  
As a member of a multidisciplinary treatment team, the student becomes a cofacilitator of patient and family group therapy sessions; involvement in inpatient service and outpatient program.

**5518. COMMUNITY PSYCHIATRY (Five-County Human Development Program, Inc., Brahm).** (087034) (9 cr per period; prereq med student) Walton  
Participation as a physician member of a multidisciplinary team composed of health science students and mental health professionals.

**5521. COMMUNITY PSYCHIATRY (Dakota County Mental Health Center).** (687036) (9 cr per period; prereq med student) Nagobads  
Experience in outpatient community psychiatry. Useful for students considering family practice.

**5530. INDEPENDENT STUDY.** (487037) (Up to 9 cr per period; prereq med student; hrs ar) Heston  
Completion of individual projects or study courses in psychiatry or basic sciences.

**5602. CLINICAL PSYCHOPHARMACOLOGY SEMINAR.** (287041) (1 cr; prereq #; hrs ar) Abuzzahab  
Structured discussion of current problems in clinical psychopharmacology.

**5800. CASE CONFERENCE; PSYCHIATRY IN MEDICINE.** (787058) (1 cr; prereq MD or #) Popkin, Brantner

**5801. CONSULTATION-LIAISON PSYCHIATRY.** (987060) (Cr ar; prereq MD) Popkin, staff

**5825. PSYCHIATRIC INTERVIEWING.** (486793) (2 cr; prereq MD or #; 1300-1600 Th)

**8201. CLINICAL PSYCHIATRY.** (587062) (Up to 12 cr per qtr; hrs ar) Staff

**8203. ADVANCED CLINICAL PSYCHIATRY.** (387063) (Up to 12 cr per qtr; hrs ar) Staff

**8205. SPECIAL ASSIGNMENTS.** (687067) (Up to 12 cr per qtr; hrs ar) Staff

**8206. RESEARCH.** (487068) (Up to 12 cr per qtr; hrs ar) Staff

**8208. SURVEY OF PHYSIOLOGICAL TREATMENTS.** (887066) (2 cr; hrs ar) Eckert

**8209. CLINICAL PSYCHOATHOLOGY.** (188098) (3-4 cr; hrs ar) Sines

**8221. SEMINAR: CURRENT LITERATURE (Hennepin County Medical Center).** (287069) (1 cr; hrs ar) Simon

**8227. BIOLOGICAL PSYCHIATRY.** (286794) (3 cr; prereq MD or #)

**8265. READINGS, PSYCHOSOMATIC MEDICINE, CONSULTATION-LIAISON PSYCHIATRY.** (087065) (Cr ar [max 3]; prereq MD, #) Popkin

**8970. DIRECTED STUDY.** (187064) (Up to 9 cr per qtr; hrs ar) Staff

## SECOND TERM

**5500. PSYCHIATRY EXTERNSHIP.** (086885) (9 cr; prereq regis med)

<sup>1</sup>Adult and Teacher Education (Educ), page 4.

## Aerospace Engineering and Mechanics (AEM)

107 Akerman Hall, 373-5010  
Institute of Technology

### FIRST TERM

**R 1015. STATICS.** (4 cr; each rec limited to 30 students; prereq Phys 1271, Math 1231; lect 0800-0955 MWF; Arch 10) Vector algebra. Principles of statics. Application of equations of equilibrium to analysis of simple structures and machines. Statically determinate beams. Cables. Nature and influence of friction.

Rec 1, (089303) 0905-0955 TTh, Arch 10  
Rec 2, (889304) 0905-0955 TTh, MechE 221

**R 3036. DYNAMICS.** (4 cr; each rec limited to 30 students; prereq 1015, Math 3221; lect 1010-1205 MWF; Arch 40) Review of particle dynamics. Mechanical systems and the rigid-body model. Equilibrium. Kinematics and dynamics of plane systems. Technical applications.

Rec 1, (689305) 1010-1100 TTh, Arch 40  
Rec 2, (289307) 1010-1100 TTh, MechE 212

**R 5001. AEROSPACE ENGINEERING WORKSHOP FOR ELEMENTARY AND SECONDARY TEACHERS—July 7-18.** (290635) (4 cr; limited to 30 students; 1300-1730 MTWThF; CivMinE 213) Kaldahl, Aerospace Engineering and Mechanics faculty

Lectures, film reviews, construction and demonstration of classroom aids, involvement with the NASA spacemobile, flight experience, and field trips cover such topics as satellites and probes, model rocketry including a launch, astronaut in space, principles of flight, conventional aircraft, space age education tools. Visits to local aerospace facility and to major aerospace installation in the country. (Subject to availability of airlift.)

**8800. SELECTED TOPICS IN MECHANICS AND MATERIALS.** (190636) (1-4 cr per qtr; prereq #)  
Topics of current interest.

**8880. PLAN B PROJECT.** (188084) (1-4 cr per qtr; prereq grad aerospace engineering and mechanics maj, Δ)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**5800. PROBLEMS IN MECHANICS AND MATERIALS.** (489628) (1-4 cr per qtr; prereq #)  
Topics of current interest. Individual projects.

**5810. PROBLEMS IN FLUID MECHANICS.** (289629) (1-4 cr per qtr; prereq #).

**5840. INDUSTRIAL ASSIGNMENT.** (990637) (2 cr; prereq regis in engineering intern program)  
Engineering intern industrial laboratory. A formal technical report, covering the work during the industrial assignment, is required.

**5841. INDUSTRIAL ASSIGNMENT.** (790638) (2 cr; prereq regis in engineering intern program)

**5842. INDUSTRIAL ASSIGNMENT.** (590639) (2 cr; prereq regis in engineering intern program)

**5843. INDUSTRIAL ASSIGNMENT.** (986443) (2 cr; prereq regis in engineering intern program)

### SECOND TERM

**R 3016. DEFORMABLE BODY MECHANICS.** (4 cr; each rec limited to 30 students; prereq 1011 or 1015, Math 3221; lect 1010-1205 MWF; Arch 40)  
Principles of statics; equilibrium conditions. Uniaxial loading and deformation. Stress and strain at a point. Material behavior; linear elasticity. Torsion. Bending of beams of symmetrical section.

Rec 1, (489306) 1010-1100 TTh, Arch 40  
Rec 2, (189308) 1010-1100 TTh, Arch 20

**8810. SELECTED TOPICS IN FLUID MECHANICS.** (885396) (1-4 cr per qtr; prereq #)  
Topics of current interest.

**8880. PLAN B PROJECT.** (388083) (1-4 cr per qtr; prereq grad aerospace engineering and mechanics maj, Δ)

## Aerospace engineering workshop for teachers

This workshop for elementary and secondary school teachers, AEM 5001, will be held in Minneapolis from July 7-18. Offered through the cooperation of the National Aeronautics and Space Administration (Lewis Center), Civil Air Patrol Liaison Personnel (U.S. Air Force), Minnesota Department of Aeronautics, and Department of Aerospace Engineering and Mechanics of the University of Minnesota, the workshop is designed to provide teachers with a background in recent discoveries in the space sciences that can be used as the basis for new or existing classroom programs. Enrollment will be limited to 30 participants. Further information may be obtained from the Aerospace Workshop Coordinator, 107 Akerman Hall, University of Minnesota, 110 Union Street S.E., Minneapolis, MN 55455.

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

## Afro-American Studies (Afro)

214 Social Sciences Tower, 373-0143  
College of Liberal Arts

### FIRST TERM

**3072. RACISM: SOCIAL-PSYCHOLOGICAL CONSEQUENCES FOR BLACK AMERICANS.** (990850) (4 cr; §5072; 0915-1000 MTWTh; BlegH 250) Taborn  
Racism and its effects on black Americans; definitions, determinants, and dynamics. Examined in an experiential context to reflect individual and institutional racism in milieu of student interest.

**3601. INTRODUCTION TO AFRICAN LITERATURE.** (790851) (4 cr; 1015-1100 MTWThF; BlegH 250)  
Oral and written African literature of the 19th and 20th centuries. All readings in English. (Survey of African Literature).

**3970. DIRECTED STUDIES.** (689255) (1-15 cr per term; prereq #, Δ, CLA approval)

**5970. DIRECTED STUDIES.** (789182) (1-6 cr per term; prereq #, Δ, CLA approval; qualified sr and grad students may register with # for work on tutorial basis)

### SECOND TERM

**3013. CITIES IN AFRICA: AFRICAN, ISLAMIC, EUROPEAN TRADITIONS.** (590852) (4 cr; 1015-1100 MTWThF; BlegH 250) Coifman  
African urban development through time. Links between towns and countryside. Regal-ritual cities; mercantile cities and city-states; administrative cities; colonial cities and company towns; industrial cities and illegal urban settlements.

**3970. DIRECTED STUDIES.** (087714) (1-15 cr per term; prereq #, Δ, CLA approval)

**5970. DIRECTED STUDIES.** (089267) (1-6 cr per term; prereq #, Δ, CLA approval; qualified sr and grad students may register with # for work on tutorial basis)



## Agricultural and Applied Economics (AgEc)

231B Classroom/Office Building, St. Paul, 373-1755  
College of Agriculture

### FIRST TERM

**5990. SPECIAL TOPICS AND INDEPENDENT STUDY IN AGRICULTURAL AND APPLIED ECONOMICS.** (388648) (Cr ar; prereq #) Staff  
Independent study, supervised reading, or research on agricultural economics problems not covered in regularly offered courses.

**8200. ADVANCED TOPICS IN AGRICULTURAL AND APPLIED ECONOMICS.** (189809) (1-9 cr; [may be repeated for cr]; hrs ar) Staff  
Special problems for individual work by qualified students.

### SECOND TERM

**5990. SPECIAL TOPICS AND INDEPENDENT STUDY IN AGRICULTURAL AND APPLIED ECONOMICS.** (188649) (Cr ar; prereq #) Staff  
See First Term.

**8200. ADVANCED TOPICS IN AGRICULTURAL AND APPLIED ECONOMICS.** (588650) (1-9 cr; [may be repeated for cr]; hrs ar) Staff  
See First Term.

## Agricultural Education (AgEd)

320b Vocational/Technical Building, St. Paul, 373-1020  
College of Education

### FIRST TERM

**R 5027. PRACTICUM: PLACEMENT FOR EXTENSION EXPERIENCES.** (390738) (2-9 cr [max 9 cr]; §HEd 3605, 5027; hrs ar; off campus; S-N optional) Norenberg  
Observation of the activities of county extension staff; familiarization with staff, program planning and development, county committee, youth activities and office activities, with opportunity to participate in the functions of an extension educator.

**5041. WORKSHOP: AGRICULTURAL EDUCATION TECHNOLOGY.** (1-6 cr [max 6 cr]; A-N only)

New understandings, techniques, and materials in animal science, plant science, horticulture, soil science, agricultural mechanics, forestry, natural resources, youth organization, visual aids, and occupational exploration.

Sec 1, July 7-10, (985714) 1 cr, 0900-1200 and 1300-1600 MTWTh, VoTech R385, Norenberg  
 Sec 2, July 7-10 (785715) 2 cr, 0900-1200 and 1300-1600, MTWTh, VoTech R385, Norenberg  
 Sec 3, **Agricbusiness Curriculum for Vocational Agriculture—June 23-July 3,** (190992) 3 cr. 0830-1200 MTWThF, VoTech R385, Wardlow  
 Development of curriculum materials to integrate agricbusiness into the agriculture curriculum; emphasis on applied evaluation techniques.

**5085. CAREER DEVELOPMENT IN AGRICULTURAL EMPLOYMENT—June 23-July 3,** (990993) (3 cr; A-N only; 1300-1630 MTWThF; VoTech R385 Leske)

Methods and materials in teaching career development for agricultural industries.

**5090. INDEPENDENT STUDY.** (1-3 cr; prereq sr; hrs ar; A-N only)

Topics may be chosen to permit study of areas within education or to supplement areas of inquiry not provided in the regular course structure.

Sec 21, (687781) Norenberg  
 Sec 22, (487782) Bear  
 Sec 23, (287783) Leske  
 Sec 24, (187784) Persons  
 Sec 25, (987785) Peterson  
 Sec 26, (185718) Swanson

**5095. INDEPENDENT STUDY.** (3 cr; prereq MEd student in agricultural education; hrs ar; A-N only)

Preparation of a paper dealing with studies in agricultural education applied to professional responsibilities.

Sec 21, (787786) Norenberg  
 Sec 22, (587787) Bear  
 Sec 23, (387788) Leske  
 Sec 24, (587790) Persons  
 Sec 25, (387791) Peterson  
 Sec 26, (085719) Swanson

**8001. RESEARCH IN AGRICULTURAL EDUCATION.** (Cr ar; prereq 15 cr in education)

Selecting problems, preparing bibliographies, analyzing and interpreting data, and preparing manuscripts.

Sec 21, (187792) Norenberg  
 Sec 22, (087793) Bear  
 Sec 23, (887794) Leske  
 Sec 24, (687795) Persons  
 Sec 25, (487796) Peterson  
 Sec 26, (385720) Swanson

**8091. FIELD PROBLEMS.** (3 cr; hrs ar)

Making investigations, gathering data, and formulating plans regarding agricultural education.

Sec 21, (287797) Norenberg  
 Sec 22, (187798) Bear  
 Sec 23, (987799) Leske  
 Sec 24, (687800) Persons  
 Sec 25, (487801) Peterson  
 Sec 26, (185721) Swanson

**SECOND TERM**

**5027. PRACTICUM: PLACEMENT FOR EXTENSION EXPERIENCES.** (289775) (2-9 cr [max 9 cr]; \$Heed 3605, 5027; prereq #: hrs ar; off campus; S-N optional) Norenberg  
 See First Term.

**5041. WORKSHOP: AGRICULTURAL EDUCATION TECHNOLOGY: Labor Laws and Regulations—August 4,** (587756) (1-6 cr [max 6 cr]; 0800-1200, 1300-1600, 1800-2100 M; VoTech R385; A-N only) Leske

See First Term. This offering for 1 credit.

**5052. FARM BUSINESS MANAGEMENT EDUCATION—August 7-8 and 20-22,** (790994) (3 cr; prereq 5049 or #: A-N only; 0900-1200 and 1300-1600 WThF; VoTech R385) Persons

Administration, organization, and operation of farm business management education programs for adult; development and utilization of curriculum materials based on farm business record data.

**5072. PRACTICUM: AGRICULTURAL BUSINESS AND INDUSTRY—August 6,** (685125) (1-3 cr [max 9 cr]; prereq 5071 or #: 0800-1200 and 1300-1600 W, and hrs ar; VoTech R385; A-N only) Leske

Observation, study, and experience in agricultural business and industry; application to educational programs in agriculture. This offering for 3 credits.

**5090. INDEPENDENT STUDY.** (1-3 cr; prereq sr; hrs ar; A-N only)

See First Term.

Sec 21, (187758) Norenberg  
 Sec 22, (087759) Leske  
 Sec 23, (187761) Persons  
 Sec 24, (087762) Bear  
 Sec 25, (887763) Peterson  
 Sec 26, (685724) Swanson

**5095. INDEPENDENT STUDY.** (3 cr; prereq MEd student in agricultural education; hrs ar; A-N only)

See First Term.

Sec 21, (687764) Norenberg  
 Sec 22, (487765) Leske  
 Sec 23, (287766) Persons  
 Sec 24, (187767) Bear  
 Sec 25, (987768) Peterson  
 Sec 26, (485725) Swanson

**8001. RESEARCH IN AGRICULTURAL EDUCATION.** (Cr ar; prereq 15 cr in education)

See First Term.

Sec 21, (787769) Norenberg  
 Sec 22, (187770) Leske  
 Sec 23, (987771) Persons  
 Sec 24, (787772) Bear  
 Sec 25, (387774) Peterson  
 Sec 26, (285726) Swanson

**8091. FIELD PROBLEMS.** (3 cr; hrs ar)

See First Term.

Sec 21, (187775) Norenberg  
 Sec 22, (087776) Leske  
 Sec 23, (887777) Persons  
 Sec 24, (687778) Bear  
 Sec 25, (487779) Peterson  
 Sec 26, (185727) Swanson

## Agricultural Engineering Technology (AgET)

213 Agricultural Engineering, St. Paul. 373-1305 College of Agriculture

**FIRST TERM**

**1020. AGRICULTURAL SHOP—METALWORK.** (289811) (4 cr; prereq Chem 1004 or #: 2 lect and 6 lab hrs per wk; lect 0800-0850 MTWTh, AgEng 42; lab 0905-1100 MTWTh, 0800-1205 F, AgEng 20) Theil  
 Arc and oxyacetylene welding, soldering, use and conditioning of metalworking tools, and the identification and characteristics of metals used in farm machinery.

**5020. PROGRAM PLANNING AND INSTRUCTIONAL METHODS IN AGRICULTURAL MECHANICS—June 9-13,** (190854) (4 cr; prereq 10 cr in agricultural engineering technology, AgEd 3031 or AgEd 3031; 0800-1205 and 1325-1730 MTWThF; AgEng 218) Bear

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

**5030. AGRICULTURAL TRACTOR AND ENGINE POWER.** (390853) (1-3 cr; prereq 5020 or #: special problems ar; AgEn 218) Bear

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

**SECOND TERM**

**5031. AGRICULTURAL MACHINERY AND MECHANIZATION.** (090855) (1-3 cr; prereq 5020 or #: special problems ar; AgEng 218) Bear

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

## Agronomy and Plant Genetics (Agro)

303 Agronomy, St. Paul. 373-0866 College of Agriculture

**FIRST TERM**

**1020. SPECIAL PROBLEMS.** (989813) (1-3 cr; prereq #)

Smith, Cardwell  
 In-depth research or studies in agronomy. Intended for students who wish to pursue aspects of agronomy in greater depth than that offered in formal courses or who wish to investigate areas not presently offered in courses. Tutorial instruction under staff guidance.

**5001. PROBLEMS IN AGRONOMY FOR ADVANCED STUDENTS.** (589815) (1-5 cr; prereq #) Smith, Cardwell

In-depth research or studies in agronomy. Intended for advanced students who wish to pursue aspects of agronomy in greater depth than that offered in formal courses or who wish to investigate areas not presently offered in courses. Independent study and research under staff guidance.

**8010.\* RESEARCH IN AGRONOMY.** (389816) (Cr ar; prereq #) Staff

Problems in physiology and production of crop plants.

**8330.\* RESEARCH IN PLANT GENETICS.** (189817) (Cr ar) Staff

**FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)**

**8310.\* ORIENTATION TO FIELD CROP BREEDING.** (089818) (1 cr; prereq 5020 or #) Stuthman

Field study of plant breeding programs and techniques.

**8320.\* ORIENTATION TO AGRONOMY AND SOILS FIELD RESEARCH TECHNIQUES.** (788632) (1 cr; S-N; prereq 5040 or #) Goodding

Field survey and discussion of research techniques in crop physiology, crop and soil management and weed science programs in agronomy and soils.

**SECOND TERM**

**1020. SPECIAL PROBLEMS.** (690759) (1-3 cr; prereq #)

Smith, Cardwell  
 See First Term.

**5001. PROBLEMS IN AGRONOMY FOR ADVANCED STUDENTS.** (890761) (1-5 cr; prereq #) Smith, Cardwell

See First Term.

**8010.\* RESEARCH IN AGRONOMY.** (690762) (Cr ar; prereq #) Staff

See First Term.

**8330.\* RESEARCH IN PLANT GENETICS.** (289453) (Cr ar) Staff

## American Indian Studies (AIn)

489 Ford Hall. 376-1235 College of Liberal Arts

**FIRST TERM**

**1021. BEGINNING OJIBWE.** (890856) (5 cr; 1010-1205 MTWThF; KolH S136) Northbird

Acquisition of speaking skills in Ojibwe.

**3810. FIELD PRACTICE IN INDIAN STUDIES.** (485711) (3-9 cr per term; prereq soph or jr or sr, #, Δ)

Supervised field practice in approved agencies serving Indian clients.

**5990. DIRECTED RESEARCH.** (088183) (4-15 cr per term; prereq by petition only)  
 Independent research under faculty guidance.

**SECOND TERM**

**3810. FIELD PRACTICE IN INDIAN STUDIES.** (285712) (3-9 cr per term; prereq soph or jr or sr, #, Δ)

See First Term.

**5990. DIRECTED RESEARCH.** (688199) (4-15 cr per term; prereq by petition only)  
 See First Term.



## American Studies (AmSt)

104 Scott Hall, 373-3667  
College of Liberal Arts

### FIRST TERM

**R1003. AMERICAN CULTURE: 1920s TO THE PRESENT.** (185713) (4 cr; limited to 49 students; 0905-0955 MTWThF; ScottH 4) Staff

The development and transformation of culture among Americans. Interdisciplinary approach; organized around the interpretation of four types of culturally significant material: events, literary documents, artifacts, and places.

**R3111. CREATIVE AMERICANS AND THEIR WORLDS.** (190989) (4 cr; limited to 49 students; 1115-1300 TT; BlegH 225) Furia

The cultural life of Americans through study of works and lives of selected artists in several media, such as painting, literature, architecture, music, and drama.

**3970. DIRECTED STUDIES.** (790025) (1-15 cr; prereq #, Δ, CLA approval) Staff

**R8201. INTRODUCTION TO AMERICAN STUDIES.** (490990) (4 cr; limited to 12 students; 1315-1515 TT; ScottH 107) Staff  
Exposition of interdisciplinary methods and of the concept of American studies, reading of classics in American civilization, extended exploration of a topic.

**8970. INDEPENDENT READINGS IN AMERICAN CIVILIZATION.** (390027) (Cr and hrs ar; prereq consent of program chair) Staff

### SECOND TERM

**R1003. AMERICAN CULTURE: 1920s TO THE PRESENT.** (290991) (4 cr; limited to 49 students; 0905-0955 MTWThF; ScottH 4) Staff  
See First Term.

**3970. DIRECTED STUDIES.** (185265) (1-15 cr; prereq #, Δ, CLA approval) Staff

**8970. DIRECTED STUDIES.** (485269) (1-15 cr; prereq #, Δ) Staff

## Anatomy (Anat)

4-135 Jackson Hall, 373-2603  
Medical School

### FIRST TERM

**3970. SPECIAL PROBLEMS.** (685092) (2 cr; prereq #) Staff  
Guided individual reading or study.

**8156. ADVANCED ANATOMY.** (485093) (1-6 cr; prereq #) Staff  
Individual problems in gross anatomy, embryology, histology, or neuroanatomy.

**8204. RESEARCH IN ANATOMY.** (285094) (1-10 cr; prereq #) Staff  
Gross anatomy, cytochemistry, histology, endocrinology, embryology, hematology, or neuroanatomy. Special facilities offered to graduate students in clinical departments for work on problems in applied anatomy.

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

**8141. NEUROANATOMICAL METHODS.** (490858) (2 cr; prereq #; special course fee of \$30) Elde  
Introduction to contemporary morphological techniques applicable to investigation of the nervous system, theoretical basis of these techniques, and practical aspects related to their use. Laboratory experience with selected techniques.

### SPECIAL TERMS: THREE- OR SIX-WEEK COURSES (Register once in Term I)

**5304. HEAD AND NECK ANATOMY FOR MEDICAL/DENTAL RESIDENTS.** (185095) (5 cr; prereq participation in a residency in the Medical School or School of Dentistry) Robertson and staff

**5500. GENERAL GROSS ANATOMY.** (985096) (3-4.5 cr; prereq Years 3 and 4) Robertson

**5501. THE EXTREMITIES.** (785097) (3-4.5 cr; prereq Years 3 and 4) Robertson

**5502. HEAD AND NECK.** (585098) (3-4.5 cr; prereq Years 3 and 4) Robertson

**5508. THE THORAX.** (385099) (3-4.5 cr; prereq Years 3 and 4) Robertson

**5509. THE ABDOMEN.** (185100) (3-4.5 cr; prereq Years 3 and 4) Robertson

**5510. PERINEUM, GENITAL-URINARY SYSTEM AND PELVIS.** (985101) (3-4.5 cr; prereq Years 3 and 4) Robertson

### SECOND TERM

**3970. SPECIAL PROBLEMS.** (287038) (2 cr; prereq #) Staff  
See First Term.

**8156. ADVANCED ANATOMY.** (187039) (1-6 cr; prereq #) Staff  
See First Term.

**8204. RESEARCH IN ANATOMY.** (487040) (1-10 cr; prereq #) Staff  
See First Term.

## Ancient Near Eastern and Jewish Studies (ANEJ)

156 Klaeber Court, 373-5837  
College of Liberal Arts  
(See also Hebrew)

### FIRST TERM

**3251. THE MODERN STUDY OF THE OLD TESTAMENT.** (586445) (4 cr; 0800-0955 MW; FolH 303) Reisman  
Methods employed in the study of the Old Testament, including textual criticism, the anthropological approach, form criticism, the sociological approach, the history of religion, and the uses of archaeology in interpreting the text.

**5970. DIRECTED STUDIES.** (490195) (1-4 cr; prereq #, Δ, CLA approval)  
Guided individual reading or study.

### SECOND TERM

**1002. THE BIBLE: PROPHECY.** (786444) (4 cr; 0900-1055 MW; FolH 110) Staff  
Survey of Israelite prophets with emphasis on Amos, Hosea, Isaiah, Jeremiah, Ezekiel, and Second Isaiah. Israelite prophecy compared with other ancient and contemporary examples of oracular speakers. Prophetic contributions to Israelite religion, personality of prophets, politics and prophetic reaction. Introduction to textual analysis and biblical scholarship. Meets with 3002.

**3002. THE BIBLE: PROPHECY.** (186537) (4 cr, §1002; 0900-1055 MW; FolH 110) Staff  
See 1002. Meets with 1002.

**5970. DIRECTED STUDIES.** (585392) (1-4 cr; prereq #, Δ, CLA approval)  
See First Term.

## Anesthesiology (Anes)

B515 Mayo, 373-8831  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

#### Elective Courses

**5015. DIRECTED STUDY: ANESTHESIA TOPICS/PROJECT COURSE DEVELOPMENT.** (689157) Buckley, staff (Cr ar; prereq CRNA, regis B.S. in nurs anes, #)

**5181. EXTERNSHIP IN CLINICAL PRACTICE OF ANESTHESIOLOGY.** (785102) (9 cr; University Hospitals; MTWThF; Mayo B515) Buckley, staff  
Primarily for family practice and surgery tracks, although open to others in limited number. Fundamentals of clinical anesthesia with emphasis on airway and ventilatory management, resuscitation, evaluation of the unconscious patient, choice of agents and techniques, practice administration of general and regional anesthesia, pre- and post-anesthetic management.

**5182. INDEPENDENT STUDY, ANESTHESIOLOGY.** (290859) (Cr and hrs ar) Buckley and staff  
On- or off-campus learning experiences individually arranged between the student and a faculty member for credit in areas not covered by regular course(s). May include clinical/basic science research, library research or special projects.

**5186. CLINICAL PRACTICE IN ANESTHESIA.** (489158) Buckley, staff (15 cr; prereq CRNA, regis B.S. in nurs anes, 5086, #)

**5286. DIRECTED STUDY, ANESTHESIA TOPICS/PROJECT: CLINICAL.** (989679) (cr ar; prereq CRNA, regis B.S. in nurs anes, #)

**5386. EDUCATION IN NURSE ANESTHESIA.** (889156) Buckley, staff (1 cr; prereq CRNA, regis B.S. in nurs anes, #)

### Required Courses for Graduate Students

**8265. GENERAL ANESTHESIA.** (585103) (12 cr; MTWThF; Mayo B515) Buckley, staff  
Instruction and experience in general anesthesia.

**8266. REGIONAL ANESTHESIA.** (385104) (4 cr; MTWThF; Mayo B515) Buckley, staff  
Observation, instruction, and administration in all types of local, regional, and spinal anesthesia.

**8267. PRE- AND POST-ANESTHETIC EVALUATION.** (185105) (2 cr; 1430-1520 MTWThF; Mayo B580) Buckley, staff  
Selection of proper anesthetic agent and technique, premedication and observation of recovery from anesthesia.

**8268. SEMINAR: ANESTHESIOLOGY.** (085106) (2 cr; Mayo B580) Buckley, staff  
Review of literature, reporting of case problems, and discussion of research work in progress within the department.

**8269. RESEARCH IN ANESTHESIA.** (885107) (Cr and hrs ar) Buckley, staff  
Anesthesia problems in experimental laboratory or in hospital.

## Animal Science (AnSc)

120 Peters Hall, St. Paul, 373-1485  
College of Agriculture

### FIRST TERM

**5710. SPECIAL PROBLEMS.** (889819) (Cr ar; open to students who have completed appropriate prereqs with #) Staff  
Research in an area of animal science under the supervision of a staff member. A written report on the research is required.

**5715. TUTORIAL.** (386446) (Cr ar; prereq #)  
Informally structured course to encourage study in depth of a specific discipline in animal science. Pertinent readings, centered on fundamental propositions, suggested preparation of written essays of high quality required. Tutorials available in cryobiology, cytogenetics, genetics, meats, nutrition, and physiology.

**8750. CONCEPTS AND DEVELOPMENTS IN MEAT SCIENCE AND TECHNOLOGY.** (189820) (1 cr [may be repeated once for cr]; prereq #) Staff  
Review and evaluation of pertinent scientific literature.

**8810.\* RESEARCH IN ANIMAL SCIENCE.** (089821) (Cr and hrs ar; prereq #) Staff  
Research including experimental studies in the disciplines associated with animal production and research, with emphasis on interdisciplinary studies embracing environmental and managerial considerations.

**8820.\* RESEARCH IN ANIMAL GENETICS.** (889822) (Cr and hrs ar; prereq #) Staff  
Research in quantitative genetics, cytogenetics, and other areas related to animal breeding.

**8830.\* RESEARCH IN ANIMAL PHYSIOLOGY.** (689823) (Cr and hrs ar; prereq #) Staff  
Individual research under faculty direction. Topics to be determined by consultation; may be a specialized aspect of a thesis problem or an individual problem of mutual interest to graduate student and adviser.

**8840.\* RESEARCH IN ANIMAL NUTRITION.** (489824) (Cr and hrs ar; prereq #) Staff  
Research in selected areas of animal nutrition. Topics and species studied determined by consultation with adviser.

**8850.\* RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY.** (289825) (Cr and hrs ar; prereq #) Staff  
Individual, original research, under staff direction, on selected problems involving the chemical, biochemical, and physiological

aspects of muscle and meat technology. The topic may be a specialized aspect of a thesis problem or an individual problem of mutual interest to graduate student and adviser.

## SECOND TERM

**5710. SPECIAL PROBLEMS.** (490763) (Cr ar; open to students who have completed appropriate prereqs with #) Staff  
See First Term.

**5715. TUTORIAL.** (089270) (Cr ar; prereq #)  
See First Term.

**8750. CONCEPTS AND DEVELOPMENTS IN MEAT SCIENCE AND TECHNOLOGY.** (290764) (1 cr [may be repeated once for cr]; prereq #) Staff  
See First Term.

**8810.\* RESEARCH IN ANIMAL SCIENCE.** (190765) (Cr and hrs ar; prereq #) Staff  
See First Term.

**8820.\* RESEARCH IN ANIMAL GENETICS.** (990766) (Cr and hrs ar; prereq #) Staff  
See First Term.

**8830.\* RESEARCH IN ANIMAL PHYSIOLOGY.** (790767) (Cr and hrs ar; prereq #) Staff  
See First Term.

**8840.\* RESEARCH IN ANIMAL NUTRITION.** (590768) (Cr and hrs ar; prereq #) Staff  
See First Term.

**8850.\* RESEARCH IN MUSCLE CHEMISTRY AND PHYSIOLOGY.** (390769) (Cr and hrs ar; prereq #) Staff  
See First Term.

## Anthropology (Anth)

215 Ford Hall. 373-2601  
College of Liberal Arts

### FIRST TERM

**1101. HUMAN ORIGINS.** (188652) (5 cr, §1101H; 0905-0955 MTWThF; FordH 285)  
World prehistory as investigated by anthropologists; methods and concepts used by anthropologists in studying of prehistoric human biological and cultural development.

**1102. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY.** (088653) (5 cr, §1115, §5102; 1115-1205 MTWThF; FordH 120) Rowe  
Varieties and range of human behavior as revealed through comparative study of cultures in all parts of the world.

**3101. HISTORY OF ANTHROPOLOGY.** (085722) (4 cr; prereq 1102 and 15 cr in 3xxx and 5xxx courses; 1010-1100 MTWThF; FordH 285) Penn  
Beginnings of anthropology as a discipline; associated intellectual climate and context. Subfields of archaeology, ethnology, physical anthropology, and linguistics.

**R3376. FIELD RESEARCH IN ARCHAEOLOGY—June 30-August 1.** (689093) (2-10 cr; limited to 16 students; prereq 1101 and #) Spector  
See box. Meets with HSem 3020.

**3970. DIRECTED STUDIES.** (090029) (Cr and hrs ar; prereq #, Δ, CLA approval) Staff

**5910. TOPICS IN ANTHROPOLOGY: U.S. POLICY TOWARDS MEXICO AND CENTRAL AMERICA.** (690860) (4 cr, 1010-1100 MTWThF; BlegH 210) Miller

**5970. DIRECTED READINGS.** (888654) (2-4 cr; prereq #, Δ, CLA approval)  
Qualified students may register for work on tutorial basis.

**8211. ADVANCED FIELD TECHNIQUES IN ARCHAEOLOGY.** (688655) (3 cr; hrs ar) Staff

**8950. DIRECTED STUDIES.** (390030) (Cr and hrs ar; prereq, #) Staff

### SECOND TERM

**1102. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY.** (188658) (5 cr, §1115, §5102; 1115-1205 MTWThF; FordH 120)  
See First Term.

**3970. DIRECTED STUDIES.** (585277) (Cr and hrs ar; prereq #, Δ, CLA approval) Staff

**5102. PRINCIPLES OF CULTURAL ANTHROPOLOGY.** (885723) (4 cr, §1102; prereq jr standing or #; 1010-1100 MTWThF; FordH 60) Prell

# Archaeology field research offered by department of Anthropology

A 19th-century eastern Dakota fur trading site at Little Rapids is the center of a 5-week field program in historic archaeology (Anth 3376 and HSem 3020) June 30-August 1. Students will learn a variety of archaeological, historical, and ecological methods used by researchers to study the history and culture of people living at Little Rapids in the early 1800s.

Elements of cultural anthropology. Range and variability of human behavior. Principles of cultural dynamics.

**5151. CULTURAL CHANGE AND DEVELOPMENT.** (287802) (4 cr; prereq 1102 or 5102 or #; 0905-0955 MTWThF; FordH 120) Rowe

Processes of cultural change; invention, diffusion, and acculturation. Effects of colonialism, urbanization, and modernization. Analysis of developing societies. Applied anthropology.

**5970. DIRECTED READINGS.** (988659) (2-4 cr; prereq #, Δ, CLA approval)  
See First Term.

**8950. ADVANCED RESEARCH.** (385278) (Cr and hrs ar; prereq #) Staff

## Architecture (Arch)

110 Architecture. 373-2198  
Institute of Technology

### FIRST TERM

**1021. HISTORY OF ARCHITECTURE.** (191656) (4 cr; §LA 1021; 1010-1205 MWF; Arch 25) Olhausen  
Introduction to history and theory of architecture. Survey of architecture from ancient through modern periods.

**3970. DIRECTED STUDY.** (789764) (Cr ar; prereq #)

**R5950. TOPICS IN ARCHITECTURE: Design and Climate Case Studies—Corbu, Kahn, and Correa in India.** (186058) (4 cr; prereq 3093 or #; 1400-1700 MWF; Arch 240) Ubbelohde

**R5961. COMPUTER AIDED ARCHITECTURAL DESIGN.** (789134) (4 cr; prereq Arch major, 3083, or #; 1010-1205 TTh; Arch 45) Anderson  
Introduction to computing and Pascal programming. Methods in computer-aided architectural design; methods, hardware, software, problems and potential of CAAD; weekly lab projects using Terak microcomputers as a design tool.

**5970. DIRECTED STUDY.** (889626) (Cr ar; prereq #)

### FIRST AND SECOND TERMS; TEN-WEEK COURSES (Register once in Term I)

**R3082-3083. ARCHITECTURAL DESIGN I.** (890601) (690602) (6 cr each; prereq 3081; 1325-1730 MWF; Arch 210) Weeks  
Basic exercises in composition of line, form, proportion, color, and texture. Elements of architectural design. Architectural drawing. Model making.

**R3092-3093. ARCHITECTURAL DESIGN II.** (490603) (290604) (6 cr each; prereq 3091; 1325-1730 MWF; Arch 210) Weeks  
Architectural problems with emphasis on development of structure as an integral part of design; site planning.

**R5112. ARCHITECTURAL DESIGN III.** (990606) (6 cr; prereq 5111; 1325-1730 MWF; Arch 210) Lavine  
Advanced architectural problems of complex requirements, involving thorough study and detailed solution; electrical and mechanical equipment and structure as an integral part of design; research techniques. Individual effort and group collaboration.

**R5113. ARCHITECTURAL DESIGN III.** (790607) (6 cr; prereq 5112; 1325-1730 MWF; Arch 210) Lavine  
See 5112.

**R5122. ARCHITECTURAL DESIGN IV.** (390609) (6 cr; prereq 5121; 1325-1730 MWF; Arch 210) Lavine  
Building design and development in the urban context. Individual and collaborative effort; urban problems; reporting on and preparation of large-scale proposals.

### SECOND TERM

**1022. HISTORY OF LANDSCAPE ARCHITECTURE.** (991657) (4 cr; § LA1022; 1010-1205 MWF; Arch 25) Olhausen  
Introduction to history and theory of landscape architecture. Survey of landscape architecture from ancient through modern periods.

**3970. DIRECTED STUDY.** (589765) (Cr ar; prereq #)

**R5950. TOPICS IN ARCHITECTURE.** (prereq 3093 or #; hrs ar)  
**Sec 1. Designed Landscape Space Typology.** 5 cr, 1315-1700 MF, Arch 15, Weeks, Condon  
**Sec 2.** (186490) **Studio: Computer-Aided Architectural Design Tools.** 4 cr, limited to 15 students, 1400-1700 MWF, Arch 240

**5970. DIRECTED STUDY.** (689627) (Cr ar; prereq #)

## Art Education (ArEd)

135 Wulling Hall. 373-4050  
College of Education

### FIRST TERM

**R3001. SURVEY OF ART ACTIVITIES.** (589927) (4 cr; not open to art education majors; limited to 30 students; 0830-1130 TWTTh; WullH 220; A-N only) Freedman  
Introduction to pictorial expression, design, and the function of art in the school environment.

**R5001. ART MEDIA TECHNIQUES.** (1-12 cr [max 12 cr]; section 2 limited to 15 students; A-N only)  
Lectures, demonstrations, discussions, critique sessions exploring techniques and processes in creativity; handling specific media; each offering focuses on a single topic.

**Sec 1. Introduction to Discipline-Based Art Education (DBAE) in Art Curriculum Planning—June 17-27.** (590995) 3 cr, 0830-1130 MTWThF, WullH 240, DiBlasio  
The concept model of DBAE forms the foundation of current efforts to improve the art education curriculum. The course is primarily for art teachers and classroom generalists who wish to implement the "Getty" model of art education in their school districts and focus on the concept and application in curriculum development.  
**Sec 2. Computer Use in the Art Class—July 1-17.** (390996) 3 cr, 1130-1500 TWTTh, WullH 240, Freedman  
For primary and secondary art specialists and teachers; development of appropriate art learning experiences using microcomputer technology; focus on skills for using such hardware peripherals as drawing tablets and video; and software including PAINT and CAD programs.

**5600. INTERNSHIP.** (190997) (3-9 cr; prereq #: hrs ar; A-N only) Freedman  
Professional assignment for degree candidates under joint supervision of departments and cooperating agency.

**5605. PRACTICUM.** (3-9 cr; prereq #: A-N only)  
Independent project under direction; gathering data, developing proposals, experimenting with evaluating innovative practices.

Sec 21, (389928) Freedman  
Sec 22, (189929) DiBlasio

**5900. PROFESSIONAL PROBLEMS.** (3 cr; prereq MEd student; #: hrs ar, A-N only)  
Independent study for M.Ed. candidates integrating learning from art education, art, and education.

Sec 21, (589930) Freedman  
Sec 22, (389931) DiBlasio

**8306. SEMINAR: ART EDUCATION—June 17-26.** (090998) (1 cr; 1200-1600 TWTh; WullH 120) DiBlasio  
Reports, evaluation of problems, recent literature.

**8900. PROBLEMS: ART EDUCATION.** (Cr ar; prereq #: hrs ar)  
Independent projects under staff guidance; may include advanced studio practice or technical problems requiring experimental or library research.

Sec 21, (189932) Freedman  
Sec 22, (089933) DiBlasio

## SECOND TERM

**5600. INTERNSHIP.** (890999) (3-9 cr; prereq #: hrs ar; A-N only) DiBlasio  
See First Term

**5605. PRACTICUM: Writing DBAE Curriculum for Art Programs—August 4-21.** (985731) (3-9 cr; prereq #: A-N only; 0830-1130 MTWTh; WullH 240) DiBlasio  
See First Term. This 3-credit practicum is the second course in a sequence on DBAE curriculum development. Participants in section 1 of ArEd 5001 in first term (Introduction to DBAE in Art Curriculum Planning) as well as persons who have been introduced to the DBAE concept in ArEd 5302 (Curriculum Innovations) will develop a comprehensive curriculum outline translating the concept into program planning and implementation. The practicum will enable participants to work with an art curriculum development specialist to refine the scope and sequence of the DBAE model for an individual school district.

**5900. PROFESSIONAL PROBLEMS.** (785732) (3 cr; prereq MEd student; #: hrs ar; A-N only) DiBlasio  
See First Term.

**8900. PROBLEMS: ART EDUCATION.** (585733) (Cr ar; prereq #: hrs ar) DiBlasio  
See First Term.

## Art History (ArH)

108a Jones Hall. 373-3057  
College of Liberal Arts

### FIRST TERM

**R3008. HISTORY OF ANCIENT ART.** (188005) (4 cr, §1008; limited to 55 students; 1010-1100 MTWThF; JonesH 207B) Cooper  
Architecture, sculpture, and painting of selected early cultures; stress on those contributing to the development of Western art.

**R3011. HISTORY OF RENAISSANCE AND BAROQUE ART.** (185694) (4 cr; limited to 100 students; 1115-1205 MTWThF; FraserH 102) Canedy  
The major monuments in architecture, sculpture, and painting from the early 14th century through the baroque period.

**R3012. HISTORY OF 19TH- AND 20TH-CENTURY ART.** (088006) (4 cr; limited to 100 students; 1220-1310 MTWThF; FraserH 102) Cooper  
Major monuments and concepts of the modern period: sculpture, architecture, painting, and prints.

**3970. DIRECTED STUDIES.** (188188) (1-5 cr; prereq #: Δ, college approval) Staff  
Guided individual reading or study.

**3971. MAJOR PROJECT.** (788663) (1 cr; prereq art history major, 3895, #) Staff  
Completion of a research paper begun in a 5xxx-level project course.

**5307. 15TH-CENTURY ITALIAN ARCHITECTURE, SCULPTURE, AND PAINTING.** (090984) (4 cr; prereq 3011 or grad or #: 0905-0955 MTWThF; JonesH 207A) Canedy  
Early Renaissance art from Brunelleschi to Bellini; development of the "repertory" of monument types that survived to modern times.

**5463. EARLY 20TH-CENTURY PAINTING.** (890985) (5 cr; prereq one American or modern art course or #: 1010-1100 MTWThF; JonesH 207A) Haxthausen  
Topics or movements in painting, mainly before the mid-1920's.

**5970. DIRECTED STUDIES.** (289341) (1-5 cr; prereq sr, #, Δ, CLA approval) Staff  
Guided individual reading or study.

**8995-8996-8997. MUSEOLOGY II, III, IV.** (190031) (090032) (890033) (5 cr; required for MA candidates in museology; prereq Δ) Staff  
Apprenticeship program in museum practices. Four hours a day internship activity in various departments of museums participating in the program—education, conservation, curatorial.

## SECOND TERM

**3009. HISTORY OF MEDIEVAL ART.** (185279) (4 cr; 1010-1100 MTWThF; JonesH 207B) Steyaert  
Medieval architecture, painting, and sculpture from early Christian to Gothic period.

**R3012. HISTORY OF 19TH- AND 20TH-CENTURY ART.** (690986) (4 cr; limited to 100 students; 1115-1205 MTWThF; FraserH 102) Haxthausen  
Major monuments and concepts of the modern period: sculpture, architecture, painting, and prints.

**3970. DIRECTED STUDIES.** (888007) (1-5 cr; prereq #: Δ, college approval) Staff  
See First Term

**3971. MAJOR PROJECT.** (588664) (1 cr; prereq art history major, 3895, #) Staff  
See First Term.

**5464. LATER 20TH-CENTURY PAINTING.** (490987) (5 cr; prereq one American or modern art course or #: 0905-0955 MTWThF; JonesH 207B) Simon  
Painting after the mid-1920's.

**5970. DIRECTED STUDIES.** (585280) (1-5 cr; prereq sr, #, Δ, CLA approval) Staff  
See First Term.

**8995-8996-8997. MUSEOLOGY II, III, IV.** (085283) (185282) (385281) (5 cr; required for MA candidates in museology; prereq Δ) Staff  
See First Term.

## Arts, Studio (ArS)

208 Art Building. 373-3663  
College of Liberal Arts

Materials fees are assessed at the time of registration for most Studio Arts courses. The fee covers part of the cost of expendable materials, models, breakage, and special facilities.

### FIRST TERM

**R1101. DRAWING I.** (4 cr; each section limited to 25 students)  
Introduction to studio work; exploration of contemporary and traditional methods. Work from nature, various drawing mediums.

Sec 1, (690034) 0800-0955 MTWThF, ArtB 160, Cowette  
Sec 2, (888671) 0800-0955 MTWThF, ArtB 140, Rowan  
Sec 3, (688672) 1010-1205 MTWThF, ArtB 160, Cowette

**R1105. BEGINNING PAINTING.** (490035) (4 cr; limited to 25 students; 1010-1205 MTWThF; ArtB 151) Roode  
Contemporary and traditional surfaces in oil and acrylic media.

**R1302. SCULPTURE.** (287721) (4 cr; limited to 20 students; 1010-1205 MTWThF; ArtB 65, 90) Lucey  
Study of structure with emphasis on form and space. Clay, plaster, wood. Mold making and casting.

**R1510. PRINTMAKING: INTAGLIO.** (290036) (4 cr per term [max 8 cr]; limited to 9 students; 0800-0955 MTWThF; ArtB 170) Myers

Intaglio printing processes. Intensive study of etching, engraving, and collagraphic techniques in their creative context.

**R1701. PHOTO MEDIUM.** (4 cr; each section limited to 20 students)  
Contemporary and historical use of photography. Use of camera, film development, and enlarging. The creative process.  
Sec 1, (488866) 0800-0955 MTWThF, ArtB 120  
Sec 2, (487717) 1010-1205 MTWThF, ArtB 120

**R1812. CERAMICS: WHEELTHROWING.** (591001) (4 cr; limited to 25 students; 0800-0955 MTWThF; ArtB 10) Hoard  
Introduction to wheel throwing techniques for individual creative expression.

**R3110. DRAWING.** (190037) (4 cr per term [max 12 cr]; limited to 15 students; prereq 1102, 1401; 1010-1205 MTWThF; ArtB 140) Rowan

From model, still life, and nature; individual creative expression in various mediums. Meet with 5110.

**R3160. WATERCOLOR.** (488673) (4 cr per term [max 12 cr]; limited to 15 students; prereq 1101, 1401, 1404 or #: 1010-1205 MTWThF; ArtB 141) Myers  
Transparent watercolor, gouache, casein, tempera. Figure, still life, landscape, abstract design. Meets with 5160.

**R3420. WORKSHOP: PERFORMANCE ART.** (885740) (4 cr; limited to 10 students; 0800-0955 MTWThF, ArtB 65) Lucey  
Performance/Art/development of individual performance artworks and research pioneers of this art form.

**R3430. PAPERMAKING.** (391002) (4 cr per term [max 12 cr]; limited to 12 students; prereq ArtS 1401, one 1xxx Studio Arts course or #: 0800-0955 MTWThF; ArtB 35) Krepps  
Creative and traditional approaches to papermaking. Meets with 5430.

**R3510. PRINTMAKING: INTAGLIO.** (287718) (4 cr per term [max 12 cr]; limited to 6 students; prereq 1401, 4 cr of 1510 or #: 0800-0955 MTWThF; ArtB 170) Myers  
Intaglio techniques on metal and collagraph. Embossing.

**3970. DIRECTED STUDY.** (1-5 cr per term [max 8 cr]; prereq 24 cr in studio arts and #, Δ, CLA approval)

Sec 4, (589197) Cowette  
Sec 7, (988175) Hallman  
Sec 8, (291011) Henkel  
Sec 9, (685741) Hoard  
Sec 11, (791014) Krepps  
Sec 13, (191017) Lucey  
Sec 15, (191020) Myers  
Sec 17, (691023) Roode  
Sec 19, (585750) Rowan

**3980. DIRECTED INSTRUCTION.** (1-5 cr per term [max 8 cr]; prereq #: Δ, CLA approval)  
Students assist in teaching a course they have completed.

Sec 4, (389198) Cowette  
Sec 7, (186805) Hallman  
Sec 8, (191012) Henkel  
Sec 9, (085753) Hoard  
Sec 11, (591015) Krepps  
Sec 13, (091018) Lucey  
Sec 15, (091021) Myers  
Sec 17, (491024) Roode  
Sec 19, (285757) Rowan

**R5110. DRAWING.** (990038) (4 cr per term [max 16 cr]; limited to 10 students; prereq 12 cr of 3110 or #: 1010-1205 MTWThF; ArtB 140) Rowan  
Drawing in all mediums from life. Meets with 3110.

**R5160. WATERCOLOR.** (288674) (4 cr per term [max 16 cr]; limited to 10 students; prereq 12 cr of 3160 or #: 1010-1205 MTWThF; ArtB 141) Myers  
Advanced watercolor techniques, aesthetic directions. Individual concepts and development of sensibilities. Meets with 3160.

**5190. DRAWING AND PAINTING.** (4 cr; max 16 cr; prereq #, Δ non-majors)

Sec 4, (291042) Cowette  
Sec 17, (191043) Roode  
Sec 19, (391629) Rowan

**5390. SCULPTURE.** (791644) (4 cr; max 16 cr; prereq #, Δ non-majors) Lucey

**R5420. WORKSHOP: PERFORMANCE ART.** (785746) (4 cr; limited to 10 students; 0800-0955 MTWThF; ArtB 65) Lucey  
See 3420. Meets with 3420.



**R5430. PAPERMAKING.** (191003) (4 cr per term [max 12 cr]; limited to 10 students; prereq 12 cr of 3430 or #; 0800-0955 MTWThF; ArtB 35) Krepps  
See 3430. Meets with 3430.

**R5510. PRINTMAKING: INTAGLIO.** (487720) (4 cr per term [max 16 cr]; limited to 5 students; prereq 12 cr of 3510 or #; 0800-0955 MTWThF; ArtB 170) Myers  
Color processes, intaglio and combined techniques

**5590. PRINTMAKING.** (591564) (4 cr; max 16 cr; prereq #,  $\Delta$  non-majors)  
Sec 11, (691040) Krepps  
Sec 15, (491041) Myers

**5790. PHOTOGRAPHY.** (591645) (4 cr; max 16 cr; prereq #,  $\Delta$  non-majors)

**5890. CERAMICS AND GLASS WORKING.** (391646) (4 cr; max 16 cr; prereq #,  $\Delta$ ) Hoard

**5970. DIRECTED STUDY.** (1-5 cr per term [max 12 cr]; prereq 24 cr in studio arts and #,  $\Delta$ , CLA approval)

Sec 4, (189199) Cowette  
Sec 7, (086806) Hallman  
Sec 8, (991013) Henkel  
Sec 9, (285760) Hoard  
Sec 11, (391016) Krepps  
Sec 13, (891019) Lucey  
Sec 15, (891022) Myers  
Sec 17, (291025) Roode  
Sec 19, (989200) Rowan

**8110. DRAWING.** (4 cr per term [max 12 cr]; prereq #)

Sec 4, (186447) Cowette  
Sec 17, (791028) Roode  
Sec 19, (886449) Rowan

**8120. PAINTING.** (4 cr per term [max 24 cr]; prereq #)

Sec 4, (086451) Cowette  
Sec 17, (991027) Roode  
Sec 19, (686453) Rowan

**8510. PRINTMAKING.** (4 cr per term [max 36 cr]; prereq #)

Sec 11, (191026) Krepps  
Sec 15, (791000) Myers

**8710. PHOTOGRAPHY.** (186456) (4 cr per term [max 24 cr]; prereq #)

**8810. CERAMICS.** (986457) (4 cr per term [max 24 cr]; prereq #) Hoard

## SECOND TERM

**R1101. DRAWING I.** (4 cr; each section limited to 25 students) See First Term.

Sec 1, (288867) 0800-0955 MTWThF, ArtB 141  
Sec 2, (185775) 1010-1205 MTWThF, ArtB 140

**R1102. DRAWING II.** (885284) (4 cr; limited to 25 students; prereq 1101; 1010-1205 MTWThF; ArtB 150) Gray  
Work from life and nature; color and pictorial structure.

**R1301. SCULPTURE.** (787724) (4 cr; limited to 20 students; 1010-1205 MTWThF; ArtB 50) Baldwin  
Study of structure with emphasis on form and space. Direct construction in metal.

**R1404. COLOR.** (891005) (4 cr; limited to 25 students. \$1104; prereq 1101; 0800-0955 MTWThF; ArtB 150) Bethke  
Color and its visual implications.

**1530. PRINTMAKING RELIEF.** (691006) (4 cr per term [max 8 cr]; limited to 9 students; 1010-1205 MTWThF; ArtB 175) Bethke  
Traditional and contemporary relief printing media. Lino, woodcut, cardboard, metal, and letterpress techniques and their aesthetic applications. Meets with 3530 and 5530.

**R1701. PHOTO MEDIUM.** (988676) (4 cr; limited to 20 students; 0800-0955 MTWThF; ArtB 120) See First term

**R1811. CERAMICS: HANDBUILDING.** (889349) (4 cr; limited to 20 students; 1010-1205 MTWThF; ArtB 10) Lane  
Introduction to hand-building techniques in clay for individual creative expression.

**R3110. DRAWING.** (385295) (4 cr per term [max 12 cr]; limited to 15 students; prereq 1102, 1401; 0800-0955 MTWThF; ArtB 150) Gray  
See First Term. Meets with 5110.

**R3120. PAINTING.** (885298) (4 cr per term [max 12 cr]; limited to 15 students; prereq 1105, 1401, 1404, and 4 cr of 3110 or #; 1010-1205 MTWThF; ArtB 151) Feinberg  
Media and problems in painting. Individual projects. Meets with 5120.

**R3420. WORKSHOP: PAINTED SCULPTURE.** (191009) (4 cr; limited to 10 students; prereq one 1xxx level Studio Arts course; 0800-0955 MTWThF; ArtB 140) Feinberg

Concepts of the interdependency of 2 and 3 dimensional form combined with a work of art. Camouflage, illusion, and the sensation of deep space will be presented in various assignments. Meets with 5420.

**R3530. PRINTMAKING: RELIEF.** (491007) (4 cr per term [max 12 cr]; limited to 9 students; prereq 1401 or 1530 or #; 1010-1205 MTWThF; ArtB 175) Bethke  
Relief printing techniques, emphasis on color processes. Meets with 1530 and 5530.

**R3710. PHOTOGRAPHY.** (089351) (4 cr per term [max 12 cr]; limited to 20 students; prereq 1401, 1701 or Jour 3301 or #; 1010-1205 MTWThF; ArtB 120)

Photographic controls and processes. Related photosensitive media. Creative processes suited to individual interests.

**3970. DIRECTED STUDY.** (1-5 cr per term [max 8 cr]; prereq 24 cr in studio arts and #,  $\Delta$ , CLA approval)

Sec 1, (591029) Baldwin  
Sec 2, (591032) Bethke  
Sec 5, (387726) Feinberg  
Sec 6, (187727) Gray  
Sec 7, (091035) Hallman  
Sec 8, (686808) Henkel  
Sec 12, (491038) Lane

**3980. DIRECTED INSTRUCTION.** (1-5 cr per term [max 8 cr]; prereq #,  $\Delta$ , CLA approval)  
See First Term.

Sec 1, (991030) Baldwin  
Sec 2, (391033) Bethke  
Sec 5, (087731) Feinberg  
Sec 6, (887732) Gray  
Sec 7, (891036) Hallman  
Sec 8, (486809) Henkel  
Sec 12, (291039) Lane

**R5110. DRAWING.** (285306) (4 cr per term [max 16 cr]; limited to 10 students; prereq 12 cr of 3110 or #; 0800-0955 MTWThF; ArtB 150) Gray  
See First Term. Meets with 3110.

**R5120. PAINTING.** (185307) (4 cr per term [max 16 cr]; limited to 10 students; prereq 12 cr of 3120 or #; 1010-1205 MTWThF; ArtB 151) Feinberg  
Various media. Individual problems. Meets with 3120.

**5190. DRAWING AND PAINTING.** (4 cr [max 16 cr]; prereq #,  $\Delta$  non-major)

Sec 5, (791630) Feinberg  
Sec 6, (591631) Gray

**5390. SCULPTURE.** (191647) (4 cr [max 16 cr]; prereq #,  $\Delta$  non-major) Baldwin

**R5420. WORKSHOP: PAINTED SCULPTURE.** (491010) (4 cr; limited to 10 students; prereq one 1xxx level Studio Arts course; 0800-0955 MTWThF; ArtB 140) Feinberg  
See 3420. Meets with 3420.

**R5530. PRINTMAKING: RELIEF.** (291008) (4 cr per term [max 16 cr]; limited to 7 students; prereq 12 cr of 3530 or #; 1010-1205 MTWThF; ArtB 175) Bethke  
Relief processes. Letterpress and combined techniques. Meets with 1530 and 3530.

**5590. PRINTMAKING.** (091648) (4 cr [max 16 cr]; prereq #,  $\Delta$  non-major) Bethke

**5790. PHOTOGRAPHY.** (891649) (4 cr [max 16 cr]; prereq #,  $\Delta$  non-major)

**5890. CERAMICS AND GLASS WORKING.** (191650) (4 cr [max 16 cr]; prereq #  $\Delta$ ) Lane

**5970. DIRECTED STUDY.** (1-5 cr per term [max 12 cr]; prereq 24 cr in studio arts and #,  $\Delta$ , CLA approval)

Sec 1, (791031) Baldwin  
Sec 2, (191034) Bethke  
Sec 5, (487734) Feinberg  
Sec 6, (287735) Gray  
Sec 7, (691037) Hallman  
Sec 8, (886807) Henkel  
Sec 12, (091004) Lane

**8110. DRAWING.** (4 cr per term [max 12 cr]; prereq #)

Sec 5, (786458) Feinberg  
Sec 6, (586459) Gray

**8120. PAINTING.** (4 cr per term [max 24 cr]; prereq #)

Sec 5, (786461) Feinberg  
Sec 6, (586462) Gray

**8710. PHOTOGRAPHY.** (186464) (4 cr per term [max 24 cr]; prereq #)

**8810. CERAMICS.** (086465) (4 cr per term [max 24 cr]; prereq #) Lane

## Astronomy (Ast)

358 Physics. 373-3307  
Institute of Technology

### FIRST TERM

**R1011. DESCRIPTIVE ASTRONOMY.** (290697) (4 cr, \$1021; limited to 25 students; 0905-1100 MWF; Phys 166)  
Survey of the sun, moon, planets, and stars; description of the galaxy and universe to which the sun belongs. Nonmathematical.

**R1015. DESCRIPTIVE ASTRONOMY LAB.** (1 cr, \$1025H; each section limited to 25 students; 4 lab hrs per wk; minimum one night observation required)

Sec 1, (190698) 1330-1530 MW, Phys 143  
Sec 2, (990699) 0905-1100 TTh, Phys 143

### SECOND TERM

**R1011. DESCRIPTIVE ASTRONOMY.** (485434) (4 cr, \$1021; limited to 25 students; 0905-1100 MWF; Phys 133)  
See First Term.

**R1015. DESCRIPTIVE ASTRONOMY LAB.** (1 cr, \$1025; each section limited to 25 students; 4 lab hrs per wk; minimum one night observation required)

Sec 1, (285435) 1330-1530 MW, Phys 143  
Sec 2, (185436) 0905-1100 TTh, Phys 143



## Biochemistry (BioC)

140 Gortner Laboratory, St. Paul. 373-1303  
College of Biological Sciences

### FIRST TERM

**5950. SPECIAL TOPICS.** (189132) (1-5 cr; prereq #,  $\Delta$ )

**5970. DIRECTED STUDIES.** (889108) (Cr ar; prereq #,  $\Delta$ ) Staff

**5990. DIRECTED RESEARCH.** (689109) (Cr ar; prereq #,  $\Delta$ ) Staff  
Laboratory or field investigation of selected areas of research.

**8290. CURRENT RESEARCH TECHNIQUES.** (589846) (1-3 cr; prereq grad major in biochemistry, #) Graduate faculty  
Research projects in biochemistry carried out in the research laboratory of an individual staff member. Will satisfy all or part of the laboratory requirements for the Ph.D. degree.

**8990. GRADUATE RESEARCH.** (389847) (2-5 cr; prereq #) Graduate faculty  
Research problems in various fields in biochemistry represented by staff interest.

### SECOND TERM

**5950. SPECIAL TOPICS.** (989133) (1-5 cr; prereq #,  $\Delta$ )

**5970. DIRECTED STUDIES.** (089110) (Cr ar; prereq #,  $\Delta$ ) Staff

**5990. DIRECTED RESEARCH.** (889111) (Cr ar; prereq #,  $\Delta$ ) Staff  
See First Term.

**8290. CURRENT RESEARCH TECHNIQUES.** (390786) (1-3 cr; prereq grad major in biochemistry, #) Graduate faculty  
See First Term.

**8990. GRADUATE RESEARCH.** (190787) (2-5 cr; prereq #) Graduate faculty  
See First Term.

## Biochemistry, Medical (BioC)

4-225 Millard Hall, 373-3336  
Medical School

### Elective Courses

#### FIRST TERM

**5053. PROBLEMS IN BIOCHEMISTRY.** (685108) (1-10 cr; may be taken one or both terms; prereq 5101 or 5751; hrs ar) Staff  
Special work arranged with qualified students.

**8290. CURRENT RESEARCH TECHNIQUES.** (485109) (1-3 cr; prereq major in biochemistry, #) Staff

**8300. RESEARCH IN BIOCHEMISTRY.** (885110) (Cr and hrs ar) Staff

#### SECOND TERM

**5053. PROBLEMS IN BIOCHEMISTRY.** (187042) (1-10 cr; may be taken one or both terms; prereq 5101 or 5751; hrs ar) Staff  
See First Term.

**8290. CURRENT RESEARCH TECHNIQUES.** (987043) (1-3 cr; prereq major in biochemistry, #) Staff

**8300. RESEARCH IN BIOCHEMISTRY.** (787044) (Cr and hrs ar) Staff

## Biology (Biol)

P180 Koltoff Hall, 373-1266  
College of Biological Sciences

(See also Itasca Biology Program)

#### FIRST TERM

**r 1009. GENERAL BIOLOGY.** (5 cr; limited to 96 students; lect 0900-1000 MTWThF; MoosT 2-620) Swart  
An introduction to the principles of biology. The cell, metabolism, heredity, reproduction, ecology, and evolution.

Lab 1, (188702) 1015-1200 MTWTh, Kolth S177  
Lab 2, (088703) 1015-1200 MTWTh, Kolth S179  
Lab 3, (888704) 1015-1200 MTWTh, Kolth S183  
Lab 4, (688705) 1015-1200 MTWTh, Kolth S187

**r 3011. ANIMAL BIOLOGY.** (5 cr, §1106; limited to 44 students; prereq 1009, Chem 1005; lect 1215-1330 MTWTh; ClaOff B35) Kerr  
Comparison of ways different phyla have solved similar physiological problems. Laboratory includes survey of major animal groups and physiological experiments. Meets with 3111.

Lab 1, (091097) 1000-1200 MTWTh, BioSci 107  
Lab 2, (891098) 1400-1600 MTWTh, BioSci 107

**3111. ANIMAL BIOLOGY.** (691099) (4 cr, §3011; prereq 1009, 1106, Chem 1005; 1215-1330 MTWTh; ClaOff B35) Kerr  
Lectures covering the comparative physiology of various animal groups; coordination, movement, support, excretion, reproduction. Meets with 3011.

**3112. BIOLOGICAL RHYTHMS—June 17-July 11.** (189848) (4 cr, §5112; prereq 1009 or #: 1115-1240 MTWThF; BioSci 70) Koukkari  
Timing mechanisms and rhythms of organisms in physiological processes, ecological adaptation, and health; current hypotheses concerning their cellular and molecular nature. Meets with 5112.

**5001. BIOCHEMISTRY.** (089849) (4 cr, §3021, §BioC 5001; prereq 1009, 12 cr organic chemistry or #: 0825-0945 MTWThF; ClaOff B35) Staff  
Biochemistry and biophysics of cells; emphasis on enzyme catalysis, cellular energetics, biosynthesis of cellular constituents, and cellular regulatory mechanisms.

**r5041. ECOLOGY.** (4 cr, §3041; limited to 80 students; prereq Math 1231 or #: lect 0815-0955 MTThF; Zoology 102)  
Interactions of plant and animal populations and their environments. Organization, functioning, and development of ecological systems; population growth and regulation. Human impact on the biosphere in modern times.

Rec 1, (591094) 1015-1100 TTh, Zoology 102  
Rec 2, (391095) 1115-1200 TTh, Zoology 102

**5112. RHYTHMS AND CIRCADIAN REGULATION—June 17-July 11.** (389850) (5 cr, §3112; prereq 15 cr biology, 10 cr chemistry or #: 1115-1240 MTWThF; BioSci 70) Koukkari  
Laboratory experience arranged. Meets with 3112.

**5890. RESEARCH PROBLEMS AT ITASCA IN ECOLOGY AND BEHAVIORAL BIOLOGY; OR ENTOMOLOGY; OR FISHERIES AND WILDLIFE; OR PLANT PATHOLOGY.** (see page 78) (Cr ar; prereq #, Δ) Staff

**5950. SPECIAL TOPICS: Spectroscopic Techniques for the Study of Metalloproteins—July 7-August 2.** (391100) (4 cr; prereq Δ; introductory biochemistry or physical chemistry rec; 0830-1000 MTWThF; Gray Freshwater Biological Institute, Navarre) Muenck, Ugurbil, Lipscomb, others  
In depth study of biophysics: Magnetic resonance methods (Mossbauer, ESR, NMR spectroscopy) applied to metalloproteins. Four distinguished lecturers will give additional classes and seminars in afternoon sessions.

#### SECOND TERM

**r 1103. GENERAL BOTANY.** (890789) (5 cr, §3012; limited to 40 students; prereq 1009; students who plan to major in biology in CLA or any bioscience major in CBS should take 3012; lect 1220-1320 MTWThF, BioSci 12; lab 0905-1205 TTh, BioSci 176, 182) Biesboer  
Levels of organization of plants, plant functions, plant growth and development, plant reproduction.

**r 1106. GENERAL ZOOLOGY.** (586171) (5 cr; limited to 72 students; prereq 1009; lect 0815-0915 MTWThF; FordH 115; lab 1325-1625 MW; Kolth P168)  
Survey of animal phyla; structure, function, behavior, adaptation, and evolutionary relationships.

**r 3012. PLANT BIOLOGY.** (288707) (5 cr, §1103; limited to 40 students; prereq 1009, Chem 1005; lect 0805-0915 MTWTh, BioSci 84; lab 0920-1220 TW; BioSci 151, 163)  
Plant diversity and evolution; structure and function of the plant cell and of the whole organism; growth and development of plants.

**r 3051. BIOLOGY AND THE FUTURE OF MAN.** (190790) (4 cr; S-N only; limited to 100 students, 1220-1310 MTWThF; AndH 210)  
Nontechnical discussion of biological factors affecting the quality of life—pollution, chemical and biological warfare, population growth, food supply, resource sufficiency, value of wilderness, genetics and eugenics, public health, aging, behavior control, and biological aspects of ethics, morals, and societal organizations.

**5003. GENETICS.** (891103) (4 cr, §GCB 3022, §GCB 5022; prereq 5001; 1115-1215 MTWThF and 1 hr ar; ClaOff B25)  
Introduction to the nature of genetic information, its transmission from parents to offspring, its expression in cells and organisms, and its course in populations.

**5004. CELL BIOLOGY.** (090791) (3 cr; prereq 5001; 1000-1100 MTWThF; ClaOff B25)  
Structures and functions of membranes, organelles, and other macromolecular aggregates found in plant, animal, and bacterial cells. Cell form and movement, intercellular communication, transport, and secretion.

## Botany (Bot)

220 Biological Science, St. Paul, 373-1836  
College of Biological Science

(See also Itasca Biology Program)

#### FIRST TERM

**3131. SURVEY OF PLANT PHYSIOLOGY.** (490861) (4 cr, §5131, §PIPh 3131, §PIPh 5131; prereq Biol 1103 or 3012, BioC 1302 or §BioC 1302 or Biol 5001; 1110-1225 MTWThF; BioSci 6) Biesboer, staff  
Physiological principles underlying processes that occur in living plants with emphasis on higher plants. Growth and development, mineral nutrition, transport, water relations, and metabolism, especially emphasizing photosynthesis and nitrogen assimilation. Meets with 5131.

**5131. SURVEY OF PLANT PHYSIOLOGY.** (290862) (4 cr, §3131, §PIPh 3131, §PIPh 5131; prereq Biol 1103 or 3012, BioC 1302 or §BioC 1302 or Biol 5001; 1110-1225 MTWThF, 1240-1400 W; BioSci 6) Biesboer, staff  
See 3131; 5131. Includes a weekly discussion section. Meets with 3131.

**r 5801. PLAINS AND BOREAL FLORA.** (189857) (5 cr; limited to 20 students; prereq course in taxonomy, Δ; 0800-1700 MTh, Itasca, see page 79) Lee

**r 5811. FRESHWATER ALGAE.** (989858) (5 cr; limited to 20 students; prereq 10 cr in botany, biology or zoology, Δ; 0800-1700 TF, Itasca, see page 79) Czarnecki

**5870. DIRECTED STUDIES.** (489113) (Cr ar; prereq #, Δ) Staff

**5990. DIRECTED RESEARCH.** (188725) (Cr ar; prereq #, Δ) Staff  
Laboratory or field investigation of selected areas of research.

**8990. RESEARCH PROBLEMS.** (189851) (Cr ar; prereq #) Staff

#### SECOND TERM

**5870. DIRECTED STUDIES.** (689112) (Cr ar; prereq #, Δ) Staff

**5990. DIRECTED RESEARCH.** (988726) (Cr ar; prereq #, Δ) Staff  
See First Term.

**8990. RESEARCH PROBLEMS.** (890792) (Cr ar; prereq #) Staff

## Business Administration (BA)

290 Hubert H. Humphrey Center, 373-3701  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

#### FIRST TERM

**r 3998. INDEPENDENT STUDY.** (789876) (Cr ar [may be repeated for cr]; limited to 10 students; prereq consent of faculty member willing to supervise the study) Staff  
Student-initiated project and/or independent course of study.

#### SECOND TERM

**r 3998. INDEPENDENT STUDY.** (790817) (Cr ar [may be repeated for cr]; limited to 10 students; prereq consent of faculty member willing to supervise the study) Staff  
See First Term.

## Business and Marketing Education (BME)

420A Vocational/Technical Education Building,  
St. Paul, 373-3330  
College of Education

#### FIRST TERM

**r 1501.<sup>1</sup> BASIC KEYBOARDING/TYPERWRITING.** (787741) (3 cr, §BDE 1501; limited to 25 students; S-N optional for nonmajors; 1115-1205 MTWThF; VoTech 240)  
Emphasis on correct keyboarding techniques for the typewriter, microcomputer, and other applications; letter format; manuscripts; proofreading. Meets with BME 1502 and 1503.

**r 1502.<sup>1</sup> INTERMEDIATE TYPERWRITING.** (587742) (3 cr, §BDE 1502; limited to 8 students; prereq 1501 or proficiency exam; 1115-1205 MTWThF; VoTech 240; A-N only)  
Business letters; job application forms; personal data sheets; centering and tabulations; memoranda; manuscripts with footnotes; speed and accuracy building. Meets with BME 1501 and 1502.

**r 1503.<sup>1</sup> ADVANCED TYPERWRITING.** (387743) (3 cr, §BDE 1503; limited to 7 students; prereq 1502 or proficiency exam; 1115-1205 MTWThF; VoTech 240; A-N only)  
Form letters; business and personal letters; business forms; tabular/columnar copy; speed and accuracy building. Meets with BME 1501 and 1502.

**5161. RECORDS MANAGEMENT.** (190863) (4 cr; 1700-1930 TTh; VoTech R285; A-N only) Hopkins  
Management of records in business; records creation, maintenance, protection, and disposition.

<sup>1</sup> These courses meet concurrently. A total of 40 students will be accepted in the three courses.

# New for BME teachers

**Special Topics in Business and Marketing Education.** During the first term, June 23-27, the integration of computer literacy concepts and skills into the business and marketing curricula will be examined in BME 5380. Selection of content, equipment, business applications software and instructional courseware, and articulation of program offering with other subject areas and levels in instruction will be discussed.

**Teaching Machine and Shorthand Transcription** is offered first term, July 7-18 as a section of BME 5370. Focus is on refining language skills.

**Business Observation and Seminar** is offered July 28-August 1 (BME 5361) for business and marketing education teachers and teacher/coordinators. Students will investigate job opportunities and requirements, job performance standards with implications for curriculum revision, and current training practices.

**R5310. INTRODUCTION TO MICROCOMPUTER APPLICATIONS IN BUSINESS AND MARKETING EDUCATION** (187744) (3 cr, \$BDE 5310; limited to 22 students; 1700-1930 MW; VoTech 230; A-N only) Lambrecht  
Instructional uses of microcomputers, representative business and marketing education applications, and BASIC programming.

**5359. OCCUPATIONAL EXPERIENCE.** (087745) (1-18 cr; prereq #: S-N optional; 1800-2000 T and hrs ar; VoTech 420C) Hopkins  
Observation and employment experiences in business offices or marketing businesses; weekly seminars on application to teaching and guidance of high school and post-high school students. Each 1-credit offering requires 85 hours of work.

**5370. SPECIAL TOPICS IN INSTRUCTION: Transcription and Business English—July 8-18.** (887746) (1-6 cr; 0905-1205 MTWThF and hrs ar; VoTech 230; A-N only) Lambrecht  
Topics will vary with each offering. This 3-credit offering will examine instructional practices and materials for office education programs. Discussion and practice in developing beginning, remedial, or advanced instructional activities, including evaluation procedures and standards and microcomputer-assisted instruction.

**5380. SPECIAL TOPICS IN CURRICULUM: Computer Literacy Courses in Business and Marketing Education—June 23-27.** (990864) (1-6 cr; 1220-1625 MTWThF and hrs ar; VoTech 230; A-N only) Hopkins  
Topics will vary with each offering. This 2-credit offering will examine issues related to the selection of content, equipment, business applications software, instructional courseware, and selection of other instructional materials; articulation of program offerings with other subject areas and levels of instruction.

**5600. FIELD-BASED PROJECTS IN BUSINESS AND MARKETING EDUCATION.** (790865) (1-12 cr [max 12 cr]; prereq #: hrs ar; A-N only) Hopkins  
Individual or group work on curricular, instructional, developmental, or evaluation problems and projects applicable to local school or business situations.

**5900. DIRECTED STUDY IN BUSINESS AND MARKETING EDUCATION.** (590866) (1-6 cr [max 6 cr]; S-N optional; prereq Δ; hrs ar) Hopkins  
Opportunity for individual learning experiences not covered by regular courses.

**8900. PROBLEMS: BUSINESS AND MARKETING EDUCATION.** (390867) (1-9 cr [max 9 cr]; prereq #: hrs ar) Hopkins  
Individual research.

## SECOND TERM

**5359. OCCUPATIONAL EXPERIENCE.** (190868) (1-18 cr; prereq #: 1800-2000 W and hrs ar; VoTech 420C; S-N optional) Ashmun  
See First Term.

**5361. BUSINESS OBSERVATION AND SEMINAR—July 28-August 1.** (090869) (3-9 cr; \$BDE 5361; 0800-1205 and 1325-1625 MTWThF and hrs ar; VoTech 220; A-N only) Ashmun  
Current operating practices and career opportunities in business and industry combining planned on-site experience in work environments and related seminars. This offering for 3 credits.

**5600. FIELD-BASED PROJECTS IN BUSINESS AND MARKETING EDUCATION.** (787738) (1-12 cr [max 12 cr]; prereq #: hrs ar; A-N only) Ashmun  
See First Term.

**5900. DIRECTED STUDY IN BUSINESS AND MARKETING EDUCATION.** (587739) (1-6 cr [max 6 cr]; S-N optional; prereq Δ; hrs ar) Ashmun  
See First Term.

**8900. PROBLEMS: BUSINESS AND MARKETING EDUCATION.** (987740) (1-9 cr [max 9 cr]; prereq #: hrs ar) Ashmun  
See First Term.

## Business, Government, and Society (BGS)

835 Management/Economics. 373-4377  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

## FIRST TERM

**R3002. BUSINESS AND SOCIETY.** (589877) (4 cr; limited to 50 students; prereq jr or sr; 0800-0955 MTWTh; BlegH 145; A-N only) Gilbert  
Basic economic and social goals and various attempts to meet them, with emphasis on American society. Business as an institution; its relationships to other institutions and to society. Ethical and practical conflicts in the role of the firm and the manager are examined in the context of the public policy process. Current social issues and their impact on business.

**R3004. INTERNATIONAL BUSINESS.** (4 cr; each section limited to 45 students; A-N only)  
World business with emphasis on the global economy, international concepts, global business strategies, multinational corporations and technology, personnel and operations in the host nations. Resource (including energy) questions in their global contexts: quantities, demands, distribution of resources.

Sec 1, (087809) 0800-0955 MTWTh, BlegH 130, Bhat  
Sec 2, (885804) 0905-1100 MTWTh, BlegH 150, Holloway

## SECOND TERM

**R3004. INTERNATIONAL BUSINESS.** (187811) (4 cr; limited to 45 students; 1010-1205 MTWTh; BlegH 150; A-N only) Bhat  
See First Term.

## Business Law (BLaw)

1235 Management/Economics. 373-4406  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

## FIRST TERM

**R3058. INTRODUCTION TO LAW, THE LAW OF CONTRACTS AND SALES CONTRACTS.** (4 cr, \$8158; each section limited to 50 students; prereq Econ 1002 or equiv; A-N only)

Study of the origin of law, its place in and effect upon society; the history and development of law; the system of courts; and legal procedure. An extensive study of the law of contracts as the basic law affecting business transactions; and law affecting the sales of goods contracts.

Sec 1, (389878) 0800-0850 MTWThF, BlegH 435  
Sec 2, (189879) 0905-0955 MTWThF, BlegH 435



## Chemical Engineering (ChEn)

151 Arundson Hall. 373-2300  
Institute of Technology

## FIRST TERM

**5902, 5903, 5904, 5905. SPECIAL PROBLEMS.** (990640) (790641) (590642) (390643) (Cr ar)

**8901-8902-8903. RESEARCH.** (190644) (090645) (890646) (Cr ar)

## FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**3091. INDUSTRIAL EMPLOYMENT.** (389718)

## SECOND TERM

**5902, 5903, 5904, 5905. SPECIAL PROBLEMS.** (685397) (485398) (285399) (085400) (Cr ar)

**8901-8902-8903. RESEARCH.** (885401) (685402) (485403) (Cr ar)

## Chemistry (Chem)

139 Smith Hall. 373-2324  
Institute of Technology

A \$20 deposit card, available at the Bursar's Office, Williamson Hall, is necessary for all laboratory courses.

## FIRST TERM

**R1004. GENERAL PRINCIPLES OF CHEMISTRY.** (190613) (5 cr, limited to 100 students; 1004-1005, §1001, §1002, §1014, §1031, §1032; primarily for non-chemistry majors; prereq high school chemistry, placement index of Y or predicted mathematics GPA 1.90 on ACT or Math 0009 or college course in algebra...4 yrs high school mathematics...high school physics recommended; lect 0800-0910 MTWThF, SciCB 325; rec 1220-1310 MWF; lab 1325-1625 MWF, SmithH ar)  
Introduction to chemistry from the standpoint of atomic structure; periodic properties of elements and compounds derivable from structural considerations; laws governing behavior of matter, theories of solutions, acids, bases, and equilibria.

**1006. PRINCIPLES OF SOLUTION CHEMISTRY.** (890615) (4 cr; limited to 20 students; prereq 1005 or 1032; lect 0905-0955 MTWThF, SciCB 175; lab 1220-1625 MWF, SmithH ar)

Lecture and laboratory work is related to chemistry of selected cations and anions. Detection methods include spectrophotometric and potentiometric as well as chromatographic procedures. Included in the program of metal ion studies are systematics; acid-base principles; influence on the environment; importance in biological systems; formation and stereochemistry of complexes.

**1014. CONCEPTS OF CHEMISTRY.** (886533) (4 cr; §1001-1102, §1004-1005, §1031-1032; for IT students only; prereq Phys 1105 or 1281 or #; 1010-1120 MTWThF; SciCB 175)

Fundamental principles of chemistry. A terminal course.

**3100. QUANTITATIVE ANALYSIS LECTURE.** (690616) (3 cr, limited to 60 students; 3100-3101; for non-chemistry majors; prereq 1005 or 1032; 1220-1415 MWF; Phys 170)

Modern quantitative methods of analysis.

**3101. QUANTITATIVE ANALYSIS LABORATORY.** (490617) (2 cr, limited to 40 students; 3100-3101; for non-chemistry majors; prereq 3100 or §3100; 0800-1100 MTWThF; SmithH 310)

Modern quantitative methods of analysis including elementary physicochemical procedures.

**3301. ELEMENTARY ORGANIC CHEMISTRY I.** (290618) (4 cr, limited to 100 students; §3331; for non-chemistry majors; prereq 1005 or 1032 or equiv; 0800-0955 MTWTh; Phys 210)

Important classes of organic compounds, both aliphatic and aromatic, and heterocyclic compounds.

**3303. ELEMENTARY ORGANIC CHEMISTRY III.** (191048) (4 cr; limited to 30 students; prereq 3302, 3306 or §3306; 0800-0955 MTWTh; KoltH S136)

Basic principles of organic chemistry, with emphasis on a survey of organic reaction mechanisms, intended to coordinate the knowledge which has been acquired in the preceding two quarters of organic chemistry.

**3305. ELEMENTARY ORGANIC CHEMISTRY LABORATORY I.** (490620) (2 cr; limited to 72 students; prereq 3301 or §3301; lect 1010-1100 T, Phys 210; lab 1010-1415 WTh, ApH 125, KoltH 365)

See 3301.

**3499. SENIOR THESIS.** (290621) (Cr ar; prereq #, 4th yr)

Written final senior thesis report.

**3970. DIRECTED STUDY.** (590625) (Cr ar; prereq #)

On- or off-campus learning experiences, individually arranged between a student and faculty member, in areas not covered by regular courses.

**5520. ELEMENTARY PHYSICAL CHEMISTRY.** (790624) (3 cr; limited to 50 students; prereq 1 yr college chemistry, Phys 1291 and 1295 or §Phys 1291 and §1295 or 1106 with #, Math 3211; 0800-0955 MWF; ApH 150)

Brief general survey. Chemical thermodynamics.

**5534. CHEMICAL THERMODYNAMICS.** (391050) (4 cr; limited to 50 students; prereq IT upper division or CLA chem major or Δ, Phys 1291 or §Phys 1291, or Phys 1106 with #, Math 3211; 0800-0955 MTWTh; SciCB 375)

Principles of thermodynamics with applications to chemical systems.

## SECOND TERM

**1003. PHYSICAL WORLD, CHEMISTRY.** (785603) (5 cr, § any other college chemistry courses; a terminal course... cannot be used as prereq for any other advanced chemistry course; a similar course but without lab is offered as 1008; prereq 1 yr high school algebra...high school chem recommended; lect 0900-1000 MTWThF, SciCB 375; rec 1325-1415 MWF; lab 1430-1625 MWF, SmithH ar)

Fundamental concepts of chemical bonding, structure of matter, and forces in the physical world. Scientific methods and principles contribute to understanding of the environment and problems faced in improving it. Labs to illustrate. Lectures 1003 and 1008 meet concurrently.

**1005. GENERAL PRINCIPLES OF CHEMISTRY.** (085610) (5 cr, 1004-1005, §1014, §1032; primarily for non-chemistry majors; prereq 1004, high school chemistry, placement index of Y or predicted mathematics GPA 1.90 on ACT or Math 0009 or college course in algebra...4 yrs high school mathematics...high school physics recommended; lect 0800-0910 MTWThF, SciCB 325; rec 1220-1310 MWF; lab 1325-1625 MWF)

See 1004 First Term.

**1008. PHYSICAL WORLD, CHEMISTRY.** (289503) (4 cr, limited to 25 students; § any other college chemistry courses; a terminal course... cannot be used as prereq for any other advanced chemistry course; prereq 1 yr high school algebra...high school chemistry recommended; lect 0900-1000 MTWThF; SciCB 375)

See 1003 Second Term. No lab. Lectures 1003 and 1008 meet concurrently.

**3302. ELEMENTARY ORGANIC CHEMISTRY II.** (185615) (4 cr; limited to 100 students; prereq 3301, 3305 or §3305; if 3305 taken concurrently, a passing grade required for 3305 to receive cr for 3302; 0800-0955 MTWTh; Phys 210)

See 3301 First Term.

**3306. ELEMENTARY ORGANIC CHEMISTRY LABORATORY II.** (585621) (2 cr; limited to 72 students; prereq 3302 or §3302; lect 1010-1100 T, Phys 210; lab 1010-1415 WTh; ApH 125)

See 3301 First Term.

**3499. SENIOR THESIS.** (085624) (Cr ar; prereq #, 4th yr)

See First Term.

**3970. DIRECTED STUDY.** (685626) (Cr ar; prereq #)

See First Term.

**5126. MODERN ANALYTICAL CHEMISTRY.** (285631) (4 cr; primarily for chemical engineering majors; prereq 3332 and 3335; lect 1220-1415 TW, KoltH S137; lab 0800-1205 MTWThF, KoltH 297, 299)

Strategies and techniques for solving modern analytical problems. The use of modern instruments in analysis.

**5521. ELEMENTARY PHYSICAL CHEMISTRY.** (985633) (3 cr; prereq 1 yr college chemistry, Phys 1291 and 1295 or §Phys 1291 and §1295 or 1106 with #, Math 3211; 0800-0955 MWF; ApH 150)

See 5520 First Term.



## Chicano Studies (Chic)

483 Ford Hall, 373-9707  
College of Liberal Arts

### FIRST TERM

**1106. INTRODUCTION TO CHICANO STUDIES: MEXICO AND THE UNITED STATES.** (390870) (4 cr; 0905-0955 MTWThF; FordH 175) Rojas

Convergence of Spanish-Mexican and Anglo-American societies in the Spanish borderlands. Literary, social, cultural and historical perspectives, 1821 to 1960.

**3970. DIRECTED STUDIES.** (489242) (Cr ar; prereq #, Δ, CLA approval)

Guided individual reading or study.

**5970. DIRECTED STUDIES.** (889724) (Cr ar; prereq #, Δ, CLA approval)

Guided individual reading or study.

### SECOND TERM

**3970. DIRECTED STUDIES.** (489726) (Cr ar; prereq #, Δ, CLA approval)

Guided individual reading or study.

**5970. DIRECTED STUDIES.** (089768) (Cr ar; prereq #, Δ, CLA approval)

Guided individual reading or study.

## Child and Adolescent Psychiatry (CAPy)

D-697 Mayo, 373-8871  
Medical School

### SPECIAL TERM: JUNE 24-SEPTEMBER 13

**5203. CHILD AND ADOLESCENT OUTPATIENT PSYCHIATRY FOR HEALTH CARE PSYCHOLOGY INTERNS.** (587076) (1-5 cr; prereq #) Jensen

Experience in assessment and therapeutic interventions with children, adolescents, and families in an outpatient child and adolescent psychiatric setting.

**5204. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (387077) (1 cr; prereq med student, #; hrs ar) August, Yellin, Hoberman

Multidisciplinary evaluations of children, adolescents, and their families are presented for discussion, dynamic and diagnostic formulations, and disposition planning in conference setting.

**5501. PEDIATRIC, PEDIATRIC NEUROLOGY: PSYCHIATRIC LIAISON.** (889657) (9-18 cr; prereq med student, #)

**5520. OUTPATIENT CLINICAL CHILD AND ADOLESCENT PSYCHIATRY FOR PRIMARY CARE TRAINEES.** (689658) (Cr ar; prereq med student, #)

**5602. READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (187078) (3 cr; hrs ar) Garfinkel, staff

Assigned readings and discussions with faculty. A survey course; includes child development, diagnostic and therapeutic techniques, and psychopathology.

**5603. INPATIENT CLINICAL CHILD PSYCHIATRY.** (087079) (9 cr per term; prereq med student; hrs ar) Sonis

Supervised diagnostic and therapeutic experiences in an inpatient, multidisciplinary child psychiatry unit with emphasis on groups and milieu therapies.

**5608. INTRODUCTION TO FAMILY THERAPY: THEORY AND PRACTICE.** (387080) (3 cr; prereq MD and/or #, basic psychopath course, current supervised involvement in treatment of cases)

**5609. CHILD DEVELOPMENT.** (187081) (3 cr; prereq MD and/or #)

**8100. READINGS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (087082) (1 cr; hrs ar) Garfinkel, staff

Comprehensive review of the classical and contemporary literature in the field of child, adolescent, and family psychiatry including growth and development, diagnostic and therapeutic techniques, and psychopathology, with supplemental course work in other departments and schools.

**8110. DIAGNOSTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (887083) (1 cr; hrs ar) August, Yellin, Hoberman

See 5204.

**8120. THERAPEUTIC METHODS IN CHILD, ADOLESCENT, AND FAMILY PSYCHIATRY.** (687084) (1 cr; hrs ar) Staff

See 5206.

**8200. OUTPATIENT CLINICAL CHILD AND ADOLESCENT PSYCHIATRY.** (487085) (3 cr; 15-30 hrs per wk) Jensen

Supervised diagnostic and therapeutic experiences in an outpatient setting.

**8212. CLINICAL INPATIENT CHILD PSYCHIATRY.** (287086) (3 cr; 15-30 hrs per wk) Sonis, staff

Supervised diagnostic and therapeutic experiences in an inpatient, multidisciplinary child psychiatry unit with an emphasis on group and milieu therapies.

**8214. INPATIENT CLINICAL ADOLESCENT PSYCHIATRY.** (187087) (3 cr; hrs ar) Staff

Supervised diagnostic and therapeutic experiences in an inpatient, multidisciplinary adolescent psychiatry unit with an emphasis on group and milieu therapies.

**8216. PEDIATRIC-PSYCHIATRY LIAISON.** (987088) (3 cr; prereq med student, #; hrs ar) Lawton

See 5500.

**8228. RESEARCH IN CHILD AND ADOLESCENT PSYCHIATRY.** (787089) (1 cr; hrs ar) August, Yellin

Research design, methodology, and current research projects are reviewed with faculty members and invited guests.

## Child Psychology (CPsy)

104c Child Development. 376-4914  
College of Education

### FIRST TERM

**1301. INTRODUCTORY CHILD PSYCHOLOGY.** (189915) (4 cr, §3309, §5301; prereq 5 cr introductory psychology) Introduction to science of child behavior; review of theories and research. See also Section 2 in ten-week listing. Meets with 3309, section 1.

Sec 1, 1115-1205 MTWThF, ChDev 216, Nañez

**3303. ADOLESCENT PSYCHOLOGY.** (089916) (4 cr, §5303; prereq 5 cr introductory psychology; 1115-1205 MTWThF; ChDev 218) Miller  
Physical, cognitive, and social development during adolescence. Meets with 5303.

**3309. INTRODUCTORY CHILD PSYCHOLOGY FOR THE SOCIAL SCIENCES.** (085767) (4 cr, §1301, §5301; prereq Psy 1001)

Science of child behavior; review of theory and research; designed for majors in psychology, sociology, and related disciplines; not suggested for CPsy majors. See also Section 2 in ten-week listing. Meets with 1301, section 1.

Sec 1, 1115-1205 MTWThF, ChDev 216, Nañez

**3311. BEHAVIORAL AND EMOTIONAL PROBLEMS.**

(889917) (4 cr, §5311; prereq 1301 or equiv; 1010-1100 MTWThF; ChDev 218) Jacobovitz  
Description, etiology, development of behavioral and emotional problems of children; treatment where germane. Excluded are problems deriving primarily from sensory or physical handicap, mental retardation, or neurological impairment. Meets with 5311.

**3313. PSYCHOLOGY OF ATYPICAL CHILDREN.** (091214) (4 cr, §5313; prereq 1301 or equiv; 0800-0850 MTWThF; ChDev 218) Brown

Problems of research, assessment, and behavior associated with atypicality; evaluation of research in areas of major concern for sensory, language, intellectual, and physical deviation. Meets with 5313.

**3990. DIRECTED INSTRUCTION.** (489919) (1-4 cr [max 4 cr]; prereq #: S-N only) Gunnar  
Undergraduates serve as teaching assistants in courses they have successfully completed for credit.

**5303. ADOLESCENT PSYCHOLOGY.** (889920) (4 cr, §3303; prereq 5 cr introductory psychology; 1115-1205 MTWThF; ChDev 218) Miller  
Physical, cognitive, and social development during adolescence. Meets with 3303.

**5310. TOPICS IN CHILD PSYCHOLOGY: Understanding Troubled Children and Youth—June 18-July 7.** (385748) (1-4 cr; prereq 1301; 1100-1430 MW; PIH 215) Charlesworth  
Selected topics in the general content area. This 4-credit offering is a survey of social and emotional development during middle and later childhood with particular emphasis on the factors and processes associated with antisocial behavior.

**5311. BEHAVIORAL AND EMOTIONAL PROBLEMS.** (689921) (4 cr, §3311; prereq 1301 or equiv; 1010-1100 MTWThF; ChDev 218) Jacobovitz

Description, etiology, development of behavioral and emotional problems of children; treatment where germane. Excluded are problems deriving primarily from sensory or physical handicap, mental retardation, or neurological impairment. Meets with 3311.

**5313. PSYCHOLOGY OF ATYPICAL CHILDREN.** (691216) (4 cr, §3313; prereq 1301 or equiv; 0800-0850 MTWThF; ChDev 218) Brown  
Problems of research, assessment, and behavior associated with atypicality; evaluation of research in areas of major concern for sensory, language, intellectual and physical deviation. Meets with 3313.

**5318. CLINICAL PROCEDURES WITH CHILDREN AND YOUTH.** (491217) (4 cr; prereq 12 cr in psychology, educational psychology, sociology, or child psychology; 0905-0955 MTWThF; ChDev 218) Gross

Assessment and intervention procedures of clinical child psychology in clinical and community settings. Primarily for students not majoring in clinical psychology.

**5349. CHILDREN'S LEARNING AND INTELLECTUAL SKILLS—June 17-July 3.** (291218) (4 cr, §3347; prereq 1301, 3343, or #: 1100-1430 TTh; PIH 215) H Pick  
Current research on learning, problem solving, intellectual performance in children; practical applications.

**5970. DIRECTED STUDY IN CHILD PSYCHOLOGY.** (289923) (Cr ar; prereq #) Gunnar  
Independent reading.

**5990. DIRECTED RESEARCH IN CHILD PSYCHOLOGY.** (189924) (Cr ar; prereq #) Gunnar  
Individual empirical investigation.

**8970. INDEPENDENT STUDY.** (989925) (Cr ar; prereq #) Gunnar  
Independent reading.

**8990. RESEARCH PROBLEMS.** (789926) (Cr ar; prereq #) Gunnar  
Individual empirical investigation.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**1301. INTRODUCTORY CHILD PSYCHOLOGY.** (187820) (4 cr, §3309, §5301; prereq 5 cr introductory psychology) See five-week listing First Term. Meets with 3309, section 2.  
Sec 2, 1800-2030 T, BlegH 245, Morgan

**3309. INTRODUCTORY CHILD PSYCHOLOGY FOR THE SOCIAL SCIENCES.** (885768) (4 cr, §1301, §5301; prereq Psy 1001)

See five-week listing First Term. Meets with 1301, Sec 2.  
Sec 2, 1800-2030 T, BlegH 245, Morgan

### SECOND TERM

**1301. INTRODUCTORY CHILD PSYCHOLOGY.** (791224) (4 cr, §3309, §5301; prereq 5 cr introductory psychology; 0905-0955 MTWThF; ChDev 216) Maratsos  
See First Term. Meets with 3309.

**3302. INFANCY.** (587823) (4 cr; prereq 1301 or #: 1010-1100 MTWThF; ChDev 218) Mangelsdorf  
Perceptual, motor, emotional, social, and cognitive development during the first two years of life; the developing infant in his social and physical environment.

**3303. ADOLESCENT PSYCHOLOGY.** (490827) (4 cr, §5303; prereq 5 cr introductory psychology; 1010-1100 MTWThF; ChDev 216) Rosengren  
See First Term. Meets with 5303.

**3309. INTRODUCTORY CHILD PSYCHOLOGY FOR THE SOCIAL SCIENCES.** (591225) (4 cr, §1301, §5301; prereq Psy 1001; 0905-0955 MTWThF; ChDev 216) Maratsos  
See First Term. Meets with 1301.

**3331. PROCESSES OF SOCIALIZATION OF CHILDREN.** (391226) (4 cr, §5331; prereq 1301 or equiv; 1220-1310 MTWThF; ChDev 216) Dzur  
Processes of social learning; identification, imitation, reward and punishment, internalization, object choice. Meets with 5331.

**3332. CROSS-CULTURAL CHILD DEVELOPMENT.** (091651) (4 cr; prereq 4 cr child psychology; S-N optional; 1220-1310 MTWThF; ChDev 218) Tapp  
Interdisciplinary cross-cultural survey of theories and research on similarities and differences in cognitive, perceptual, socioemotional, and personality development; emphasis on child-caregiver relations and Asian and Hispanic cultures.

**3990. DIRECTED INSTRUCTION.** (190829) (1-4 cr [max 4 cr]; S-N only; prereq #) Gunnar  
See First Term.

**5303. ADOLESCENT PSYCHOLOGY.** (290831) (4 cr, §3303; prereq 5 cr introductory psychology; 1010-1100 MTWThF; ChDev 216) Rosengren  
See First Term. Meets with 3303.

**5310. TOPICS IN CHILD PSYCHOLOGY: Problems of Adolescence.** (785777) (1-4 cr; prereq 1301; 1115-1205 MTWThF; ChDev 218) Paikoff  
See First Term. An examination of the factors and processes related to adolescent drug use, teen pregnancy, teen suicide, and other problems of the adolescent period. Issues of intervention and prevention are explored in this offering for 4 credits.

**5331. PROCESSES OF SOCIALIZATION OF CHILDREN.** (191227) (4 cr, §3331; prereq 1301 or equiv; 1220-1310 MTWThF; ChDev 216) Dzur  
Processes of social learning; identification, imitation, reward and punishment, internalization, object choice. Meets with 3331.

**5970. DIRECTED STUDY IN CHILD PSYCHOLOGY.** (990833) (Cr ar; prereq #) Gunnar  
See First Term.

**5990. DIRECTED RESEARCH IN CHILD PSYCHOLOGY.** (590835) (Cr ar; prereq #) Gunnar  
See First Term.

**8970. INDEPENDENT STUDY.** (190837) (Cr ar; prereq #) Gunnar  
See First Term.

**8990. RESEARCH PROBLEMS.** (890839) (Cr ar; prereq #) Gunnar  
See First Term.

## Chinese (Chn)

113 Folwell Hall. 373-2564  
College of Liberal Arts

(See Nankai Institute, page 93)

### FIRST TERM

**3970. DIRECTED STUDIES.** (388665) (1-15 cr; prereq #, Δ, CLA approval) Staff

**5970. DIRECTED STUDIES.** (489497) (1-4 cr; prereq #, Δ, college approval) Staff

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll for all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**1011-1012-1013. INTENSIVE BEGINNING MODERN CHINESE.** (15 qtr credit for both terms. [10 semester credits] 10 hours with principal instructor, 10 hours with drillmaster; 0800-1205 MTWThF; CwMinE 213)

R 1011, Sec 5, (186053) June 17-July 9

R 1012, Sec 5, (986054) July 10-31

R 1013, Sec 5, (786055) August 1-22, 5 cr

### SECOND TERM

**3970. DIRECTED STUDIES.** (087826) (1-15 cr; prereq #, Δ, CLA approval) Staff

**5970. DIRECTED STUDIES.** (887827) (1-4 cr; prereq #, Δ, college approval) Staff

## Civil Engineering (CE)

122 Civil and Mineral Engineering Building. 373-3135  
Institute of Technology

### FIRST TERM

**5097. ADVANCED DESIGN, ANALYSIS, RESEARCH OR TUTORIAL IN CIVIL ENGINEERING.** (589703) (Cr ar; prereq approval of faculty adviser; A-N only)

**8097. CIVIL ENGINEERING RESEARCH.** (089687) (Cr ar; prereq #: A-N only)

### SECOND TERM

**5097. ADVANCED DESIGN, ANALYSIS, RESEARCH OR TUTORIAL IN CIVIL ENGINEERING.** (189705) (Cr ar; prereq approval of faculty adviser; A-N only)

**8097. CIVIL ENGINEERING RESEARCH.** (689689) (Cr ar; prereq #: A-N only)

## Classics (Clas)<sup>1</sup>

309 Folwell Hall. 373-3912  
College of Liberal Arts

(See also Greek, Latin)

### FIRST TERM

**1042. GREEK AND ROMAN MYTHOLOGY I.** (889528) (4 cr; 0905-0955 MTWTh; FolH 308) Hershbell  
The heroes, gods, and goddesses of ancient Greece and Rome. The stories of the myths and the stories behind the myths.

<sup>1</sup>Knowledge of Greek or Latin is not required.

**1045. BASIC PROGRAM IN TECHNICAL TERMINOLOGY AND WORD STUDY.** (686937) (3 cr, §1048, 1141, 3046; independent and optional assistance labs ar; **orientation** 0800-0850 T, June 17 or 1220-1310 W, June 18 or 1325-1415 Th, June 19; FolH 308)

**1048. TECHNICAL TERMS OF THE MEDICAL AND BIOLOGICAL SCIENCES.** (486938) (2 cr, §1141, prereq 1045 or §1045; independent and optional assistance labs ar; **orientation** 0800-0850 T, June 17 or 1220-1310 W, June 18 or 1325-1415 Th, June 19; FolH 308)

**1141. GREEK AND LATIN TERMINOLOGY FOR NURSING.** (687831) (3 cr, §1048; independent and optional assistance labs ar; **orientation** 0800-0850 T, June 17, or 1220-1310 W, June 18, or 1325-1415 Th, June 19; FolH 308)  
Greek and Latin prefixes, suffixes, and roots basic to the vocabulary of nursing through computer-assisted instruction. Meets with 1045.

**3007. THE WORLD OF GREECE.** (691054) (4 cr, §5007; 1115-1205 MTWTh; FolH 305) Hershbell  
General survey of Greek civilization from the world of Homer to the age of Alexander. The Greek view of life as seen in art, history, literature, and philosophy. Special attention paid to the golden age of Greece in the Fifth Century B.C. and to the expansion of the Greek spirit under Alexander. Meets with 5007.

**3046. ADVANCED ETYMOLOGY: VOCABULARY OF THE SCIENCES AND HUMANITIES.** (487832) (2 cr; prereq 1045 or §1045; independent and optional assistance labs ar; **orientation** 0800-0850 T, June 17, or 1220-1310 W, June 18, or 1325-1415 Th, June 19; FolH 308)  
Latin and Greek roots that have English derivatives; regularities of linguistic change (Grimm's law), principles of etymology, and lessons on specialized terminology in various fields, computer-assisted instruction. Meets with 1045.

**3970. DIRECTED STUDIES.** (288190) (1-5 cr per term; prereq #, Δ, CLA approval)  
Guided individual reading or study.

**5007. THE WORLD OF GREECE.** (491055) (4 cr, §3007; 1115-1205 MTWTh; FolH 305) Hershbell  
See 3007. Requires additional work. Meets with 3007.

**5970. DIRECTED STUDIES.** (189249) (1-5 cr; prereq #, Δ, CLA approval)  
Guided individual reading or study.

## SECOND TERM

**1045. BASIC PROGRAM IN TECHNICAL TERMINOLOGY AND WORD STUDY.** (186061) (3 cr; §1048, 1141, 3046; independent and optional assistance labs ar; **orientation** 0800-0850 M, July 21, or 1220-1310 T, July 22, or 1325-1415 W, July 23; FolH 307)

**1048. TECHNICAL TERMS OF THE MEDICAL AND BIOLOGICAL SCIENCES.** (086062) (2 cr; prereq 1045 or §1045; independent and optional assistance labs ar; **orientation** 0800-0850 M, July 21, or 1220-1310 T, July 22, or 1325-1415 W, July 23; FolH 307)

**1141. GREEK AND LATIN TERMINOLOGY FOR NURSING.** (886063) (3 cr, §1048; independent and optional assistance labs ar; **orientation** 0800-0850 M, July 21, or 1220-1310 T, July 22, or 1325-1415 W, July 23; FolH 307)  
See First Term. Meets with 1045.

**3008. THE WORLD OF ROME.** (291056) (4 cr, §5008; 0905-0955 MTWTh; FolH 306) Sheets  
General survey of Roman civilization from its origin to the reign of Constantine. The Roman way of life as seen in art, history, literature, and philosophy. Special attention paid to the Etruscans and to the golden age of Rome under Augustus. Meets with 5008.

**3046. ADVANCED ETYMOLOGY: VOCABULARY OF THE SCIENCES AND HUMANITIES.** (686064) (2 cr; prereq 1045 or §1045; independent and optional assistance labs ar; **orientation** 0800-0850 M, July 21, or 1220-1310 T, July 22, or 1325-1415 W, July 23; FolH 307)  
See Term I. Meets with 1045.

**3145. GREEK AND ROMAN MYTHOLOGY II: ANALYSIS AND TRADITION.** (191057) (4 cr, §5145; prereq 1042 or #; 1010-1100 MTWTh; FolH 308) Hershbell  
Methods of interpreting Greco-Roman myth, from Homer to Freud, Jung, and Levi-Strauss; artistic survival of classical myth in literature, painting and music. Meets with 5145.

**3970. DIRECTED STUDIES.** (388214) (1-5 cr per term; prereq #, Δ, CLA approval)

**5008. THE WORLD OF ROME.** (991058) (4 cr, §3008; 0905-0955 MTWTh; FolH 306) Sheets  
See 3008. Requires additional work. Meets with 3008.

**5145. GREEK AND ROMAN MYTHOLOGY II: ANALYSIS AND TRADITION.** (791059) (4 cr, §3145; prereq 1042 or #; 1010-1100 MTWTh; FolH 308) Hershbell  
Same classwork as Clas 3145, but with special independent reading and research assignments in consultation with the instructor. Meets with 3145.

**5970. DIRECTED STUDIES.** (186067) (1-5 cr; prereq #, Δ, CLA approval)  
Guided individual reading or study.

## Communication Disorders (CDIs)

115 Shevlin Hall. 373-4116  
College of Liberal Arts

### FIRST TERM

**r3100. CLINICAL AND RESEARCH OBSERVATION.** (2 cr; section 1 limited to 3 students, section 2 limited to 1 student; prereq deptl written permission; S-N only) Starr, Moller  
Supervised observation of clinical procedures such as evaluation and treatment of persons with communication disorders or of research relating to normal and disordered communication.

Sec 1, (190040) 0800-1200 W, MoosT 6296

Sec 2, (191060) 1230-1600 Th, MoosT 6296

**3101. INTRODUCTION TO COMMUNICATION DISORDERS.** (191061) (4 cr; 0905-1100 TTh; FolH 303) Haroldson  
Survey of the processes and impairments of human oral communication.

**5900. TOPICS IN COMMUNICATION DISORDERS.** (4 cr)

Sec 1, (785701) Normal Language Development in Bilingual Populations. Hrs and Rm ar. Guest Lecturer  
Sec 2, (585702) Evaluation and Diagnosis; Minority Language Populations. Hrs and Rm ar. Guest Lecturer

**5970. DIRECTED STUDIES.** (990041) (Cr ar [may be repeated for cr]; prereq #, Δ, CLA approval) Staff  
Directed readings and preparation of reports on selected subjects.

**r8502. SEMINAR: STUTTERING.** (791062) (3 cr; limited to 10 students; prereq 5502 or #; 0905-1100 MW; ShevH 125) Martin  
Theoretical explanations of stuttering; research data and methodologies subserving the respective theories. Students independently design and, when feasible, execute research studies that derive from, and are consistent with, a particular theory of stuttering.

**8520. CLINICAL EDUCATION IN SPEECH-LANGUAGE PATHOLOGY.** (790042) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8521. CLINICAL EDUCATION IN SPEECH-LANGUAGE PATHOLOGY.** (388679) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8720. CLINICAL EDUCATION IN AUDIOLOGY.** (590043) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8721. CLINICAL EDUCATION IN AUDIOLOGY.** (788680) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8990. DIRECTED RESEARCH.** (390044) (Cr ar [may be repeated for cr]; prereq #) Staff  
Open to graduate students engaged in research.

### SECOND TERM

**5306. HEARING SCIENCE.** (591063) (4 cr; prereq 5301, 5302, or #; 0800-0955 MWF; ChDev 218) Ward  
Fundamental concepts in normal audition. Psychoacoustic methods; sensitivity and acuity; loudness, pitch, timbre, distortion, aural harmonics; masking, adaptation; the auditory reflex; binaural phenomena, localization.

**5504. ARTICULATION DISORDERS.** (391064) (4 cr; prereq 5301, 5302; 1010-1205 MWF; FolH 303) McDermott  
Impaired articulation performance and associated factors. Principles of diagnosis and clinical management. Observation of clinical activities.

**5900. TOPICS IN COMMUNICATION DISORDERS: Voice Problems of School Age Children.** (187834) (3 cr; 0905-1100 July 21, 22, 24, 25, 28, 29, 31, August 1; 4 addl lab hrs to be scheduled; SHH 125) Starr

Current information on the nature and clinical management of vocal pathologies of children. Procedures for the evaluation of vocal and laryngeal behavior demonstrated. Clinical management strategies for specific types of problems developed and evaluated. Students without background in speech-language pathology should contact the instructor regarding enrollment.

**5970. DIRECTED STUDIES.** (185329) (Cr ar [may be repeated for cr]; prereq #, Δ, CLA approval) Staff  
See First Term.

**8520. CLINICAL EDUCATION IN SPEECH-LANGUAGE PATHOLOGY.** (385331) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8521. CLINICAL EDUCATION IN SPEECH-LANGUAGE PATHOLOGY.** (788677) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8717. SEMINAR: HEARING.** (191065) (3 cr; prereq #; 0905-1100 TTh; ShevH 119) Van Tasell  
Major experimental research in psychophysiological and psychoacoustical nature of hearing. Critical analysis of theory, experimental method, and treatment of data.

**8720. CLINICAL EDUCATION IN AUDIOLOGY.** (185332) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8721. CLINICAL EDUCATION IN AUDIOLOGY.** (588678) (2, 4, or 6 cr [may be repeated for cr]; prereq #) Staff

**8990. DIRECTED RESEARCH.** (885334) (Cr ar [may be repeated for cr]; prereq #) Staff  
See First Term.

## Comparative Literature (CLit)

### FIRST TERM

**5910. PROBLEMS OF IDENTITY IN LANGUAGE AND CULTURE: SELECTED READINGS IN SEMIOTICS AND PSYCHOANALYSIS.** (190871) (4 cr; prereq reading knowledge of French, German or Spanish or #; 1010-1100 MWF; FolH 110) Kobrin  
Problematising the process of identity formation with regard to psyche and society through language, text, and culture.

## Composition and Communication (Comp)

209 Lind Hall. 373-2541  
College of Liberal Arts

(See also Rhetoric)

### FIRST TERM

**r1011. WRITING PRACTICE I.** (5 cr; each section limited to 24 students) Staff  
Guided practice in solving writers' problems: defining purpose, organizing and developing content, analyzing audience, drafting the whole essay and its parts, and revising and editing to master fundamentals of expository structure and style. Workshops on basic skills, syntactic fluency, and editing.

Sec 1, (588826) 0905-0955 MTWThF, 1 hr arranged, LindH 315, (ESL only, Δ)

Sec 2, (388827) 1010-1100 MTWThF, 1 hr arranged, LindH 325

Sec 3, (186487) 1115-1205 MTWThF, 1 hr arranged, LindH 303

**r1027. INTERMEDIATE EXPOSITORY WRITING.** (4 cr; each section limited to 25 students; prereq fulfillment of Writing Practice requirement or equiv) Staff  
Mastery of expository forms (e.g., comparison, analysis, evaluation); control of tone and diction to achieve a clear, accurate style.

Sec 1, (190068) 0800-0850 MTWThF, LindH 315

Sec 2, (689210) 0905-0955 MTWThF, LindH 320

**r3011. WRITING ABOUT LITERATURE.** (191079) (4 cr; limited to 20 students; prereq the Writing Practice requirement or equiv, jr.; 1010-1100 MTWThF, LindH 320) Staff  
Developing a critical argument about literary texts (novels, poems, plays) with attention to use of secondary sources. Experiments with different modes of explication and criticism.

**r3013. WRITING FOR ARTS OTHER THAN LITERATURE.** (591080) (4 cr; limited to 20 students; prereq the Writing Practice requirement or equiv, jr.; 1115-1205 MTWThF, LindH 320) Staff

Description of painting, sculpture, music, and other art forms as basis for analysis and generalization. Includes reviews and criticism, and use of others' commentaries on the arts.

**r3014. WRITING FOR THE QUANTITATIVE SOCIAL SCIENCES.** (191082) (4 cr; limited to 20 students; prereq fulfillment of the Writing Practice requirement or equiv, jr.; 0905-0955 MTWThF, LindH 303) Staff  
Developing strategies for expressing quantitative and statistical information in clear prose, and exercises in effective ways to



describe individual case histories. Includes analysis of complex situations and institutions.

**R3027. ADVANCED EXPOSITORY WRITING.** (4 cr; each section limited to 20 students; prereq the Writing Practice requirement or equiv, jr.) Staff  
Introduction to narration, description, proof, and persuasion; proper framing of arguments and analysis; use and evaluation of sources for longer papers.

Sec 1, (387841) 0905-0955 MTWThF LindH 325  
Sec 2, (588163) 1010-1100 MTWThF LindH 315

**R3031. TECHNICAL WRITING FOR ENGINEERS.** (4 cr; each section limited to 20 students; prereq the Writing Practice requirement or equiv, jr.) Staff  
Focus on the form and style of technical, engineering writing in reports, documentation, and correspondence. Exercises and frequent practical examples, tied as much as possible to student's major field.

Sec 1, (188828) 0800-0850 MTWThF, LindH 325  
Sec 2, (489211) 0800-0850 MTWThF, LindH 340  
Sec 3, (688168) 0905-0955 MTWThF, LindH 340  
Sec 4, (286651) 1010-1100 MTWThF, LindH 303

**R3032. PREPROFESSIONAL WRITING FOR BUSINESS.** (4 cr; limited to 20 students; prereq the Writing Practice requirement or equiv, jr.) Staff

Focus on the rhetoric, form, and style of business writing in reports, case studies, and correspondence. Exercises and frequent practical examples, tied as much as possible to the student's major field. This course fulfills senior business-writing requirement for the School of Management.

Sec 1, (185704) 0905-0955 MTWThF, RangC 610  
Sec 2, (186652) 1010-1100 MTWThF, BlegH 350

## SECOND TERM

**R1011. WRITING PRACTICE I.** (5 cr; each section limited to 24 students) Staff  
See First Term.

Sec 1, (088829) 0800-0850 MTWThF, 1 hr arranged, LindH 315  
Sec 2, (388830) 1010-1100 MTWThF, 1 hr arranged, LindH 315

**R1027. INTERMEDIATE EXPOSITORY WRITING.** (188831) (4 cr; limited to 25 students; prereq fulfillment of Writing Practice requirement; or equiv; 1115-1205 MTWThF; LindH 315)  
See First Term.

**R3027. ADVANCED EXPOSITORY WRITING.** (4 cr; limited to 20 students; prereq the Writing Practice requirement or equiv, jr.)  
See First Term.

Sec 1, (085705) 0905-0955 MTWThF, LindH 320, Staff  
Sec 2, (091083) 1010-1100 MTWThF, LindH 320, Anson

**R3031. TECHNICAL WRITING FOR ENGINEERS.** (4 cr; each section limited to 20 students; prereq the Writing Practice requirement or equiv, jr.) Staff  
See First Term.

Sec 1, (088832) 0800-0850 MTWThF, LindH 320  
Sec 2, (088202) 0905-0955 MTWThF, LindH 315

**R3032. PREPROFESSIONAL WRITING FOR BUSINESS.** (4 cr; each section limited to 20 students; prereq the Writing Practice requirement or equiv, jr.) Staff  
See First Term.

Sec 1, (888833) 1010-1100 MTWThF, BlegH 255  
Sec 2, (789263) 1115-1205 MTWThF, BlegH 105

## Computer Science (CSci)

136 Lind Hall, 373-0133  
Institute of Technology

### FIRST TERM

**R3101. A FORTRAN INTRODUCTION TO COMPUTER PROGRAMMING.** (4 cr; prereq Math 1111 or 1201 or equiv or #)

FORTRAN computer language with extension; applications; programming techniques. Designed to bring students to advanced level competence in FORTRAN programming. Integral nonscheduled laboratory.

Sec 1, (390626) 1115-1310 MT, 1115-1205 W, Arch 5  
Sec 2, (489127) 1115-1310 MT, 1115-1205 W, Arch 55

**R3104. INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING.** (5 cr; prereq Math 1211 or equiv or #; intended for CSci majors)

Required introductory course for CSci and Math/CSci majors; others require department permission. Problem solving techniques, stepwise refinement, systematic loop design, evaluation criteria, programming style, documentation, design of

test data. Applications in PASCAL. Scheduled lab sections.

Sec 1, (190627) 0905-0955 MTWThF, Arch 5, Du  
Sec 2, (289128) 0905-0955 MTWThF, Arch 35

**R3105. FUNDAMENTALS OF ALGORITHMS AND LANGUAGES I.** (289310) (4 cr; prereq 3101 or 3102 or 3104 or #; informal lab; 1010-1205 TTh, 1115-1205 W; Phys 166)  
Informal and formal approaches to algorithms, their properties and specification through an algorithmic language; computability, complexity, O-notation. Design of algorithms, solution techniques, problem decomposition, design documentation. Scope of variables and block structure. Analysis of numerical errors. Program testing. Examples from sorting and searching are required, to illustrate solution techniques.

**R3400. DISCRETE STRUCTURES OF COMPUTER SCIENCE.** (090628) (4 cr; prereq Math 1231 or 1331 or #; 1600-1730 MW, 1600-1645 Th; Arch 5) Leininger  
Proof techniques. Propositional calculus. First-order logic. Sets and multisets. Combinatorics. Analysis of algorithms. Graphs.

**5106. STRUCTURE OF HIGHER LEVEL LANGUAGES.** (290988) (4 cr; prereq 5102 and 5121 or #; 1115-1205 MTWThF; Arch 35) Powell  
Formal definition of the syntax and semantics of programming languages; semantics both by means of interpreters and by using the axiomatic approach. Concepts underlying programming languages and their realizations in a selected group of languages. Program description at compile time and execution time.

**R5121. INTRODUCTION TO DATA STRUCTURES.** (890629) (4 cr; prereq 3106 and 3400 or #; informal lab; 0810-1005 MW, 0910-1005 T; Arch 50)  
Basic concepts of data and their representation. Sequential and linked representation. Arrays, stacks and queues. Chains, circular lists and doubly linked lists. Dynamic storage management. Garbage collection and storage compaction. Generalized lists. Strings. Binary trees and trees. Tree traversal. Graphs. Activity networks.

**R5301. NUMERICAL ANALYSIS.** (189311) (4 cr; prereq Math 3142 or #...a knowledge of Pascal or FORTRAN is assumed; informal lab; 1010-1205 MT, 1115-1205 W; Arch 50)  
Floating point arithmetic and rounding errors. Iterative methods. Numerical solution of nonlinear equations. Newton's method. Direct methods for linear systems of equations. Gauss elimination. Factorization methods. Interpolation and approximation. Numerical integration and differentiation. Introduction to numerical solution of ordinary differential equations.

### SECOND TERM

**R3101. A FORTRAN INTRODUCTION TO COMPUTER PROGRAMMING.** (188708) (4 cr; prereq Math 1111 or 1201 or equiv or #; for non-CSci majors; 1015-1205 MT, 1115-1210 W; Arch 10)  
See First Term.

**R3104. INTRODUCTION TO PROGRAMMING AND PROBLEM SOLVING.** (189129) (5 cr; prereq Math 1211 or equiv or Math 1331 or Math 1621 or #; intended for CSci majors; 0905-0955 MTWThF; Arch 50)  
See Term I.

**R3106. FUNDAMENTALS OF ALGORITHMS AND LANGUAGES II.** (899312) (4 cr; prereq 3104 and 3105 or #; informal lab; 1010-1205 MT, 1115-1205 W; Arch 50) Esterline  
Recursion as an algorithm development technique and its implementation in a programming language. LISP. Data structures, use of recursive data structures, pointers and records in Pascal, data abstractions and data invariants. Syntax BNF. Semantics, abstract interpreters. Proving correctness of programs, inductive assertions, structural induction.

## Curriculum and Instructional Systems (CISy)

130 Peik Hall, 373-5158  
College of Education

### FIRST TERM

**R5003. INTRODUCTION TO COMPUTERS AND THEIR USES.** (889934) (1 cr; limited to 25 students; 1535-1830 T, PeikH 355; S-N only) Willie  
Introduction to computer technology in instruction; hardware, software, terminology, word processing, instructional applications.

**R5006. INTRODUCTION TO INSTRUCTIONAL COMPUTER PROGRAMMING.** (990878) (1 cr; prereq 5003 or #; limited to 25 students; 0905-1100 S; PeikH 355; S-N only)  
Introduction to designing computer-based instructional

programs using software languages most used in learning environments (BASIC or PILOT). Students need not have mathematical or science background.

**R5206. MICROCOMPUTER USES IN ELEMENTARY CLASSROOMS—June 16-July 1.** (188661) (3 cr, \$Elem 5140; limited to 5 students; 1220-1520 MTWThF; PeikH 355; A-N only) Stochl  
Uses of microcomputers to enhance instruction; applications in language arts, mathematics, science, social studies; evaluation of available programs. Meets with Elem 5140.

**R5216. COMPUTER-BASED INSTRUCTIONAL SIMULATIONS.** (790879) (3 cr; prereq 5205 or #; limited to 25 students; 0930-1200 MW; EdHAn 64, PeikH 355; A-N only)  
Analysis of types of simulation and factors making them instructionally effective; issues in development and classroom use.

**5509. DIRECTED INDIVIDUAL STUDY.** (290876) (1-6 [max 6 cr]; prereq  $\Delta$ ; A-N only) Kimpston  
Review of literature in research and theory of instructional systems.

**5600. INTRODUCTION TO CURRICULUM SYSTEMS—June 17-July 3.** (488656) (3 cr; 0800-0955 MTWThF; PeikH 225; A-N only) Kimpston  
Exploration of forces influencing goals and curriculum planning, trends and issues, traditional and emergent curricular designs, current proposals for change; a model for curriculum planning.

**5605. PRINCIPLES AND PROCEDURES IN DESIGNING CURRICULUM—June 17-July 3.** (288657) (3 cr, \$SeEd 5114; 1010-1205 MTWThF; PeikH 225; A-N only) Kimpston  
Systematic curriculum planning; students develop models for planning, formulate plans, outline a curriculum design for an educational setting.

**8501. PROBLEMS: INSTRUCTIONAL SYSTEMS.** (190877) (Cr ar; prereq  $\Delta$ ) Kimpston  
Individual empirical investigation.

**8700. CURRICULUM AND INSTRUCTIONAL SYSTEMS FIELD EXPERIENCE.** (288660) (3-6 cr [max 6 cr]; prereq #; hrs ar) Kimpston  
Internship experience in an educational setting; planning, implementing, and supervising curriculum or instructional change.

### SECOND TERM

**R5205. COMPUTER-BASED INSTRUCTION: METHODS AND DEVELOPMENT—July 21-August 8.** (190880) (3 cr; prereq 5006 or #; limited to 25 students; 0900-1200 MWF; PeikH 355; A-N only) Trollip  
Computer uses in education and training; instructional applications: tutorials, drills, simulations, instructional games, testing; model for designing instruction; criteria for selection, evaluation and examination of on-line examples.

**5509. DIRECTED INDIVIDUAL STUDY.** (1-6 cr [max 6 cr]; prereq  $\Delta$ ; A-N only)  
See First Term.

Sec 21, (187856) Trollip  
Sec 22, (990881) Carrier

**8501. PROBLEMS: INSTRUCTIONAL SYSTEMS.** (Cr ar; prereq  $\Delta$ )  
See First Term.

Sec 21, (087857) Trollip  
Sec 22, (790882) Carrier





## Dance (Dnce)

208 Middlebrook Hall. 373-4882  
College of Liberal Arts

### FIRST TERM

**R 1022. BALLROOM DANCE.**—June 17-July 11. (1 cr; each section limited to 25 students) Jette  
Elementary steps and variations of the foxtrot, waltz, tango, samba, cha-cha, rumba, and swing.

- Sec 1, (890730) 1220-1310 MTWTh, NorrisH M153A (men only)  
Sec 2, (690731) 1220-1310 MTWTh, NorrisH M153A (women only)  
Sec 3, (090886) 1325-1425 MTWTh, NorrisH M153A (men only)  
Sec 4, (590883) 1325-1425 MTWTh, NorrisH M153A (women only)

**R 1024. MODERN DANCE.** (1 cr; each section limited to 25 students) Jette

Introduction to fundamental techniques of modern dance.  
Sec 1, (490732) 0905-0955 MTWTh; NorrisH M153A  
Sec 2, (186439) 1010-1100 MTWTh; NorrisH M153A

**R 5701. WORKSHOP: DANCE PERFORMANCE**—June 17-July 11. (3 cr [max 12 cr]; limited to 25 students; prereq #)

- Sec 1, **Intermediate Modern Dance Technique.** (390884) 0905-1100 MTWThF, NorrisH M151  
Sec 2, **Advanced Modern Dance Technique and Theory.** (190885) 1220-1425 MTWThF, NorrisH M151

## Decision Sciences (DSci)

735 Management/Economics Building. 373-4377  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R 1050. ELEMENTARY MANAGERIAL STATISTICS.** (586087) (4 cr, §QA 1050; limited to 50 students; prereq Math 1111 or equiv or Math 1131; lect 0900-1130 MTh, BlegH 370; lab 0900-1015 TF; AndH 370; A-N only)  
Introduction to quantitative decision making. Probabilistic and statistical techniques in decision making, data analysis, and management information systems; e.g., laws of probability, sampling, estimation, and regression.

**R 3055. INTRODUCTION TO MANAGEMENT SCIENCES.** (186089) (4 cr, §QA 3055; limited to 50 students; prereq 1050, Math 1142 or equiv; lect 0900-1130 TTh, BlegH 415, lab 0900-1015 MW, BlegH 415; A-N only)  
Analytical approaches and quantitative reasoning in management problems; problem formulation, analytical methods for solution, and use of computer models. Management science concepts, decision theory, simulation, linear programming, implementation.

**8990. READINGS IN QUANTITATIVE ANALYSIS.** (586090) (Cr ar; prereq # and Grad Sch Mgmt approval; A-N only)

**8995. GRADUATE RESEARCH IN QUANTITATIVE ANALYSIS.** (386091) (Cr ar; prereq # and Grad Sch Mgmt approval; A-N only)

### SECOND TERM

**R 1050. ELEMENTARY MANAGERIAL STATISTICS.** (686095) (4 cr, §QA 1050; limited to 50 students; prereq Math 1111 or equiv or Math 1131; lect 0900-1130 MTh, lab 0900-1015 TF; AndH 250; A-N only)  
See First Term.

**R 3055. INTRODUCTION TO MANAGEMENT SCIENCES.** (986099) (4 cr, §QA 3055; limited to 50 students; prereq 1050, Math 1142 or equiv; lect 0900-1130 MW, lab 0900-1015 TTh; BlegH 115; A-N only)  
See First Term.

**8990. READINGS IN QUANTITATIVE ANALYSIS.** (686100) (Cr ar; prereq # and Grad Sch Mgmt approval; A-N only)

**8995. GRADUATE RESEARCH IN QUANTITATIVE ANALYSIS.** (486101) (Cr ar; prereq # and Grad Sch Mgmt approval; A-N only)

## Dental Hygiene (DH)

5164 MoosT. 373-3271  
School of Dentistry

### FIRST TERM

**3399. INDEPENDENT STUDY.** (187848) (Cr ar) Stoltenberg  
Opportunity to study an area not covered in other course offerings. May include off-campus experiences.

**3501. DH SUMMER RESIDENCY I.** (388164) (Cr ar) Stoltenberg  
Advanced clinical hygiene experience to prepare for private practice employment, community work continued education, or other career opportunities.

### SECOND TERM

**3399. INDEPENDENT STUDY.** (987849) (Cr ar) Stoltenberg  
See DH 3399 First Term.

**3502. DH SUMMER RESIDENCY II.** (188165) (Cr ar) Stoltenberg  
See DH 3501 First Term.

## Dentistry (Dent)

15-209 Moos Tower. 373-4372  
School of Dentistry

### FIRST TERM

**5054. DENTAL AUXILIARY UTILIZATION CLINIC (DAU I, II).** (985048) (2 cr total) Martens  
Clinical experience designed to help students develop specific skills in sit-down, four-handed dentistry with emphasis on the efficient utilization of chairside assistants. Through seminars, demonstrations, and clinical practice, students work daily with trained dental assisting teaching specialists in providing restorative dental services.

**5070. HEALTH ECOLOGY ELECTIVE.** (185050) (1 cr) Martens

**5075. SPECIAL TOPICS IN DENTAL ASSOCIATESHIPS.** (985051) (Cr ar; elective)

An individually designed readings and research course focused on dental practice, associateships, career decision-making and career tracks for dentists. Intended as an extension of previous practice management studies.

**5989. ADVANCED CLINICAL GERIATRIC DENTISTRY.** (186738) (Cr ar)

Practical clinical experience in examination, diagnosis, treatment planning and treatment of older adult patients in the dental clinic at the Amherst H. Wilder Senior Health Center. Extensive case history reports reflecting the total social, psychological and physical aspects of the patient as well as the oral health status will be prepared and presented.

**5995. ADVANCED CLINICAL RESTORATIVE DENTISTRY.** (189185) (Cr and hrs ar) Zidan  
Application of advanced technical and clinical procedures with emphasis on the more complex problems in operative dentistry; diagnosis and treatment planning, management of patients, and dental auxiliary utilization.

**5999. DENTAL CLINIC.** (785052) (Cr ar) Jensen

**8150. RESEARCH IN RESTORATIVE DENTISTRY.** (089186) (Cr and hrs ar) Zidan  
Organized literature review in area of specific interest of student, selection of thesis project, and completion of research and thesis.

### FIRST AND SECOND TERM: TEN-WEEK COURSES (Register once in Term I)

**5970. GENERAL PRACTICE SEMINAR I.** (289677) (Cr ar) Simmons

A sequence of lectures, discussions, and seminars on topics, related to current dental practice. Correlated with clinical experiences.

**5974. GENERAL PRACTICE CLINICAL ADMINISTRATION I.** (789750) (Cr ar) Simmons  
Residents gain field experience in Hospital Dental Clinic Administration.

**5980. GENERAL PRACTICE CLINIC I.** (189678) (Cr ar) Simmons  
A series of planned experiences in the clinical disciplines of dentistry, Emphasis on patient care.

**5984. GENERAL PRACTICE CLINIC V.** (589751) (Cr ar) Simmons  
A series of planned experiences in the clinical disciplines of dentistry. Emphasis on patient care.

### SECOND TERM

**5054. DENTAL AUXILIARY UTILIZATION CLINIC (DAU I, II).** (586994) (2 cr total) Martens  
See First Term.

**5070. HEALTH ECOLOGY ELECTIVE.** (186996) (1 cr) Martens

**5075. SPECIAL TOPICS IN DENTAL ASSOCIATESHIP.** (086997) (Cr ar; elective)  
See First Term.

**5460. PERIODONTICS: INDEPENDENT STUDY.** (189266) (Cr and hrs ar)

**5602. BIOMATERIALS: INDEPENDENT STUDY.** (289260) (Cr and hrs ar)

**5995. ADVANCED CLINICAL RESTORATIVE DENTISTRY.** (889187) (Cr and hrs ar) Zidan  
See First Term.

**5999. DENTAL CLINIC.** (189261) (Cr ar) Jensen

**Dent 8129. TOPICS AND PROBLEMS IN DENTAL EDUCATION.** (788209) (Cr ar) Loupe  
Independent study arranged for individual student to pursue advanced work in student learning, instructional development, curriculum planning, student testing and evaluation, and academic administration, where these areas and their interfaces are applied directly to professional dental education. Provides opportunity for applying and extending concepts learned in 8126, 8127, 8128.

**8150. RESEARCH IN RESTORATIVE DENTISTRY.** (689188) (Cr and hrs ar) Zidan  
See First Term.

## Dermatology (Derm)

4240 Phillips-Wangensteen Building. 625-8625  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**5181. CLINICAL PROBLEMS.** (685111) (Cr ar; prereq regis med; 1515-1645 W, MoosT 2520) Dahl, Gentry, Manick, others

**5182. PRECEPTORSHIP IN DERMATOLOGY.** (485112) (Cr ar; prereq regis med; 1515-1645 W, MoosT 2520) Dahl, Gentry, Manick, others

**5183. ADVANCED DERMATOLOGY.** (285113) (Cr ar; prereq 5181 or 5182; 1515-1645 W, MoosT 2520) Dahl, Gentry, Manick, others

**5184. SPECIAL COURSE.** (185114) (Cr ar) Manick

**5185. RESEARCH IN DERMATOLOGY.** (985115) (Cr ar; prereq 5181 or 5182) Dahl, Hordinsky

**8225. CLINICAL DERMATOLOGY.** (785116) (Cr ar) Dahl, Gentry, others

**8226. CLINICAL SEMINAR.** (585117) (Cr ar; 1300-1630 WF; PWB 4-272) Gentry, others  
Conference twice weekly on diagnosis and treatment of skin conditions.

**8227. HISTOLOGY OF THE SKIN.** (385118) (Cr ar; 1400-1500 M, 1500-1630 W; PWB 4-272) Kaye, Orkin, others  
Includes histopathology, histochemistry, and fluorescence microscopy.

**8228. RESEARCH IN DERMATOLOGY.** (185119) (Cr ar) Dahl, Hordinsky, others



- 8229. ELECTRON MICROSCOPY IN DERMATOLOGY.** (585120) (Cr ar) Zelickson, others
- 8230. FUNCTIONAL BIOLOGY OF THE SKIN.** (385121) (Cr ar) Dahl, others
- 8231. CLINICS: DERMATOLOGY: NONDERMATOLOGISTS.** (185122) (Cr ar) Gentry, others
- 8232. SEMINAR: DERMATOLOGIC HISTOPATHOLOGY, MYCOLOGY.** (085123) (Cr ar) Kaye, Manick, others

## Design (Dsgn)

240 McNeal Hall, St. Paul, 376-1536  
College of Home Economics

### FIRST TERM

- R1521. DESIGN PROCESS COLOR.** (185914) (4 cr; limited to 24 students; 0800-1200 MWF; McNH 262)  
Color concepts and their application to design. Required supplies for this course will probably exceed \$125.00
- R1523. DESIGN PROCESS: VISUAL PRESENTATION.** (491069) (4 cr; limited to 24 students; 0800-1200 MWF; McNH 258)  
Development of basic drawing skills for the designer.
- R3521. DESIGN PROCESS: COLOR II.** (891070) (4 cr; limited to 20 students; 0800-1200 TTH; McNH 262)  
Continued study of color concepts and their application to design.
- R3576. INTERNSHIP IN INTERIOR DESIGN.** (386737) (max 15 cr; S-N only; prereq 3553, Psy 1001)  
Full-time directed professional work experience with a firm, studio, retail store, or community service organization.
- R5571. SPECIAL TOPICS IN APPLIED DESIGN: Complex Weaves—From the Traditional Floor Loom to the Jacquard.** June 16-28. (691653) (3 cr; prereq 3532 or other beginning floor loom class; limited to 18 students; 0800-1200, 1300-1500 MTWThF; McNH 16) Jirousek  
Studio experience in multi-harness weaving, including the dobby and Jacquard loom. Drafting and design of complex weaves.

### SECOND TERM

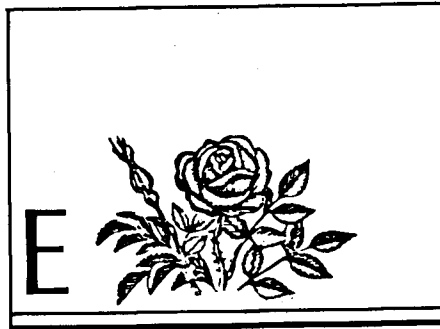
- R1550. DRAFTING—BASIC DRAFTING TECHNIQUES.** (291459) (4 cr; limited to 20 students; 0800-1200 MTH; McNH 69) Hutchins  
Architectural drafting instruction in the use of drafting instruments. Emphasis on plans, elevations, details, and architectural symbols and vocabulary as related to interior design. Required supplies for this course will probably exceed \$125.00.
- R3525. DESIGN PROCESS: TWO-DIMENSIONAL DESIGN II.** (391047) (4 cr; limited to 24 students; 0800-1200 MWF; McNH 258)  
Experiments with principles of two-dimensional design.
- R3576. INTERNSHIP IN INTERIOR DESIGN.** (586736) (max 15 cr; S-N only; prereq 3553, Psy 1001)  
Full-time directed professional work experience with a firm, studio, retail store, or community service organization.

## Dutch (Dtch)

219 Folwell Hall, 373-2624  
College of Liberal Arts

### FIRST AND SECOND TERM: TEN-WEEK COURSE (Register once in Term I)

- R1101-1102-1103†. BEGINNING AND INTERMEDIATE DUTCH: CLASSROOM INSTRUCTION.** (15 cr for both terms; \$1110; limited to 25 students; 0905-1205 MTWThF; FoIH 302) Van Kampen  
Structure, listening and reading comprehension, writing, speaking. A concentrated program of study committed to bringing students to the intermediate level according to the national ACTFL Proficiency Guidelines. Students must enroll in all three courses and may not enroll in other summer courses. Prospective students should talk to an adviser before registering for intensive language courses.
- R1101, Sec 5, (691071) June 17-July 9, 5 cr  
R1102, Sec 5, (491072) July 10-July 31, 5 cr  
R1103, Sec 5, (291073) August 1-August 22, 5 cr



## East Asian Studies (EAS)

113 Folwell Hall, 373-2564  
College of Liberal Arts

### FIRST TERM

- 3471. 20TH-CENTURY JAPAN.** (991075) (4 cr, \$Hist 3471, 5471; 1010-1100 MTWThF; FoIH 50) Marshall  
Development of an industrial society, parliamentary government, mass culture, and imperialism from Meiji reforms of 19th century through World War II to contemporary period. Meets with Hist 3471 and Hist 5471.
- 3808. MUSIC IN EAST ASIA** (191074) (4 cr, \$Mus 3808; 1325-1415 MTWThF; FergH 123) Kagan  
Religious, courtly, operatic, chamber, and folk music of China, Japan, Korea, and Tibet. Historical developments and cultural determinants of style, repertoire, and usage. Meets with Mus 3808.
- 3970. DIRECTED STUDIES.** (687862) (1-15 cr; prereq #, Δ, □) Staff

### SECOND TERM

- 3468. PEOPLE'S REPUBLIC OF CHINA: THE COMMUNIST REVOLUTION, 1900 TO PRESENT.** (791076) (4 cr, \$Hist 3468, 5468; 1010-1100 MTWThF; BlegH 210) Farmer  
Introduction to Marxism in China, rise of Communist Party, and development of rural guerilla movement. Career of Mao Tse-tung and developments in People's Republic; the Great Leap, Cultural Revolution, Gang of Four. Meets with Hist 3468 and Hist 5468.
- 3970. DIRECTED STUDIES.** (987866) (1-15 cr; prereq #, Δ, □) Staff

## Ecology and Behavioral Biology (EBB)

109 Zoology, 373-5177  
College of Biological Science

(See also Itasca Biology Program, page 79)

### FIRST TERM

- R3800. INTRODUCTION TO FIELD RESEARCH—July 6-August 16.** (189860) (10 cr; limited to 20 students; prereq 2 courses in biology, Δ; hrs ar; offered at Itasca) Regal
- R5814. COMMUNITY STRUCTURE AND FUNCTION—July 6-August 16.** (591077) (5 cr; limited to 20 students; prereq course in ecology; 0800-1700 WS; offered at Itasca) Auerbach
- R5817. VERTEBRATE ECOLOGY—July 6-August 16.** (391078) (5 cr; limited to 15 students; prereq course in ecology, #, Δ; 0800-1700 TF; offered at Itasca) Tester
- R5820. WETLAND ECOLOGY—July 6-August 16.** (391081) (10 cr; limited to 15 students; prereq 15 cr in biol, Δ...introductory chem, course in plant identification, Biol 3041 rec; offered at Itasca) Gorham
- R5831. NATURAL HISTORY OF INVERTEBRATES—June 15-July 5.** (186349) (5 cr; limited to 20 students; prereq course in general biology or equiv, Δ; 0800-1700 MTH; offered at Itasca) Gilbertson

- R5834. FIELD ORNITHOLOGY—June 15-July 19.** (989861) (5 cr; limited to 15 students; prereq course in general biology or equiv, Δ; 0800-1700 WS; offered at Itasca) Warner

**5970. DIRECTED STUDIES.** (089852) (Cr ar; prereq Δ) Staff

**5990. DIRECTED RESEARCH.** (289114) (Cr ar; prereq #, Δ) Staff  
Laboratory or field investigation of selected areas of research.

**8391. ADVANCED WORK IN ECOLOGY AND BEHAVIORAL BIOLOGY.** (889853) (Cr ar; prereq #) Staff

**R8800. ADVANCED FIELD ECOLOGY—July 6-August 16.** (891084) (limited to 24 students; prereq admission to a grad program, Δ; offered at Itasca)

### SECOND TERM

**5970. DIRECTED STUDIES.** (690793) (Cr ar; prereq Δ) Staff

**5990. DIRECTED RESEARCH.** (189115) (Cr ar; prereq #, Δ) Staff  
See First Term.

**8391. ADVANCED WORK IN ECOLOGY AND BEHAVIORAL BIOLOGY.** (490794) (Cr ar; prereq #) Staff

## Economics (Econ)

1035 Management/Economics Building, 373-3690  
College of Liberal Arts

(See also Public Affairs)

### FIRST TERM

- R1001. PRINCIPLES OF MACROECONOMICS.** (4 cr, \$1004, \$1014, \$3001, \$3002; each section limited to 40 students; prereq 3rd-qr fr or CDS student, knowledge of elementary algebra at level of Math 0006)  
National income, money and banking, business cycles, and international trade.
- Sec 1, (190045) 0800-0850 MTWThF, BlegH 135  
Sec 2, (090046) 0905-0955 MTWThF, AndH 330  
Sec 3, (890047) 1010-1100 MTWThF, BlegH 130  
Sec 4, (690048) 1115-1205 MTWThF, BlegH 250  
Sec 5, (490049) 1220-1310 MTWThF, BlegH 145

**R1002. PRINCIPLES OF MICROECONOMICS.** (4 cr, \$1005, \$1015, \$3001, \$3002; each section limited to 40 students; prereq 3rd-qr fr; knowledge of elementary algebra at level of Math 0006)  
Demand and supply, competition and monopoly, and the distribution of income.

- Sec 1, (890050) 0800-0850 MTWThF, BlegH 105  
Sec 2, (690051) 0905-0955 MTWThF, BlegH 215  
Sec 3, (490052) 1010-1100 MTWThF, BlegH 215  
Sec 4, (687876) 1115-1205 MTWThF, BlegH 205

**R3101. MICROECONOMIC THEORY.** (290053) (4 cr, \$3105, \$5151; no cr SMgt student; limited to 50 students; prereq 1001, 1002, Math 1111 or Math 1131 equiv or #; 1010-1100 MTWThF; BlegH 235)

Behavior of firms and industries under competitive and monopolistic conditions; factors influencing production, price, and advertising decisions. Meets with 5151.

**R3102. MACROECONOMIC THEORY.** (190054) (4 cr, \$5152; limited to 45 students; prereq 3101 or equiv; 1115-1205 MTWThF; BlegH 440)

Determinants of national income, employment, and price level; aggregate consumption and investment. Meets with 5152.

**R3105. MANAGERIAL ECONOMICS.** (089334) (4 cr, \$3101, \$BGS 3001; limited to 45 students; prereq 1001, 1002, 1 qtr calculus, School of Management student; 0905-0955 MTWThF; BlegH 225)

Theory of the firm; managerial decision problems. Demand theory. Production technology and cost concepts. Pricing and output decisions. Investment behavior.

**R3501. LABOR ECONOMICS.** (586154) (4 cr, \$5531; limited to 50 students, not open to economics majors; prereq 1001, 1002 or equiv; 1115-1205 MTWThF; BlegH 235) Simler  
Role of labor in economy; labor as a factor of production; population and the labor force; economics of labor markets; labor market institutions; theories of wages and employment; unions and collective bargaining, public policy.

**R3701. MONEY AND BANKING.** (789523) (4 cr, \$5701, \$5721; limited to 100 students; prereq 1001, 1002 or equiv; not open to economics majors; 1115-1205 MTWThF, AndH 230)

Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve system and monetary policy.

**3970. DIRECTED STUDIES.** (990055) (Cr ar; prereq #, Δ, □)

**5151. ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD.** (790056) (3 cr, §3101; limited to 15 students; prereq 1001, 1002, 1 qtr calculus, grad student or #; 1010-1100 MTWThF; BlegH 235)

Individual decision making by households and firms under conditions of monopoly, competition; some welfare economics. Meets with 3101.

**5152. ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT.** (590057) (3 cr, §3102; limited to 15 students; prereq 1001, 1002, 1 qtr calculus, grad student or #; 1115-1205 MTWThF; BlegH 440)

Determinants of national income, employment, and price level; aggregate consumption, investment, and asset holding. Meets with 3102.

**5301. ECONOMIC DEVELOPMENT.** (390058) (4 cr, §5331; limited to 35 students; prereq 1001, 1002 or equiv; not open to economics majors; 1115-1205 MTWThF; BlegH 215) Smith  
Problems of economic growth in low income countries. Theory of aggregate and per capita income growth. Role of population growth, productivity increases and capital formation. Allocation of resources between consumption and investment and among sectors. International assistance and trade. Meets with 5331.

**5331. ECONOMIC DEVELOPMENT.** (190059) (4 cr, §5301; limited to 35 students; prereq 3101, 3102 or equiv or #; 1115-1205 MTWThF; BlegH 215) Smith  
See 5301. Meets with 5301.

**5401. INTERNATIONAL ECONOMICS.** (590060) (4 cr, §5431; limited to 50 students; not open to economics majors; prereq 1001, 1002 or equiv; 1010-1100 MTWThF; BlegH 420) Smith

The case for free trade. Effects of tariffs; protection of infant industries; common markets. Balancing international receipts and payments, the role of exchange rates, international monetary reform.

**5431. INTERNATIONAL ECONOMICS.** (390061) (4 cr, §5401; limited to 50 students; prereq 3102, 3103 or equiv or #; 1010-1100 MTWThF; BlegH 135)  
See 5401.

**5721. MONEY AND BANKING.** (190062) (4 cr, §3701, §5701; limited to 50 students; prereq 3102 or equiv; 0905-0955 MTWThF; BlegH 115)

Historical development, present characteristics, and economic role of financial institutions. Commercial banking, the Federal Reserve system and monetary policy.

**5731. MACROECONOMIC POLICY.** (891652) (4 cr, limited to 50 students; prereq 3102, 1115-1205 MTWThF; BlegH 150)  
Evaluation of policy alternatives. Rational expectations. Rules versus discretion. Control of inflation. Natural rate of unemployment. Targets and instruments.

**5831. COST-BENEFIT ANALYSIS.** (386155) (4 cr; limited to 50 students; prereq 3101, 3103; 0800-0850 MTWThF; BlegH 115)

Principles for evaluation of benefits and costs of public projects or programs. Definition and measurement of benefits and costs. Rate of return and rate of discount. Treatment of market imperfections, risk and uncertainty.

**5970. DIRECTED STUDIES.** (090063) (Cr ar; prereq #, Δ, □)  
Areas useful to individual programs and objectives not available in regular course offerings.

**8990. INDIVIDUAL GRADUATE RESEARCH.** (890064) (Cr ar) Staff

## SECOND TERM

**1001. PRINCIPLES OF MACROECONOMICS.** (4 cr, §1004, §1014, §3001, §3002; each section limited to 45 students; prereq 3rd-4th fr or CDS student, knowledge of elementary algebra at level of Math 0006)  
See First Term.

Sec 1, (285337) 0800-0850 MTWThF, BlegH 250  
Sec 2, (185338) 0905-0955 MTWThF, BlegH 425  
Sec 3, (287878) 1010-1100 MTWThF, BlegH 435

**1002. PRINCIPLES OF MICROECONOMICS.** (4 cr, §1005, §1015, §3001, §3002; each section limited to 40 students; prereq 3rd-4th fr; knowledge of elementary algebra at level of Math 0006)  
See First Term.

Sec 1, (985339) 0800-0850 MTWThF, BlegH 235  
Sec 2, (185341) 0900-0955 MTWThF, BlegH 250  
Sec 3, (985342) 1010-1100 MTWThF, BlegH 130  
Sec 4, (785343) 1115-1205 MTWThF, BlegH 215

**3101. MICROECONOMIC THEORY.** (4 cr, §3105, §5151; no cr SMGT student; section 1 limited to 50 students; prereq 1001, 1002, Math 1111 or equiv Math 1131 or #)  
See First Term. Sec 1 meets with 5151.

Sec 1, (385345) 0905-0955 MTWThF, BlegH 150  
Sec 2, (885348) 0905-0955 MTWThF, HHHCtr 35, Kudrie  
(August 18-September 19; Humphrey Institute students only)

**3102. MACROECONOMIC THEORY.** (685349) (4 cr, §5152; limited to 50 students; prereq 3101 or equiv; 1115-1205 MTWThF; BlegH 250)  
See First Term. Meets with 5152.

**3103. WELFARE ECONOMICS.** (885351) (4 cr; limited to 50 students; prereq 3101 or 3101H or equiv; 1015-1105 MTWThF; AndH 330) Coen

Introduction to welfare economics. Economic efficiency and the conditions necessary to sustain it. Conflicts between the efficiency and income distribution goals. How market structure and public policies increase or decrease efficiency.

**3105. MANAGERIAL ECONOMICS.** (889335) (4 cr, §3101, §BGS 3001; limited to 45 students; prereq 1001, 1002, 1 qtr calculus. School of Management student; 1010-1100 MTWThF; BlegH 105)  
See First Term.

**3601. INDUSTRIAL ORGANIZATION AND ANTITRUST POLICY.** (186156) (4 cr, §5631; limited to 30 students; not open to economics majors; prereq 1001, 1002 or equiv; 1010-1100 MTWThF, BlegH 215)

Economic aspects of antitrust and related policies. Relations between market structure and economic efficiency and welfare. Economic origins of monopoly and other restraints on competition. Purposes and effects of antitrust and related legislation. Meets with 5631.

**3701. MONEY AND BANKING.** (685352) (4 cr, §5701, §5721; limited to 50 students; prereq 1001, 1002 or equiv; not open to economics majors; 0905-0955 MTWThF; BlegH 235)  
See 3701 First Term.

**3801. ELEMENTS OF PUBLIC FINANCE.** (886158) (4 cr, §5821; limited to 30 students; prereq 1001, 1002 or equiv; not open to Economics majors; 0905-0955 MTWThF; BlegH 145)  
Tax and expenditure policies, primarily at federal level. Impact of tax structure on the distribution of income. Evaluation of public programs. Optimal mix of public and private sector output. Meets with 5821.

**3970. DIRECTED STUDIES.** (485353) (Cr ar; prereq 1002, #, Δ, □)

**5151. ELEMENTS OF ECONOMIC ANALYSIS: FIRM AND HOUSEHOLD.** (285354) (3 cr, §3101; limited to 15 students; prereq 1001, 1002, 1 qtr calculus, grad student or #; 0905-0955 MTWThF, BlegH 150)  
See First Term. Meets with 3101, Sec 1.

**5152. ELEMENTS OF ECONOMIC ANALYSIS: INCOME AND EMPLOYMENT.** (785357) (3 cr, §3102; limited to 15 students; prereq 1001, 1002, 1 qtr calculus, grad student or #; 1115-1205 MTWThF; BlegH 250)  
See First Term. Meets with 3102.

**5307. COMPARATIVE ECONOMIC SYSTEMS.** (287881) (4 cr, §5337; limited to 35 students; prereq 1001, 1002 or equiv; not open to Econ majors; 1010-1100 MTWThF; BlegH 120) Smith  
Functions of economic systems; market economy, liberal socialism, centrally planned economy. American and Soviet economies. Meets with 5337.

**5337. COMPARATIVE ECONOMIC SYSTEMS.** (187882) (4 cr, §5307; limited to 25 students; prereq 3101, 3102 or #; 1010-1100 MTWThF; BlegH 120) Smith  
See 5307. Meets with 5307.

**5401. INTERNATIONAL ECONOMICS.** (187879) (4 cr, §5431; limited to 50 students; not open to economics majors; prereq 1101, 1002 or equiv; 1115-1205 MTWThF; BlegH 120) Smith  
See First Term.

**5631. INDUSTRIAL ORGANIZATION AND ANTITRUST POLICY.** (086157) (4 cr, §3601; limited to 30 students; prereq 3103; 1010-1100 MTWThF, BlegH 215)  
See 3601. Meets with 3601.

**5821. ELEMENTS OF PUBLIC FINANCE.** (686159) (4 cr, §3801; limited to 20 students; prereq 3101...3303; 0905-0955 MTWThF; BlegH 145)  
See 3801. Meets with 3801.

**5970. DIRECTED STUDIES.** (585358) (Cr ar; prereq #, Δ, □)  
CLA approval) Staff  
See First Term.

**8990. INDIVIDUAL GRADUATE RESEARCH.** (385359) (Cr ar) Staff

## Educational Administration (EdAd)

275 Peik Hall, 373-5568, 373-9899  
College of Education

### FIRST TERM

**5103. SUPERVISION AND ADMINISTRATION OF SPECIAL EDUCATION—June 17-July 1.** (086479) (3 cr, §EPsy 5660 or PsyS 5160; limited to 25 students; 0800-0955 MTWThF; PeikH 31; A-N only) Weatherman  
Procedures for establishing and improving educational programs for emotional children. Meets with EPsy 5660.

**5128. WORKSHOP: EDUCATIONAL ADMINISTRATION.** (1-6 cr; section 2 limited to 40 students; S-N optional)  
Laboratory approach provides opportunities for experienced administrators to concentrate on common administrative and supervisory problems. See Special Programs section.

Sec 1, **Community Education in the Year 2000, July 7-11.** (891232) 3 cr, 1230-1900 MTWThF and 3 hrs ar; ClaOff B45, Hughes. Meets with Educ 5103.

Sec 2, **Clinical Supervision for School Administrators, July 14-18.** (186473) 3 cr, 0830-1700 MTWThF, Kellogg Senior High School, 15 E County Rd B-2, Roseville Area Schools, Little Canada, MN, Suzuki

**5180. SEMINAR: ADMINISTRATION OF SPECIAL EDUCATION—July 2-18.** (691233) (3 cr, §EPsy 8760; prereq 5103 or EPsy 5660 or PsyS 5160 or #; A-N only; 0800-0955 MTWThF, PeikH 46) Weatherman  
Problems of administration and organization of special education programs. Meets with EPsy 8760.

**5201. FORMAL ORGANIZATIONS IN EDUCATION.** (591239) (3 cr, §8201; 1010-1215 TTh; PeikH 215; A-N only) Popper  
Formal school organization as a complex social system focusing on the executive role and its extensions, administrative process, and the historical development of the professional field.

**5202. POLITICS OF EDUCATION.** (189106) (3 cr, §8202 or SPFE 8202 or 5202; 1010-1205 MWf; PeikH 28; A-N only) Mazzoni  
Social science findings, concepts, and methods used to consider the political context of educational administration; emphasis on public school policy by local and state governments; role of administrators. Meets with SPFE 5202.

**5210. FINANCING ELEMENTARY AND SECONDARY SCHOOLS.** (487894) (3 cr, §8210; 0800-0955 MWf; PeikH 215; A-N only) Mueller  
Value assumptions and educational finance policy, economic factors, sources and characteristics of educational revenue, state and local distribution systems, federal support, urban/rural variations, institutional financing alternatives.

**5213. FINANCIAL RESOURCE MANAGEMENT—July 14-August 11.** (491234) (3 cr, §8213; prereq 5212 or 8212 or #; 0930-1200, 1300-1530 M, 125 Bohannon Hall, University of Minnesota, Duluth; A-N only) Sederberg  
Students must register on the Twin Cities Campus. Registration forms available in class the first day. Concepts and skills involved in the management of financial resources in public schools; performance exercises related to public school accounting systems, purchasing, the controller function, and reporting and interpreting school financial data.

**5224. LEGAL IMPLICATIONS OF ACTS BY SCHOOL BOARDS, ADMINISTRATORS, AND TEACHERS—June 17-July 1.** (291235) (3 cr, §8224; 1220-1415 MTWThF; BlegH 260; A-N only) Hooker  
Constitutional, statutory, and common-law bases of school administration; principles growing out of fundamental legal procedures.

**5227. PUBLIC SCHOOL PERSONNEL PROGRAMS—June 17-July 1.** (089107) (3 cr, §8227; 1230-1425 MTWThF, PeikH 225; A-N only) Alkire  
Selection, assignment, evaluation, and development of school personnel; salary and conditions of service; policies for administrative, instructional, and noninstructional personnel.

**5250. AMERICAN HIGHER EDUCATION.** (588695) (4 cr; §Educ 5250, §HiEd 5250; S-N optional; 0800-0955 MW; PeikH 315) Clark

Higher and postsecondary educational systems and institutions; purposes and functions; governance and organization, instructional programs, outcomes. Meets with HiEd 5250.

**5280. INTRODUCTION TO THE ECONOMICS OF EDUCATION.** (191236) (4 cr; §SPFE 5180; 1010-1255 TTh; EdHAnnex 64; A-N only) Lewis  
Economic impact of education on educational markets, prices and production relationships, distribution of income, and investment and cost-benefit analysis in education. Meets with SPFE 5180.

**8215. THE ELEMENTARY SCHOOL PRINCIPALSHIP—July 2-18.** (589992) (3 cr; 1115-1310 MTWThF; PeikH 155) Lambert  
Problems in elementary school administration and the principal's role of leadership.

**8220. QUANTITATIVE FOUNDATIONS FOR MANAGEMENT METHODS.** (389993) (3 cr; 0800-1015 TTh; PeikH 33) Hendrix  
Quantitative techniques for research and analysis of policy, program, and management problems and decision situations in administration of educational organizations; includes computer usage.

**8228. PROBLEMS: HIGHER EDUCATION.** (Cr and hrs ar, §HiEd 8228; prereq #)  
Selected topics on college programs, instruction, organization, and administration.

Sec 1, (291705) Assessment of the Undergraduate Experience—June 27-July 3. See HiEd 8228 for description of special course/conference on undergraduate assessment. Corcoran

Sec 21, (388696) Clark

Sec 22, (188697) Corcoran

Sec 23, (086661) Hearn

Sec 24, (991237) Kellogg

Sec 25, (791238) Lewis

**8238. SEMINAR: THEORY AND RESEARCH.** (689319) (3 cr; prereq 8218 and 8235, educational administration major or #; 1010-1205 MWF; PeikH 31) Mueller  
Research design involving thesis or field project; includes interrelatedness of formulation of conceptual framework and the analytical process; clinical and research problems.

**8253. ADMINISTRATION IN HIGHER EDUCATION.** (088698) (3 cr, §HiEd 8255; prereq 5250 or HiEd 5250; 1010-1215 MW; PeikH 27) Hearn  
Higher education governance, management, and leadership from the theoretical and applied perspectives; decision-making structures and processes, management of constrained resources, conflict management, information systems and planning. Meets with HiEd 8255.

## Educational Administration special interest courses

**Administrator Development Seminar**—Applicants for admission to degree programs in educational administration are encouraged to participate in a second term seminar requiring a combined registration in EdAd 5130 and EdAd 5139. Assessment and counseling, skill development, and contemporary issues in the field are topics of this second term seminar. See course listings for registration requirements. Registration in both courses for a total of 6 credits is mandatory, and advance application is required. Inquiries should be addressed to the Department of Educational Policy and Administration, 275 Peik Hall, University of Minnesota, 159 Pillsbury Drive S.E., Minneapolis, MN 55455.

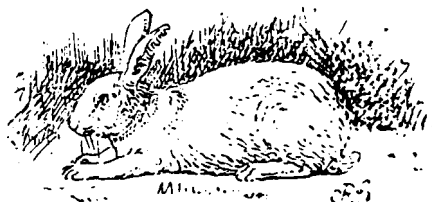
**Clinical Supervision for School Administrators**—Joel Suzuki, a nationally known authority on clinical supervision in schools, will offer a concentrated section of EdAd 5128 (section 2) July 14-18. This course provides practicing and prospective school administrators instruction and experience in collecting and analyzing observational data, and trains them to conduct teacher conferences to incorporate the elements of effective instruction. Students will have the opportunity to learn in a realistic setting at the Roseville Area Schools, where parking and air-conditioned facilities will be provided. Inquiries should be addressed to 275 Peik Hall, 159 Pillsbury Drive S.E., Minneapolis, MN 55455, or call 612/373-5568, or 373-9899.

**Crucial Faculty Issues in Postsecondary Administration**—This second term workshop (August 11-22), (EdAd 5128) focuses on the evolution and governance of postsecondary institutions and their organization and administration. This workshop will be of special value to those who have had little exposure to the history of administration of such institutions. Emphasis is on all Minnesota postsecondary, nonbaccalaureate-granting institutions and the interrelationships between systems. Present status of faculty representative associations, their organization and activities, and interactions of faculty and administration in areas of staff, organization, and curriculum and resource development will be discussed.

**Financial Resource Management (EdAd 5213)** is an introductory course designed for general school and district administrators who need a broad overview of financial management. Content includes a survey of fund accounting, financial statements, cashflow management, internal control, short and long term borrowing and related topics.

**Special Education Administration**—Administration and organization of programs for handicapped individuals with emphasis on public school policy and policies of related human service agencies is offered under EdAd 5180 or EPsy 8760.

**Community Education Institute.** The theme of this year's institute offered July 7-11 is "Community Education in the Year 2000." It is listed jointly as Educ 5103 and EdAd 5128, section 1. The instructor for EdAd 5128 is Senator Jerome Hughes. Interested students should contact Professor Charles Bruning, 125 Peik Hall, University of Minnesota, 159 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-2244).



**8270. PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #)

Sec 21, (788694) Alkire  
Sec 22, (986720) Lambert

**8271. PROBLEMS: SECONDARY SCHOOL ADMINISTRATION.** (191230) (Cr and hrs ar; prereq #) Popper

**8272. PROBLEMS: EDUCATIONAL ADMINISTRATION.** (1-3 cr per term; hrs ar)  
For superintendents and principals qualified to make intensive studies of a school system.

Sec 21, (485823) Alkire  
Sec 22, (189994) Hendrix  
Sec 23, (089995) Hooker  
Sec 24, (889996) Lambert  
Sec 25, (689997) Mazzoni  
Sec 26, (489998) Mueller  
Sec 27, (886659) Popper  
Sec 28, (786721) Sederberg  
Sec 29, (991240) Weatherman

**8273. FIELD STUDY.** (0-10 cr; prereq #; hrs ar)  
Required for specialist in education certificate. The 10 credits will be based on a written report covering an approved field study. Students may register for the general planning and organization of their study without credit.

Sec 21, (185825) Alkire  
Sec 22, (889321) Hendrix  
Sec 23, (689322) Hooker  
Sec 24, (489323) Lambert  
Sec 25, (189325) Mazzoni  
Sec 26, (989326) Mueller  
Sec 27, (186660) Popper  
Sec 28, (586719) Sederberg  
Sec 29, (091231) Weatherman

**SECOND TERM**

**5128. WORKSHOP: EDUCATIONAL ADMINISTRATION: Crucial Faculty Issues in Postsecondary Administration—August 11-22.** (685867) (1-6 cr; 0900-1200 MTWThF; Peik 31; S-N optional) Morgan  
See First Term. This offering for 3 credits.

**81530. ADMINISTRATOR DEVELOPMENT SEMINAR.** (287900) (3-9 cr [max 9 cr]; limited to 25 students; 1010-1520 MTWThF; PeikH 46; A-N only) Alkire

Assessment and development of skills required of the administrator in planning, decision making, and human relations; introduction to contemporary issues in educational administration; polling community opinions on educational issues confronting schools in urban areas. Initial course for students pursuing professional licensure programs. Participants register concurrently for 3 credits in EdAd 5130 and 3 credits in EdAd 5139. Advance application required by July 15, 1986.

**81539. LABORATORY IN DECISION MAKING.** (187901) (1-4 cr per qtr; limited to 25 students; 1010-1520 MTWThF; PeikH 46; A-N only) Alkire

Contributions of recent research and theory to effective administration; analysis of administrative behavior in realistic settings and relations of administration to human behavior. Participants register concurrently for 3 credits in EdAd 5130 and 3 credits in EdAd 5139. Advance application required by July 15, 1986.

**5203. THE COMMUNITY SCHOOL—July 21-August 8.** (391257) (3 cr; 1010-1205 MTWThF; PeikH 27; A-N only) Popper

Changing structure and process in school organization; the evolving team model; the multiple skills process in socialization.

**5213. FINANCIAL RESOURCE MANAGEMENT.** (491461) (3 cr; \$8213; prereq 5212 or 8212 or #; 1220-1445 TTh; PeikH 225; A-N only) Sederberg  
See First Term for description. First term class meets in Duluth. July 14-August 11.

**8221. QUANTITATIVE MODELS FOR PROGRAM ANALYSIS AND RESEARCH—July 21-August 5.** (188675) (3 cr; prereq 8220; 0800-0955 MTWThF; PeikH 33) Duane  
Quantitative techniques for program analysis, research, and decision making in the administration of educational organizations; emphasis on general linear models and computer usage.

**8247. SEMINAR: SCHOOL DISTRICT POLITICS.** (991254) (3 cr; prereq 8202; 1010-1205 MWF; PeikH 33) Mazzoni  
Local school district as an arena for political action; emphasis on conceptual and technical skills useful to administrators exercising policy leadership in this arena.

# Educational Psychology workshops

**Consultation for Professionals—(EPsy 5400, June 17-July 3)** This workshop focuses on application of consultation strategies to human service areas, particularly to school settings. Participants will develop a theoretical base for consultation, examine major consultation models for their utility and differences, and develop a systematic approach to consultation by application of strategies learned in a variety of case situations. The course is designed for teachers, special educators, psychologists, health and recreation professionals, human resource development specialists, and other caregivers. For information contact Professor W. Wesley Tenyson, 137 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455, or call 612/373-2239.

**Cross-Cultural Counseling—(EPsy 5461)** scheduled as an intensive one-week workshop for 3 credits (July 21-25), will focus on the special influences and issues of cultural differences as they affect the counseling process. Participants will develop effective skills in counseling culturally different clients as they address the role of cultural values in the counseling process and those values implicit in Western therapeutic modes, conceptions of mental health and deviant behavior in other cultures, and ethical issues and dilemmas in cross-cultural counseling. The workshop will include practical experience as well as lectures and guest speakers.

**8264. THE SECONDARY SCHOOL PRINCIPALSHIP.** (285869) (3 cr; 1010-1100 MTWThF; PeikH 215) Nickerson  
Role of the principal: qualifications, duties, and problems, including current issues and factors of staff and student relationships.

**8265. ADMINISTERING THE HIGH SCHOOL PROGRAM.** (485871) (3 cr; 0800-0850 MTWThF; PeikH 215) Nickerson  
Practices and procedures used in building a master schedule; analysis and evaluation of the school program and services.

**8270. PROBLEMS: ELEMENTARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #)  
Sec 21, (787903) Alkire  
Sec 22, (285872) Lambert

**8271. PROBLEMS: SECONDARY SCHOOL ADMINISTRATION.** (Cr and hrs ar; prereq #)  
Sec 21, (185873) Nickerson  
Sec 22, (985874) Popper

**8272. PROBLEMS: EDUCATIONAL ADMINISTRATION.** (1-3 cr per term; hrs ar)  
See First Term.

Sec 21, (785018) Alkire  
Sec 22, (585019) Hendrix  
Sec 23, (985020) Lambert  
Sec 24, (785021) Mazzoni  
Sec 25, (785875) Morgan  
Sec 26, (585876) Nickerson  
Sec 27, (385877) Popper  
Sec 28, (085879) Sederberg  
Sec 29, (591256) Weatherman

**8273. FIELD STUDY.** (0-10 cr; prereq #; hrs ar)  
See First Term.

Sec 21, (585022) Alkire  
Sec 22, (385023) Hendrix  
Sec 23, (185024) Lambert  
Sec 24, (085025) Mazzoni  
Sec 25, (385880) Morgan  
Sec 26, (486437) Nickerson  
Sec 27, (085882) Popper  
Sec 28, (885883) Sederberg  
Sec 29, (491251) Weatherman

## Educational Psychology (EPsy)

204 Burton Hall, 373-3483  
College of Education

**FIRST TERM**

**8131. INTRODUCTION TO HUMAN RELATIONS.** (885737) (3 cr, \$PsyF 3380; limited to 30 students; prereq education sr; 0800-1000 June 17 and 0800-1100 MTWThF July 7-18; Arch 30; S-N only) Petersen

Based on small group training theory and methods; designed to help the student develop an understanding of his or her own behavior, the behavior of other individuals, and group and organizational behavior.

**8306. EXCEPTIONAL STUDENTS IN REGULAR CLASSES.** (685738) (2 cr, \$5606, \$PsyS 5106, \$PsyS 3106; limited to 60 students; 1115-1205 MTWTh; ELTH N119; A-N only) Balow

Policies and procedures for teaching handicapped and gifted students in regular school settings; exposure to special curriculum adaptations; collaborative roles of regular and special education teachers, parents, pupil personnel workers, and other educators. Meets with 5606.

**5111. PSYCHOLOGY AND PEDAGOGY OF READING.** (091309) (3 cr; \$PsyF 5148; 1300-1500 TTh; PeikH 315; A-N only) Samuels

Physiological, psychological, and linguistic factors influencing beginning and fluent reading, and their implications for instruction.

**5114. PSYCHOLOGY OF STUDENT LEARNING.** (485739) (3 cr, \$PsyF 5182; 1300-1500 MW; PeikH 315; A-N only) Samuels  
Survey of psychological methods and principles; models of the learner; topics in development, creativity, intelligence, and motivation; implications for teaching and curriculum design in preschool, elementary, and secondary education; professional training with children and adolescents as clients.

**5130. PERSONALITY AND SOCIAL DEVELOPMENT.** (285743) (3 cr, \$PsyF 5162; prereq 5 or introductory psychology; 1010-1100 MTWThF; PH 214; A-N only)  
Major concepts and research findings in adjustment and development with special emphasis on educational implications.



For information write to Kay Thomas, 129 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455, or call 612/373-4094.

**Teaching Exceptional Children (SLBP Resource or Clinical Teacher Sequence)**—The eight credits earned in a combined first-term offering of EPsy 5701, sections 2 and 3 may be applied to SLBP: LD teacher licensure or to a graduate degree by those students admitted to the Graduate School. Participants will work with learning-disabled children, concentrating on the remediation of academic problems and the quality of interaction between teacher and learner. Enrollment is limited to those who have completed EPsy 5615 during the academic year 1985-86. Advance application is required by May 15, 1986. Requests should be directed to Professor Stanley L. Deno, 233 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455.

**Teaching Children With Emotional Disturbances**—The eight credits earned in EPsy 5701, section 1, a workshop scheduled during a six-week period from June 17 through July 25, may be applied to SLBP:ED licensure or to a graduate degree with consent of the adviser. Priority will be given to those seeking licensure, but teachers, administrators, and other professionals in the field are encouraged to apply for admission. Advance application is required. Requests should be directed to Professor Frank H. Wood, 226 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455. See Course Descriptions section for registration information.

**#5135. WORKSHOP IN HUMAN RELATIONS.** (585747) (6 cr, \$PsyF 5305; limited to 25 students; 0800-1300 June 17 and 0800-1300 MTWThF July 7-18; Arch 15; S-N only) Maruyama  
Experientially based course including simulation activities, curriculum writing, and supervised practice in basic human relations skills emphasizing individual, cultural, and ethnic differences and their implications for educational practice.

**5220. EDUCATIONAL MEASUREMENT IN THE CLASSROOM.** (885754) (4 cr, \$PsyF 5120; 0905-0955 MTWThF; ChDev 216; S-N optional) Terwilliger  
Principles and methods for construction, evaluation, and improvement of classroom measures; techniques for describing results statistically; use of measurement in evaluating instruction and student performance; assignment of grades.

**5221. BASIC PRINCIPLES OF MEASUREMENT.** (185758) (3 cr, \$PsyF 5121; prereq 5260 or 8260 or PsyF 5110 or 8110; 1010-1100 MTWThF; ChDev 216; S-N optional) Terwilliger  
Fundamental concepts, principles, and methods in educational and psychological measurement; educationally useful properties of tests; types and uses of derived scores; factors influencing reliability and validity.

**5240. PRINCIPLES AND METHODS OF EVALUATION.** (391310) (3 cr; \$PsyF 5125; 0800-0850 MTWThF; BuH 123; S-N optional)  
Introductory course in program evaluation; theory; practical examples; purpose, roles, program descriptions, and evaluation strategies.

**#5260. INTRODUCTORY STATISTICAL METHODS.** (4 cr, \$PsyF 5110; each section limited to 40 students; S-N optional) Stecklein  
Techniques for organizing and presenting data; descriptive indices of central tendency, variability, and bivariate correlation/regression; procedures for making inferences concerning means and proportions.

Sec 1, (785763) 0800-0850 MTWThF, BuH 125

Sec 2, (585764) 0905-0955 MTWThF, BuH 125

**5280. COMPUTER PROGRAMMING.** (385765) (3 cr, \$PsyF 5330; prereq sr; 0800-0850 MTWThF; BuH 120; S-N optional) D Anderson  
Computer as a tool for research in the behavioral sciences; computer systems, language, and development of specific programs demonstrating computer characteristics; laboratory experience.

**5400. WORKSHOP: COUNSELING PSYCHOLOGY: Consultation For Professionals—June 17-July 3.** (191308) (1-6 cr [max 12 cr]; prereq #: 1010-1205 MTWThF, BuH 125; A-N only) W Tennyson

For all counselors, teachers, and administrators; aspects of intervention theory in relation to psychological principles; counseling, career development, assessment, psychological education, and consultation. This 2-credit workshop will cover application of consultation strategies to human service areas, particularly to school settings; major consultation models examined for their utility.

**5401. COUNSELING PROCEDURES.** (685769) (3 cr, \$PsyS 5110; limited to 35 students; 1010-1205 TTh, 1 hr ar; BuH 123; A-N only) Shaffer

For persons whose professional work includes counseling and interviewing; not for licensure as school counselors. Emphasis on counseling relationship and principles of interviewing; case studies, role-playing, and demonstration.

**5601. EDUCATION OF EXCEPTIONAL CHILDREN.** (485773) (4 cr, \$PsyS 5101; 0905-0955 MTWThF; WulIH 130; A-N only) Turnure  
Introduction to field of special education for classroom teachers and other school personnel.

**5604. SOCIAL AND VOCATIONAL DEVELOPMENT OF HANDICAPPED STUDENTS.** (285774) (4 cr, \$PsyS 5104; 0800-0850 MTWThF; ChDev 105; A-N only) W Tennyson  
Organization and design of training programs to promote independent living, vocational and community adjustment of handicapped persons; curriculum materials and methods at adolescent and adult levels.

**#5606. EXCEPTIONAL STUDENTS IN REGULAR CLASSES.** (585778) (2 cr, \$3606, \$PsyS 3106, \$PsyS 5106; limited to 10 students; 1115-1205 MTWThF; ELTH N119; A-N only) Balow

Policies and procedures for teaching handicapped and gifted students in regular school settings; exposure to special curriculum adaptations; collaborative roles of regular and special education teachers, parents, pupil personnel workers, and other educators. Meets with 3606.

**5608. PARENT AND PROFESSIONAL PLANNING FOR HANDICAPPED STUDENTS.** (191311) (3 cr, \$PsyS 5108; 0800-0850 MTWThF; ChDev 216; A-N only) Bruininks  
Study and demonstration of constructive approaches to

cooperative planning and implementation of education programs by parents, teachers, and persons involved with children who have special needs.

**5615. EDUCATIONAL INTERVENTIONS FOR LEARNING DISABILITIES—June 17-July 11.** (091312) (5 cr; 1000-1200 MTWThF; Arch 30; A-N only) Deno  
Planning, implementing, and evaluating academic programs for students with disabilities in written and spoken language, quantitative concepts, and in cognitive skills required for learning.

**5645. TEACHING SPEECH TO THE HEARING IMPAIRED I.** (891313) (3 cr; \$PsyS 5145; 0905-0955 MTWThF; NichH 107; A-N only) Rose  
Survey of speech methodologies in teaching auditorily impaired children; major emphasis on techniques for teaching specific sounds, articulation, voice, and sentence rhythm, stressing intelligibility of speech. Demonstration and practice with individuals and groups of auditorily impaired children.

**5647. AURAL REHABILITATION OF HEARING-IMPAIRED CHILDREN.** (691314) (3 cr; \$PsyS 5147; 1115-1205 MTWThF; NichH 122; A-N only) Rose  
Recent trends in training hearing-impaired (deaf and hard-of-hearing) children in utilization of residual hearing; consideration of present alternative approaches to auditory training and aural rehabilitation.

**5660. SUPERVISION AND ADMINISTRATION OF SPECIAL EDUCATION—June 17-July 1.** (086482) (3 cr; \$EdAd 5103, \$PsyS 5160; 0800-0955 MTWThF; PeikH 31; A-N only) Weatherman  
Procedures in establishing and improving educational programs for exceptional children. Meets with EdAd 5103.

**5670. INTRODUCTION TO EDUCATION OF VISUALLY HANDICAPPED CHILDREN—June 24-July 1.** (386642) (3 cr; \$PsyS 5170; 0900-1500 MTWThF; Bemidji State University; A-N only) Knowlton  
Educational programs, services, and resources for blind and partially seeing children; historical background; philosophy; sociological and psychological problems. Students will register on University of Minnesota forms on the first day of class. For exact location please contact Marie Knowlton, 229 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 or call (612/373-4953).

**5675. STRUCTURE AND FUNCTION OF THE EYE: EDUCATIONAL IMPLICATIONS—July 10-17.** (586641) (3 cr; \$PsyS 5175; 0900-1500 MTWThF; Bemidji State University; A-N only) Knowlton  
Ophthalmological and educational considerations of anatomy and physiology of the eye and visual tract, visual screening, and visual efficiency. Students will register on University of Minnesota forms on the first day of class. For exact location please contact Marie Knowlton, 229 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN or call (612/373-4953).

**5700. ASSESSMENT AND DECISION MAKING IN SPECIAL EDUCATION.** (785794) (4 cr, \$PsyS 5200; 1010-1100 MTWThF; Arch 35; A-N only)  
For teachers and other educational personnel; identifying the needs of handicapped students; planning, monitoring, evaluating instructional programs; practice in use of standardized devices and development of clinical measures for handicapped students.

**5701. PRACTICUM: SPECIAL EDUCATION.** (Cr ar, \$PsyS 5601; prereq #: S-N optional)  
Supervised experience in teaching or related work in schools or other agencies serving exceptional children. Advance application required for sections 2 and 3.

**Sec 1, Teaching Children With Emotional Disturbances.** (085798) 6 cr, 0800-1520 MTWThF, off campus, Wood. Students must also register for 5701, section 1 in Term 2, for 2 cr. Inclusive dates for both are June 17-July 25.

**Sec 2, Diagnosis and Remediation of Learning Disabilities I.** (885799) 4 cr, 0800-1200 MTWThF, off campus, Deno

Advance application required by May 15, 1986.

**Sec 3, Diagnosis and Remediation of Learning Disabilities II.** (385801) 4 cr, 1300-1700 MTWThF, off campus, Deno

Advance application required by May 15, 1986.

Sec 21, (185802) Rose

Sec 22, (085803) Rynders

**5705. BEHAVIOR ANALYSIS PROCEDURES WITH MILDLY AND MODERATELY HANDICAPPED PEOPLE.** (685805) (4 cr, \$PsyS 5305; 5116 or PsyF 5149 or Psy 5017 recommended; 0905-0955 MTWThF; Pth 215; A-N only)  
Behavioral approaches to improving the academic and personal-social behavior of mildly and moderately handicapped people in mainstream and resource programs.

**5900. INDEPENDENT STUDY.** (Cr and hrs ar [max 12 cr]; prereq #: A-N only)

**5900. INDEPENDENT STUDY.** Sec 1. (191706) June 27-July 3. See HiEd 8228, section 1 for description of special course/conference on undergraduate assessment. Corcoran  
Sec 21, (485806) psychological foundations, MacEachern  
Sec 22, (285807) counseling, Shaffer  
Sec 23, (185808) counseling, W Tennyson  
Sec 24, (985809) special education, Balow  
Sec 25, (285810) special education, Bruininks  
Sec 26, (185811) special education, Deno  
Sec 27, (985812) special education, Rose  
Sec 28, (785813) New Developments in Infant Programming, June 16-20. 2 cr, 0900-1600 MTWThF, College of St. Benedict, St. Joseph, MN. For information please write John Rynders, 249 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 or call (612)373-4961.  
Sec 29, (585814) special education, Wood  
Sec 30, (385815) special education, Weatherman  
Sec 31, (291316) special education, Turnure

**8129. RESEARCH PROBLEMS: LEARNING AND COGNITION.** (885818) (Cr and hrs ar, \$PsyF 8940; prereq #) Samuels  
Formulation of research designs.

**8239. PROBLEMS: MEASUREMENT.** (1-3 cr [max 9 cr], \$PsyF 8920; hrs ar)  
Intensive study and individual research.  
Sec 21, (286438) Stecklein  
Sec 22, (685819) Terwilliger

**8259. PROBLEMS: EVALUATION: Assessment of the Undergraduate Experience—June 27-July 3.** (991660) (Cr ar; prereq 5243 or 8245 or PsyF 5521 or 8525 and #) See HiEd 8228, section 1, for description of special course/conference on undergraduate assessment, Corcoran

**8260. STATISTICAL METHODS.** (685822) (3 cr, \$PsyF 8110; prereq 5260 or PsyF 5110 or Psy 3801 or equiv; 0745-0850 MTWThF; AndH 250) MacEachern  
Foundations of statistical theory; practice in applying theories in solution of educational and psychological problems.

**8262. STATISTICAL METHODS.** (285824) (3 cr, \$PsyF 8112; prereq 8261 or PsyF 8111; 0905-0955 MTWThF; AndH 250) MacEachern

Foundations of statistical theory; practice in applying theories in solution of educational and psychological problems.

**8279. PROBLEMS: STATISTICS FOR STUDENTS IN EDUCATION AND PSYCHOLOGY.** (Cr and hrs ar, \$PsyF 8910)  
Recent developments in statistical science; applications to educational and psychological problems.  
Sec 21, (985826) D Anderson  
Sec 22, (785827) MacEachern  
Sec 23, (585828) Stecklein

**8289. RESEARCH PROBLEMS: COMPUTER APPLICATIONS.** (785830) (Cr ar, \$PsyF 8930; prereq #) D Anderson  
Recent developments in computer applications to educational and psychological problems.

**8760. SEMINAR: ADMINISTRATION OF SPECIAL EDUCATION—July 2-18.** (991318) (3 cr, \$PsyS 8560 or EdAd 5180; prereq 5660 or PsyS 5160, EdAd 5103 or #; 0800-0955 MTWThF; PTH 46) Weatherman  
Problems of administration and organization of special education programs. Meets with EdAd 5180.

**8900. RESEARCH PROBLEMS.** (Cr and hrs ar; prereq #)  
Sec 21, (585831) psychological foundations, D Anderson  
Sec 22, (385832) psychological foundations, Davison  
Sec 23, (885835) psychological foundations, MacEachern  
Sec 24, (685836) psychological foundations, Maruyama  
Sec 25, (485837) psychological foundations, Samuels  
Sec 26, (285838) psychological foundations, Stecklein  
Sec 27, (185839) psychological foundations, Terwilliger  
Sec 28, (485840) counseling, Shaffer  
Sec 29, (285841) counseling, W Tennyson  
Sec 30, (185842) special education, Balow  
Sec 31, (985843) special education, Bruininks  
Sec 32, (785844) special education, Deno  
Sec 33, (585845) special education, Rose  
Sec 34, (385846) special education, Rynders  
Sec 35, (185847) special education, Turnure  
Sec 36, (085848) special education, Weatherman  
Sec 37, (791661) special education, Wood

## SECOND TERM

**R3131. INTRODUCTION TO HUMAN RELATIONS.** (3 cr, \$PsyF 3380; each section limited to 30 students; prereq education sr; S-N only)  
See First Term.  
Sec 1, (185850) 0800-1100 July 21 and 0800-1100 MTWThF, August 4-15, Arch 30, Petersen  
Sec 2, (085851) 0800-1100 July 21 and 0800-1100 MTWThF August 4-15, Arch 45

**3606. EXCEPTIONAL STUDENTS IN REGULAR CLASSES.** (885852) (2 cr, \$5606, \$PsyS 5106, \$PsyS 3106; 1115-1205 MTWTh; BuH 120; A-N only) Balow  
See First Term. Meets with 5606.

**5115. ADULT LEARNING AND EDUCATIONAL PRACTICE.** (785990) (4 cr, \$PsyF 5183; 1010-1100 MTWThF; FolH 50; A-N only) Bart  
Survey of psychological methods and principles in human learning; models of adult learner, topics in motivation, creativity, achievement, intelligence; implications for teaching and curriculum design in higher education, continuing education, and professional training.

**R5151. STRUCTURING LEARNING: SOCIAL PSYCHOLOGICAL APPROACHES.** (985857) (3 cr, \$PsyF 5172; limited to 60 students; 1300-1600 MTWThF July 21-August 8, and 1300-1500 F August 22; PTH 214, and hrs ar off-campus; A-N only) Petersen  
How to use cooperation, competition, and individualization to affect learning climate and cognitive and affective outcomes of instruction.

**5220. EDUCATIONAL MEASUREMENT IN THE CLASSROOM.** (291333) (4 cr, \$PsyF 5120; hrs and rm ar; S-N optional) Terwilliger  
Principles and methods for construction, evaluation, and improvement of classroom measures; techniques for describing results statistically; use of measurement in evaluating instruction and student performance; assignment of grades.

**R5260. INTRODUCTORY STATISTICAL METHODS.** (4 cr, \$PsyF 5110; each section limited to 40 students; S-N optional) D Anderson  
See First Term.  
Sec 1, (285855) 0800-0850 MTWThF, EIH N647  
Sec 2, (185856) 0905-0955 MTWThF, EIH N647

**5401. COUNSELING PROCEDURES.** (785858) (3 cr, \$PsyS 5110; 1010-1205 TTh, 1 hr ar; BuH 125; A-N only) Shaffer  
See First Term.

**5461. CROSS-CULTURAL COUNSELING—July 21-25.** (891330) (3 cr, \$PsyS 5505; prereq #: 0830-1630 MTWThF; EIH N647; A-N only) Thomas  
Effect of cross-cultural and cross-national differences in counseling process.

**5606. EXCEPTIONAL STUDENTS IN REGULAR CLASSES.** (585859) (2 cr, \$3606, \$PsyS 3106, \$PsyS 5106; 1115-1205 MTWTh; BuH 120; A-N only) Balow  
See First Term. Meets with 3606.

**5612. EDUCATION OF LEARNING-DISABLED CHILDREN.** (785861) (3 cr, \$PsyS 5112; 1010-1100 MTWThF; PTH 215; A-N only) Balow  
Analysis of considerations in design and conduct of services for learning-disabled children; approaches to education of such children.

**5654. EDUCATIONAL INTERVENTIONS FOR EMOTIONAL DISTURBANCE/BEHAVIORAL DISORDERS—July 21-August 15.** (191334) (5 cr; 1000-1200 MTWThF; Arch 15; A-N only) Wood  
Preparation for specialists; theoretical background; assessment procedures; strategies and interventions appropriate for school settings; teaching social behavior; team procedures.

**5674. ORIENTATION AND MOBILITY TECHNIQUES FOR VISUALLY IMPAIRED STUDENTS—July 21-August 1.** (591662) (3 cr, \$PsyS 5174; 0900-1200 MTWThF; Bemidji State University; A-N only)  
Introduction to basic techniques to gain skills in pre-cane techniques, orientation to learning environment, construction of mobility maps; consideration of cane, guide dog, and telescopic aids to mobility. Students will register on University of Minnesota forms on the first day of class. For exact location please contact Marie Knowlton, 229 Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 or call (612)373-4953.

**5690. EDUCATION OF THE GIFTED AND TALENTED.** (991335) (3 cr, \$PsyS 5190; 0905-0955 MTWThF; BuH 125; A-N only)  
Origin and development of terms such as giftedness, creativity, genius, talent, and intelligence; implications for educational practice; current issues and trends.

**5701. PRACTICUM: SPECIAL EDUCATION.** (Cr and hrs ar; S-N optional; prereq #)

**Sec 1, Teaching Children with Emotional Disturbances—July 21-25.** (885866) 2 cr, 0800-1520 MTWThF, students must also register for 5701, section 1, first term for 6 cr. Inclusive dates for both are June 17-July 25. Off campus, Wood

**5900. INDEPENDENT STUDY.** (Cr and hrs ar [max 12 cr]; prereq #: A-N only)  
Sec 21, (185887) psychological foundations, MacEachern  
Sec 22, (985888) counseling, Shaffer  
Sec 23, (785889) special education, Balow  
Sec 24, (185890) special education, Wood

**8129. RESEARCH PROBLEMS: LEARNING AND COGNITION.** (491332) (Cr ar; prereq #) Bart  
Formulation of research designs.

**8239. PROBLEMS: MEASUREMENT.** (385894) (1-3 cr [max 9 cr]; hrs ar) Terwilliger  
See First Term.

**8261. STATISTICAL METHODS.** (185895) (3 cr, \$PsyF 8111; prereq 8260 or PsyF 8110; 0745-0850 MTWThF; BuH 120) MacEachern  
Foundations of statistical theory; practice in applying theories in solution of educational and psychological problems.

**8263. DESIGN AND ANALYSIS OF EXPERIMENTS.** (885897) (3 cr, \$PsyF 8113; prereq 8262 or PsyF 8112 or #: 0905-0955 MTWThF; BuH 120) MacEachern  
Functional approach to principles of efficient design in experiments and other types of observational programs; improved sampling techniques; methods of analyzing observational results.

**8279. PROBLEMS: STATISTICS FOR STUDENTS IN EDUCATION AND PSYCHOLOGY.** (Cr and hrs ar)  
See First Term.  
Sec 21, (385913) D Anderson  
Sec 22, (685898) MacEachern

**8289. RESEARCH PROBLEMS: COMPUTER APPLICATIONS.** (185900) (Cr and hrs ar; prereq #) D Anderson  
See First Term.

**8900. RESEARCH PROBLEMS.** (Cr and hrs ar; prereq #)  
Sec 21, (685903) psychological foundations, D Anderson  
Sec 22, (485904) psychological foundations, Bart  
Sec 23, (285905) psychological foundations, Davison  
Sec 24, (185906) psychological foundations, MacEachern  
Sec 25, (985907) psychological foundation, Terwilliger  
Sec 26, (785908) counseling, Shaffer  
Sec 27, (585909) special education, Balow  
Sec 28, (491329) special education, Wood

## Electrical Engineering (EE)

139 Electrical Engineering. 373-4895  
Institute of Technology

### FIRST TERM

**R1400. CIRCUITS LABORATORY.** (1 cr; each section limited to 14 students; prereq IT student, 3009 or 13009) Laboratory to accompany EE 3009 and 3010.

Lab 1, (988709) 1220-1415 MW, ElectE 121  
Lab 2, (288710) 1220-1415 TTh, ElectE 121

**R3009. LINEAR CIRCUITS I.** (588714) (4 cr; limited to 90 students; prereq IT major; at least C grades in Math 3212 or 1Math 3212, or Math 3221 or 1Math 3221, Phys 1281 or 1Phys 1281; 0800-0955 MTWThF; Arch 40)  
Physical principles underlying the modeling of circuit elements. Two- and three-terminal resistive elements. Kirchhoff's laws. Simple resistive circuits. Linearity in circuits. Storage elements. First- and second-order circuits.

**5470. DIRECTED STUDY.** (789313) (Cr and hrs ar; prereq Δ)

**8450. SPECIAL INVESTIGATIONS.** (589314) (Cr and hrs ar; prereq #)

**8460. PLAN B PROJECT.** (389315) (4 cr; prereq #)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**R3003. CIRCUITS AND ELECTRONICS.** (188711) (4 cr; limited to 50 students; not for EE majors; prereq IT student, Phys 1291, Math 3221 or 1Math 3221; 0800-0850 MTWThF; Arch 55)

Analysis of linear passive circuits; semiconductor principles, devices, and circuits. Applications to digital circuits, logic elements, microprocessors, and operational amplifiers.

**R3004. CIRCUITS AND ELECTRONICS LABORATORY.** (1 cr; each section limited to 14 students; no EE majors; prereq IT student, 3003 or \*3003)

Lab 1, (988712) 1010-1205 M, ElectE 118  
Lab 2, (788713) 0800-0955 Th, ElectE 118

**R3012. SYSTEM DESIGN.** (990654) (4 cr; limited to 50 students; prereq 3011, at least C grade in Math 3213 or 3221, upper division EE major; 1115-1205 MTWF; MechE 212) Continuous, discrete-time systems. Feedback; stability, applications.

**R3062. DIGITAL ELECTRONICS.** (287914) (4 cr; limited to 65 students; prereq upper division EE, CSci, or ME major, 3061, 3351; 0905-0955 MTWF; Arch 55) Implementation of digital circuits with bipolar and field effect transistors; application to inverters, gates, flip-flops, logic arrays, and storage elements.

**R3111. ELECTROMAGNETIC WAVES.** (187915) (4 cr; limited to 50 students; prereq 3110, upper division EE major; 1010-1100 MTWF; Arch 55)

Time-varying electromagnetic fields. Propagation of electromagnetic waves. Metallic and optical waveguides.

**R3351. INTRODUCTION TO LOGIC DESIGN.** (4 cr, \$5051; each section limited to 14 students; prereq soph standing in IT; lect 1115-1205 MWThF; CivMinE 212)

Boolean algebra and logic gates. Combination logic; simplification and design examples. Sequential logic and design of synchronous, sequential logic systems. Integral laboratory.

Lab 1, (188716) 1430-1625 M, ElectE 216  
Lab 2, (088717) 1430-1625 M, ElectE 216  
Lab 3, (888718) 1010-1205 T, ElectE 216  
Lab 4, (688719) 1010-1205 T, ElectE 216  
Lab 5, (589247) 1220-1415 Th, ElectE 216  
Lab 6, (491198) 1220-1415 Th, ElectE 216

**R3402. JUNIOR ELECTRICAL ENGINEERING LABORATORY.** (2 cr; each section limited to 14 students; prereq IT student, 3401, 3062 or \*)

Lab 1, (090662) 1220-1625 T, ElectE 21  
Lab 2, (890663) 1220-1625 W, ElectE 21  
Lab 3, (890664) 0800-1205 Th, ElectE 21  
Lab 4, (089690) 1220-1625 Th, ElectE 21

**3476. INDUSTRIAL ASSIGNMENT I.** (790655) (2 cr; prereq regis in intern program)

Industrial work assignment in engineering intern program. Grade based on formal written report covering the quarter's work assignment, but deferred until completion of EE 5478, Industrial Assignment III.

**3477. INDUSTRIAL ASSIGNMENT II.** (590656) (2 cr; prereq 3477)  
See 3476.

**R5002. DIGITAL SIGNAL PROCESSING.** (987916) (4 cr; prereq IT student or grad IT major, 3012; 0800-0850 MTWF; Arch 5)

General concepts of signal processing; discrete-time systems and digital filters.

**5478. INDUSTRIAL ASSIGNMENT III.** (390657) (2 cr; prereq 3477, regis in intern program)

Industrial work assignment in engineering intern program. Grade based on formal written report covering the quarter's work assignment.

**5479. INDUSTRIAL ASSIGNMENT IV.** (190658) (2 cr; prereq 5478)  
See 5478.

## SECOND TERM

**R1400. CIRCUITS LABORATORY.** (787917) (1 cr; limited to 14 students; prereq IT student, 3009 or \*3009; 1220-1415 MW; ElectE 121)

**R3010. LINEAR CIRCUITS II.** (488723) (4 cr; limited to 75 students; prereq IT student; at least C grades in 3009, Math 3212 or Math 3221, Phys 1291 or PPhys 1291; 0800-0955 MTWThF; Arch 10)

Modeling of lumped-parameter networks. Sinusoidal steady-state analysis. Two-port networks.

**5470. DIRECTED STUDY.** (889688) (Cr and hrs ar; prereq  $\Delta$ )

**8450. SPECIAL INVESTIGATIONS.** (689708) (Cr and hrs ar; prereq #)

**8460. PLAN B PROJECT.** (587918) (4 cr; prereq #)

## Elementary Education (Elem)

125 Peik Hall. 373-3974, 373-3300  
College of Education

### FIRST TERM

**3604. STUDENT TEACHING IN THE NURSERY SCHOOL.** (189941) (3-6 cr; S-N only; prereq approval of major adviser and director of student tchg; hrs ar) Weigand

**R5100. ELEMENTARY SCHOOL CURRICULUM—June 17-July 1.** (989942) (3 cr; limited to 30 students; prereq 3101; 1115-1310 MTWThF; PTh 214; A-N only) Lambert

**R5140. MICROCOMPUTER USES IN ELEMENTARY CLASSROOMS—June 16-July 1.** (688669) (3 cr; limited to 25 students; C/ISy 5206; 1220-1520 MTWThF; PeikH 355; A-N only) Stochl  
Uses of microcomputers to enhance instruction; applications in language arts, mathematics, science, social studies; evaluation of available programs. Meets with C/ISy 5206.

**R5141. USING LOGO IN THE CLASSROOM—July 2-18.** (391386) (3 cr; prereq C/ISy 5003 or equiv; limited to 30 students; 1220-1520 MTWThF; PeikH 355; A-N only) Stochl  
Using LOGO in the elementary and middle grades to develop skills in thinking, planning, and logic; applying fundamental mechanics and philosophy of LOGO using turtle graphics; developing classroom materials.

**5227. TEACHING ABOUT NEWSPAPERS IN THE CLASSROOM—July 7-18.** (491654) (1-3 cr [max 4 cr]; \$SeEd 5227, 1300-1600 MTWThF; PeikH 165; A-N only) Mackey  
The institution of the newspaper; articulation of a series of useful instructional strategies, curriculum development techniques, and teaching materials. This offering for 3 credits. Meets with SeEd 5227.

**5300. LITERATURE FOR THE ELEMENTARY SCHOOL.** (789943) (3 cr; 0905-0955 MTWThF; BuH 120; A-N only) Odland

**5316. TEACHING AND SUPERVISION OF ENGLISH IN THE ELEMENTARY SCHOOLS—June 17-July 1.** (888668) (3 cr; prereq 3316 or elem tchg exper; 1325-1520 MTWThF; PeikH 40; A-N only) Monson  
Improvement of instruction; study of trends in English education.

**R5318. CREATIVE WRITING FOR AND BY CHILDREN—June 17-July 1.** (589944) (3 cr [max 6 cr]; limited to 60 students; prereq 3300 or 3316 or elem tchg exper or #; 1010-1205 MTWThF; BuH 120; S-N only) Odland, Monson  
Language arts in the elementary school for experienced teachers, supervisors, graduate students, and college instructors; emphasis on creative aspects of writing of children's literature and the children's own writing. Authors and illustrators of children's books will be involved in this 3-credit offering.

**5319. TEACHING SECOND LANGUAGES AND CULTURES IN ELEMENTARY SCHOOLS—June 17-July 8.** (285919) (3 cr; 1430-1625 MTWThF; PeikH 215; A-N only) Jorstad  
Methods and materials; development of oral and written communication; consideration of alternatives in program format; preparation of materials; global awareness and cross-cultural experience; assessment of children's language; children's literature, games, songs; development of units and lessons.

**R5330. COMPUTER-ASSISTED INSTRUCTION IN READING AND LANGUAGE ARTS FOR ELEMENTARY SCHOOL STUDENTS.** (685920) (3 cr; prereq education major or elementary or secondary school tchg exper or #; limited to 30 students; 0800-0955 MTWTh; PeikH 355; A-N only) Schreiner  
Developing, evaluating, and using materials to present reading and language arts content to elementary age students; interface of theoretical issues with instructional techniques presented on computers.

**5336. CLINICAL PRACTICE IN REMEDIAL TEACHING.** (789490) (3 cr; prereq 5334 or 5107 and #; 0800-0955 MTWTh; off campus; A-N only) Taylor  
Remedial tutoring of individual children who have difficulty in school learning. Students will be informed of where class will meet upon registration.

**5338. TEACHING READING IN THE INTERMEDIATE GRADES—July 2-18.** (687909) (3 cr; prereq 3331 and #; 1010-1205 MTWThF; PeikH 165; A-N only) Taylor  
For teachers and specialists interested in problems of teaching reading beyond the decoding stages; comprehension strategies, basic study skills, and reading in the content areas.

**R5347. WORKSHOP: CURRICULUM IMPLEMENTATION IN ELEMENTARY SCHOOL SCIENCE.** (1-3 cr [max 12 cr]; prereq elem tchg exper; each section limited to 20 students; A-N only) Gennaro  
Offered in summer with focus on a single program for each offering; treating concept foundations, goals, and teaching and evaluation procedures.

**Sec 1, Development of Animal Behavior Curriculum Materials, June 17-27.** (191387) 3 cr, 0830-1200 MTWThF, Minnesota Zoological Gardens, 12101 Johnny Cake Ridge Road, Apple Valley, Mn.

Teachers will develop curricular materials for students taking a trip to the zoo; the use of animals in the classroom and the topic of animal behavior. Curriculum writing will be done in teams. Speakers, behind-the-scenes tours, and hands-on experience with animals will be included.

Students should meet at the Education Center at the Zoo on the first day; meet with SeEd 5394 section 1.

**Sec 2, Environmental Education, June 30-July 11.** (091388) (3 cr 0830-1200 MTWThF, PeikH 385).  
History and philosophy of the State Plan; SELOS (Some Essential Learning Outcomes) in environmental education (EE); integrating EE into the curriculum; ICE materials from National Diffusion Network; water quality and acid rain

## Creative writing for and by children

The seventh annual Chase Lecture will be presented this year on June 24 at 3:30 p.m. in Coffman Memorial Union. This lecture, which emphasizes creative writing for and by children, is open to the public and is supported by the University of Minnesota Foundation with funds from an endowment given for the purpose of encouraging the improvement of children's writing and reading. This year's guest lecturer, Jean Craighead George, is an award winning writer

on nature subjects, both fiction and nonfiction.

Among the guest lecturers who will be featured for the creative writing course (Elem 5318) are John Parker, Susan Pearson and Jane Resh Thomas.

Questions about the course or the Chase Lecture may be directed to Department of Curriculum and Instruction, 125 Peik Hall, University of Minnesota, 159 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-3974).

<sup>1</sup>Student teaching is open only to students in regular degree programs of the College of Education. Application must be made by May 1. Forms and instructions are available in 203 Burton Hall.

curricular materials; energy education; Project Wild; Project Learning Tree and other Minnesota issues such as chemical and nuclear wastes, use of peat as an energy source. Meets with SeEd 5394, section 2.

**5361. TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL—July 2-18.** (485921) (3 cr; prereq 3101 or equiv; 1115-1310 MTWThF; PeikH 46; A-N only) Ellis  
Content and organization of social studies programs; programs for understanding, improving the learning situation; and effective use of materials.

**r5363. WORKSHOP: CURRICULUM IMPLEMENTATION IN ELEMENTARY SCHOOL SOCIAL STUDIES (Geographic Inquiry for Elementary and Middle School Teachers)—July 2-18.** (285922) (Cr ar [max 9 cr]; limited to 30 students; prereq elementary tchg exper and #; A-N only; 1330-1600 MTWThF; PeikH 46) Ellis  
Analysis of new instructional materials and recent curriculum developments in the field; training in innovative instructional procedures. This 3-credit offering will emphasize content, concepts, and skills of geography in the school curriculum. Participant will learn about and use the tools of geographic inquiry including mapping, problem solving, and planning. For teacher K through middle school.

**5602. PRACTICUM: IMPROVEMENT OF TEACHING.** (3 cr; prereq MEd student in elem education, #; S-N only; hrs ar)

Sec 21, (089947) Lambert  
Sec 22, (889948) Post  
Sec 23, (689949) Stochl  
Sec 24, (089950) Odland  
Sec 25, (889951) Monson  
Sec 26, (689952) Schreiner  
Sec 27, (489953) Taylor  
Sec 28, (289954) Ellis

**8300. RESEARCH IN SPECIAL COLLECTIONS OF CHILDREN'S LITERATURE.** (189955) (1-3 cr [max 6 cr]; 1325-1520 TTh; BuH 125) Odland

This offering for 3 credits will provide comparative study of national and international special collections of original manuscripts, artwork, first editions, and other bases for collection of children's books; research in University Libraries Special Collections or other accessible collections.

**8916. PROBLEMS: TEACHING ENGLISH.** (891383) (Cr and hrs ar; prereq #) Monson

**8931. PROBLEMS: TEACHING READING.** (Cr and hrs ar; prereq 5331 or SeEd 5344 and #)

Sec 21, (989956) Odland  
Sec 22, (789957) Schreiner  
Sec 23, (085929) Taylor

**8961. PROBLEMS, TEACHING SOCIAL STUDIES.** (091715) (Cr and hrs ar; prereq 5361 or SeEd 5155 or 8104, and #) Ellis

**8991. PROBLEMS: IMPROVEMENT OF INSTRUCTION.** (Cr and hrs ar; prereq #)

Sec 21, (389959) Lambert  
Sec 22, (389962) Post  
Sec 23, (189963) Stochl  
Sec 24, (089964) Odland  
Sec 25, (889965) Monson  
Sec 26, (689966) Schreiner  
Sec 27, (489967) Taylor  
Sec 28, (289968) Ellis

## SECOND TERM

**5107. DIAGNOSIS AND TREATMENT OF LEARNING DIFFICULTIES—July 21-August 7.** (585005) (3 cr; 1010-1205 MTWTh; PeikH 28; A-N only) Park

**5145. CLASSROOM MANAGEMENT—July 21-August 8.** (291400) (3 cr; §SeEd 5145; prereq tchg or admin exper or #; 0800-0955 MTWThF; PeikH 315; A-N only) H Hansen  
For teachers, administrators, and support staff working in elementary school programs: focus on management of student behavior, of instruction as it relates to student behavior, and on teacher organizational tasks within the classroom.

**5164. GLOBAL EDUCATION: CONTENT AND PROCESS—July 28-August 2; August 14-15.** (291655) (3 cr; §SeEd 5164; 0800-1700 MTWThF; off campus) Cogan  
Designed to help classroom teachers and administrators assess current methods and materials and select appropriate evaluation instruments by examination of existing content and methods in global education. Meets with SeEd 5164. This offering will be held in northern Minnesota. A limited number of partial tuition scholarships will be available to in-service teachers who meet specified criteria. Contact Professor John Cogan, 101 Pattee Hall, 150 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/376-4580). Advanced application required; deadline is May 1, 1986.

**5331. TEACHING AND SUPERVISION OF READING IN THE ELEMENTARY SCHOOL—July 21-August 8.** (385944) (3 cr; prereq 9 cr in education; 0800-0955 MTWThF; PeikH 40; A-N only) Dykstra

Objectives, materials, and teaching procedures; current practices and curricula; class and individual projects; observation of reading techniques and material in the demonstration school.

**5334. READING DIFFICULTIES—July 21-August 8.** (385006) (3 cr; prereq 5331 or SeEd 5344; 0800-0955 MTWThF; PeikH 48; A-N only)

**r5350. ELEMENTARY SCHOOL SCIENCE: MATERIALS AND RESOURCES—August 4-15.** (088670) (3 cr; prereq 5349; limited to 30 students; 0830-1200 MTWThF; PeikH 385; A-N only) Finley  
Experiences in the use of educational materials and media common to the teaching of modern elementary school science.

**5376. CURRENT TRENDS IN EARLY CHILDHOOD EDUCATION—July 21-August 8.** (191401) (3 cr; prereq tchg exper in kindergarten or primary school or #; 1010-1205 MTWThF; PeikH 315; A-N only) H Hansen  
Continuing needs of children in our changing culture; current practices and recent research.

**5602. PRACTICUM: IMPROVEMENT OF TEACHING.** (3 cr; prereq MEd student in elem education, #; S-N only; hrs ar)

Sec 21, (185007) Jackson  
Sec 22, (085008) H Hansen  
Sec 23, (885009) Cogan  
Sec 24, (185010) Dykstra  
Sec 25, (085011) Schreiner  
Sec 26, (188143) Lambert

**8916. PROBLEMS: TEACHING ENGLISH.** (891392) (Cr and hrs ar; prereq #) Dykstra

**8931. PROBLEMS: TEACHING READING.** (785939) (Cr and hrs ar; prereq 5331 or SeEd 5344 and #) Schreiner

**8961. PROBLEMS: TEACHING SOCIAL STUDIES.** (686436) (Cr and hrs ar; prereq 5361 or SeEd 5155 or 8104, and #) Cogan

**8976. PROBLEMS: TEACHING KINDERGARTEN.** (991402) (3 cr; prereq #; hrs ar) H Hansen

**8991. PROBLEMS: IMPROVEMENT OF INSTRUCTION.** (Cr and hrs ar; prereq #)

Sec 21, (885012) Jackson  
Sec 22, (685013) H Hansen  
Sec 23, (485014) Cogan  
Sec 24, (285015) Dykstra  
Sec 25, (185016) Schreiner  
Sec 26, (288142) Lambert

## Endodontics (Endo)

8-166 Moos Tower. 373-2809  
School of Dentistry

### FIRST TERM

**5303. ADVANCED CLINICAL ENDODONTICS.** (585053) (1 cr) El Deeb  
Diagnosis and treatment of clinical cases. Students assigned complex cases and explore new and unique techniques.

**5313. ENDODONTIC EMERGENCY PROBLEMS.** (385054) (1 cr) Jensen  
Each student is responsible for all emergencies in the Endodontic Clinic during an assigned 1-week period (8 hours a day).

**5333. REVIEW OF CASES.** (185055) (1 cr) ElDeeb  
Students present cases from the previous quarter for review by endodontic faculty and graduate students.

**8004. RESEARCH IN ENDODONTICS.** (085056) (1 cr) Messer  
Organized literature review in areas of specific interest to student, selection of this project, and completion of research and thesis.

**8323. ADVANCED ENDODONTIC LECTURES.** (885057) (1 cr) ElDeeb  
Pulpal and periapical pathology, diagnosis, and treatment planning.

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

**8313. SEMINAR: ENDODONTICS.** (685058) (2 cr) ElDeeb, Messer  
Organized literature review in areas of interest to student, selection of a project, and completion of research and a thesis.

## SECOND TERM

**5303. ADVANCED CLINICAL ENDODONTICS.** (686999) (1 cr) El Deeb  
See First Term.

**5313. ENDODONTIC EMERGENCY PROBLEMS.** (587000) (1 cr) Jensen  
See First Term.

**5333. REVIEW OF CASES.** (387001) (1 cr) El Deeb  
See First Term.

**8004. RESEARCH IN ENDODONTICS.** (187002) (1 cr) Messer  
See First Term.

**8323. ADVANCED ENDODONTIC LECTURES.** (087003) (1 cr) ElDeeb  
See First Term.

## English Language and Literature (Engl)

207 Lind Hall. 373-2595  
College of Liberal Arts

### FIRST TERM

**r 1009. INTRODUCTION TO THE STUDY OF LITERATURE.** (689367) (4 cr; limited to 36 students; 1010-1100 MTWThF; LindH 215) Savage  
Reading of selected literary works with emphasis on learning basic techniques and terminology of literary study; major literary forms, traditions, conventions, frames of reference, metrics, the critical reading of literary works in general, and the conventions employed in the presentation of literary criticism and scholarship.

**r 1013. FAMOUS ENGLISH AND AMERICAN POEMS.** (291686) (4 cr; limited to 40 students; 0905-0955 MTWThF LindH 305) Staff  
Shorter poems by English and American poets, from the Renaissance to the present. Introduction to the reading of poetry; introduction to poems basic to English and American literature.

**r 1016. INTRODUCTION TO AMERICAN LITERATURE.** (690065) (4 cr; limited to 45 students; 0905-0955 MTWThF; LindH 217) Staff  
Critical discussion of and writing about selected works of American literature. Typical authors: Poe, Hawthorne, Whitman, Dickinson, Twain, Frost, Fitzgerald.

**r 1018. INTRODUCTION TO MODERN FICTION.** (388066) (4 cr; limited to 45 students; 1115-1300 MW; LindH 215) Sugrlet  
Critical discussion of and writing about selected modern novels and stories. Typical authors: Conrad, Lawrence, Joyce, Woolf, Hemingway, Faulkner, Nabokov.

**r 1069. GREAT PLAYS.** (191687) (4 cr, limited to 40 students, 1115-1205 MTWThF; LindH 302) Hurrell  
World's great plays, from ancient Greece to contemporary culture, representing a variety of countries, periods, and theatrical modes. Common features and diverse dramatic forms and styles, characterizing the range of Western drama.

**r3111. SURVEY OF ENGLISH LITERATURE.** (690910) (4 cr; limited to 45 students; 0800-0855 MTWThF; LindH 217) Haley  
Historical survey of major figures, movements, and trends in English literature. Chaucer to Marvell, including Spenser, Shakespeare and Donne.

**r3241. SHAKESPEARE.** (490066) (4 cr, §3243; limited to 36 students; 1010-1100 MTWThF; LindH 305) Clayton  
Plays from Shakespeare's early and middle periods. All sections will read *A Midsummer Night's Dream*, *Hamlet*, a history play, and three or four other plays.

**r3357. MODERN BRITISH LITERATURE.** (786072) (4 cr; limited to 40 students; 0800-0850 MTWThF; LindH 302) Reed  
Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes. 1939-1975. Typical authors: Cary, Greene, Murdoch, Fowles, Beckett, Osborne, Pinter, Stoppard, Hughes, and Larkin.

**r3413. SURVEY OF AMERICAN LITERATURE.** (786525) (4 cr; limited to 45 students; 0905-0955 MTWThF; LindH 302) Solotaroff  
Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes. Lecture course, with wide reading. Stephen Crane through World War II (1900-1945).

Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes. Lecture course, with wide reading. Stephen Crane through World War II (1900-1945).



**R3671. THE NOVEL.** (490911) (4 cr; limited to 45 students; 1115-1300 TTh; LindH 215) Hirsch  
Introduction to the novel as a literary form. Reading of selected works of fiction from the 18th century to the present.

**R3851. THE ENGLISH LANGUAGE.** (290067) (4 cr, \$5851; limited to 50 students; 0800-0850 MTWThF; LindH 229) MacLeish  
An introduction to the English language including English grammars, phonetics and phonology, British and American dialects, and native language acquisition.

**R3960. JUNIOR-SENIOR SEMINAR: KURT VONNEGUT.** (290912) (4 cr; limited to 18 students; prereq English major status, jr or sr or Δ; 1010-1100 MTWThF; LindH 302) Reed  
Vonnegut's nine novels, from *Player Piano* to *Jailbird*. Their social commentary and the social contexts in which they were written, relevant biography, technique, theme, and form.

**3963H. HONORS THESIS.** (886081) (4 cr; prereq honors candidacy in English and consent of English honors adviser)

**3970. DIRECTED STUDIES.** (088149) (1-15 cr per term; prereq #, Δ, □)  
Guided individual reading or study.

**3980. DIRECTED INSTRUCTION.** (986071) (Cr ar; prereq #, Δ, □)

**R5173. RESTORATION AND 18TH-CENTURY DRAMA.** (190913) (4 cr; limited to 40 students; prereq 3241 or 3242; 1010-1100 MTWThF; LindH 217) Haley  
The heroic play, tragedy, comedy of manners, sentimental comedy.

**R5851. STRUCTURE OF MODERN ENGLISH.** (086076) (4 cr, \$3851; limited to 40 students; 1010-1100 MTWThF; LindH 229) MacLeish  
Modern English grammar: phonology, syntax, and semantics; variations and change.

**5970. DIRECTED STUDY IN WRITING.** (788162) (1-4 cr; prereq #, Δ, CLA approval)  
Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing.

**R8610. STUDIES IN 20TH-CENTURY BRITISH AND AMERICAN LITERATURE: ERNEST HEMINGWAY.** (990914) (4 cr; limited to 12 students; 1115-1300 TTh; LindH 216) Solotaroff

**8970. INDEPENDENT READING.** (388150) (1-15 cr; prereq #)

**SECOND TERM**

**R1009. INTRODUCTION TO THE STUDY OF LITERATURE.** (386527) (4 cr; 0800-0850 MTWThF; limited to 36 students; LindH 229) Rozsnyai  
Critical reading of selected literary works with emphasis on basic techniques and terminology of literary study; major literary forms, traditions, and conventions; frames of reference, metrics, conventions of literary criticism and scholarship.

**R1016. INTRODUCTION TO AMERICAN LITERATURE.** (888069) (4 cr; limited to 40 students; 1115-1310 TTh; LindH 215) Roth  
Critical discussion of and writing about selected works of American literature. Typical authors: Poe, Hawthorne, Whitman, Dickinson, Twain, Frost, Fitzgerald.

**R1018. INTRODUCTION TO MODERN FICTION.** (486079) (4 cr; limited to 45 students; 1010-1100 MTWThF; LindH 229) Staff  
Critical discussion of and writing about selected modern poems. Typical authors: Conrad, Lawrence, Joyce, Woolf, Hemingway, Faulkner, Nabokov.

**R1101. INTRODUCTION TO FICTION WRITING.** (991688) (4 cr; limited to 25 students; prereq completion of writing practice or equiv; 0905-0955 MTWThF; Arch 20) Burns  
Principles of composition in the art of fiction.

**R1104. INTRODUCTION TO POETRY WRITING.** (390903) (4 cr; limited to 25 students; prereq completion of writing practice or equiv; 1115-1300 MW; LindH 215) Browne  
Workshop for beginning students. Discussion of student poems, assignments, formal experiments. No manuscript prerequisite.

**R1621. INTRODUCTION TO WOMEN WRITERS.** (190904) (4 cr; limited to 45 students; 0905-0955 MTWThF; LindH 302)  
An introduction to several major women writers from Great Britain and the United States. The works to be studied include novels, short stories, poetry and drama.

**R1671. THE SHORT STORY.** (791689) (4 cr; limited to 45 students; 1115-1205 MTWThF; LindH 217) Burns  
Lecture introduction to short stories, with some emphasis on the history and diversity of the form. Typical authors: Poe, Chekhov, Lawrence, Joyce, Kafka, Welty, Faulkner.

**R3242. SHAKESPEARE.** (185363) (4 cr; \$3243 limited to 36 students; 0800-0850 MTWThF; LindH 302) McNaron  
Plays from the middle and late periods. All sections read *King Lear*, *Macbeth*, *The Tempest*, and three or four others.

**R3411. SURVEY OF AMERICAN LITERATURE.** (090905) (4 cr; limited to 45 students; 1010-1100 MTWThF; LindH 302) Rozsnyai  
Historical survey of important authors, intellectual currents, movements, conventions, genres, and themes. Lecture course, with wide reading. Beginning through Hawthorne (to 1850).

**R3455. AMERICAN SHORT STORY.** (890906) (4 cr; limited to 45 students; 0905-0955 MTWThF; LindH 229) Furia  
Typical authors: Irving, Poe, Hawthorne, Twain, Crane, Cather, Faulkner, Welty, Bellow.

**R3851. THE ENGLISH LANGUAGE.** (085364) (4 cr, \$5851; limited to 50 students; 0800-0855 MTWThF; LindH 305) Mitchell  
See First Term.

**3963H. HONORS THESIS.** (486082) (4 cr; prereq honors candidacy in English and consent of English honors adviser)

**3970. DIRECTED STUDIES.** (188151) (1-15 cr per term; prereq #, Δ, □)  
Guided individual reading or study.

**3980. DIRECTED INSTRUCTION.** (886077) (Cr ar; prereq #, Δ, □)

**5100. ADVANCED NON-FICTION WRITING. "Computers and Composition"—July 21-August 2.** (991691) (4 cr, lect 1010-1100 MTWThF, LindH 305; lab 1210-1500 MTWThF, LindH 306B; Ross)

For current and potential high school and college teachers of composition who want to learn more about working with computers to make a difference in students' writing ability. Students will explore software applications and practice Computer Aided Instruction (CAI) lesson and screen design. Students registered for the course will be expected to attend the two day conference which comes at the end of the course (August 1-2). See Conference Courses, Page 90.

**R5261. MILTON.** (886080) (4 cr; limited to 40 students; 0905-0955 MTWThF; LindH 305) O'Brien  
*Paradise Lost*, *Samson Agonistes*, minor poems, *Areopagitica*, and often *Paradise Regained*.

**R5432. AMERICAN POETRY.** (690907) (4 cr; limited to 40 students; 1115-1205 MTWThF; LindH 229) Furia  
Major figures; historical and intellectual background; poetic theory. Since 1890. Typical authors: Frost, Stevens, Pound, Eliot, Moore, Williams.

**R5620. BRITISH AND AMERICAN WOMEN WRITERS.** (490908) (4 cr; limited to 40 students; 1010-1100 MTWThF; LindH 215) McNaron  
Readings in works of one or more women writers, perhaps examining various times within various forms.

**5970. DIRECTED STUDY IN WRITING.** (788212) (1-4 cr; prereq #, Δ, CLA approval)  
Projects in writing poetry, fiction, drama, and nonfiction, or study of ways to improve writing.

**8970. INDEPENDENT READING.** (088152) (1-15 cr; prereq #)

**Entomology (Ent)**

219 Hodson Hall, St. Paul. 373-1701  
College of Biological Science

(See also Itasca Biology Program)

**FIRST TERM**

**3100. ENTOMOLOGICAL TECHNIQUES.** (189826) (Cr ar; prereq 3175 or equiv, or #) Staff  
Practical laboratory instruction in dealing with entomological materials.

**5901. SPECIAL PROBLEMS IN ENTOMOLOGY.** (989827) (Cr ar; prereq #) Staff  
Individual field, laboratory, or library studies in various areas of entomology.

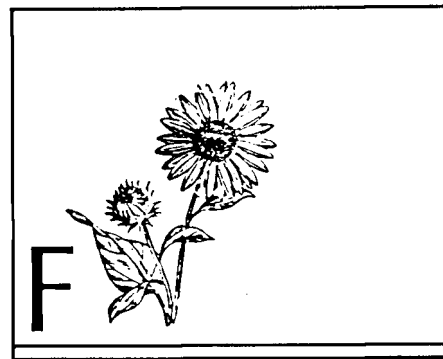
**8500.\* RESEARCH IN ENTOMOLOGY.** (789828) (Cr ar; prereq #) Staff

**SECOND TERM**

**3100. ENTOMOLOGICAL TECHNIQUES.** (790770) (Cr ar; prereq 3175 or equiv, #) Staff  
See First Term.

**5901. SPECIAL PROBLEMS IN ENTOMOLOGY.** (590771) (Cr ar; prereq #) Staff  
See First Term.

**8500.\* RESEARCH IN ENTOMOLOGY.** (390772) (Cr ar; prereq #) Staff



**Family Practice and Community Health (FPCH)**

6-240 Phillips-Wangensteen Building, 373-8539  
Medical School

**SPECIAL TERM: JULY 1-SEPTEMBER 30**

**Required Courses**

**8201. CLINICAL FAMILY MEDICINE.** (485126) (9 cr; hrs ar) Sutherland, staff

**8208. FAMILY MEDICINE CONFERENCE.** (285127) (1 cr; hrs ar) Sutherland, staff

**8210. FAMILY MEDICINE GRAND ROUNDS.** (185128) (0-1 cr; hrs ar) Sutherland, staff

**8212. CLINICAL PSYCHIATRY ROUNDS.** (985129) (1 cr; hrs ar) Kelly, staff

**Elective Courses**

**5504. MEDICAL ETHICS.** (191681) (2 cr; 1300-1630 Th, 0830-1630 F; Green Rm, N Bldg Fairview Hosp.) Nelson  
Seminar on six current ethical issues confronting physicians in contemporary primary care medicine. The student will assess relevant multiple orientations, values, social and religious factors, and countervailing judgment. Regular attendance and participation in class sessions and discussions is expected. Each week a case study and readings will be assigned. The student will write a brief outline of an issue of interest.

**5516. RESEARCH IN HUMAN SEXUALITY.** (185131) (Cr ar; prereq #) Staff  
Clinical and/or laboratory research related to human sexuality; adapted to interests of student and faculty. Involves ongoing research projects in areas such as incest, rape, transsexualism, results of penile implantation, prostitution, sex offenses and sexual dysfunction. Contact: Sharon Satterfield, M.D. (376-7520), to make arrangements.

**5550. AMBULATORY CARE.** (086501) (9 cr; prereq med students only, #; hrs ar) Allemeier

**5585. SEXUAL PROBLEMS IN CLINICAL PRACTICE.** (985132) (Cr ar; prereq med students only #; hrs ar) Satterfield, staff

**5960. BASIC RESEARCH METHODS SEMINAR AND PRACTICUM.** (488687) (4 cr; hrs ar) Holloway

**5967. INTRODUCTION TO HEALTH DATA SYSTEMS.** (888086) (Cr ar) O'Leary, staff

**5968. COMPUTERS IN THEORY AND PRACTICE.** (989178) (Cr ar 2 cr) Krogh

**8207. SEMINAR: COMMON DISEASES SEEN IN FAMILY PRACTICE.** (785133) (1 cr; hrs ar) Sutherland, staff

**8209. FAMILY MEDICINE X-RAY CONFERENCE.** (585134) (1 cr; hrs ar) Sutherland, staff

**8223. INTRODUCTION TO GERONTOLOGY AND GERIATRIC MEDICINE.** (988161) (1300-1630 Th; 0800-1600 F; Ebenezer Society) Pattee

**8253. RESEARCH PROBLEMS.** (385135) (Cr ar; prereq #: hrs ar) O'Leary, staff

## Family Social Science (FSoS)

290 McNeal Hall, 373-1856  
College of Home Economics

### FIRST TERM

**1001. DYNAMICS OF FAMILY RELATIONSHIPS.** (790915) (3 cr; \$1002; 0900-1130, MW, McNH 179) Truchsess  
Application of behavioral sciences to mate selection, interaction in marriage and other committed relationships, sex roles, and maintaining and ending relationships.

**1025. PARENTHOOD.** (590916) (4 cr; 1000-1230 TTh, McNH 198) Hedberg  
Differing concepts of family roles—father, mother, son, daughter, sister, brother. Their implications for parent-child and sibling interaction. Effects of parenthood on husband-wife relations.

**3260. FAMILY RESOURCE MANAGEMENT.** (390917) (3 cr; prereq AgEc 1030; 0900-1200 TTh, McNH 179) Johnson  
Development of a theoretical systems framework to analyze behavior in families with emphasis on managerial aspects of behavior; goal setting, planning and implementing in use of resources.

**3500. CONSUMER AND THE MARKET SYSTEM.** (190918) (3 cr; prereq Soc 1001, Psy 1001, AgEc 1030, 3260 recommended; 1115-1415 MW, McNH 197) Gage  
Analysis of the interaction of the family and marketing systems; consumer problems resulting from that interaction.

**R5001. HUMAN SEXUAL BEHAVIOR.** (188093) (4 cr; prereq 15 cr in psychology or sociology; 0830-1115 TTh; McNH 197) Thibault  
Nature of sexual functions, sexual development, ethics and attitudes, research problems. Students pick up syllabus in McNeal Hall 290 for assignments to be completed before class begins. **Syllabus available by June 9 in 290 McNeal Hall. Students are expected to complete and return some assignments by Monday, June 16, the Friday before the first class meeting.**

**R5025. PARENTING.** (887861) (4 cr; prereq 5200 or 5202, CPsy 1301; 0900-1200 MW; McNH 198) Budd  
Parenting methods, the child's development from infancy through adolescence. Designed to help students identify differing parenting techniques, develop their own parenting approach, and conduct parenting classes.

**R5200. FAMILY RELATIONSHIPS.** (789960) (5 cr, \$Soc 5501; prereq Psy 1001 or equiv, Soc 1001 or equiv; 1330-1600 MWTh; BioSci 18) Olson  
The family as an institution and system of relationships. Current developments in study of the family. Changes in American society and their influence on family life.

**5230. INDEPENDENT STUDY.** (589961) (1-5 cr [max 16 cr]; prereq #) Staff

**8251. PROBLEMS: FAMILY SOCIAL SCIENCE.** (289971) (1-5 cr; prereq #: hrs ar) Staff

**8252. PROBLEMS: FAMILY SOCIAL SCIENCE.** (189972) (4 cr; prereq #: hrs ar) Staff

**8270. PRACTICUM: FAMILY RESEARCH.** (689711) (1-5 cr; prereq #: hrs ar) Staff

### SPECIAL TERM: JUNE 17-AUGUST 22, 1986

**5249. FIELDWORK: DIRECTED COMMUNITY WORK EXPERIENCE.** (090919) (5 cr; prereq 5200 and #: 0930-1100 T, PalmC 12) Zimmerman  
Directed preprofessional work experience with families, social, medical, and/or educational orientation.

### SECOND TERM

**3001. COMMUNICATION SKILLS AND INTERVIEWING TECHNIQUES: AN INTRODUCTION.** (186495) (3 cr; prereq 1001; 1400-1630 TTh; McNH 197) Macy  
Introductory training and experience in various communication skills and interviewing techniques for undergraduates. Integration of didactic and experiential training, and preparation for more advanced course work in the department.

**5230. INDEPENDENT STUDY.** (185212) (1-5 cr [max 16 cr]; prereq #) Staff

**5240. SPECIAL TOPICS: FEMINIST THEORIES AND THE FAMILY.** (285953) (3 cr; \$WoSt 5910; 0930-1100 MWF, FordH 150) Rosenblatt, Staff

Develop some basic feminist theories and critique family field textbooks and often-cited and/or recent family field research in terms of those theories.

**5260. DYNAMICS OF FAMILY DECISION MAKING.** (390920) (3 cr; prereq 3260 or #: 0945-1200 TTh, McNH 197) Hogan  
Conceptual models of decision making and resource management. Review and critique of current research and literature.

**8251. PROBLEMS: FAMILY SOCIAL SCIENCE.**

**Sec 1, Professional Ethics.** (985213), 1-5 cr, prereq #, 1200-1800 Th, McNH 198, Maddock  
Ethical issues and laws in family therapy practice. Confidentiality, legal liabilities, court testimony, sexual code, licensure, certification and value implications of modalities and interventions.

**Sec 2.** (091682), 1-5 cr, prereq #, hrs ar, Staff

**8252. PROBLEMS: FAMILY SOCIAL SCIENCE.** (785214) (4 cr; prereq #: hrs ar) Staff

**8270. PRACTICUM: FAMILY RESEARCH.** (489712) (1-5 cr; prereq #: hrs ar) Staff

## Finance (BFin)

837 Management/Economics Building, 373-3579  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R3000. FINANCE FUNDAMENTALS.** (4 cr, \$MBA 8040; each section limited to 50 students; prereq Acct 3001 or 1051; A-N only)

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

**Sec 1.** (589880) 0815-0945 MTWTh, BlegH 125, Rosko  
**Sec 2.** (389881) 1000-1130 TWTThF, BlegH 125, Rosko

**R3300. INVESTMENT MANAGEMENT AND FINANCIAL MARKETS.** (189882) (4 cr, \$8300; limited to 40 students; prereq 3000; 0930-1200 MW; BlegH 340) Alexander  
Introduces decision procedures for a variety of financial markets. The banking system and other financial intermediaries, risk-return relationships of various marketable securities, analytical techniques of portfolio management in the context of the nation's changing financial markets.

**R8150. THEORY OF FINANCE.** (4 cr; limited to 37 students; prereq MBA 8040 or #, grad mgmt/IR student or Grad Sch Mgmt approval)

A rigorous introduction to the modern theory of finance. Discussion of, *inter alia*, capital budgeting, capital structure, dividend policy, asset pricing, the application of option pricing to corporate finance, and the efficiency of financial markets.

**Sec 1.** (291719) 1730-2000 TTh; BlegH 330

**R8300. INVESTMENTS AND SECURITY ANALYSIS.** (4 cr; limited to 35 students; prereq 8150, 8200 or #, grad mgmt/IR student or Grad Sch Mgmt approval) Resnick  
An introduction to investment decision making for individuals and institutions. Discussion of *inter alia*, alternative methods of choosing securities and managing portfolios, with special emphasis given to the risk-return characteristics of securities.

**Sec 1.** (691720) 1730-2000 MW; BlegH 330, Alexander

**8850. INDEPENDENT STUDY IN FINANCE.** (386026) (Cr ar [may be repeated for cr]; prereq #, grad mgmt/IR student or Grad Sch Mgmt approval)  
Problems or developments of special interest in finance.

### SECOND TERM

**R3000. FINANCE FUNDAMENTALS.** (590818) (4 cr, \$MBA 8040; limited to 50 students; prereq Acct 3001 or 1051; A-N only; 0900-1030 MTWTh; BlegH 125) Fisher  
See First Term.

**R3100. FINANCIAL MANAGEMENT AND FINANCIAL MODELING.** (286021) (4 cr; limited to 37 students; prereq 3000; A-N only; 0800-0915 MTWTh; BlegH 335)

A broad, case-oriented course building on concepts introduced in 3000, with considerable emphasis on the use and misuse of the personal computer to solve financial management problems. The viewpoint of a corporation's principal financial officer is generally used. Case discussions, augmented by lectures and readings, prepare students to apply finance principles in actual business situations and to use personal computer in obtaining problem solutions. Experience in problem definition, specification of alternatives, computer analysis, and decisions. Effective verbal and written communication stressed. *Rigorous analysis of the assignment prior to each class session is expected as preparation for active class discussion.*

**R3300. INVESTMENT MANAGEMENT AND FINANCIAL MARKETS.** (390819) (4 cr, \$8300; limited to 40 students; prereq 3000; 0930-1200 TTh; Bleg 335) Ramamurtie  
See First Term.

**R3500. REAL ESTATE INVESTMENT ANALYSIS.** (287864) (4 cr; limited to 40 students; prereq 3000 and Econ 1002 or equiv; 0930-1200 MW; BlegH 335)  
Analysis and economic aspects of investments in real property including cash flows; accounting depreciation vs. market value depreciation or appreciation; financing methods and costs; sources of funds; measures of return on investment.

**R8200. FINANCIAL MARKETS AND INTEREST RATES.** (4 cr; limited to 37 students; prereq MBA 8040 or #, grad mgmt/IR student or Grad Sch Mgmt approval)  
Survey of financial markets of modern economies and introduction to theory of how interest rates in the various markets are related. Discussion of *inter alia*, interest rate term structure, relationship between interest rate and exchange rate, inflation and interest rates, and use of financial futures.

**Sec 1.** (291722) 1730-2000 MW; BlegH 330, Richardson

**8850. INDEPENDENT STUDY IN FINANCE.** (786024) (Cr ar [may be repeated for cr]; prereq #, grad mgmt/IR student or Grad Sch Mgmt approval)  
Problems or developments of special interest in finance.

## Fisheries and Wildlife (FW)

200 Hodson Hall, St. Paul, 373-3029  
College of Forestry

### FIRST TERM

**5393. SPECIAL PROBLEMS IN FISHERY BIOLOGY.** (589829) (Cr ar; prereq #) Staff  
Individual field, library, and laboratory research in various areas of fishery biology.

**5398. SPECIAL PROBLEMS IN WILDLIFE BIOLOGY.** (989830) (Cr ar; prereq #) Staff  
Individual field, library, and laboratory research in various areas of wildlife biology.

**8364.\* RESEARCH IN FISHERY BIOLOGY.** (789831) (Cr ar; prereq #) Staff

**8377.\* RESEARCH IN WILDLIFE BIOLOGY.** (589832) (Cr ar; prereq #) Staff

### SECOND TERM

**3400. FISHERIES TECHNIQUES—August 26-September 21.** (490892) (5 cr; prereq Biol 5041, Chem 1005 and FW 3052; Δ; offered at Itasca) Staff  
Field experience in gathering data on fish populations and their habitats; data analysis including computer applications and written reports.

**3500. WILDLIFE TECHNIQUES—August 26-September 21.** (290893) (3 cr; prereq Biol 5041 and FW 3052; Δ; offered at Itasca) Staff  
Field experience in gathering data on wildlife populations and their habitats; data analysis including computer applications and written reports.

**5393. SPECIAL PROBLEMS IN FISHERY BIOLOGY.** (190773) (Cr ar; prereq #) Staff  
See First Term.

**5398. SPECIAL PROBLEMS IN WILDLIFE BIOLOGY.** (090774) (Cr ar; prereq #) Staff  
See First Term.

**8364.\* RESEARCH IN FISHERY BIOLOGY.** (890775) (Cr ar; prereq #) Staff

**8377.\* RESEARCH IN WILDLIFE BIOLOGY.** (690776) (Cr ar; prereq #) Staff

## Food Science and Nutrition (FScN)

228 Food Science and Nutrition, St. Paul. 373-1073  
Colleges of Agriculture and Home Economics

### FIRST TERM

**n 3600. PRINCIPLES OF NUTRITION.** (389833) (4 cr; limited to 25 students; prereq Biol 1011 and Chem 1004 or equiv; 0800-0955 MWF, 0905-0955 TTh; FScN 15)

The fundamental principles of nutrition, including the essentiality and metabolism of nutrients and results of nutritional deficiencies or excesses. Presented in the context of personal, national and global aspects of human nutrition.

**5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (189834) (1-5 cr [may be repeated for cr]; prereq Δ; hrs ar) Staff

Individual laboratory or library research in some area related to food chemistry, food processing, nutrition, food service, or hospitality management.

**n 5404. CURRENT ISSUES IN FOOD AND NUTRITION—July 7-18.** (889836) (3 cr; limited to 25 students; prereq 15 cr in food science and nutrition or #: 0905-1135 MTWThF; ABLMS 125) Levine

Evaluation of popular and scientific literature as it deals with nutrition, food additives, food safety, food fads, health foods, environmental contamination, the consumer movement, naturally occurring food toxicants, processed foods, synthetic foods, organically grown foods.

**8401. INDEPENDENT STUDY: FOOD SCIENCE.** (689837) (1-5 cr; prereq #: hrs ar) Staff

Independent study and written reports.

**8621. INDEPENDENT STUDY: NUTRITION.** (489838) (1-9 cr; prereq Δ; hrs ar) Staff

Independent study and written reports.

### SECOND TERM

**1102. TECHNOLOGY OF FOOD PROCESSING.** (490777) (4 cr; prereq high school chemistry and biology; 0800-0955 MWF; 0905-0955 TTh; ABLMS 125)

Introduction to the technology of processing and distributing foods with reference to the prevention of biological, physical, and chemical deterioration. Changes in food composition, microbiological safety, food laws and regulations, technologies of the major food processes such as canning, freezing, drying, and cereal and oilseed processing.

**5111. INDEPENDENT STUDY IN FOOD SCIENCE AND NUTRITION.** (290778) (1-5 cr [may be repeated for cr]; prereq Δ; hrs ar) Staff

See First Term.

**8401. INDEPENDENT STUDY: FOOD SCIENCE.** (490780) (1-5 cr; prereq Δ; hrs ar) Staff

See First Term.

**8621. INDEPENDENT STUDY: NUTRITION.** (290781) (1-9 cr; prereq #: hrs ar) Staff

See First Term.

## Foreign Study (FoSt)

1246 Social Sciences. 373-2691  
College of Liberal Arts

### FIRST TERM

**0010. STUDY ABROAD.** (688123) (prereq permission of study abroad adviser; S-N only)

This no credit registration allows students to maintain their status at the University while studying abroad; for less than half-time study.

**0060. STUDY ABROAD.** (488124) (prereq permission of study abroad adviser)

Same as 0010; for half-time but less than three-quarter-time study.

**0090. STUDY ABROAD.** (288125) (prereq permission of study abroad adviser)

Same as 0010; for program of more than three-quarter but less than full-time.

**0120. STUDY ABROAD.** (188126) (prereq permission of study abroad adviser)

Same as 0010; for program of full-time study abroad.

## Fieldwork opportunities

Students may want to arrange a project in a community agency, government office, business organization, health care facility, cultural institution, or any other appropriate off-campus location. For information about current opportunities, contact the Office for Special Learning Opportunities (OSLO), 220 Johnston Hall.

In some cases, it may be possible to earn credit for a study project carried out in conjunction with the fieldwork. This is done through departmental directed study (3970 or 5970) or an extra credit (X) registration. These must be approved by the instructor and the department. For more information, contact the appropriate department or the Office for Special Learning Opportunities (373-7550).

**0150. STUDY ABROAD.** (190894) (prereq permission of coordinator of Foreign Study).

Same as 0120; for full time study on International Student Exchange program (ISEP).

**5960. SPAN SEMINAR FOR FOREIGN STUDY.** (990069) (6 cr; prereq approval before Nov 1984 by a faculty selection committee) Stavrou, Blue, Jones, Aldrich  
Preparation for independent study in Greece, Cameroon, British Isles, or Malaysia/Singapore, investigating history, social and political ambience, and culture.

### SECOND TERM

**0010. STUDY ABROAD.** (988127) (prereq permission of study abroad adviser)

See First Term.

**0060. STUDY ABROAD.** (788128) (prereq permission of study abroad adviser)

See First Term.

**0090. STUDY ABROAD.** (588129) (prereq permission of study abroad adviser)

See First Term.

**0120. STUDY ABROAD.** (988130) (prereq permission of study abroad adviser)

See First Term.

**0150. STUDY ABROAD.** (191642) (prereq permission of coordinator of Foreign Study).

Same as 0120; for full time study on International Student Exchange program (ISEP).

**5960. SPAN INDEPENDENT PROJECT.** (188868) (6 cr; prereq satisfactory completion of first term) Kelsey, Stavrou, Blue, Jones, Aldrich  
Following an 8-week stay in Greece, Cameroon, British Isles, or Malaysia/Singapore, participants prepare and submit a project growing from their study at home and abroad.

## Forest Products (ForP)

203 Kaufert Laboratory, St. Paul. 373-1203  
College of Forestry

### FIRST TERM

**8300.\* RESEARCH PROBLEMS.** (585196) (Cr ar) Staff

**8301.\* RESEARCH PROBLEMS.** (385197) (Cr ar) Staff

**8302.\* RESEARCH PROBLEMS.** (185198) (Cr ar) Staff

### FIRST AND SECOND TERM: TEN-WEEK COURSES (Register once in Term I)

**3301. INDUSTRIAL ASSIGNMENT.** (186568) (1 cr; prereq Forest Product student, registration in cooperative education program; S-N only) Bowyer  
Industrial work assignment in Forest Products cooperative education program. Evaluation based on formal report written by student at end of each quarter of work assignment.

**5401. SPECIAL TOPICS.** (186764) (prereq sr, #) (Cr ar)

### SECOND TERM

**8300.\* RESEARCH PROBLEMS.** (085171) (Cr ar) Staff

**8301.\* RESEARCH PROBLEMS.** (885172) (Cr ar) Staff

**8302.\* RESEARCH PROBLEMS.** (685173) (Cr ar) Staff

## Forest Resources (FR)

110 Green Hall, St. Paul. 373-0840  
College of Forestry

### FIRST TERM

**3225. DIRECTED STUDY EXPERIENCE.** (591659) (1-5 cr; prereq #)

**8100.\* RESEARCH PROBLEMS: SILVICULTURE.** (085199) (Cr ar) Scholten, Alm

**8101.\* RESEARCH PROBLEMS: FOREST TREE PHYSIOLOGY.** (785200) (Cr ar) Sucoff, Dixon

**8102.\* RESEARCH PROBLEMS: FOREST TREE GENETICS.** (585201) (Cr ar) Mohn

**8103.\* RESEARCH PROBLEMS: FOREST HYDROLOGY.** (385202) (Cr ar) Brooks, Perry

**8105. ADVANCED FIELD SILVICULTURE.** (185209) (3 cr; prereq 5101, #; offered at Cloquet Forestry Center) Staff  
Selected current silvicultural problems and research. Plant-soil relationships with particular reference to forest soils. Methods of forest soil investigations in the field and in the laboratory. Offered alternate years.

**8200.\* RESEARCH PROBLEMS IN FOREST MANAGEMENT.** (185203) (Cr ar) Hallgren, Irving, Rose, Blinn

**8201.\* RESEARCH PROBLEMS IN FOREST ECONOMICS.** (085204) (Cr ar) Skok, Ellefson, Gregersen, Rose, Blinn

**8202.\* RESEARCH PROBLEMS IN FOREST BIOMETRY.** (885205) (Cr ar) Ek, Rose, Burk

**8203.\* RESEARCH PROBLEMS IN FOREST RECREATION.** (685206) (Cr ar) Knopp

**8204.\* RESEARCH PROBLEMS IN FOREST POLICY.** (485207) (Cr ar) Irving, Merriam, Skok, Ellefson, Gregersen, Hallgren

**8205.\* RESEARCH PROBLEMS IN REMOTE SENSING.** (285208) (Cr ar) Bauer

### SECOND TERM

**3225. DIRECTED STUDY EXPERIENCE.** (088216) (1-5 cr; prereq #)

**8100.\* RESEARCH PROBLEMS: SILVICULTURE.** (485174) (Cr ar) Scholten, Alm

**8101.\* RESEARCH PROBLEMS: FOREST TREE PHYSIOLOGY.** (285175) (Cr ar) Sucoff, Dixon

**8102.\* RESEARCH PROBLEMS: FOREST TREE GENETICS.** (185176) (Cr ar) Mohn

**8103.\* RESEARCH PROBLEMS: FOREST HYDROLOGY.** (985177) (Cr ar) Brooks, Perry

**8200.\* RESEARCH PROBLEMS IN FOREST MANAGEMENT.** (785178) (Cr ar) Hallgren, Irving, Rose, Blinn

- 8201.\* RESEARCH PROBLEMS IN FOREST ECONOMICS.** (585179) (Cr ar) Skok, Ellefson, Gregersen, Rose, Blinn
- 8202.\* RESEARCH PROBLEMS IN FOREST BIOMETRY.** (985180) (Cr ar) Ek, Rose, Burk
- 8203.\* RESEARCH PROBLEMS IN FOREST RECREATION.** (785181) (Cr ar) Knopp
- 8204.\* RESEARCH PROBLEMS IN FOREST POLICY.** (585182) (Cr ar) Irving, Skok, Ellefson, Gregersen, Hallgren
- 8205.\* RESEARCH PROBLEMS IN REMOTE SENSING.** (385183) (Cr ar) Bauer

### SPECIAL TERM—AUGUST 26-SEPTEMBER 21

**R 3100. MINNESOTA PLANTS—August 26-September 21.** (1 or 2 cr; prereq, Biol 1103; Δ; offered at Itasca) Identification of plants as related to habitat.

- Sec 1, (185184) Scholten
- Sec 2, (085185) Scholten
- Sec 3, (885186) Scholten
- Sec 4, (685187) Scholten

**R 3101. FIELD FOREST ECOLOGY—August 26-September 21.** (3 cr; prereq Chem 1001 or 1004; Δ; offered at Itasca) Field examination of succession, soils, silvical characteristics, tree classification, stand structure, and the ecology of regeneration.

- Sec 1, (485188) Kurmis, Sucoff
- Sec 2, (285189) Kurmis, Sucoff
- Sec 3, (685190) Kurmis, Sucoff
- Sec 4, (485191) Kurmis, Sucoff

**R 3201. FIELD FOREST MEASUREMENT—August 26-September 21.** (1 cr; prereq Math 1008; Δ; offered at Itasca) Introduction to land, survey, tree and stand measurement, and basic forest sampling techniques.

- Sec 1, (285192) Splett
- Sec 2, (185193) Splett
- Sec 3, (985194) Splett
- Sec 4, (785195) Splett

**R 5160. PRACTICUM IN FOREST BIOLOGY AND MEASUREMENTS—August 26-September 21.** (386477) (3 cr; prereq graduate student; offered at Itasca) Sucoff Plant identification, plant dynamics, land survey, tree measurement.

**3601. FRENCH LITERATURE IN ENGLISH TRANSLATION.** (389332) (4 cr [or does not count toward French major]; taught in English; 1010-1205 MWF; FolH 303) Waldauer Representative works from medieval times to present examined through movements, genres, or themes.

**3970. DIRECTED READINGS.** (090077) (1-5 cr; prereq undergrad, #, Δ, □)

**R 5415. RABELAIS.** (791241) (4 cr; limited to 25 students; prereq 3209 or above; 1400-1700 MW; FolH 204) Conley *Gargantua and Pantagruel* in original text.

**8970. DIRECTED READINGS.** (890078) (1-5 cr; prereq # and consent of dept chair; hrs ar) Staff

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll for all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**R 1101-1102-1103. BEGINNING FRENCH.** (15 cr for both terms; limited to 30 students; 0905-1205 MTWThF; FolH 104)

- R 1101, Sec 5, (690079) June 17-July 9, 5 cr
- R 1102, Sec 5, (090080) July 10-31, 1, 5 cr
- R 1103, Sec 5, (890081) August 1-22, 5 cr

### SECOND TERM

**R 1102. BEGINNING FRENCH.** (885365) (5 cr; limited to 30 students; prereq 1101 or 1 yr high school French; 0905-1100 MTWThF; FolH 209)

**R 1103. BEGINNING FRENCH.** (885366) (5 cr; limited to 30 students; prereq 1102 or 2 yrs high school French; 0800-0955 MTWThF; FolH 205)

**R 1105. INTERMEDIATE FRENCH.** (285368) (5 cr; limited to 30 students; prereq 1104; 1010-1205 MTWThF; FolH 306) Barnes

**R 3016. ADVANCED FRENCH COMPOSITION AND CONVERSATION.** (485370) (4 cr; limited to 15 students; prereq 3015 or #; 1010-1205 MWF; FolH 205)

**R 3017. STYLISTICS THROUGH TRANSLATION.** (591242) (4 cr; limited to 15 students; prereq 3016 or superior achievement in 3015 or #; 1010-1205 MWF; FolH 52) Organized around various perspectives: the arts, economics, ecology, politics, sociology.

**R 3299. THEMES IN FRENCH LITERATURE: "Short Stuff": French Tales and Short Stories from the 16th to the 19th Century.** (391243) (4 cr; limited to 20 students; prereq 3101; 1010-1205 MWF; FolH 105) Caron Literature in relation to other cultural activities, e.g., the arts, philosophy, politics.

**3602. FRENCH LITERATURE IN ENGLISH TRANSLATION.** (189333) (4 cr [or does not count toward French major]; taught in English; 1220-1415 MWF; FolH 209) Representative works from medieval times to present examined through movements, genres, or themes.

**3970. DIRECTED READINGS.** (285371) (1-5 cr; prereq undergrad, #, Δ, □) Staff

**R 5990. PROFICIENCY TEACHING OF FRENCH.** (891702) (6 cr; limited to 15 students; prereq teaching certification in French or #; July 21-August 8, 0900-1200, 1300-1500 MTWThF; CivMinE 214) Solberg Intensive work with the implications of the ACTFL Proficiency Guidelines for the classroom teacher, combined with intensive proficiency-oriented language instruction in French.

**8970. DIRECTED READINGS.** (185372) (1-5 cr; prereq # and consent of dept chair; hrs ar) Staff

## French and Italian (Frlt)

### SECOND TERM

**R 3608. NEW WAVE CINEMAS.** (689529) (4 cr; limited to 60 students; does not count toward French major; knowledge of French and Italian helpful but not necessary; 1220-1415 MWF; FolH 303)

Film work of directors recasting classical traditions of Europe and America. Film theories of the western, B-genre; political cinema: Godard, Resnais, Rivette, Pasolini, Antonioni, Bertolucci.

## French (Fren)

200 Folwell Hall. 373-5202  
College of Liberal Arts

### FIRST TERM

**R 1101. BEGINNING FRENCH.** (5 cr; each section limited to 30 students)

- Sec 1, (290070) 0905-1100 MTWThF, Arch 20
- Sec 2, (190071) 0905-1100 MTWThF, AkerH 215
- Sec 3, (788730) 0905-1100 MTWThF, MinMet 116

**R 1102. BEGINNING FRENCH.** (990072) (5 cr; limited to 30 students; prereq 1101 or 1 yr high school French; 0800-0955 MTWThF; JonesH 4)

**R 1103. BEGINNING FRENCH.** (790073) (5 cr; limited to 30 students; prereq 1102 or 2 yrs high school French; 0800-0955 MTWThF; JonesH 2)

**R 1104. INTERMEDIATE FRENCH.** (590074) (5 cr; limited to 30 students; prereq 1103 or 3 yrs high school French; 1010-1205 MTWThF; FolH 105)

**R 3015. FRENCH CONVERSATION AND COMPOSITION.** (390075) (4 cr; limited to 15 students; prereq 1105 or #; 1010-1205 MWF; FolH 103) Robinson Emphasis on writing, development of communication skills. Based on a consolidation of grammar.

**R 3016. ADVANCED FRENCH COMPOSITION AND CONVERSATION.** (190076) (4 cr; limited to 15 students; prereq 3015 or #; 1220-1415 MWF; FolH 302) Akehurst Builds on 3015 with emphasis on aspects of expression and writing. Readings and discussions with attention to different cultural contexts.

**R 3101. INTRODUCTION TO FRENCH LITERARY TEXTS: POETRY.** (586185) (4 cr; limited to 25 students; prereq 3015 or equiv; 0905-1100 MWF; FolH 205) Sivert Approaches to literary analysis and techniques examined through critical reading. Aims beyond, but focuses on, poetry.





## General College (GC)

106 Nicholson Hall. 373-4104

(See also Itasca Biology Program)

(See also Rhetoric 1147)

### FIRST TERM

**R 1132. BIOLOGICAL SCIENCE: THE HUMAN BODY.** (688736) (5 cr; limited to 75 students; 0800-0955 MTWThF; SciCB 125) Dearden

Problems of physical, mental, and social health are related to anatomy, physiology, and needs of the human organism. Films, televised dissections, and demonstrations supplement lectures.

**R 1133. NATURE STUDY—June 15-July 5.** (787870) (5 cr; limited to 20 students; offered at Itasca, see page 79.) Hatch  
A general natural history course for students with little or no prior training in biology. Natural histories of common Minnesota plants and animals are discussed and examined in the field from the standpoint of the informed amateur naturalist. Natural habitat associations are stressed as are techniques in field observation and identification.

**R 1166. PHYSICAL SCIENCE: PRINCIPLES OF CHEMISTRY.** (689353) (5 cr; limited to 50 students; 1010-1205 MTWThF; SciCB 125) Uthe

Fundamental principles and laws, stressing development and application of theories and their roots in experience. Topics and demonstrations deal with classification of matter, reactions, elements, atomic and molecular structure, chemical bonding theory, and other subjects that may vary from quarter to quarter. Students gain general understanding of both content and process of the science of chemistry.

**R 1235. UNITED STATES: LAW IN SOCIETY.** (491203) (4 cr; limited to 40 students; 0800-0955 MTWThF; NichH 207) Hower  
The role of law in our changing society; legal aspects of current topics. Topics include courts and court systems, corrections, police-community relations, environmental problems, domestic problems, wills and probate, and insurance. When possible on individual or group basis, students visit conciliation, municipal, or district courts, prisons, workhouses, jails, juvenile detention centers, or similar institutions.

**R 1243. HISTORICAL BIOGRAPHY: WORLD WAR II AND COLD WAR PERSONALITIES.** (191205) (4 cr; §3243; limited to 40 students; 0800-0955 MTWTh; NichH 216) Buckley  
Perspective on America's present world position through examining personalities and policies of such figures as Roosevelt, Churchill, Hitler, Marshall, Truman, Stalin, and Eisenhower (as well as less famous men and women of that period). Meets with 3243.

**R 1285. CULTURAL ANTHROPOLOGY.** (791207) (4 cr; limited to 50 students; 0800-0955 MTWTh; NichH 213) F Johnson  
Human culture viewed as integrated system of learned and shared knowledge that guides behavior of all members of given society. Attempt to develop generalizations about influence of culture on human behavior by analyzing and comparing ways of life in a wide range of cultures. Power of culture to shape personality and power of individuals to alter cultures.

**R 1312. ART: ART TODAY I.** (591208) (3 cr; students may enroll for 1 or 2 quarters in any sequence; limited to 40 students; 1010-1100 MTWThF; NichH 111; S-N only) Gates  
Participation in selected fields of study related to contemporary art and art activity, generally in areas such as painting, filmmaking, sculpture, architecture, and crafts.

**R 1411. FUNDAMENTALS OF USAGE AND STYLE.** (585991) (3 cr; limited to 30 students; 1005-1055 MTWThF; NichH 209) Albrecht  
Principles of grammar, usage, and style, through exercises and by writing sentences and paragraphs.

**R 1421. WRITING LABORATORY: PERSONAL WRITING.** (188019) (4 cr; limited to 25 students; 1010-1205 TWThF; NichH 216) Rathburn  
Students read and write descriptive narratives, characterizations, and autobiographical sketches. Personal help with writing problems in laboratory. Emphasis is on clear and effective written expression.

**R 1433. FUNDAMENTAL COLLEGE MATHEMATICS.** (389945) (1-10 cr; initial registration should be for 4 cr; limited to 35 students; prereq GCPP math level A or B or C or 1431 or 1434 or Δ; 0800-0955 MTWThF; FolH 101) Johnson  
For students with limited background in arithmetic or elementary algebra who want to study this material at their own pace in a classroom setting using a semiprogrammed text. With aid of instructor, students select topics from the following: whole numbers, fractions, decimals, percents, signed numbers, formulas, simple graphs, ratio and proportion, sets, properties, equations, inequalities, rectangular graphs, polynomials, factoring, rational expressions, and radicals. Students may not receive credit in 1433 for equivalent work done in any other math course.

**R 1465. ORAL COMMUNICATION: INTERPERSONAL COMMUNICATION.** (589099) (4 cr; limited to 25 students; 0905-1055 MTWTh; NichH 122) Amram  
Students examine their own communication patterns—verbal, nonverbal, and vocal—and try to discover why they are effective or ineffective communicators, to uncover some origins of their communicative behavior, and to understand means we use to relate to each other and ways we alienate ourselves from each other. Course asks students to begin or deepen their search for identity and to aid others in their search.

**R 3243. HISTORICAL BIOGRAPHY: WORLD WAR II AND COLD WAR PERSONALITIES.** (391209) (4 cr; §1243; limited to 10 students; 0800-0955 MTWTh; NichH 216) Buckley  
Perspective on America's present world position through examining personalities and policies of such figures as Roosevelt, Churchill, Hitler, Marshall, Truman, Stalin, and Eisenhower (as well as less famous men and women of that period). Meets with 1243.

**R 3282. PSYCHOLOGY APPLIED TO SOCIAL PROBLEMS.** (485997) (4 cr; prereq 1281 or equiv, 3rd-qtjr; limited to 40 students; 0800-1100 TTh; NichH 109) Brothen  
Social-psychological analysis of social problems facing society today, such as drug use, crime, violence, and prejudice, and how they might be understood and solved through applications of psychological research findings.

**R 3531. WRITING FOR BUSINESS AND THE PROFESSIONS.** (289355) (4 cr; prereq 1412 or 1421...1425 or 1531 recommended; limited to 25 students; 1010-1205 MTWTh; NichH 254) Adamson  
Students write letters, informal and formal reports, recommendations, proposals, summaries, memos—i.e., forms of writing used in business; in health, education, and welfare; and in legal professions. Content adapted to vocational needs of students enrolled. Form, clarity, economy of expression, and suitable tone stressed. *Typed final drafts required.*

**R 3602. APPLIED SUPERVISION.** (791210) (4 cr; limited to 40 students; prereq 45 cr, 1511, one course in psychology and sociology or #; 1010-1205 MWF, 1115-1205 TTh; NichH 109) Kroll  
Practical approaches to supervision principles and problems in small- and medium-size businesses. Through case problems, role playing in simulated business situations, and decision-making exercises, students learn relationship between authority and responsibility as well as delegation process; manager or group decision-making methods; techniques of communication process between management and employees; practical knowledge of concept of job enrichment; and characteristics of the high-productivity manager.

### SECOND TERM

**R 1283. PSYCHOLOGY OF HUMAN DEVELOPMENT.** (191219) (4 cr; limited to 50 students; 1000-1205 MTWTh; NichH 209) Latts  
Focuses on growth and development of individual from conception through old age. Physical, motor, social, emotional, and psychological and cognitive development. Integrated new view of facets of development in order to understand human being as a complex organism functioning in a complex environment. The family as the main environmental factor in early development of the individual.

**R 1311. ART: GENERAL ARTS.** (191213) (4 cr; §3311; limited to 30 students; 0800-0955 MTWTh; NichH 111) Byrne  
Representative works of art from genre of painting, sculpture, architecture, literature, and music to discover how and why art is created and to enable students to formulate and evaluate ideas and attitudes about it. Meets with 3311.

**R 1402. VOCABULARY DEVELOPMENT.** (491220) (3 cr; limited to 25 students; no prereq; 0900-0955 MTWThF; NichH 122) Koch

In-class discussion, small-group work, and individual projects. Students develop substantial and workable vocabulary through study of dictionary, word parts, and meanings in context in programmed textbooks, current college textbooks, and individually compiled contextual passages. Both written and oral classwork.

**R 1422. WRITING LABORATORY: COMMUNICATING IN SOCIETY.** (485210) (4 cr. §1423; prereq 1421; limited to 25 students; 1010-1205 MTWTh; NichH 216)

How people communicate in society, and how they perceive and think, write, and talk about events. Assumptions, inferences, and distortions involved in thinking; habits and processes of observation; factual and slanted reporting; persuasive devices; and cultural and cross-cultural communication. Primarily a writing course but also involves reading and discussion.

**R 1445. MATHEMATICS: INTERMEDIATE ALGEBRA.** (285211) (5 cr. §1443, 1444; limited to 45 students; prereq GCPP math level D or 1435; 0800-0955 MTWThF; FolH 101)

Concepts and manipulative skills necessary for college algebra. The real number system, special products and factoring, exponents and radicals, linear equations in one and two variables, quadratic equations in one variable, progressions, inequalities, variation, and logarithms. Prospective students may have to give evidence of adequate preparation.

**R 1534. PRACTICAL LAW.** (591211) (4 cr; limited to 40 students; 1010-1205 MTWThF; NichH 207) Kahn

Common legal problems, formation and discharge of contracts, torts (personal injury and property damage suits), criminal law, bailments, nature and classification of real and personal property and joint ownership and tenancy.

**R 1537. PROFESSIONAL SELLING.** (387872) (4 cr; limited to 30 students; 0800-0955 MTWTh; NichH 109) Nelson

Sales as an occupation; qualifications needed for successful career in selling and sales management. Principles and techniques practiced by role playing and sales demonstrations. Resource people, guest speakers, recordings, films, and discussions. Students develop salesplanning portfolios. Concurrent employment in selling or sales-related occupation recommended but not required.

**R 1721. MARRIAGE, FAMILY, AND PERSONAL FULFILLMENT.** (991223) (4 cr; limited to 50 students; 0800-0955 MTWTh; NichH 207) Thoen

Psychological, social, and biological aspects of marriage and family living. Helping students gain understanding of and self awareness concerning dating, selecting mates, getting married, having children, and sexuality. Adjustments outside traditional marital and family relationships.

**R 3311. ART: GENERAL ARTS.** (391212) (4 cr. §1311; limited to 15 students; 0800-0955 MTWTh; NichH 111) Byrne

Examines representative works of art from genres of painting, sculpture, architecture, literature, and music to discover how and why art is created and to enable students to formulate and evaluate ideas and attitudes about it. Meets with 1311.

**R 3423. WRITING THE RESEARCH OR SURVEY REPORT.** (191222) (4 cr; prereq 1421, 1422 recommended; limited to 20 students; 0800-0955 MTWTh; NichH 216) Kurak

Writing informal and formal survey or research reports; discovering information resources; developing multimedia techniques for securing, tabulating, and interpreting data; and organizing, illustrating, writing, and presenting final reports. Designed especially for students working toward baccalaureate degrees or preparing for senior demonstrations. Close and frequent liaison between student, supervisor or adviser in field of concentration, and professor teaching course. **S-N recommended.**

**R 3464. COMMUNICATION IN ORGANIZATIONS.** (789098) (4 cr; prereq 1461 or 1465, 5 cr in psychology; limited to 30 students; 1010-1205 MTWTh; NichH 122) F T Benson

For managers, supervisors, and others who directly control quality of life of persons in organizations; focuses on processes and problems involved in working and communicating with people in organizational settings and on knowledge, attitudes, and skills that underlie effective behavior in organizational relationships.

**R 3605. INTERVIEWING.** (187873) (4 cr; limited to 30 students; prereq #; 1010-1205 MTWTh; NichH 213) Skovholt

For students who plan to enter occupations in which structured communication—particularly formal interview—is required. Development of skills related to wide spectrum of occupations. Interactive process of interview and roles of participants in dyad, variety of communication patterns in interview context, and how the interviewer affects others (and others affect the interviewer) in goal-directed dyadic interaction. Actual and simulated situations. (GrA).

**R 3761. CONSUMER/BUYER BEHAVIOR.** (291221) (4 cr; limited to 30 students; prereq 75 cr, 1551 or #; 1010-1205 MTWTh; NichH 109) Peterson

Consumer behavior, relation to buying-decision process. Who the consumer is, environment in which he or she operates, internal and external influences. Perception, attitudes, learning, motivation, and personality.



## Genetics and Cell Biology (GCB)

250 Biological Science, St. Paul. 373-0966  
College of Biological Science

### FIRST TERM

**3022. GENETICS.** (786007) (4 cr, §Biol 5003; not intended for biology majors; prereq Biol 1009; 1000-1110 MTWThF; ClaOff B35)

Mechanisms of heredity; their implications for biological populations, and applications to practical problems. Meets with 5022.

**5022. GENETICS.** (586008) (3 cr, §3022, §Biol 5003; not open to grad students in genetics; 1000-1110 MTWThF; ClaOff B35) See 3022.

**5970. DIRECTED STUDIES.** (588731) (Cr ar; prereq #, Δ) Staff Individual study on selected topics or problems with emphasis on selected readings and use of scientific literature.

**5990. DIRECTED RESEARCH.** (388732) (Cr ar; prereq #, Δ) Staff Laboratory or field investigation of selected areas of research.

**8970. DIRECTED STUDIES.** (689854) (Cr ar; prereq #, Δ) Staff

**8990. RESEARCH.** (489855) (Cr ar; prereq #) Staff

### SECOND TERM

**5970. DIRECTED STUDIES.** (188733) (Cr ar; prereq #, Δ) Staff See First Term.

**5990. DIRECTED RESEARCH.** (088734) (Cr ar; prereq #, Δ) Staff See First Term.

**8970. DIRECTED STUDIES.** (209795) (Cr ar; prereq #, Δ) Staff

**8990. RESEARCH.** (190796) (Cr ar; prereq #) Staff

## Geography (Geog)

414 Social Sciences. 373-2661  
College of Liberal Arts

### FIRST TERM

**R 1501. THE LANGUAGE OF MAPS.** (5 cr; each recitation limited to 30 students; §3331; 1010-1100 MTWThF; AndH 230) Gersmehl

Rec 1, (191132) 1115-1205 T; BlegH 445

Rec 2, (091133) 0905-0955 W; BlegH 445

Rec 3, (891134) 1115-1205 Th; BlegH 445

Maps of many kinds; symbolic vocabulary of spatial communication; analysis of location, distance, direction, shape, area, gradient, trend, and association of features; spatial patterns, inferred causes, and exceptions; perception, meaning, and distortion.

**3141. AFRICA.** (691135) (4 cr; 1115-1205 MTWThF; BlegH 435) Scott

Regional differentiation of human groups and environments; culture contact and problems of undeveloped countries south of the Sahara.

**3331. ECONOMIC GEOGRAPHY.** (888735) (4 cr; 0905-0955 MTWThF; BlegH 425) Scott  
World patterns of economic activity; levels of development; appraisal of resources, production, circulation, and consumption; principles, models, and planning of economic behavior.

**3345. ENERGY AND MINERALS.** (491136) (4 cr; 1220-1310 MTWThF; BlegH 435) R Adams  
Sources, production, circulation, and consumption of power, metals, and nonmetallic minerals. Problems of exhaustion, substitution, pollution, costs, trade, and policy. National and local case studies.

**3940. DIRECTED FIELD STUDY.** (088166) (2-4 cr; prereq #) Staff  
Guided individual field study.

**3970. DIRECTED STUDIES.** (190085) (1-15 cr per qtr; prereq #, Δ, □) Staff

**5172. EASTERN EUROPE.** (291137) (4 cr; 1010-1100 MTWThF; BlegH 435) R Adams  
Physical and human geography of the socialist realm of Eastern Europe with comparative analyses of individual countries; emphasis upon the historical, economic, and political diversity with topical case studies.

**R 5701. FIELD RESEARCH.** (191138) (4 cr; limited to 14 students; prereq 12 cr in geography; #; arr) J Adams  
Field investigation in physical, cultural, and economic geography; techniques of analysis and presentation; reconstruction of environments.

**8970. DIRECTED READINGS.** (990086) (1-5 cr) Staff

### SECOND TERM

**1301. HUMAN GEOGRAPHY.** (991139) (5 cr; §1302; 0905-0955 MTWThF; AndH 230) Rice  
Geography of population and principal ways of life; capacity of earth for future population.

**1425. INTRODUCTION TO METEOROLOGY.** (291140) (4 cr; §Soil 1262; 1010-1100 MTWThF; AndH 230) Skaggs  
Nature of the atmosphere and its behavior. Atmospheric composition, structure, stability, and motion; precipitation processes, air masses, fronts, cyclones, and anti-cyclones; general weather patterns; meteorological instruments and observation; plotting and analysis of maps; forecasting.

**3940. DIRECTED FIELD STUDY.** (888166) (2-4 cr; prereq #) Staff  
Guided individual field study.

**3970. DIRECTED STUDIES.** (985373) (1-15 cr per qtr; prereq #, Δ, □) Staff

**5112. WESTERN UNITED STATES.** (191141) (4 cr; 0905-0955 MTWThF; BlegH 435) Mather  
Physical and human resources of western United States.

**5113. CANADA AND ALASKA.** (991142) (4 cr; 1115-1205 MTWThF; BlegH 435) Mather  
Physical and human geography. Internal and external areal relationships.

**8970. DIRECTED READINGS.** (785374) (1-5 cr) Staff

## Urban field research

**Geography 5701, Field Research, June 16-27, is a comparative field investigation of selected urban regions in north-eastern Anglo-America (Milwaukee, Detroit, Toronto, Buffalo, Pittsburgh, Cleveland, Toledo, Chicago, Dubuque). The focus is on selected aspects of the changing metropolitan economy (land use change, neighborhood vitality), population (age structure, race, ethnicity, household structure, immigration), and housing (construction, renovation, preservation). Written reports will be required. Permission of instructor required for registration. Course is limited to 14 students.**

## Geology field study

Fieldwork in geologic mapping (Geo 5111) will be conducted in a special term (June 16-July 25) in the Sawatch Mountains near Gunnison, Colorado. The course is restricted to geology and geophysics majors who have satisfactorily completed the core sequence of Geo 1111 (or 1001), 3102, 3112, 3401, 5201, 5501, and 5651. A major paper is required. Instructor's permission is required to register.

## Geology and Geophysics (Geo)

106 Pillsbury. 373-4137  
Institute of Technology

### FIRST TERM

**R 1001. PHYSICAL GEOLOGY.** (5 cr; each section limited to 26 students; lect 0905-0955 MTWThF; PillsH 110) Stout  
A non-mathematical survey of the Earth; its internal and external structure; earthquakes and volcanoes, glaciers; mountain building and destruction, continent formation, seafloor spreading resources for our future.

Lab 1, (090631) 1010-1205 MWF, FordH 185  
Lab 2, (890632) 1325-1520 MWF, FordH 185

**3990. PROBLEMS IN GEOLOGY AND GEOPHYSICS.** (788047) (1-6 cr; prereq # and Δ)  
Individual research or problem selected on the basis of individual interests and background.

**R 5051. PHYSICAL GEOLOGY FOR TEACHERS.** (4 cr, §1001, §1111; each section limited to 4 students; only for students holding degrees in education; prereq 1 term college chemistry or physics; lect 0905-0955 MTWThF; seminar 1220-1310 TTh; PillsH 110) Stout

Scientific methods and nature of the earth. Main features of the physical world and of the processes that have formed them. Meets with 1001.

Lab 1, (589488) 1010-1205 MWF, FordH 185  
Lab 2, (389489) 1325-1520 MWF, FordH 185

**R 5111. FIELD GEOLOGY—June 16-July 25.** (5-9 cr; limited to students majoring in geology, geophysics, or geoenvironment; prereq 5201 and #) Staff  
Geologic mapping on topographic maps and aerial photos, field identification of igneous, sedimentary, and metamorphic rocks, measurement of stratigraphic sections, study of structural and geomorphic features. Major report required after completion of field work.

Sec 1, (588048) June 16-July 25 (9 cr)  
Sec 2, (386107) (5 cr, prereq grad student; ar)

## German (Ger)

219 Folwell Hall. 373-2624  
College of Liberal Arts

### FIRST TERM

**R 1101. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (790087) (5 cr, §1010, §1110, §1201; §1210; limited to 25 students; 0800-0955 MTWThF; FolH 204)

Structure, listening and reading comprehension, writing, speaking.

**R 1103. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (791143) (5 cr, §1010, §1110, §1203, §1210; limited to 25 students; prereq 1102 or placement; 0905-1100 MTWThF; AkerH 211)  
See 1101.

**R 3011. CONVERSATION AND COMPOSITION.** (486194) (4 cr; limited to 20 students; prereq 1105 or placement; 0905-0955 MTWThF; FolH 307) Taraba  
Spoken German; composition; development of vocabulary; grammar review.

**R 3014. CONVERSATION AND COMPOSITION.** (391145) (4 cr; limited to 20 students; prereq 3013 or #; 1010-1100 MTWThF; FolH 306) Michel  
Practice in German conversation and composition with a focus on the media. Reading and analysis of German newspapers and journals; exercises using German-language radio and video broadcasts.

**R 3043. ORAL INTERPRETATION OF GERMAN DRAMA.** (191146) (2 cr; limited to 15 students; prereq 3013 or equiv, #; 1115-1205 MWF; FolH 205) Weiss  
Dramatic reading of German plays for pronunciation and preparation for German play production.

**R 3601. GERMAN LITERATURE IN TRANSLATION: MEDIEVAL LITERATURE.** (487877) (4 cr [does not count toward German major or minor]; limited to 30 students; may be used in fulfillment of Route II, Part B of BA foreign language requirement; knowledge of German not required; 1115-1205 MTWThF; FolH 207) Liberman

**R 5020. GERMAN STYLISTICS.** (091147) (4 cr per term [max 8 cr]; limited to 15 students; prereq 5011 or #; 0905-0955 MTWThF; FolH 103) Weiss  
Practice in advanced composition and conversation; discussion and analysis of style levels, theory of stylistics, rhetoric.

**8990. READING AND RESEARCH.** (189762) (3-6 cr; prereq #)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**R 1101-1102-1103. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (15 cr for both terms; §1010, §1110, §1201-1202-1203, 1210; limited to 25 students; 0905-1205 MTWThF; KolH S135)  
Structure, listening and reading comprehension, writing, speaking. A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll in all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

- R 1101, Sec 5, (590088) June 17-July 9, 5 cr
- R 1102, Sec 5, (390089) July 10-31, 5 cr
- R 1103, Sec 5, (790090) August 1-22, 5 cr

**R 1104. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (489337) (5 cr, §1204; limited to 25 students; prereq 1103 or 15 cr of 1110 or placement; 0905-0955 MTWThF; FolH 105)  
See 1101 First Term.

**R 1105. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (591144) (4 cr, §1205; limited to 25 students; prereq 1104 or placement; 1115-1205 TWThF; FolH 208)  
See 1101 First Term.

**R 1110. BEGINNING GERMAN: INDIVIDUALIZED.** (188739) (1-10 cr per qtr; 10 cr max). §1102-1103, prereq 1101 or 1102 or 5 cr of 1110 prior to fall 1985 or #; limited to 50 students; 1010-1100 T (first meeting only) [plus additional hours arranged]; PillsH 110)  
Structure, writing, and comprehension. Students work at own pace with book, computer, audio and video tapes, earning credit as they progress through material. Teacher available for consultation and testing 7 hours per week.

### SECOND TERM

**R 1102. BEGINNING AND INTERMEDIATE GERMAN: CLASSROOM INSTRUCTION.** (585375) (5 cr, §1010, §1110, §1202, §1210; limited to 25 students; prereq 1101 or placement; 0900-0955 MTWThF; FolH 203)  
See 1101 First Term.

**R 3610. GERMAN AUTHORS OR TOPICS IN TRANSLATION: Germans and Jews—The Literary Relationship.** (487880) (4 cr [does not count toward German major or minor]; limited to 30 students; may be used in fulfillment of Route II, Part B of BA foreign language requirement; knowledge of German not required; 1010-1100 MTWThF; FolH 204) Hirschbach  
This course will try to illuminate the complex history of the relationship between Jews and Germans through literature written by and about German Jews from the Enlightenment to the

Holocaust. It will include translations of texts by Lessing, Raabe, Frisch, Hochhuth, Feuchtwanger, Weiss, and Meyrink and will be complemented by a number of films.

**R 5010. GERMAN PROFICIENCY TEACHING IN ACTION—July 28-August 15.** (691703) (6 cr [max 18 cr]; limited to 15 students; prereq 8 Gr cr at 3xxx-level or #; §5103; 0905-1415 MTWThF; KolH S136) Wakefield  
Intensive work with the testing and curricular implications of ACTFL Proficiency Guidelines combined with intensive proficiency-oriented language instruction in German to improve language skills and to demonstrate and critique various techniques.

**8990. READING AND RESEARCH.** (288741) (3-6 cr; prereq #)

## Graduate School (Grad)

306 Johnston Hall. 373-2973

### FIRST TERM

**0000. STUDENT STATUS.** (188070) (0 cr; prereq graduate student)

**8777. THESIS CREDITS: MASTERS.** (088071) (1-10 cr; open to graduate students first registered in the Graduate School in Fall, 1983 or later)

**8888. THESIS CREDITS: DOCTORAL.** (888072) (1-10 cr; open to graduate students first registered in the Graduate School in Fall, 1983 or later)

### SECOND TERM

**0000. STUDENT STATUS.** (688073) (0 cr; prereq graduate student)

**8777. THESIS CREDITS: MASTERS.** (488074) (1-10 cr; open to graduate students first registered in the Graduate School in Fall, 1983 or later)

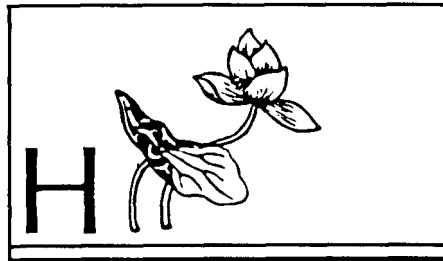
**8888. THESIS CREDITS: DOCTORAL.** (288075) (1-10 cr; open to graduate students first registered in the Graduate School in Fall, 1983 or later)

## Greek, Modern (MdGk)

309 Folwell Hall, 373-3912  
College of Liberal Arts

### SECOND TERM

**1001. BEGINNING MODERN GREEK: INTENSIVE ACCELERATED.** (191714) (10 cr; §1101, 1102-1103; 0905-1205 MTWThF, FolH 103) Stavrou  
Ten class hours weekly, plus individual and small group sessions. Grammar, syntax, composition, and reading.



## Hebrew (Hebr)

177 Klaeber Court, 373-2548  
College of Liberal Arts

### FIRST TERM

**5870. DIRECTED READINGS.** (290196) (Cr ar; for advanced students wishing to work on special problems; prereq 3013, #, Δ, CLA approval)

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence

## Ulpan Hebrew language course

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

The Ulpan Hebrew language course offered this summer will extend over the two terms, June 17 through August 22. It will provide intensive study of the language as well as learning experiences in Israeli culture. The program is designed for individuals who have not previously studied Hebrew. Students will spend 15 hours per week in class during the 10 weeks. In addition to formal class sessions, special learning activities that involve natural and spontaneous use of Hebrew will include games and sports activities, Israeli folk dancing and singing, meeting with delegates of Israeli students from Pishon le Tzion, and sessions with Israeli artists, musicians, and other professionals.

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

in language. Students must enroll in all three courses and may not enroll in other summer courses. Prospective students should talk to an adviser before registering for intensive language courses.

**1101-1102-1103. BEGINNING HEBREW ("ULPAN").** (15 cr for both terms; 0900-1200 MTWThF; Pth 102) Amit, Eshel  
Specially designed summer program combining language study with learning experiences in culture and group activities that stimulate active use of the language. Introduction to speaking, reading, and listening comprehension of modern Hebrew. May serve as a basis for biblical study.

1101, Sec 5, (391663) June 17-July 9, 5 cr

1102, Sec 5, (191664) July 10-July 31, 5 cr

1103, Sec 5, (091665) August 1-22, 5 cr

## SECOND TERM

**5970. DIRECTED READINGS.** (385393) (Cr ar; for advanced students wishing to work on special problems; prereq 3013, #, Δ. CLA approval)

## Higher Education (HiEd)

275 Peik Hall. 373-5568, 373-9899  
College of Education

### FIRST TERM

**5250. AMERICAN HIGHER EDUCATION.** (189316) (4 cr, §EdAd 5250 or EdAd 5250; S-N optional; 0800-0955 MW; PeikH 315) Clark

American higher and postsecondary education in historical and contemporary perspective; special emphasis on the societal and political demands on the higher education system and consequent changes in its various forms and functions. Meets with EdAd 5250.

**8228. PROBLEMS: HIGHER EDUCATION.** (Cr and hrs ar. §EdAd 8228; prereq #)

Selected topics on college programs, instruction, organization, and administration.

**Sec. 1. (791711) Assessment of the Undergraduate Experience—June 27-July 3.** cr ar; prereq #. Corcoran  
Designing, implementing, analyzing strategies; exploring issues under current national debate regarding policies, procedures, instruments, and appropriateness of assessing undergraduate education outcomes. Students are required to attend a three-day conference on the same topic June 30-July 2. (See Special Programs Section for conference information.) Advance application is required to negotiate number of credits, determine correct section for registration and receive reading assignments to be discussed at the first meeting. Students will meet on June 27 with Professor Corcoran to identify issues and to be paired with a faculty mentor who will provide guidance on paper/projects. The students will reconvene on July 3 after the conference to discuss assigned readings and to plan research papers. For further information write or call Professor Mary Corcoran, 221A Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-5841) Course meets with EdAd 8228, section 1; EPsy 5900, section 1; and EPsy 8259, section 1.

Sec. 21, (989939) Clark

Sec. 22, (289940) Hearn

Sec. 23, (886662) Kellogg

Sec. 24, (591712) Lewis

**8255. ADMINISTRATION IN HIGHER EDUCATION.** (888699) (3 cr, §EdAd 8253; prereq 5250 or Ed Ad 5250; 1010-1215 MW; PeikH 27) Hearn

Control, faculty and employee personnel administration, budget making and administration, financial accounting and reporting, protection of college funds, public relations. Meets with EdAd 8253.

## History (Hist)

614 Social Sciences. 373-2705  
College of Liberal Arts

### FIRST TERM

**1002. INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (086045) (4 cr, §1002H, §3002; not open to jrs, srs; 0905-0955 MTWThF; BlegH 335) Thayer  
Revolution, liberalism, and nationalism to 1870. Meets with 1002H and 3002.

**1002H. HONORS COURSE: INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (891151) (4 cr, §1002, §3002; not open to jrs, srs; prereq #; 0905-0955 MTWThF; BlegH 335) Thayer  
See 1002. Meets with 1002 and 3002.

## Higher Education

**Assessment of the Undergraduate Experience (HiEd 8228 or EdAd 8228 or EPsy 5900 or EPsy 8259, cr ar, June 27-July 3.)** The course will explore issues under current national debate regarding policies, procedures, instruments, and appropriateness of assessing undergraduate education outcomes. Students are required to attend a three-day conference on the same topic June 30-July 2. Advance application is required to negotiate number of credits, determine correct section for registration and receive reading assignments to be discussed at the first meeting.

Students will meet on June 27 with Professor Corcoran to identify issues and to be paired with a faculty mentor who will provide guidance on paper/projects. The students will reconvene on July 3 after the conference to discuss assigned readings and to plan research papers. For further information write or call Professor Mary Corcoran, 221A Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-5841). Course meets with EdAd 8228, section 1; EPsy 5900, section 1; and EPsy 8259, section 1.

**1051. ANCIENT CIVILIZATION.** (691152) (4 cr per term, §3051; 0905-0955 MTWThF; BlegH 210) J Evans  
The history of civilization of the ancient world to 500 B.C. Meets with 3051.

**1101. INTRODUCTION TO MEDIEVAL HISTORY.** (686047) (4 cr; 0800-0850 MTWThF; BlegH 260) Bachrach  
Europe from the decline of Rome to the early Renaissance: politics, institutions, society, economy, and culture of the Middle Ages.

**1301. AMERICAN HISTORY.** (986474) (4 cr, §1301H; 1010-1100 MTWThF; BlegH 120) Staff  
Colonial era and early national period from the Revolution through Civil War and Reconstruction.

**1301H. HONORS COURSE: AMERICAN HISTORY.** (786475) (4 cr, §1301; prereq #; 1010-1100 MTWThF; BlegH 120) Staff  
See 1301. Meets with 1301.

**1422. THE WORLD AND THE WEST.** (491153) (4 cr, §3422; 0905-0955 MTWThF; BlegH 350) Kopf  
Survey of the political, economic, and cultural interaction between the peoples of Europe, Africa, America, and Asia. Modern world of Renaissance, nationalism, modernization and countermodernization, 1850 to present. Meets with 3422.

**3002. INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (286049) (4 cr, §1002, §1002H; 0905-0955 MTWThF; BlegH 335) Thayer  
See 1002. Meets with 1002 and 1002H.

## Minnesota History Workshop

Minnesota history comes alive in this annual two-week workshop tailored for the upper elementary and high school teacher. Each year it examines a different aspect of Minnesota history where you will find new ideas, new resources, and new strategies for teaching state history. This year's workshop, "A Place to Call Home: The Family in Minnesota History," examines such topics as family structure, childhood, economic status, and ethnicity. Small-group and field-trip activities are planned in addition to lectures. With the resources of the Minnesota Historical Society available to you and with the workshop planned and conducted by faculty of the University history department and the education staff of the Minnesota Historical Society, you will be able to develop your own projects and curriculum packets. Because the topics change from summer to summer, teachers may take advantage of this unique workshop every year.

The workshop will be offered June 16-27 in an all day format at the Minnesota Historical Society, 690 Cedar Avenue, St. Paul. First time registrants should register for Hist 5381; those who are repeating the workshop should register for Hist 5970, section 2. Registration procedure is the same as for other classes at the University (see page 105).



**3051. ANCIENT CIVILIZATION.** (291154) (4 cr, §1051; 0905-0955 MTWThF; BlegH 210) J Evans  
See 1051. Meets with 1051.

**3412. HISTORY OF BRAZIL, 1808 TO PRESENT.** (191155) (4 cr; 1115-1205 MTWThF; BlegH 210) Schwartz  
Major themes of modern Brazilian history with emphasis on political and economic aspects.

**3422. THE WORLD AND THE WEST.** (991156) (4 cr, §1422; 0905-0955 MTWThF; BlegH 350) Kopf  
See 1422. Meets with 1422.

**3425. HISTORY OF MEXICO: THE 19TH AND 20TH CENTURIES.** (288061) (4 cr; 0800-0850 MTWThF; BlegH 205) McCaa  
The struggle for land and liberty from the Hidalgo revolt to the age of oil.

**3471. 20TH-CENTURY JAPAN.** (591158) (4 cr, §5471, §EAS 3471; 1010-1100 MTWThF; FolH 50) Marshall  
The development of an industrial society, parliamentary government, mass culture, and imperialism from the Meiji reforms of the late 19th century through World War II to the contemporary period. Meets with 5471 and EAS 3471.

**3505. SURVEY OF THE MIDDLE EAST.** (191633) (4 cr, §MidE 3505, 5505; 1115-1205 MTWThF; HHHCtr 15) Farah  
Lands and peoples of the Middle East, historical evolution of Middle East civilizations and societies, the status of Middle East countries in world affairs. Meets with MidE 3505.

**3633. HISTORY OF GERMANY: EMPIRE TO HITLER, 1848-1945.** (791160) (4 cr; 1010-1100 MTWThF; BlegH 245) Rudolph  
Unification, political and economic development, growth of socialism, World War I and revolution, the Weimar years, the Nazi seizure of power.

**3622. UNITED STATES IN THE 20TH CENTURY: 1932-1960.** (391162) (4 cr; 1115-1205 MTWThF; BlegH 245) Spear  
The Great Depression and the New Deal; the challenge of fascism and the coming of World War II; the origins of the Cold War; the great red scare; the politics and culture of the Eisenhower era; the origins of the civil rights movement.

**3845. AMERICAN ECONOMIC HISTORY, 1870 TO PRESENT.** (091164) (4 cr; 0800-0850 MTWThF; BlegH 335) Green  
Farm problems in the 19th century. Rise of big business and finance capitalism. The 1920s economy and the Great Depression. Corporate capitalism, government policies, and modern society.

**3970. DIRECTED STUDIES.** (590091) (1-15 cr; prereq #, Δ, □)  
Guided individual reading or study. Open to qualified students for 1 or more quarters.

**3990. DIRECTED RESEARCH.** (390092) (1-15 cr; prereq #, Δ, □)  
Qualified students, with consent of instructor, work on a tutorial basis.

**5285. DIPLOMATIC HISTORY OF EUROPE: 1871-1918.** (089530) (4 cr; 1115-1205 MTWThF; BlegH 350) Kieft  
Bismarck alliance system; Eastern question; overseas imperialism; World War I.

**5381. MINNESOTA HISTORY WORKSHOP: Topics in Minnesota History: A Place to Call Home—The Family in Minnesota History—June 16-27.** (891716) (5 cr; first time repeaters register for 5970, sec 2; limited to 50 students)  
Designed for upper elementary and secondary teachers, the Minnesota History Workshop is a two-week introduction to state and local history and to the collections of the Minnesota Historical Society. Classes meet at the Minnesota Historical Society, 690 Cedar Avenue, St. Paul, 8:30 a.m. to 4:30 p.m.

**5471. 20TH-CENTURY JAPAN.** (891165) (5 cr, §3471, §EAS 3471; 1010-1100 MTWThF; FolH 50) Marshall  
See 3471. Meets with 3471 and EAS 3471.

**5970. DIRECTED STUDY.**  
Sec 1, (190093) (1-15 cr; prereq #, Δ, CLA approval)  
Qualified senior and graduate students may register for work on tutorial basis. Guided individual reading or study.  
Sec 2, (691717) (5 cr; for students who are repeating Hist 5381, Minnesota History Workshop, June 16-27).

**5990. DIRECTED RESEARCH.** (090094) (1-15 cr; prereq #, Δ, CLA approval)  
Qualified senior and graduate students may register for work on tutorial basis.

**SECOND TERM**

**1003. INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (891166) (4 cr, §1003H, §3003; not open to jrs, srs; 0905-0955 MTWThF; BlegH 205) Staff  
1870 to recent times. Meets with 1003H and 3003.

**1003H. HONORS COURSE: INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (491167) (4 cr, §1003, §3003; not open to jrs, srs; prereq #: 0905-0955 MTWThF; BlegH 205) Staff  
See 1003. Meets with 1003 and 3003.

**1052. ANCIENT CIVILIZATION.** (291168) (4 cr, §3052; 0905-0955 MTWThF; BlegH 120) Kelly  
History and civilization of the ancient world, 500-146 B.C. Meets with 3052.

**1302. AMERICAN HISTORY.** (288092) (4 cr, §1302H; 1010-1100 MTWThF; BlegH 415) Noble  
Modern America from 1880 to present. Meets with 1302H.

**1302H. HONORS COURSE: AMERICAN HISTORY.** (488091) (4 cr, §1302; prereq #: 1010-1100 MTWThF; BlegH 415) Noble  
See 1302. Meets with 1302.

**1432. HISTORY OF AFRICA: 1800 TO PRESENT.** (191169) (4 cr, §3432; 0905-0955 MTWThF; BlegH 350) Isaacman  
Colonial rule, the forced restructuring and underdevelopment of African economies, African resistance, nationalism, and the problems of independence. Meets with 3432.

**3003. INTRODUCTION TO MODERN EUROPEAN HISTORY SINCE THE MIDDLE AGES.** (491170) (4 cr, §1003, §1003H; 0905-0955 MTWThF; BlegH 205) Staff  
See 1003. Meets with 1003 and 1003H.

**3052. ANCIENT CIVILIZATION.** (291171) (4 cr, §1052; 0905-0955 MTWThF; BlegH 120) Kelly  
See 1052. Meets with 1052.

**3432. HISTORY OF AFRICA: 1800 TO PRESENT.** (191172) (4 cr, §1432; 0905-0955 MTWThF; BlegH 350) Isaacman  
See 1432. Meets with 1432.

**3468. PEOPLE'S REPUBLIC OF CHINA: THE COMMUNIST REVOLUTION, 1900 TO PRESENT.** (991173) (4 cr, §5468, §EAS 3468; 1010-1100 MTWThF; BlegH 210) Farmer  
Introduction of Marxism to China, rise of Communist Party, and development of a rural guerilla movement. The career of Mao Tse-tung and developments in the People's Republic: The Great Leap, Cultural Revolution, Gang of Four. Meets with 5468 and EAS 3468.

**3616. FRANCE IN THE HIGH MIDDLE AGES.** (287931) (4 cr; 1115-1205 MTWThF; BlegH 255) Reyerson  
A history of the growth of royal power during the era of the Capetian monarchy, 987-1328.

**3624. FRANCE FROM THE RENAISSANCE TO RICHELIEU.** (391176) (4 cr; 0800-0850 MTWThF; BlegH 210) Tracy  
The religious wars and the growth of an absolute monarchy.

**3722. EUROPE IN THE ERA OF WORLD WAR II.** (191177) (4 cr, §3224; 1010-1100 MTWThF; BlegH 260) Munnholland  
Rise of fascism and totalitarian movements in Europe; political and military origins of World War II; course of the war and its impact on European society.

**3882. HISTORY OF AMERICAN FOREIGN RELATIONS.** (091178) (4 cr; 1115-1205 MTWThF; BlegH 245) Brauer  
America's commercial expansion, involvement in war, and imperialism, 1865-1945.

**3970. DIRECTED STUDIES.** (885382) (1-15 cr; prereq #, Δ, □)  
See First Term.

**3990. DIRECTED RESEARCH.** (685383) (1-15 cr; prereq #, Δ, □)  
See First Term.

**5332. AMERICAN CONSTITUTIONAL HISTORY.** (891179) (4 cr; 0905-0955 MTWThF; BlegH 210) Murphy  
The Constitution and the rule of law in modern America.

**5468. PEOPLE'S REPUBLIC OF CHINA: THE COMMUNIST REVOLUTION, 1900 TO PRESENT.** (591175) (4 cr, §3468, §EAS 3468; 1010-1100 MTWThF; BlegH 210) Farmer  
See 3468. Meets with 3468 and EAS 3468.

**5970. DIRECTED STUDIES.** (589345) (1-15 cr; prereq #, Δ, CLA approval)  
See First Term.

**5990. DIRECTED RESEARCH.** (485384) (1-15 cr; prereq #, Δ, CLA approval)  
See First Term.

# Home Economics Education

**Nutrition and Exercise—(HEED 5001), a two week (July 21-August 1), 3-credit workshop is taught jointly with the Division of Physical Education as PE 5720. The instructors are Allan S. Levine, adjunct associate professor of Food Science and Nutrition, and Robert C. Serfass, associate professor of Physical Education.**

The course covers application of basic nutrition to exercise, athletics, diet and weight control, and is designed for athletic coaches, teachers, health professionals, and others interested in the relationship between nutrition and exercise. Specific topics include the energy foods, vitamins, minerals, water, energy requirements of exercise, exercise and weight control, and ergogenic aids.

**Group Methods for Parent and Family Education—(HEED 5406, June 30-July 3) is a first term course designed to develop understanding and skills for leading parent and family education groups. The course will focus on group purposes, types of family and parent groups, group development and dynamics, group leadership skills, and evaluating the educational effectiveness of family and parent groups. The instructor is Ted Bowman.**

**Education for Work/Family Relationships—(HEED 5408, June 23-July 3) is a first term course concerned with educating others for understanding and managing interactions between work and the family. It is appropriate for educators, counselors, employee services personnel, work place managers, and organization development specialists. Areas covered include meaning of work in the lives of family members, issues surrounding work-family interactions; strategies for managing work and family roles; special challenges of parental responsibilities, marital stress, unemployment and retirement; and approaches to developing future healthy families.**

## Home Economics Education (HEED)

325 Vocational/Technical Building, St. Paul. 373-1530  
College of Education

### FIRST TERM

**5003. INTERNSHIP: COMMUNITY/WORK SETTINGS.** (089320) (3-12 cr [max 12 cr]; prereq #: max of 3 credits may be used in MED and MA programs; limited to 20 students; S-N only; hrs ar, VoTech 325K) Kvistberg

Planned work experience focusing on educational competencies in these settings. Students assume defined responsibilities of the position. For information, contact Lorraine Kvistberg, 325 Vocational and Technical Education Building, University of Minnesota, 1954 Buford Avenue, St. Paul, MN 55108 (373-1530).

**5027. PRACTICUM: PLACEMENT FOR EXTENSION EXPERIENCES.** (386480) (2-9 cr [max 9 cr], SHEED 3605, \$AgEd 5027; hrs ar, VoTech 325 M, off campus; S-N optional) Smith

Observation of the activities of county extension staff; familiarization with staff, program planning and development, county committee, youth activities and office activities; opportunity to participate in functions of an extension educator.

**5320. ADULT EDUCATION IN HOME ECONOMICS—July 7-18.** (491265) (3 cr; limited to 30 students; A-N only; 0900-1200 MTWThF; VoTech R380) Cooke  
Planning a community program; teaching procedures; special problems.

**5406. SPECIAL TOPICS IN PARENT AND FAMILY EDUCATION: Group Methods for Parent and Family Education—June 30-July 3.** (891666) (1-6 cr; limited to 25 students; 0845-1200 MTWThF; VoTech R380; S-N optional) Bowman

Study of issues and current literature focused on emerging topics. This 2 credit offering focuses on methods and theories applied to developing skills for leading such groups. See box, page 35.

**5407. FAMILY LIFE EDUCATION—July 7-18.** (190739) (1-4 cr [max 12 cr]; 1300-1600 MTWThF and hrs ar; limited to 30 students; VoTech R380; A-N only) Rossmann  
Objectives, content, curriculum development, methods, materials, and evaluation approaches for teaching diverse groups of youth and adults family life concepts including current research in communication, relationships, sexuality, self-esteem and decision making. This offering for 3 credits.

**5408. EDUCATION FOR WORK-FAMILY RELATIONSHIPS—June 23-July 3.** (291266) (3 cr; 1300-1600 MTWThF; VoTech R380; A-N only) Ernst  
Examination of interactions between work and family, with focus on educational applications for youth and adults. (See page 35)

**5440. COMPUTER APPLICATIONS IN HOME ECONOMICS—June 17-27.** (387919) (3 cr; limited to 24 students; 0900-1200 MTWThF and hrs ar; VoTech 230; A-N only) McClelland  
Uses of computers in instruction and management of home economics programs; review of software. Accession and use of information; evaluation of databases and software; impact of computers on families and consumer behavior.

**5900. READINGS IN HOME ECONOMICS EDUCATION.** (1-3 cr [max 12 cr]; prereq #: hrs ar; A-N only)  
Independent study under tutorial guidance.

Sec 21, (085963) Rossmann  
Sec 22, (485966) McClelland  
Sec 23, (285967) Smith

**5920. DIRECTED STUDIES.** (691264) (1-6 cr; prereq #: hrs ar) McClelland  
Opportunity for individualized learning experience not covered by regular courses.

**8900. PROBLEMS: HOME ECONOMICS EDUCATION.** (1-9 cr; prereq 8300, #: hrs ar)  
Independent study of current educational problems.

Sec 21, (885964) Rossmann  
Sec 22, (185968) McClelland  
Sec 23, (985969) Smith

### SECOND TERM

**5001. SPECIAL TOPICS: Nutrition and Exercise—July 21-August 1.** (691460) (1-6 cr; limited to 20 students; 1300-1600 MTWThF; VoTech R385; S-N optional) Serfass, Levine

Study of a topic not covered by available courses. This offering for 3 credits considers application of basic nutrition to exercise, athletics, diet and weight. Meets with PE 5720. (See box, page 35)

**5003. INTERNSHIP: COMMUNITY/WORK SETTINGS.** (791269) (3-12 cr [max 12 cr]; limited to 20 students; prereq #: max of 3 credits may be used in MED and MA programs; S-N only; hrs ar, VoTech 325K) Kvistberg  
See First Term.

**5027. PRACTICUM: PLACEMENT FOR EXTENSION EXPERIENCES.** (389170) (2-9 cr [max 9 cr], SHEED 3605 or AgEd 5027; hrs ar VoTech 325M, off campus; S-N optional) Smith  
See First Term.

**5405. CHILD DEVELOPMENT AND PARENT EDUCATION—July 21-August 1.** (585974) (1-4 cr [max 12 cr]; limited to 30 students; 0900-1600 MTWThF; VoTech R380; A-N only) Thomas  
Objectives, content, curriculum organization, teaching methods, materials, and evaluation approaches for teaching youth and adults about social, cultural, psychological, economic, and technical aspects of child development, parenting, and parent-child interaction. This offering for 4 credits. Students must register concurrently for HEED 5920.

**5406. SPECIAL TOPICS IN PARENT AND FAMILY EDUCATION: Introduction to Early Childhood Family Education Programs—August 4-5.** (691667) (1-6 cr; 0800-1200 MT; VoTech R380; S-N optional) Cooke  
Study of issues and current literature focused on emerging topics. This 1-credit offering is an introduction to the concept and philosophy of such programs as a basis for program implementation.

**5900. READINGS IN HOME ECONOMICS EDUCATION.** (1-3 cr [max 12 cr]; prereq #: hrs ar; A-N only)  
See First Term.

Sec 21, (191267) Thomas  
Sec 22, (191270) Smith

**5920. DIRECTED STUDIES—July 21-August 1.** (385975) (1-6 cr; limited to 30 students; prereq #: 0900-1200, 1300-1600 MTWThF; VoTech R380; S-N optional) Thomas  
Opportunity for individualized learning experience in areas not covered by regular courses. This offering for 2 credits. Students must register concurrently for HEED 5405.

**8900. PROBLEMS: HOME ECONOMICS EDUCATION.** (1-9 cr; prereq 8300, #: hrs ar)  
See First Term.

Sec 21, (991268) Thomas  
Sec 22, (791272) Smith

## Honors Seminar (HSem)

115 Johnston Hall. 373-5116  
College of Liberal Arts

### FIRST TERM

**3010. WHEN REVOLUTIONS OCCUR, AND WHY.** (085834) (4 cr; prereq jr, sr, CLA Honors or #: 1015-1200 TTh; SocSci 101) Duvall  
Analysis of influential theories of why revolutions occur and application of these theories to recent revolutions to see the fit between theory and actual events.

**3020. EXPLORING MINNESOTA'S PAST: A LOCAL SITE STUDY—June 30-August 1.** (491668) (4 cr; prereq jr, sr, CLA Honors or #: see Anthropology 3376.) Spector, Cavender  
Interdisciplinary field course involving excavation and analysis of cultural remains of early inhabitants of the Little Rapids site in Scott County, Minnesota. Meet with Anth 3376.

## Horticultural Science (Hort)

305 Alderman Hall, St. Paul. 373-1028  
College of Agriculture

### FIRST TERM

**8051. ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING.** (789716) (3-9 cr; prereq #)

**8052. ADVANCED PROBLEMS IN PHYSIOLOGY OF HORTICULTURAL CROPS.** (888055) (3-9 cr; prereq #)

### SECOND TERM

**8007. EXTENSION HORTICULTURE PRACTICUM.** (189770) (1-5 cr, max 6 cr; prereq 12 grad cr)

**8051. ADVANCED PROBLEMS IN HORTICULTURAL CROP BREEDING.** (589717) (3-9 cr; prereq #)

**8052. ADVANCED PROBLEMS IN PHYSIOLOGY OF HORTICULTURAL CROPS.** (688056) (3-9 cr; prereq #)

## Housing (Hsg)

240 McNeal Hall, St. Paul. 373-1032  
College of Home Economics

### FIRST TERM

**1551. CONSUMER ASPECTS OF HOUSING.** (691085) (4 cr; prereq Dsgn 1501; 0900-1100 MWF; McNH 197)  
Survey of family housing in relation to needs, processes, and alternatives; buying versus renting; policy, economic, and other variables; and constraints affecting housing decisions.

**3580. INTERNSHIP IN HOUSING.** (385930) (5-15 cr [max 15]; prereq completion of half of professional sequence and #: S-N only)

International, intercultural, or other directed work in a community that offers a variety of housing experiences.

**5565. HOUSING IN WORLD PERSPECTIVES I.** (491086) (4 cr; prereq 3563 or equiv; 1300-1500 MWF; McNH 216) P. Andersen

Indigenous housing forms from around the world with emphasis on village and rural housing; analysis of cultural differences; assessment of the nature and quality of forms; application and implications for housing locally and nationally.

### SECOND TERM

**3580. INTERNSHIP IN HOUSING.** (386883) (5-15 cr [max 15]; prereq completion of half of professional sequence and #: S-N only)  
See First Term.

## Humanities (Hum)

314 Ford Hall. 373-3516  
College of Liberal Arts

### FIRST TERM

**1001. HUMANITIES IN THE MODERN WORLD I.** (890095) (4 cr, \$Rheth 1301; limited to 70 students; 0800-0955 MW; FordH 120) Leppert

Eighteenth-century Europe. Old Regime through French Revolution and Napoleon; new science, Enlightenment, cult of sensibility; rococo, neoclassicism, incipient romanticism. Integrative study of works by creative figures such as Pope, Voltaire, Rousseau, Diderot, Goethe, Watteau, Boucher, Hogarth, David, Goya, Mozart, Haydn.

**1003. HUMANITIES IN THE MODERN WORLD III.** (291087) (4 cr, \$Rheth 1303; limited to 70 students; 1010-1205 MW; FordH 115) Tapp

Impact of science, especially evolution theory, on religious and humanistic thought; roots of existentialism; disorientation in modern culture; impressionism. Integrative study of works by creative figures such as Kierkegaard, Darwin, Nietzsche, Chekhov, Joyce, Mann, Manet, Monet, Renoir, Degas, Wagner, Debussy, Mahler.

**1003. TOPICS: THE LATER NINETEENTH CENTURY—Aesthetics, Art and Society: France 1848-1900.** (191088) (4 cr; prereq 1003 or #: limited to 20 students; 1010-1205 TTh; FordH 175) Kliger  
Interdisciplinary consideration of specialized problems in later 19th-century art, thought, society, with attention to critical theory and method.

**3701. COMEDY: TEXT AND THEORY.** (991089) (4 cr; limited to 70 students; 0800-0955 TTh; FordH 120) Thomas  
Interdisciplinary study of comedy and comic theory through time and across world cultures in literature, drama, folk ritual and tale, social convention, language, sport, and film.

**3970. DIRECTED STUDIES.** (389346) (Cr ar; prereq #, Δ, □)  
Guided individual reading or study.

**5830. HUMANITIES PROSEMINAR: Nietzsche.** (486115) (3 cr; prereq sr; limited to 15 students; 1010-1205 W; LindH 216) Kliger  
Review of humanities materials: arts, sciences, and civilization.

**5970. DIRECTED STUDIES.** (189213) (Cr ar; prereq jr or sr or grad student, #, Δ, CLA approval)  
Guided individual reading or study.

### SECOND TERM

**1002. HUMANITIES IN THE MODERN WORLD II.** (291090) (4 cr, \$Rheth 1302; limited to 70 students; 1010-1205 MW; FordH 115) Archer

Romanticism, liberalism, socialism; industrial revolution, materialism, cult of the individual and some counter statements;

realism, naturalism. Integrative study of works by creative figures such as Wordsworth, Byron, Adam Smith, Bentham, Marx, Mill, Stendhal, Flaubert, Ibsen, Dostoevsky, Delacroix, Courbet, Daumier, Beethoven, Berlioz, Liszt.

**n1111. EUROPEAN HERITAGE: GREECE.** (191091) (4 cr, \$Rhet 3321; limited to 70 students; 0800-0955 TTh; FoH 110) Hershbell

Greek civilization; literary and artistic works that have influenced modern Western culture. Epic and lyric poetry, drama, architecture, sculpture, philosophy, religion; Homer, Hesiod, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle.

**n1301. THE LIFE OF THE MIND: INTRODUCTION TO METHODS IN THE HUMANITIES.** (788744) (4 cr; limited to 40 students; 0800-0955 MW; FordH 130) Mowitt

Nature of the humanities explored through interpretation of major works from literature, rhetoric, history, philosophy, the visual arts, music, and film. Humanities knowledge and its place in a liberal education.

**n3755. CINEMA AND IDEOLOGY.** (991092) (4 cr, \$CLit 3215; limited to 175 students; 1010-1205 TTh; FordH 155) Mowitt  
Major aspects of film as discourse with attention to its complex relations with the ideological and political contexts in which it appears. Specific films used to study cinema as institution, film as current product, and artistic ideologies in politics.

**3970. DIRECTED STUDIES.** (588745) (Cr ar; prereq #, Δ, □) See First Term.

**5970. DIRECTED STUDIES.** (688039) (Cr ar; prereq jr or sr or grad student, #, Δ, CLA approval) See First Term.



## Industrial Education (Ind)

425G Vocational/Technical Building, St. Paul  
373-3641  
College of Education

### FIRST TERM

**3110. CONSTRUCTION: INTERMEDIATE.** (590740) (3 or 6 or 9 cr; prereq 1612, #; hrs ar; A-N only) Miletich  
Individualized technical skill development in areas of house framing, concrete work, domestic wiring, plumbing, surveying, painting, paper hanging, and basic construction codes.

**3111. CONSTRUCTION: ADVANCED.** (390741) (3 or 6 or 9 cr; prereq 3110, #; hrs ar; A-N only) Miletich  
Individualized advanced skill development in areas of forming, block and brick, commercial plumbing, industrial circuitry, landscaping, finishing, and advanced construction codes.

**3120. GRAPHIC COMMUNICATIONS: INTERMEDIATE.** (190742) (3 or 6 or 9 cr; prereq 1622, #; hrs ar; A-N only) Miletich  
Individualized technical skill development in areas of offset printing, technical illustrating, machine and architectural drafting, photography.

**3121. GRAPHIC COMMUNICATIONS: ADVANCED.** (090743) (3 or 6 or 9 cr; prereq 3120, #; hrs ar; A-N only) Miletich  
Individualized advanced skill development in areas of color separation, web press operation, drafting design, color renditions, air brush.

**3130. MANUFACTURING: INTERMEDIATE.** (890744) (3 or 6 or 9 cr; prereq 1632, #; hrs ar; A-N only) Miletich  
Individualized technical skill development in areas of welding, lathe operation, milling machine operation, sheet metal construction.

**3131. MANUFACTURING: ADVANCED.** (690745) (3 or 6 or 9 cr; prereq 3130, #; hrs ar; A-N only) Miletich  
Individualized advanced skill development in areas of numerical control and machine setup inspection, electric discharge machining, TIG welding.

## Industrial Education

Three types of technical updating opportunities in industrial education are offered during the 1986 Summer Session.

**Occupational Internships**—Ind 5100, 5101, 5102, or 5103 are internships in the areas of communication, production/manufacturing, power/energy, and construction. Students may earn one credit for each 100 hours on the job.

**Specialized Technical Instruction**—Ind 3110, 3111, 5112, (construction); Ind 3120, 3121, 5122 (graphic communications); Ind 3130, 3131, 5132 (manufacturing); Ind 3140, 3141, 5142 (power and energy); and Ind 3150, 3151, 5152 (transportation) are courses in which instruction is individualized and planned by the student and coordinator to meet the student's needs. Metropolitan area vocational technical institutes and Dunwoody are used as instructional sites.

**Graphic Communications: Specialization**—Ind 5122, section 2, is a three-credit workshop meeting all day, July 21-25, that features computer applications in graphic communications. Students will have direct experiences with computers and software for graphic communications and will visit industries where these applications are being made.

**3140. POWER AND ENERGY: INTERMEDIATE.** (490746) (3 or 6 or 9 cr; prereq 1642, #; hrs ar; A-N only) Miletich  
Individualized technical skill development in areas of digital, hydraulic and pneumatic control systems, and radio and TV repair.

**3141. POWER AND ENERGY: ADVANCED.** (290747) (3 or 6 or 9 cr; prereq 3140, #; hrs ar; A-N only) Miletich  
Individualized advanced skill development in areas of digital, hydraulic, and pneumatic system design, electronic maintenance and repair, and alternative energy sources.

**3150. TRANSPORTATION: INTERMEDIATE.** (190748) (3 or 6 or 9 cr; prereq 1652, #; hrs ar; A-N only) Miletich  
Individualized technical skill development in areas of small gas and marine engine repair, automotive tuneup, cooling systems, brakes, and autobody repair.

**3151. TRANSPORTATION: ADVANCED.** (990749) (3 or 6 or 9 cr; prereq 3150, #; hrs ar; A-N only) Miletich  
Individualized advanced skill development in areas of diesel engine repair, auto engine overhaul, front end repair, automatic transmission, aircraft engine maintenance, chassis straightening.

**3900. INDEPENDENT STUDY.** (3 cr per qtr; prereq #; hrs ar; A-N only)  
Self-directed study, preceded by classroom instruction in basic research procedures.

Sec 21, (290750) Bjorkquist  
Sec 22, (190751) Brown  
Sec 23, (990752) Miletich  
Sec 24, (790753) Moss  
Sec 25, (386608) Pucel

**3901. INDEPENDENT STUDY.** (3 cr; prereq #; hrs ar; A-N only)  
Self-directed study, preceded by classroom instruction in basic research procedures.

Sec 21, (185999) Bjorkquist  
Sec 22, (086000) Brown  
Sec 23, (886001) Miletich  
Sec 24, (686002) Moss  
Sec 25, (186609) Pucel

**3902. INDEPENDENT STUDY.** (3 cr; prereq #; hrs ar; A-N only)  
Self-directed study, preceded by classroom instruction in basic research procedures.

Sec 21, (486003) Bjorkquist  
Sec 22, (286004) Brown  
Sec 23, (186005) Miletich  
Sec 24, (986006) Moss  
Sec 25, (586610) Pucel

**5100. COMMUNICATIONS OCCUPATIONAL EXPERIENCE.** (590754) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
Structured/supervised employment in the communications industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.

**5101. PRODUCTION/MANUFACTURING OCCUPATIONAL EXPERIENCE.** (390755) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
Structured/supervised employment in the production/manufacturing industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.

**5102. POWER/ENERGY OCCUPATIONAL EXPERIENCE.** (190756) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
Structured/supervised employment in the power/energy industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.

**5103. CONSTRUCTION OCCUPATIONAL EXPERIENCE.** (790798) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
Structured/supervised employment in the construction industry. Credits allowed will be derived from the ratio of 100 clock hours of supervised work experience to each credit given the student. Total credits earned in 5100, 5101, 5102, and 5103 may not exceed 15.

**5112. CONSTRUCTION SPECIALIZATION.** (590799) (1-9 cr; prereq Δ; hrs ar; A-N only) Miletich  
Integration of specialized technical instruction in advanced or emerging areas into courses in industrial education.

**5122. GRAPHIC COMMUNICATIONS: SPECIALIZATION.** (388746) (1-9 cr; prereq Δ; A-N only) Miletich  
Integration of specialized technical instruction in advanced or emerging areas into courses in industrial education.

**5132. MANUFACTURING: SPECIALIZATION.** (290800) (1-9 cr; prereq Δ; hrs ar; A-N only) Miletich  
Integration of specialized technical instruction in advanced or emerging areas into courses in industrial education. See Special Programs section.

**5142. POWER AND ENERGY: SPECIALIZATION.** (190801) (1-9 cr; prereq Δ; hrs ar; A-N only) Miletich  
Integration of specialized technical instruction in advanced or emerging areas into courses in industrial education.

**5152. TRANSPORTATION: SPECIALIZATION.** (990802) (1-9 cr; prereq  $\Delta$ ; hrs ar; A-N only) Miletich  
Integration of specialized technical instruction in advanced or emerging areas into courses in industrial education.

**5900. SCHOOL-BASED PROJECT IN INDUSTRIAL EDUCATION.** (1-6 cr [max 12 cr]; prereq 5305, 5325, MEed students only; hrs ar; S-N optional)  
Independent or team project designed to study, improve, evaluate, or develop curriculum or instructional materials to improve quality of instruction.

Sec 21, (790803) Bjorkquist  
Sec 22, (590804) Brown  
Sec 23, (390805) Miletich  
Sec 24, (190806) Moss  
Sec 25, (386611) Pucel

**8310. RESEARCH—June 16-27.** (291199) (3 cr; prereq #; 0905-1205 MTWThF; VoTech R270) Moss  
Analysis of existing research; selection of problems; organization and presentation of projects.

**8900. RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar)  
Individual conferences.

Sec 21, (090807) Bjorkquist  
Sec 22, (890808) Brown  
Sec 23, (690809) Miletich  
Sec 24, (090810) Moss  
Sec 25, (186612) Pucel

**8901. RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar)  
Individual conferences.

Sec 21, (890811) Bjorkquist  
Sec 22, (690812) Brown  
Sec 23, (490813) Miletich  
Sec 24, (290814) Moss  
Sec 25, (086613) Pucel

## SECOND TERM

**3110. CONSTRUCTION: INTERMEDIATE.** (085137) (3 or 6 or 9 cr; prereq 1612, #; hrs ar; A-N only) Miletich  
See First Term.

**3111. CONSTRUCTION: ADVANCED.** (885138) (3 or 6 or 9 cr; prereq 3110, #; hrs ar; A-N only) Miletich  
See First Term.

**3120. GRAPHIC COMMUNICATIONS: INTERMEDIATE.** (685139) (3 or 6 or 9 cr; prereq 1622, #; hrs ar; A-N only) Miletich  
See First Term.

**3121. GRAPHIC COMMUNICATIONS: ADVANCED.** (085140) (3 or 6 or 9 cr; prereq 3120, #; hrs ar; A-N only) Miletich  
See First Term.

**3130. MANUFACTURING: INTERMEDIATE.** (885141) (3 or 6 or 9 cr; prereq 1632, #; hrs ar; A-N only) Miletich  
See First Term.

**3131. MANUFACTURING: ADVANCED.** (589359) (3 or 6 or 9 cr; prereq 3130, #; hrs ar; A-N only) Miletich  
See First Term.

**3140. POWER AND ENERGY: INTERMEDIATE.** (685142) (3 or 6 or 9 cr; prereq 1642, #; hrs ar; A-N only) Miletich  
See First Term.

**3141. POWER AND ENERGY: ADVANCED.** (485143) (3 or 6 or 9 cr; prereq 3140, #; hrs ar; A-N only) Miletich  
See First Term.

**3150. TRANSPORTATION: INTERMEDIATE.** (285144) (3 or 6 or 9 cr; prereq 1652, #; hrs ar; A-N only) Miletich  
See First Term.

**3151. TRANSPORTATION: ADVANCED.** (185145) (3 or 6 or 9 cr; prereq 3150, #; hrs ar; A-N only) Miletich  
See First Term.

**3900. INDEPENDENT STUDY.** (3 cr per qtr; prereq #; hrs ar; A-N only)  
See First Term.

Sec 21, (985146) Bjorkquist  
Sec 22, (785147) Miletich  
Sec 23, (585148) Pucel

**3901. INDEPENDENT STUDY.** (3 cr; prereq #; hrs ar; A-N only)  
See First Term.

Sec 21, (386009) Bjorkquist  
Sec 22, (786010) Miletich  
Sec 23, (586011) Pucel

**3902. INDEPENDENT STUDY.** (3 cr; prereq #; hrs ar; A-N only)  
See First Term.

Sec 21, (186013) Bjorkquist  
Sec 22, (086014) Miletich  
Sec 23, (886015) Pucel

**5100. COMMUNICATIONS OCCUPATIONAL EXPERIENCE.** (785150) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
See First Term.

**5101. PRODUCTION/MANUFACTURING OCCUPATIONAL EXPERIENCE.** (585151) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
See First Term.

**5102. POWER/ENERGY OCCUPATIONAL EXPERIENCE.** (385152) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
See First Term.

**5103. CONSTRUCTION OCCUPATIONAL EXPERIENCE.** (185153) (1-5 cr [max 15 cr]; prereq #; hrs ar; A-N only) Miletich  
See First Term.

**5112. CONSTRUCTION: SPECIALIZATION.** (989360) (1-9 cr; prereq  $\Delta$ ; hrs ar; A-N only) Miletich  
See First Term.

**5122. GRAPHIC COMMUNICATIONS: SPECIALIZATION.** (1-9 cr; prereq  $\Delta$ ; A-N only) Miletich  
See First Term.

Sec 1, (085154) Miletich  
Sec 2, (085154) July 21-25, 3 cr, 0905-1205, 1325-1625 MTWThF, VoTech 130, 135, Miletich

**5132. MANUFACTURING: SPECIALIZATION.** (885155) (1-9 cr; prereq  $\Delta$ ; hrs ar; A-N only) Miletich  
See First Term.

**5142. POWER AND ENERGY: SPECIALIZATION.** (685156) (1-9 cr; prereq  $\Delta$ ; hrs ar; A-N only) Miletich  
See First Term.

**5152. TRANSPORTATION: SPECIALIZATION.** (485157) (1-9 cr; prereq  $\Delta$ ; hrs ar; A-N only) Miletich

**5900. SCHOOL-BASED PROJECT IN INDUSTRIAL EDUCATION.** (1-6 cr [max 12 cr]; S-N optional; prereq 5305, 5325, MEed students only; hrs ar)  
See First Term.

Sec 21, (285158) Bjorkquist  
Sec 22, (185159) Miletich  
Sec 23, (485160) Pucel

**8900. RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar)  
See First Term.

Sec 21, (185162) Bjorkquist  
Sec 22, (985163) Miletich  
Sec 23, (785164) Pucel

**8901. RESEARCH PROBLEMS.** (3-6-9 cr per qtr; prereq approval of candidacy; hrs ar)  
See First Term.

Sec 21, (385166) Bjorkquist  
Sec 22, (185167) Miletich  
Sec 23, (085168) Pucel

## Industrial Engineering/Operations Research (IEOR)

125 Mechanical Engineering, 373-3302  
Institute of Technology

### FIRST TERM

**R 5030. QUALITY CONTROL AND RELIABILITY.** (090659) (4 cr; limited to 30 students; prereq Math 1231, ME 3900 . . . IEOR 5000 recommended; 1010-1205 TWThF; MechE 202) White

History of quality control, quality policies and objectives, economics of quality, design for system effectiveness, reliability and maintainability, statistical aids to reliability, quality specifications, inspection, acceptance sampling, vendor relations, process control, motivation for quality, quality assurance, and quality control engineering.

**5050. ENGINEERING ECONOMIC ANALYSIS.** (085896) (4 cr; prereq IT student or grad, 5000 or #; 0800-0955 MWF; MechE 202) Barnett  
Fundamental principles and techniques of economic analysis of engineering projects including economic measures of effectiveness, time value of money, cost estimation, depreciation, taxes, breakeven, replacement and investment analysis.

**8410. INDUSTRIAL ENGINEERING RESEARCH.** (190921) (Cr and hrs ar)

**8411. INDUSTRIAL ENGINEERING RESEARCH.** (090922) (Cr and hrs ar)

**8412. INDUSTRIAL ENGINEERING RESEARCH.** (890923) (Cr and hrs ar)

## FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**R 5040. INTRODUCTION TO OPERATIONS RESEARCH.** (190661) (4 cr; limited to 30 students; prereq Math 1231 . . . IEOR 5000 recommended; 0800-0955 TTh; MechE 202) White, Arora

Linear programming, algebra and geometry of linear models, simplex method, sensitivity testing, and duality; network models, network algorithms, and dynamic models.

**5180. APPLIED INDUSTRIAL ENGINEERING.** (390660) (3-5 cr [1-2 cr term paper option]; prereq background in all basic industrial engineering areas [5000, 5010, 5020, 5030 and 5040])  
Industrial engineering surveys and programs. Case problems, studies in local plants.

## SECOND TERM

**R 5000. INTRODUCTION TO INDUSTRIAL ENGINEERING ANALYSIS.** (485644) (4 cr; limited to 30 students; prereq Math 1231 . . . ME 3900 recommended; 1220-1415 TWThF; MechE 221) Arora

Scientific management, mathematical models, methods engineering, work measurement, worker satisfaction and participation, wage payment plans, break-even analysis, incremental costs, the time value of money and the present value concept; cost quality and inventory control; production scheduling, plant locations, and layout; linear programming, PERT, and the systems approach to management problems.

**R 5020. ENGINEERING COST ACCOUNTING, ANALYSIS AND CONTROL.** (291669) (4 cr; limited to 30 students; prereq IT student or grad . . . 5000 and ME 3900 recommended; 0800-0955 MWF, MechE 202) Barnett  
Basic accounting concepts, financial statements, analysis and control of current assets such as cash, receivables, and inventory; income tax planning, cost analysis, standard cost for product costing, time value of money quantification of risk and uncertainty, utility theory, cost of capital and capital structure, capital budgeting under capital rationing, management decisions, and investment decisions.

**8410. INDUSTRIAL ENGINEERING RESEARCH.** (690924) (Cr and hrs ar)

**8411. INDUSTRIAL ENGINEERING RESEARCH.** (490925) (Cr and hrs ar)

**8412. INDUSTRIAL ENGINEERING RESEARCH.** (290926) (Cr and hrs ar)

## Industrial Relations (IR)

537 Management/Economics Building, 373-3826  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R 3002. PERSONNEL AND INDUSTRIAL RELATIONS.** (889884) (4 cr, \$8002; limited to 35 students; prereq Econ 1001, 1002, Psy 1001; 0800-0955 MTWTh; BlegH 245)

An introduction to the human resource management function in organizations. The labor market, recruitment, selection, training, compensation, and labor relations. The changing nature of the world of work, emerging legal issues, discrimination in pay and employment, comparable worth, work performance and its assessment, and the effects of technological change on jobs and employment. Lecture presentations, discussion, case studies, and simulation exercises.

**R 3010. THE INDIVIDUAL IN THE ORGANIZATION.** (689885) (4 cr; limited to 30 students; 1220-1415 MTWTh; BlegH 255)  
An introduction to the human side of organizations, focusing on workers and how they enter and succeed in the work setting. Theories and techniques of employment interviewing; training needs analysis; career planning; management development; turnover, outplacement, and retirement; understanding leadership roles and styles; work motivation, organization culture and job design; and planning for change. Lecture presentations, discussion, case studies, and simulation exercises.

**8002. INTRODUCTION TO INDUSTRIAL RELATIONS.** (489886) (4 cr, §3002; limited to 15 students; prereq Econ 1001, 1002, Psy 1001 and IR grad student or department approval; 0800-0955 MTWTh; BlegH 245)  
See 3002. Meets with 3002.

**8007. COLLECTIVE BARGAINING IN THE PUBLIC AND PRIVATE SECTORS.** (190930) (4 cr; limited to 25 students; prereq 8002 or # and IR grad student or department approval; 1010-1205 MTWTh; BlegH 260)  
Introduction to collective bargaining and administration. Legal frameworks imposed on public and private sector negotiators.

## SECOND TERM

**8302. PERSONNEL AND INDUSTRIAL RELATIONS.** (790820) (4 cr, §8002; limited to 45 students; prereq Econ 1001, 1002, Psy 1001; 0800-0955 MTWTh; BlegH 225)  
See First Term. Meets with 8002.

**8307. COLLECTIVE BARGAINING AND LABOR RELATIONS.** (387886) (4 cr; limited to 30 students; 1220-1415 MTWTh; BlegH 255)  
Analysis of the roles of unions and collective bargaining in contemporary American society. Negotiations and related policies and practices of employers, employees, unions, legislative bodies, and the public in dealing with questions of worker representation in the private and public sectors. Impact and transference of collective bargaining principles from the union sector to the non-union sector. Lecture presentations, discussion, case studies, and bargaining simulations.

**8002. INTRODUCTION TO INDUSTRIAL RELATIONS.** (188747) (4 cr, §3002; limited to 15 students; prereq Econ 1001, 1002, Psy 1001; 0800-0955 MTWTh; BlegH 225)  
See 3002 First Term. Meets with 3002.

**8003. STAFFING, TRAINING, AND DEVELOPMENT.** (190927) (4 cr; limited to 25 students; prereq 8002 or # and IR grad student or department approval; 1010-1205 MTWTh; BlegH 225)

Integration of organization goals and objectives with individual needs and objectives through the staffing processes of human resources planning, recruitment, selection/reduction, allocation and evaluation of human resources.

## Insurance (Ins)

837 Management/Economics Building. 373-3579  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

## FIRST TERM

**3100. RISK MANAGEMENT AND INSURANCE.** (989911) (4 cr, §8100; 0930-1045 MTWTh; BlegH 10; A-N only) Whitman  
How to recognize and evaluate the property, liability, and personnel risks facing a business, a nonprofit organization, a government unit, or an individual or family. The tools of risk management—mainly retention, loss control, and insurance—and the conditions under which they should be used. How to select and deal with an insurer. Public policy issues such as availability of insurance, insurance pricing, and social insurance.

**8100. RISK MANAGEMENT AND INSURANCE.** (589913) (4 cr, §3100; prereq grad Mgmt/IR student or Grad Sch Mgmt approval; 0930-1045 MTWTh; BlegH 10) Whitman  
Meets with 3100.

**8990. READINGS IN RISK MANAGEMENT AND INSURANCE.** (187887) (Cr ar; prereq consent of adviser, #, and Grad Sch Mgmt approval)

## SECOND TERM

**8990. READINGS IN RISK MANAGEMENT AND INSURANCE.** (889787) (Cr ar; prereq consent of adviser, and Grad Sch Mgmt approval)

## Interdepartmental Study (ID)

220 Johnston Hall. 373-7550  
College of Liberal Arts

## FIRST TERM

**3970. INTERDEPARTMENTAL DIRECTED STUDIES.** (690096) (1-15 cr; prereq consult with Office for Special Learning Opportunities, ☐)

Individual projects, readings, and research in areas that cross departmental lines.

## SECOND TERM

**3970. INTERDEPARTMENTAL DIRECTED STUDIES.** (589524) (1-15 cr; prereq consult with Office for Special Learning Opportunities, ☐)  
See First Term.

## Interdisciplinary Medicine (InMd)

Box 33 Mayo. 373-9581  
Medical School

## FIRST TERM

**5100. CLINICAL MEDICINE I.** (589202) (5 cr; prereq regis med; S-N only; 0815-0900 TTh, 1315-1500 W, MoosT 2-650)

**5110. HUMAN GENETICS.** (389203) (2 cr; prereq regis med; 0815-0900 MWF; MoosT 2-650)

**5233. HUMAN SEXUALITY.** (189204) (2 cr; prereq regis med; S-N only; 1015-1100 W, 1015-1200 F; MoosT 2-650)

**5500. DIDACTIC/SELECTIVE.** (288173) (9 cr; 0815-1100 MTWThF; MoosT 2530)

**5555. ELECTIVE AWAY FOR CREDIT.** (789649) (Cr ar; prereq #)

## SECOND TERM

**5555. ELECTIVE AWAY FOR CREDIT.** (888217) (Cr ar; prereq #)

## International Relations (IntR)

214 Social Science. 373-2691  
College of Liberal Arts

## FIRST TERM

**83105. NUCLEAR WEAPONS AND NUCLEAR WAR.** (890937) (4 cr; limited to 60 students; 1115-1205 MTWThF; BlegH 135) Goldman  
Development of nuclear weapons; policies and doctrines of development and use of nuclear weapons; social, economic, political costs of the arms race and use of nuclear weapons; efforts to control the arms race and reduce threat of nuclear war.  
Meets with Pol 3810.

**3960. FIELD STUDIES/INTERNSHIP IN INTERNATIONAL STUDIES.** (485935) (1-8 cr [8 cr max for international relations majors]; prereq Δ) Staff  
Internship with government/community/international organization or field study in international relations. Activities must have an international focus.

**3970. DIRECTED STUDIES.** (189672) (1-15 cr; prereq #, Δ, ☐) Staff  
Guided individual reading or study.

**85910. TOPICS IN INTERNATIONAL POLICY ANALYSIS—U.S. Policy Towards Mexico and Central America.** (285936) (4 cr; limited to 30 students; prereq international relations major or #; 1010-1100 MTWThF, BlegH 210) Miller  
Analysis of U.S. perceptions of and responses to social and political change in the region. Meets with Anth 5910.

## Italian (Ital)

200 Folwell Hall. 373-5202  
College of Liberal Arts

## FIRST TERM

**3970. DIRECTED STUDIES.** (389196) (1-5 cr; prereq undergrad, #, Δ, ☐) Staff  
Guided individual reading or study.

## FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll for all three courses and may not enroll in other summer courses.**

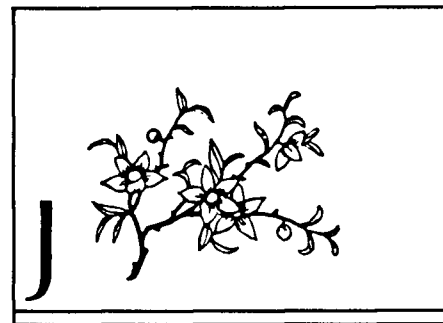
Prospective students should talk to an adviser before registering for intensive language courses.

**81101-1102-1103. BEGINNING ITALIAN.** (15 cr for both terms; limited to 30 students; 0905-1205 MTWThF; FolH 108) Martinez, Pipa  
A course with speaking objectives based on an audiolingual approach. Students learn to understand and express fundamental structures of the language. Includes audiovisual aids.

81101, Sec 5, (690082) June 17-July 9, 5 cr

81102, Sec 5, (490083) July 10-31, 5 cr

81103, Sec 5, (290084) August 1-22, 5 cr



## Japanese (Jpn)

113 Folwell Hall. 373-2564  
College of Liberal Arts

## FIRST TERM

**3970. DIRECTED STUDIES.** (989651) (1-15 cr; prereq #, Δ, ☐) Staff

**5970. DIRECTED STUDIES IN JAPANESE.** (289761) (1-15 cr; prereq #, Δ, CLA approval) Staff

## FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll for all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**81011-1012-1013†. BEGINNING JAPANESE.** (15 credits for both terms; 10 hours with principal instructor, 10 hours with drillmaster; 0800-1205 MTWThF; KolH S134)

81011, Sec 5, (090872) June 17-July 9, 5 cr

81012, Sec 5, (890873) July 10-31, 5 cr

81013, Sec 5, (690874) August 1-22, 5 cr

## SECOND TERM

**3970. DIRECTED STUDIES.** (889674) (1-15 cr; prereq #, Δ, ☐) Staff

**5970. DIRECTED STUDIES IN JAPANESE.** (289789) (1-15 cr; prereq #, Δ, CLA approval) Staff

## Jewish Studies (JwSt)

156 Klaeber Court. 373-5837  
College of Liberal Arts

(See also Hebrew)

## FIRST TERM

**3126. MODERN JUDAISM.** (185940) (4 cr; 0900-1055 TTh; FolH 110) Zahavy  
Jewish theology, religion, and ideology in the 19th and 20th centuries. American Judaism: orthodox, conservative, reform, religious, and communal organizational structures. Zionism in Europe and America. Hasidism.

**5970. DIRECTED STUDIES.** (985941) (1-12 cr [max 12 cr]; prereq #, Δ, CLA approval)  
Guided individual reading or study.

## SECOND TERM

**5970. DIRECTED STUDIES.** (185394) (1-12 cr [max 12 cr]; prereq #, Δ, CLA approval)  
See First Term.



## Journalism and Mass Communication (Jour)

112 Murphy Hall, 373-3190  
College of Liberal Arts

Departmental consent for courses marked with a delta ( $\Delta$ ) must be obtained in 18C Murphy Hall. When a typing prerequisite is listed, testing must be arranged through 18C Murphy Hall. Contact that office for a schedule. Students must abide by the course prerequisites that were in force at the time they filed an official journalism program with the School of Journalism and Mass Communication's Coordinator of Advising. Journalism and Mass Communication students must have official major status before taking 3xxx and 5xxx-level journalism courses.

### FIRST TERM

**1001. INTRODUCTION TO MASS COMMUNICATION.** (491248) (2 cr; 1220-1310 MTWThF; MurH 105; A-N only) Nature, functions, and responsibilities of communication media and agencies from professional point of view. News, opinion, entertainment, and persuasion functions; current trends. Specialized communication; aspects of advertising.

**1002. VISUAL COMMUNICATION.** (188059) (2 cr; 1010-1205 MWF; MurH 105; A-N only) Schwartz  
Study of form, content and meaning in visual communication. Introduction to basic visual elements and techniques. Issues in perception, picture use and the sources of visual conventions. Attention to the organization and production of visual media. Applications to photography, film, television, advertising and documentary work.

**R3173. MAGAZINE WRITING.** (691670) (4 cr; prereq 3101,  $\Delta$ ; 1010-1100 MTWThF; MurH 212; A-N only) Roberts  
Writing feature articles for general, class, and trade publications; market free-lance methods.

**R3008. MASS COMMUNICATION PROCESSES AND STRUCTURE.** (291249) (4 cr; prereq 1001,  $\Delta$  for non-journalism majors. . . completion of preparatory journalism courses and application filed for major status,  $\Delta$  for intended professional journalism majors . . . completion of preparatory journalism courses with 2.5 GPA across the four, filed study plan,  $\Delta$  for intended mass communication majors . . . completion of 1001 and filed study plan,  $\Delta$  for intended mass communication minors; 1015-1100 MTWThF; MurH 308; A-N only) Lee  
Analysis of a variety of communication theories as they relate to mass communication processes; major structural aspects of mass communication systems as they influence mass communication processes.

**R3321. BASIC MEDIA GRAPHICS.** (886208) (4 cr; prereq professional journalism major status, #,  $\Delta$ ; 0905-1205 MTWTh; MurH 315, 320; A-N only) Craig  
Basic introduction to mass media graphics, including design principles and history, production technology, typographic legibility research and analysis of printing and production costs.

**3776. MASS COMMUNICATION LAW.** (691250) (4 cr; 1010-1100 MTWThF; CivMinE 212; A-N only) Gillmor  
Brief historical background, First Amendment rights, basic law of defamation, free press and fair trial, access to news, access to press, privacy, contempt, obscenity, regulation of broadcasting and advertising, antitrust controls, legal and ethical rules affecting journalistic practice.

**R3970. DIRECTED STUDIES.** (489631) (1-4 cr per term; prereq major status for prof jour, mass comm students, #,  $\Delta$ ,  $\square$ ; A-N only) Staff  
Guided individual reading or study.

**5501. COMMUNICATION AND PUBLIC OPINION I.** (086210) (4 cr; prereq 16 cr in social science depts; 1115-1205 MTWThF; MurH 308; A-N only) Lee  
Theories of communication process and of persuasion and attitude change. Functions of interpersonal and mediated communication in diffusion of information and in opinion formation.

**5549. PUBLIC RELATIONS.** (291252) (4 cr; prereq 16 cr in social science depts; 1115-1205 MTWThF; MurH 311; A-N only) Lindsay  
History and development of public relations practice and principles. Process and applications in a variety of institutional settings. Analysis and critique of public relations in contemporary society.

## Journalism and Mass Communication

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

SJMC will offer two workshops for high school newspaper and yearbook staff members; teachers may attend. A newspaper and

photo workshop will be held Sunday, July 13 through Thursday, July 17, and the yearbook and photo workshop will be held Sunday, July 20 through Thursday, July 24. These workshops do not offer college credit. Details may be obtained from the MHSPA, 620 Parig Center, University of Minnesota, 330 21st Avenue South, Minneapolis, MN 55455.

**5601. HISTORY OF JOURNALISM.** (791255) (4 cr; 0905-0955 MTWThF; MurH 311; A-N only) Dicken-Garcia  
Development of American newspapers and periodicals from beginnings in Europe to present day; rise of radio and television, relation of communications developments to political, economic, and social trends.

**5615. HISTORY OF VISUAL COMMUNICATION IN THE MASS MEDIA.** (886211) (4 cr; 0905-1205 TTh; MurH 105; A-N only) Schwartz  
Social history of photography, film, and video. Informational, documentary, and entertainment functions of visual communication. Organizational structures, visual styles, and audiences.

**5801. INTERNATIONAL COMMUNICATION.** (686212) (4 cr; prereq 16 cr in social science depts; 1010-1100 MTWThF; MurH 311; A-N only) Lindsay  
Global telecommunications, channels and artifacts of international mass communication. Problems in the free flow of information. Roles of international organizations, journalism. Mass communication in social, political, educational, economic development; implications for conflict resolution.

**R5970. ADVANCED PROJECTS IN JOURNALISM.** (490097) (1-4 cr [max 8 cr]; prereq major status for prof jour, mass comm students, B avg, #,  $\Delta$ , CLA approval; A-N only) Staff

**R8970. ADVANCED PROJECTS IN MASS COMMUNICATION.** (290098) (1-4 cr [max 8 cr]; prereq grad major or minor in mass comm, #,  $\Delta$ ; A-N only) Staff  
Individual research.

### SECOND TERM

**R3101. REPORTING.** (191244) (4 cr; prereq prof jour major status, grad students type 30 wpm,  $\Delta$ ; 1010-1205 MTWThF; MurH 212; A-N only) Glasser  
Fact gathering and journalistic writing. Problems in judgment and handling of news and features.

**3201. PRINCIPLES OF ADVERTISING.** (891246) (4 cr; no prereq for non-journalism majors. . . completion of preparatory journalism courses and application filed for major status for intended professional journalism majors. . . completion of preparatory journalism courses with 2.5 GPA across the four, filed study plan for intended mass communication majors. . . completion of 1001 and study plan filed for intended mass communication minors; 1010-1100 MTWThF; MurH 308; A-N only) Jones  
Theory, principles, and functions of advertising; its role in economic, social, and marketing structure. Newspapers, magazines, radio, television as advertising media.

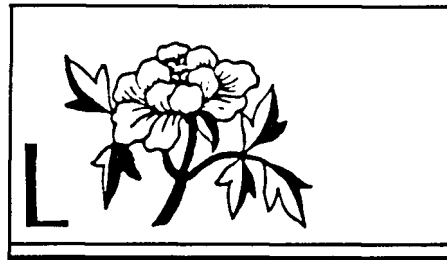
**R3970. DIRECTED STUDIES.** (289632) (1-4 cr per qtr; prereq major status for prof jour, mass comm students, #,  $\Delta$ ,  $\square$ ; A-N only) Staff  
See First Term.

**5251. PSYCHOLOGY OF ADVERTISING.** (289100) (4 cr;  $\Psi$ Psy 5751; prereq Psy 1001; 1115-1205 MTWThF; MurH 308; A-N only) Jones  
Psychological principles, research techniques, and applications in advertising and selling. Consumer attitudes and behavior. Psychological mechanisms upon which effectiveness of advertisements and commercials depends.

**5721. MASS MEDIA IN A DYNAMIC SOCIETY.** (691247) (4 cr; prereq 16 cr in social science depts; 0905-0955 MTWThF; MurH 308; A-N only) Glasser  
Economic, political, and social determinants of character and content of mass communication in America. Impact, structure, functioning of mass media. Problems, prospects, criticism. Professionalism, technology, reform.

**R5970. ADVANCED PROJECTS IN JOURNALISM.** (285385) (1-4 cr [max 8 cr]; prereq major status for prof jour, mass comm students, B avg, #,  $\Delta$ , CLA approval; A-N only) Staff

**R8970. ADVANCED PROJECTS IN MASS COMMUNICATION.** (185386) (1-4 cr [max 8 cr]; prereq grad major or minor in mass comm, #,  $\Delta$ ; A-N only) Staff  
Individual research.



## Laboratory Medicine (LMed)

D-242 Mayo, 373-8623  
Medical School

### FIRST TERM

**5139. ADVANCED MICROBIOLOGY.** (585215) (Cr ar; prereq #) Balfour

**5189. RESEARCH: HUMAN GENETICS.** (385216) (Cr ar; prereq #) Eaton

**5170. ADVANCED PROBLEMS: MEDICAL GENETICS.** (185217) (Cr ar; prereq #) Eaton

**5179. CHEMISTRY SEMINAR.** (085218) (1 cr; prereq #) Steffes

- 5180. ADVANCED CHEMISTRY.** (885219) (Cr ar; prereq #) Benson, staff
- 5273. ADVANCED IMMUNOLOGY.** (185220) (Cr ar; prereq #) Azar
- 5768. ADVANCED HEMATOLOGY.** (085221) (Cr ar; prereq #) Brunning
- 8235. ADVANCED CLINICAL LABORATORY MEDICINE.** (885222) (Cr ar; prereq #) Benson
- 8236. RESEARCH ON CLINICAL LABORATORY PROBLEMS.** (685223) (Cr ar; prereq #) Benson

## SECOND TERM

- 5139. ADVANCED MICROBIOLOGY.** (587045) (Cr ar; prereq #) Balfour
- 5169. RESEARCH: HUMAN GENETICS.** (387046) (Cr ar; prereq #) Eaton
- 5170. ADVANCED PROBLEMS: MEDICAL GENETICS.** (187047) (Cr ar; prereq #) Eaton
- 5179. CHEMISTRY SEMINAR.** (087048) (1 cr; prereq #) Steffes
- 5180. ADVANCED CHEMISTRY.** (887049) (Cr ar; prereq #) Benson, staff
- 5273. ADVANCED IMMUNOLOGY.** (187050) (Cr ar; prereq #) Azar
- 5768. ADVANCED HEMATOLOGY.** (087051) (Cr ar; prereq #) Brunning
- 8235. ADVANCED CLINICAL LABORATORY MEDICINE.** (887052) (Cr ar; prereq #) Benson
- 8236. RESEARCH ON CLINICAL LABORATORY PROBLEMS.** (687053) (Cr ar; prereq #) Benson

## Laboratory Medicine and Pathology (LaMP)

D-242 Mayo. 373-8627  
Medical School

### Courses for Medical and Undergraduate Students

#### SPECIAL TERMS: THREE- OR SIX-WEEK COURSES

- 5101. GENERAL PATHOLOGY.** (2-6 cr; prereq regis med fr or pathobiology grad; lect 0915-1000 MTThF; MoosT 2650; A-N only) Dehner  
Lab 1, (087888) 1015-1200 MTh, MoosT 3331  
Lab 2, (887889) 1315-1500 MTh, MoosT 3331
- 5113. SURGICAL PATHOLOGY.** (485224) (Cr ar; prereq Year 2) Rosai
- 5114. SURGICAL PATHOLOGY (Hennepin County Medical Center).** (285225) (Cr ar; prereq Year 2) Anderson
- 5115. SURGICAL PATHOLOGY (Veterans Hospital).** (185226) (Cr ar; prereq Year 2) Limas
- 5118. ENDOCRINE PATHOLOGY (St. Paul-Ramsey Medical Center).** (985227) (Cr ar; prereq Year 2) Haus, Lakatua
- 5125. CHRONOBIOLOGY.** (785228) (Cr ar; prereq Year 2, #) Halberg
- 5141. PROBLEMS: EXPERIMENTAL PATHOLOGY.** (585229) (Cr ar; prereq Year 2, #) Staff
- 5150. ANATOMIC PATHOLOGY (University Hospitals).** (985230) (Cr ar) Burke, Snover
- 5151. ANATOMIC PATHOLOGY: HOSPITAL SETTING (Hennepin County Medical Center).** (785231) (Cr ar) Anderson
- 5152. ANATOMIC PATHOLOGY (Veterans Hospital).** (585232) (Cr ar; prereq Year 2) Posalaky
- 5153. ANATOMIC PATHOLOGY: HOSPITAL SETTING (St. Paul-Ramsey Medical Center).** (385233) (Cr ar; prereq Year 2) Posalaky
- 5158. CARDIAC PATHOLOGY (Miller Hospital).** (185234) (Cr ar; prereq Year 2, #) Edwards
- 5180. ANATOMIC AND CLINICAL PATHOLOGY IN A HOSPITAL SETTING (Abbott-N.W.).** (185976) (Cr ar; prereq #) Jones

- 5181. LABORATORY AND CLINICAL HEMATOLOGY.** (085235) (Cr ar; prereq #) Brunning
- 5182. LABORATORY STUDIES OF GENETIC DISORDERS.** (885236) (Cr ar; prereq #) Eaton
- 5184. IMMUNOHEMATOLOGY IN BLOOD BANKING.** (685237) (Cr ar; prereq #) McCullough
- 5185. LABORATORY PROBLEMS IN BLOOD COAGULATION.** (889680) (Cr ar; prereq #) Edson
- 5190. LABORATORY MEDICINE IN A COMMUNITY HOSPITAL (Duluth).** (485238) (Cr ar; prereq Years 3 and 4) Larson
- 5192. LABORATORY MEDICINE FOR PRIMARY CARE (Virginia).** (285239) (Cr ar; prereq Years 3 and 4) Knabe
- 5193. CLINICAL PATHOLOGY EXTERNSHIP (Hibbing Hospital).** (685240) (Cr ar; prereq #) Nollet, Eilers
- 5194. COMPUTER APPLICATIONS IN MEDICINE.** (088636) (Cr ar; prereq #) Ellis
- 5195. COMPUTER APPLICATIONS IN MEDICAL RESEARCH.** (888637) (Cr ar; prereq #) Ellis
- 5203. CLINICAL BLOOD BANK IMMUNOLOGY (Minneapolis War Memorial Blood Bank).** (485241) (Cr ar; prereq Years 3 and 4) Polesky

## Landscape Architecture (LA)

205 North Hall, St. Paul. 376-7537  
Institute of Technology

### FIRST TERM

- 3098. INDEPENDENT STUDY IN DESIGN.** (189244) (Cr and hrs ar) Martin
- 5119. PLANTING DESIGN; ECOLOGICAL PRINCIPLES/LAND USE CONCEPTS AND IMPLEMENTATION OF PLANTING DESIGN.** (485983) (4 cr; prereq 5117 or #; 1700-2100 MWF; NorH 305) Harper  
Lectures, presentations, field trips, readings, and projects related to the principles and practices of using plants in an ecologically sound and environmentally sensitive manner. Principles derived from prairie, northwoods, riverine, and wetland environments. Integration of naturalized materials within a range of environments.
- 5132. SELECTED PROBLEMS IN LANDSCAPE ARCHITECTURE.** (189722) (Cr ar; prereq #) Martin
- 5140. INTERDISCIPLINARY STUDIES IN LANDSCAPE ARCHITECTURE.** (191051) (2-6 cr [max 18 cr]; prereq #; A-N only) Staff

### SECOND TERM

- 3098. INDEPENDENT STUDY IN DESIGN.** (388200) (Cr and hrs ar; prereq #)
- 5134. DIRECTED STUDIES IN EMERGING AREAS FOR LANDSCAPE ARCHITECTURE.** (589281) (Cr and hrs ar; prereq Δ)
- 5140. INTERDISCIPLINARY STUDIES IN LANDSCAPE ARCHITECTURE.** (885978) (2-6 cr [max 18 cr]; prereq #; A-N only) Staff

## Large Animal Clinical Sciences (LACS)

225 Veterinary Hospital, St. Paul. 373-1810  
College of Veterinary Medicine

### FIRST TERM

- 5000. CLINICAL LARGE ANIMAL MEDICINE.** (191258) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences to the diagnosis, prognosis, treatment, prevention, and eradication of disease in food-producing animals and the horse.
- 5002. CLINICAL LARGE ANIMAL SURGERY.** (091259) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Laboratories devoted to the application and techniques of the basic and clinical surgical sciences to the diagnosis, treatment, and surgical management of disease in food-producing animals and the horse.

**5004. CLINICAL THERIOGENOLOGY.** (391260) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences in theriogenology.

**5006. CLINICAL HERD MEDICINE.** (191261) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Application of principles and techniques of the basic and clinical medical sciences in herd medicine.

**5008. CLINICAL VIROLOGY AND IMMUNOLOGY.** (091262) (1 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Laboratories devoted to the principles and techniques of basic and clinical virology and immunology.

**5009. VETERINARY PUBLIC HEALTH.** (891263) (4 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences in veterinary public health.

**5180. INTRODUCTION TO HERD HEALTH AND DAIRY HERD HEALTH MANAGEMENT—June 23-Sept 15.** (590706) (2.5 cr; prereq regis vet med, 3rd or 4th year or grad student or #; 1300-1450 M; AnScVM 135) Farnsworth, Williamson, others  
Herd health management, general epidemiology, disease surveillance and economics of farming. Dairy cattle genetics and breeding, reproduction, applied nutrition, housing, preventive medicine programs, and management practices.

**5364. EQUINE LAMENESS—July 14-September 22.** (889116) (2 cr; prereq regis vet med, 3rd or 4th year, SACS 5352 or #; 1500-1650 M; AnScVM 125) Hilbert, Peterson, Little  
All major musculoskeletal diseases affecting the horse that contribute to lameness.

**5572. REPRODUCTIVE PATTERNS AND INFERTILITY IN THE DOG AND CAT—July 28-Aug 25.** (789117) (1 cr; prereq 5570, regis vet med, 3rd or 4th year or grad student or #; 1300-1450 M; AnScVM 125) S Johnston  
Lectures on reproductive patterns, breeding management, artificial insemination, and infertility in dogs and cats.

**5680. PROBLEMS IN VETERINARY EPIDEMIOLOGY AND PUBLIC HEALTH.** (390707) (Cr ar; prereq 5650 or equiv or #) Anderson, Diesch, Pullen, Robinson, others  
Individual study arranged with faculty member.

**5951. DIRECTED STUDIES.** (589376) (1-5 cr; prereq #, Δ) Independent, directed study in veterinary science in areas arranged by the student and a faculty member.

**8193.\* ADVANCES IN CLINICAL IMMUNOBIOLOGY.** (389377) (Cr ar; prereq grad student or #) Molitor  
Students, faculty members, and guest speakers present seminars on current research in and clinical application of immunologic procedures in the diagnosis, control, and treatment of disease processes in animals.

**8194.\* PROBLEMS IN DIAGNOSTIC VIROLOGY, SEROLOGY, AND IMMUNOLOGY.** (189378) (Cr ar; prereq grad student or #) Ames  
Laboratory techniques of diagnostic virology, serology, and immunology. Research techniques of fluorescent antibody; determination of classes of immunoglobulins and immunostimulation of lymphocytes.

**8195.\* PREVENTIVE VETERINARY MEDICINE.** (089379) (Cr ar) Anderson, Diesch, others  
Application of the principles and practice of preventive veterinary medicine in food-animal production at the herd, state, national, or international levels.

**8199. PROBLEMS IN ECONOMICS OF ANIMAL HEALTH.** (389380) (1-3 cr; prereq #) Olson, Stein, staff  
Impact of animal disease on animal productivity and the return to investment in animal health by producers or the society studied using disease problems of current interest as subjects. Questions involving human health problems may be studied.

**8290. ADVANCED VETERINARY MEDICINE.** (189381) (Cr ar; prereq 5162, 5165, 5172, #) Larson, Hardy, others  
Discussions of the diseases of organs or systems in animals from the following etiologic group: prenatal, metabolic, toxic infectious, physical influences.

**8291. ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (089382) (Cr ar; prereq 5162, SACS 5172, #) Larson, Leman, Osborne, McKeever, Ogburn, Olson, others  
Detailed examination, discussions, and treatment of cases of animal diseases.

**8292. SEMINAR: VETERINARY MEDICINE.** (889383) (Cr ar; prereq #) Larson, Osborne, others

**8293. MEDICAL CONFERENCE.** (689384) (Cr ar; prereq 5162, SACS 5172, #) Larson, Osborne, others  
Medical, surgical, or obstetrical cases supported by anatomic, bacteriologic, pathologic, physiologic, pharmacologic, and radiologic evaluations whenever applicable.

**8294. ADVANCED COMPARATIVE IMMUNOCHEMISTRY AND IMMUNOBIOLOGY.** (989004) (3 cr; prereq MicB 5216 or equiv, grad student...others by #) Maheswaran

**8299. RESEARCH IN VETERINARY MEDICINE.** (489385) (Cr ar) V Larson, others  
Research problems relating to any aspect of internal medicine or to the various systems in animals.

**8390. SEMINAR: VETERINARY SURGERY.** (289386) (Cr ar; prereq, 5365, SACS 5360 or equiv, #) Wallace

**8392. ADVANCED LARGE ANIMAL SURGERY.** (189387) (Cr ar; prereq 5365 or equiv, #) Hilbert  
Surgery of various systems in large animals with preoperative and postoperative evaluation and treatment.

**8393. PROBLEMS IN LARGE ANIMAL ORTHOPEDICS.** (989388) (3 cr; prereq 5365 or equiv, #) Hilbert

**8397. LARGE ANIMAL ANESTHESIA.** (789389) (Cr ar; prereq SACS 5380 or equiv, #) Raffe  
Special problems associated with anesthesia of large animals.

**8590. ADVANCED DIAGNOSTIC METHODS IN REPRODUCTIVE DISEASES.** (189390) (Cr ar; prereq 5570 or #) Staff

Discussion and laboratory practices of methods for determination of fertility status of female and male animals.

**8591. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (989391) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
Physiological and pathological aspects of reproductive endocrinology.

**8592. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (789392) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
Physiological and pathological aspects of reproductive endocrinology.

**8593. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (589393) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
Physiological and pathological aspects of reproductive endocrinology.

**8594. SPECIAL PROBLEMS IN ANIMAL REPRODUCTION.** (389394) (Cr ar; prereq 5570 or #) Zemjanis, staff  
Detailed discussion and laboratory study of specific reproductive disorders.

**8595. SEMINAR: VETERINARY OBSTETRICS.** (189395) (1 cr) Momont

**8790. PROBLEMS IN VETERINARY CLINICAL PHARMACOLOGY AND THERAPEUTICS.** (089396) (3 cr; prereq grad student or #) Stowe, Dunlop  
Lecture, discussion, and clinical laboratory course examining clinical cases and experimental animals, and dealing with pharmacotherapeutics of various drugs used for food producing and companion animals.

**8791. SEMINAR IN CLINICAL PHARMACOLOGY AND THERAPEUTICS.** (889397) (2 cr; prereq grad student or #) Stowe  
Examination of current literature and case material.

**8792. SEMINAR IN VETERINARY TOXICOLOGY.** (689398) (2 cr; prereq grad student or #) Stowe  
Livestock and small animal intoxication with insecticides, heavy metals, rodenticides, poisonous plants, mycotoxins, herbicides, and drugs and drug combinations.

## SECOND TERM

**5000. CLINICAL LARGE ANIMAL MEDICINE.** (991271) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5002. CLINICAL LARGE ANIMAL SURGERY.** (591273) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5004. CLINICAL THERIOGENOLOGY.** (391274) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5006. CLINICAL HERD MEDICINE.** (191275) (6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5008. CLINICAL VIROLOGY AND IMMUNOLOGY.** (091276) (1 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5009. VETERINARY PUBLIC HEALTH.** (891277) (4 cr; prereq #; arranged MTWThFS; VetTchHos) Staff  
See First Term.

**5680. PROBLEMS IN VETERINARY EPIDEMIOLOGY AND PUBLIC HEALTH.** (786914) (Cr ar; prereq 5650 or equiv or #) Anderson, Diesch, Pullen, Robinson, others  
See First Term.

**5951. DIRECTED STUDIES.** (489399) (1-5 cr; prereq #, Δ) See First Term.

**8193.\* ADVANCES IN CLINICAL IMMUNOBIOLOGY.** (189400) (Cr ar; prereq grad student or #) Molitor  
See First Term.

**8194.\* PROBLEMS IN DIAGNOSTIC VIROLOGY, SEROLOGY, AND IMMUNOLOGY.** (089401) (Cr ar; prereq grad student or #) Ames  
See First Term.

**8195.\* PREVENTIVE VETERINARY MEDICINE.** (889402) (Cr ar) Anderson, Diesch, others  
See First Term.

**8199. PROBLEMS IN ECONOMICS OF ANIMAL HEALTH.** (689403) (1-3 cr; prereq #) Olson, Stein, staff, others  
See First Term.

**8290. ADVANCED VETERINARY MEDICINE.** (489404) (Cr ar; prereq 5162, 5172, #) Larson, Hardy, others  
See First Term.

**8291. ADVANCED DIAGNOSIS AND THERAPEUTICS OF ANIMAL DISEASES.** (289405) (Cr ar; prereq 5162, SACS 5172, #) Larson, Leman, Osborne, McKeever, Ogburn, Olson, others  
See First Term.

**8292. SEMINAR: VETERINARY MEDICINE.** (189406) (Cr ar; prereq #) Larson, Osborne, others

**8293. MEDICAL CONFERENCE.** (989407) (Cr ar; prereq 5162, SACS 5172, #) Larson, Osborne, others  
See First Term.

**8294. ADVANCED COMPARATIVE IMMUNOCHEMISTRY AND IMMUNOBIOLOGY.** (589006) (3 cr; prereq MicB 5216 or equiv, grad student...others by #) Maheswaran

**8299. RESEARCH IN VETERINARY MEDICINE.** (789408) (Cr ar) V Larson, others  
See First Term.

**8390. SEMINAR: VETERINARY SURGERY.** (589409) (Cr ar; prereq 5365, SACS 5360 or equiv, #) Wallace

**8392. ADVANCED LARGE ANIMAL SURGERY.** (989410) (Cr ar; prereq 5365 or equiv, #) Hilbert  
See First Term.

**8393. PROBLEMS IN LARGE ANIMAL ORTHOPEDICS.** (789411) (3 cr; prereq 5365 or equiv, #) Hilbert

**8397. LARGE ANIMAL ANESTHESIA.** (589412) (Cr ar; prereq SACS 5380 or equiv, #)  
See First Term.

**8590. ADVANCED DIAGNOSTIC METHODS IN REPRODUCTIVE DISEASES.** (389413) (Cr ar; prereq 5570 or #) Staff  
See First Term.

**8591. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (189414) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
See First Term.

**8592. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (089415) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
See First Term.

**8593. ADVANCED ENDOCRINOLOGY OF REPRODUCTION.** (889416) (2 cr; prereq VB 5310, MdBc 5100, MdBc 5101) Zemjanis, staff  
See First Term.

**8594. SPECIAL PROBLEMS IN ANIMAL REPRODUCTION.** (689417) (Cr ar; prereq 5570 or #) Zemjanis, staff  
See First Term.

**8595. SEMINAR: VETERINARY OBSTETRICS.** (489418) (1 cr) Momont

**8790. PROBLEMS IN VETERINARY CLINICAL PHARMACOLOGY AND THERAPEUTICS.** (289419) (3 cr; prereq grad student or #) Stowe, Dunlop  
See First Term.

**8791. SEMINAR IN CLINICAL PHARMACOLOGY AND THERAPEUTICS.** (689420) (2 cr; prereq grad student or #) Stowe  
See First Term.

**8792. SEMINAR IN VETERINARY TOXICOLOGY.** (489421) (2 cr; prereq grad student or #) Stowe  
See First Term.

## Latin (Lat)

309 Folwell Hall, 373-3912  
College of Liberal Arts

### FIRST TERM

**3001. BEGINNING LATIN: INTENSIVE ACCELERATED.** (790039) (10 cr, §1101-1102-1103, §3051-3052; 0905-1205 MTWThF; FolH 203) Sheets  
Ten class hours weekly, plus individual and small group sessions. Grammar, syntax, composition, and reading. See Special Programs section.

**3070. DIRECTED STUDIES.** (189650) (1-5 cr; prereq #, Δ, □) Guided individual reading or study.

**5970. DIRECTED STUDIES.** (887892) (1-5 cr; prereq #, Δ, CLA approval)  
Guided individual reading or study.

### SECOND TERM

**3104. LATIN READINGS.** (185324) (5 cr; prereq 1104 or equiv or #; 1115-1205 MTWThF; FolH 305) Erickson  
Reading of selected Latin authors, development of reading proficiency, introduction to cultural and literary studies as in 1104, with advanced assignments. Meets with 8120.

**3970. DIRECTED STUDIES.** (187890) (1-5 cr; prereq #, Δ, □) See First Term.

**5970. DIRECTED STUDIES.** (087891) (1-5 cr; prereq #, Δ, CLA approval)  
See First Term.

**8120. LATIN TEXT COURSE.** (985325) (4 cr; prereq 3052 or Δ; restricted to students in depts other than Classics; 1115-1205 MTWThF; FolH 305) Erickson  
For nonmajors who wish text work in Latin for a minor or related field. Meets with 3104. Supplementary work at the discretion of the instructor.

## Law (Law)

285 Law, 373-2717  
Law School

### Calendar

June 2  
First day of Summer Session classes  
July 4  
Independence Day HOLIDAY  
July 25  
Last Day of Summer Session classes  
July 28-30  
Final Examination Period for Summer Session

### Admission and Registration

Students must have completed one year at an approved law school and submit a letter of good standing from a dean of an approved law school. The tuition is \$116.40 per credit\*. Students not currently enrolled in the University of Minnesota Law School must submit a nonrefundable application fee. Last day to register without a late fee is May 23, 1986. Information is available in the college office, 290 Law Building, 229 19th Avenue South, University of Minnesota, Minneapolis, MN 55455 or call (612) 376-3344.

\*Tuition is subject to change

## SPECIAL TERM: EIGHT WEEK COURSES, June 2-July 30

**5100. TAXATION I.** (586056) (3 cr; 1035-1150 MTWTh; Law 40, 55) Raskind

Introduction to the federal income tax as it applies to individual and business income; gross income, exclusions, deductions, basis, capital gains, and tax procedure with some reference to current topics of tax policy and public finance.

**5150. TRUSTS AND ESTATES** (189090) (3 cr; 1200-1315 MTWTh; Law 50, 65) Waterbury

Emphasis on law of intestate succession, wills, and administration of decedents' estates. Inter vivos gifts, common types of transfers that avoid probate, marital property rights of surviving spouses, with attention to antenuptial contracts. Basic estate planning and drafting of basic wills.

**5219. EVIDENCE.** (590947) (3 cr; 0910-1025 MTWTh; Law 65) Marshall

Study of relevance, admission and exclusion of evidence, direct and cross-examination, judicial notice, hearsay, expert testimony, burdens of proof and presumptions, privileged communications.

**5600. PROFESSIONAL RESPONSIBILITIES.** (688140) (2 cr; 0800-0900 TWTh; Law 50, 55) Goldberg

Lawyer's responsibilities to clients, the profession, the administration of justice and society; content and role of formal standards of professional ethics.

**5606. ADMINISTRATIVE LAW.** (491671) (3 cr; 1200-1315 MTWTh; Law 40, 55) Gifford

Function of administrative agencies in our society; legislative, judicial (including constitutional), and executive controls of administrative agencies; interrelations of legislative, judicial, executive, and administrative agencies in development of public policy; internal decision-making processes of administrative agencies. Most practitioners are likely to spend more of their time dealing with administrative agencies than litigating in court. The modern practice of law therefore requires a knowledge of the administrative process at both federal and state levels.

## Linguistics (Ling)

142 Klaeber Court. 373-5769  
College of Liberal Arts

### FIRST TERM

**3001. INTRODUCTION TO LINGUISTICS.** (190099) (5 cr, \$3005, \$5001; 1010-1205 MWF, 1010-1100 TTh; FolH 204) Survey of phonetics, phonology, morphology, syntax, semantics, and historical-comparative linguistics; language learning and the psychology of language; linguistic universals; language in society. Meets with 5001.

**3301. PHONETICS.** (890100) (5 cr, \$5003, \$5301; prereq 3001 or § 3001 or #; 1325-1520 MTWThF; FolH 50) Physiology and acoustics of speech sounds; practice and drill in production and perception. Meets with 5003 and 5301.

**3970. DIRECTED STUDIES.** (086756) (1-5 cr; prereq linguistics major, #, Δ, □) Guided individual reading or study.

**5001. INTRODUCTION TO LINGUISTICS.** (690101) (5 cr, \$3001, \$3005; prereq grad standing or #; 1010-1205 MWF, 1010-1100 TTh; FolH 204) See 3001. Meets with 3001.

**5003. APPLIED PHONETICS.** (490102) (5 cr, \$3301, \$5301; not open to linguistics majors; prereq 5001 or §5001 or #; 1325-1520 MTWThF; FolH 50) Primarily for teachers of English as a second language. Meets with 3301 and 5301.

**5101. LANGUAGE TYPES AND LINGUISTIC UNIVERSALS.** (4 cr, prereq 3001 or 5001 or #; 1010-1205 MWF; FolH 52) Downing  
Comparison of languages and language types; cross-linguistic similarities and universals of language, and their explanation.

**5301. PHONETICS.** (290103) (5 cr, \$3301, \$5003; prereq 3001 or 5001 or §5001 or #; 1325-1520 MTWThF; FolH 50) See 3301. Meets with 3301 and 5003.

## Logistics Management (LM)

735 Management/Economics. 373-4364  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R3000. INTRODUCTION TO LOGISTICS MANAGEMENT.** (890954) (4 cr, §Tran 3064, §Tran 8264; limited to 50 students; prereq Econ 1002 or equiv; 0905-0955 MTWThF; BlegH 135; A-N only)

Introduction to the management of the flow of physical products (physical supply and physical distribution) of the firm and the linkages between the process of controlling the physical flow of products and the major functions of the firm, i.e., finance, marketing, and operations. Includes coverage of logistics topics as well as analysis of the impact of logistics decisions on other functional areas.

**8990. READINGS IN LOGISTICS MANAGEMENT.** (690955) (Cr ar; prereq consent of advisor, #, Grad School of Mgmt approval; A-N only)

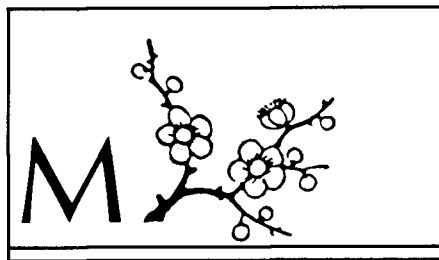
**8995. GRADUATE RESEARCH IN LOGISTICS MANAGEMENT.** (490956) (Cr ar; prereq consent of advisor, #, Grad School of Mgmt approval; A-N only)

### SECOND TERM

**R3000. INTRODUCTION TO LOGISTICS MANAGEMENT.** (290957) (4 cr, §Tran 3064, §Tran 8264; limited to 50 students; prereq Econ 1002 or equiv; 0905-0955 MTWThF; BlegH 135; A-N only) See First Term.

**8990. READINGS IN LOGISTICS MANAGEMENT.** (190958) (Cr ar; prereq consent of advisor, #, Grad School of Mgmt approval; A-N only)

**8995. GRADUATE RESEARCH IN LOGISTICS MANAGEMENT.** (990959) (Cr ar; prereq consent of advisor, #, Grad School of Mgmt approval; A-N only)



## Management (Mgmt)

735 Management/Economics Building. 373-4377  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R3001. FUNDAMENTALS OF MANAGEMENT.** (4 cr, \$8001; each section limited to 40 students; A-N only) Concepts, theory, research, and operational problems. The principal functional areas of management. Factors and relationships necessary to achieve organizational objectives: establishment of goals, policies, procedures; the planning process; control systems; organizational structure and behavior; leadership.

Sec 1, (189888) 0800-1000 MTWTh, BlegH 330, Venkataraman  
Sec 2, (988810) 0905-1100 MTWTh, HHH Ctr 15, Garud

**R3002. PSYCHOLOGY IN MANAGEMENT.** (989889) (4 cr, \$8006; limited to 30 students; 0905-1100 MTWThF; BlegH 205; A-N only) Wiseman  
Development and application of behavior principles, methods, and skills that underlie managerial competence in preventing and solving problems within and between individuals and groups and aid in effective utilization of human resources. Various laboratory procedures highlight concepts, methods, and skills and furnish practice in applying them to management problems.

**R3004. BUSINESS POLICY: STRATEGY FORMULATION AND IMPLEMENTATION.** (289890) (5 cr; limited to 35 students; prereq sr and completion of business core or final core course; 1010-1205 MTWThF; BlegH 330; A-N only) Erickson  
Identifying and analyzing problems, establishing corporate or

divisional goals, and designing realistic programs of action. Usually the viewpoint of the general line manager (department, division, or executive level) is taken. Case analysis and discussion, small group work, and occasional presentations made to the class.

**8990. READINGS IN MANAGEMENT THEORY AND ADMINISTRATION.** (189891) (Cr ar; prereq consent of advisor and #, Grad Sch Mgmt approval, requisite introductory courses) Staff

Readings involve intensive research into a particular subject and normally require preparation of a major term paper.

**8995. GRADUATE RESEARCH IN MANAGEMENT THEORY AND ADMINISTRATION.** (989892) (Cr ar; prereq consent of advisor, Grad Sch Mgmt approval, #, 2nd-yr grad student and requisite introductory courses) Staff  
Special research projects on a specific problem completed in cooperation in a business firm.

### SECOND TERM

**R3001. FUNDAMENTALS OF MANAGEMENT.** (390822) (4 cr, \$8001; limited to 45 students; 0905-1100 MTWTh; HHH Ctr 15; A-N only) Rands  
See First Term.

**8990. READINGS IN MANAGEMENT THEORY AND ADMINISTRATION.** (190823) (Cr ar; prereq consent of advisor, Grad Sch Mgmt approval, and #, 2nd-yr grad student and requisite introductory courses) Staff  
See First Term.

**8995. GRADUATE RESEARCH IN MANAGEMENT THEORY AND ADMINISTRATION.** (090824) (Cr ar; prereq consent of advisor and #, Grad Sch Mgmt approval, 2nd-yr grad student and requisite introductory courses) Staff  
See First Term.

## Management Information Systems (MIS)

735 Management/Economics Building. 373-4377  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

**R3300. INTRODUCTION TO COMPUTERS AND MANAGEMENT INFORMATION SYSTEMS.** (190961) (4 cr, \$3100, \$5100, \$5300; limited to 50 students; 0800-0955 MTWTh; AndH 270)

A computer appreciation course providing technical background for understanding the use of computers in organizations. Structure and operation of computer systems. Hardware technology and software development. Structure and components of MIS. Using a computer in organizations to support operations and management—in planning and control and in decision making. Managing the development and use of computer systems. Acquiring computer resources. The computer industry and impact of computers on society.

**8990. READINGS IN MANAGEMENT INFORMATION SYSTEMS.** (389895) (Cr ar; prereq consent of advisor, 2nd-yr grad student, requisite introductory courses; A-N only)

**8995. GRADUATE RESEARCH IN MANAGEMENT INFORMATION SYSTEMS.** (189896) (Cr ar; prereq consent of advisor, #, 2nd-yr grad student, requisite introductory courses; A-N only)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**3098. ELEMENTARY COBOL.** (789893) (2 cr; prereq 3040 or §3040 or 3100 or §3100 or 3300 or §3300; 0800-0850 W; AndH 370; S-N only)

An introduction to programming in the COBOL language. Using a programmed text in this self-paced course, the student will complete a set of simple COBOL programs. Consultants assist and administer quizzes in a laboratory environment.

**3099. ELEMENTARY FORTRAN.** (589894) (2 cr; prereq 3040 or §3040 or 3100 or §3100 or 3300 or §3300; 0905-0955 W; AndH 370; S-N only)

An introduction to programming in the FORTRAN language. Using a programmed text in this self-paced course, the student

will complete a set of simple FORTRAN programs. Consultants assist and administer quizzes in a laboratory environment.

**5098. INTERMEDIATE COBOL.** (888749) (2 cr; prereq 3098; 1010-1100 W; AndH 370; S-N only)

Self-paced course requiring the programming of a structured set of problems using intermediate and advanced features of the COBOL language. Consultants provide student assistance and administer quizzes in a laboratory environment.

## SECOND TERM

**R 3300. INTRODUCTION TO COMPUTERS AND MANAGEMENT INFORMATION SYSTEMS.** (4 cr, \$3100, \$5100, \$5300 each section; limited to 50 students; A-N only) See First Term.

Sec 1, (187896) 0800-0955 MTWTh; BlegH 155  
Sec 2, (290960) 1010-1205 MTWTh; BlegH 155

**8990. READINGS IN MANAGEMENT INFORMATION SYSTEMS.** (890825) (Cr ar; prereq consent of adviser, 2nd-yr grad student, requisite introductory courses and Grad Sch Mgmt approval; A-N only)

**8995. GRADUATE RESEARCH IN MANAGEMENT INFORMATION SYSTEMS.** (890826) (Cr ar; prereq consent of adviser, #, 2nd-yr grad student, requisite introductory courses and Grad Sch Mgmt approval; A-N only)

## Marketing (Mktg)

1235 Management/Economics Building, 373-4406  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

## FIRST TERM

**R 3000. PRINCIPLES OF MARKETING.** (4 cr, \$8000; each section limited to 50 students; prereq Econ 1002 or equiv; A-N only)

Basic policy and strategy issues in marketing and the environmental factors that affect these issues. Legal, behavioral, ethical, competitive, economic, and technological factors as they affect product, pricing, promotion, and marketing channel decisions.

Sec 1, (089897) 0800-0955 MWF, BlegH 155  
Sec 2, (889898) 1115-1310 MWF, BlegH 420

**R 3010. BUYER BEHAVIOR AND MARKETING ANALYSIS.** (689899) (4 cr; limited to 40 students; prereq 3000 and DSci 1050 or equiv; 0905-1100 MWF; BlegH 105)

Identifying and applying secondary and primary data to solve marketing problems. Emphasis on consumer and organizational buyer behavior. Topics include survey and experimental research techniques, market segmentation, data analysis, behavior concepts and processes, consumer and organizational decision-making models, and managerial applications of these models.

**R 3065. RETAIL MANAGEMENT.** (987897) (4 cr, \$8065; limited to 35 students; prereq 3010; 1115-1310 MWF; BlegH 415)

Retailing principles, problems, and trends related to various types of retailing institutions. Assignment of trade journal and supplementary readings for in-store study (buying and pricing) with a local retailer.

**8990. READINGS IN MARKETING.** (389900) (Cr ar; prereq MBA core courses, or MBA 8045 and  $\Delta$ ...and consent of adviser, #, and Grad Sch Mgmt approval)

Readings useful to the student's program and objectives that are not available in regular course offerings.

**8995. GRADUATE RESEARCH IN MARKETING.** (189901) (Cr ar; prereq MBA core courses, or MBA 8045 and  $\Delta$ ...and consent of adviser, #, and Grad Sch Mgmt approval) Individual research on an approved topic that is appropriate to the student's program and objectives.

## SECOND TERM

**R 3000. PRINCIPLES OF MARKETING.** (4 cr, \$8000; each section limited to 50 students; prereq Econ 1002 or equiv; A-N only) See First Term.

Sec 1, (290828) 0800-0955 MWF, BlegH 415  
Sec 2, (989309) 1115-1310 MWF, BlegH 415

**R 3020. MARKETING OPERATIONS MANAGEMENT.** (490830) (4 cr; limited to 35 students; prereq 3010; 0905-1100 MWF; BlegH 340)

Development of marketing plans, primarily for manufacturing organizations. Analytical methods for developing and appraising marketing programs, factors important in shaping marketing plans. Planning for selling, communication, distribution, pricing, product development, and marketing research activities.

**8990. READINGS IN MARKETING.** (190832) (Cr ar; prereq MBA core courses, or MBA 8045 and  $\Delta$ ...and consent of adviser, #, and Grad Sch Mgmt approval) See First Term.

**8995. GRADUATE RESEARCH IN MARKETING.** (790834) (Cr ar; prereq MBA core courses, or MBA 8045 and  $\Delta$ ...and consent of adviser, #, and Grad Sch Mgmt approval) See First Term.

## Master of Business Administration (MBA)

295 Hubert H. Humphrey Center, 373-5505  
School of Management

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**R 8005. COMPUTER ACCESS AND PROGRAMMING FOR BUSINESS ANALYSIS.** (1 cr; MBA students only; each section limited to 40 students; S-N only)

Provides computer access and use information necessary for MBA courses. Covers introduction to computer terminology and computing at Minnesota, plus programming in BASIC.

Sec 1, (089902) 0800-1000 T, HHH Ctr 25,  
Sec 2, (589331) 1030-1230 T, HHH Ctr 25,

**R 8015. HUMAN RESOURCES MANAGEMENT.** (4 cr; MBA students only; each section limited to 40 students)

A systematic approach to major phases of human resource management in organizations including knowledge bases and theories; problems; constraints; opportunities; program controls, evaluations and costs; and results of effective and efficient human resource management. Emphasis is that of the generalist, not that of specialist personnel and industrial relations professionals.

Sec 1, (889903) 1230-1430 TTh, HHH Ctr 15,  
Sec 2, (991674) 1230-1430 TTh, BlegH 135

**R 8025. DECISION SCIENCES AND INFORMATION SYSTEMS.** (689904) (4 cr; MBA students only; limited to 40 students; 0900-1200 Th; HHH Ctr 25.)

Systems analysis, probability and decision analysis applied to

managerial problems under uncertainty. Formulation and interpretation of mathematical models. The role of information systems in decision making. Principles of implementation of decision science models and information systems.

**R 8035. MANAGERIAL ECONOMICS AND ACCOUNTING.** (489905) (4 cr; MBA students only; limited to 40 students; 1430-1545 MWTTh; BlegH 330) Daly

The interplay of microeconomic theory of the firm, managerial accounting, and management of organizations. Topics include cost curves and cost estimation; demand curves, market structure, and demand estimation; short-run decision making of the firm and the related accounting information; and accounting choice problems under uncertainty.

**R 8040. FINANCIAL MANAGEMENT.** (4 cr; MBA students only; each section limited to 40 students) Reik  
Analytical introduction to the theory and practice of finance. Applies the basic financial concepts of risk, return, and valuation to the decisions that a person in a small business or a corporate financial officer must make about the sources and uses of funds during times of changing financial markets.

Sec 1, (289906) 1230-1415 MWF, HHH Ctr 25  
Sec 2, (189907) 1445-1630 MWF, HHH Ctr 25

**R 8045. MARKETING MANAGEMENT.** (4 cr; MBA students only; each section limited to 40 students)

Managing the marketing function; marketing planning, strategy, and management concepts. Identification of marketing problems and opportunities; construction, evaluation, and management of a marketing plan.

Sec 1, (989908) 0830-1000 MW, HHH Ctr 25  
Sec 2, (587899) 1045-1215 MW, HHH Ctr 25

**R 8050. OPERATIONS MANAGEMENT.** (4 cr; MBA students only; each section limited to 40 students)

The operations management function in different types of organizations; the relation of operations to other business decisions. Concepts of operations planning and control; process management; and the relationship to logistics.

Sec 1, (789909) 0900-1200 T, BlegH 340  
Sec 2, (189910) 0900-1200 Th, BlegH 340

**R 8070. PROBLEM FORMULATION AND DECISION MAKING.** (5 cr; MBA students only; each section limited to 30 students)

Formulation and analysis of managerial problems in unstructured situations.

Sec 1, (286469) 1730-2050 T, BlegH 335  
Sec 2, (990962) 1730-2050 W, BlegH 335

## You may start the MBA program in the summer

Students may start the full-time accelerated MBA program in the summer session. The accelerated program is designed for students with an undergraduate degree in business, and can be completed in four quarters (summer through the following spring). As part of the admissions process, prospective students need to take the Graduate Management Admission Test, which is typically offered in January, March, June and October each year. The regular MBA program, for

students with little or no undergraduate background in business, is six quarters in length, and starts in fall quarter each year.

For further details about the MBA program, contact the Graduate School of Management, 295 Hubert H. Humphrey Center, University of Minnesota, 271 19th Avenue South, Minneapolis, MN 55455 (612/373-5505). See Master of Business Administration courses listed in this bulletin.



## Materials Science (MatS)

151 Amundson Hall. 373-2300  
Institute of Technology

### FIRST TERM

**R 3400. MECHANICAL PROPERTIES OF MATERIALS.** (690647) (4 cr; prereq 2nd-year IT student; 0800-0955 MWF; AmundH 240) Silvertsen  
Structure and properties of metals, alloys, and polymers; heat treatment; alloy selection and metal processing.

**5481, 5482, 5483. SPECIAL PROBLEMS.** (490648) (290649) (690650) (Cr ar; prereq sr)

**8480, 8481, 8482. SELECTED TOPICS: MATERIALS SCIENCE, ENGINEERING.** (490651) (290652) (190653) (Cr ar)

### SECOND TERM

**5481, 5482, 5483. SPECIAL PROBLEMS.** (285404) (185405) (985406) (Cr ar; prereq sr)

**8480, 8481, 8482. SELECTED TOPICS: MATERIALS SCIENCE, ENGINEERING.** (785407) (585408) (385409) (Cr ar)

## Mathematics (Math)

127 Vincent Hall. 373-2587  
Institute of Technology

### FIRST TERM

**R 0009. INTERMEDIATE ALGEBRA.** (No cr; prereq 1 yr high school algebra or grade of C or better in 0006)  
Covers high school higher algebra.

Sec 1, (990671) 0800-0955 MTWThF, VinH 314  
Sec 2, (790672) 1010-1205 MTWThF, VinH 314

**R 1005. INTRODUCTION TO ELEMENTARY MATHEMATICS.** (590673) (4 cr; prereq [plane geometry, 2 yrs high school algebra] or [plane geometry, grade of C or better in 0009]; 1115-1205 MTTh, 1010-1205 WF; Phys 210) Harper  
Elementary computer programming (BASIC), progressions, financial mathematics, counting problems and other selected topics.

**R 1008. TRIGONOMETRY.** (4 cr, §1111, §1201; prereq plane geometry, 2 yrs high school algebra ... or plane geometry, grade of C or better in 0009)

Analytic trigonometry, identities, equations, and properties of trigonometry functions; right and oblique triangles.

Sec 1, (390674) 0905-0955 MWF, 0905-1100 TTh, Kolth S137  
Sec 2, (588759) 1115-1205 MTTh, 1010-1205 WF, Kolth S137

**R 1111. COLLEGE ALGEBRA AND ANALYTICAL GEOMETRY.** (5 cr, §1201; prereq [plane geometry, 2 yrs high school algebra] or [plane geometry, grade of C or better in 0009])  
Functions and graphs, quadratic equations, progressions, inequalities, complex numbers, theory of equations, permutations and combinations, probability, systems of equations, determinants, graphing of linear and quadratic equations, conics in standard position, logarithms.

Sec 1, (190675) 0800-0955 MTWThF, VinH 20  
Sec 2, (090676) 1010-1205 MTWThF, VinH 20

**R 1131. FINITE MATHEMATICS.** (5 cr; prereq 3 1/2 yrs high school math or grade of C or better in 1111)  
For students in pre-business administration and the social and behavioral sciences. Elementary computer programming, financial math, probability, linear algebra, linear programming, Markov chains.

Sec 1, (890677) 0800-0955 MTWThF, VinH 6  
Sec 2, (186478) 1010-1205 MTWThF, VinH 6

**R 1142. SHORT CALCULUS.** (5 cr, §1211, §1511H, §1611; prereq 3 1/2 yrs of high school math or grade of C or better in 1111 or 1201)

For students requiring a minimal amount of calculus. Derivatives, integrals, differential equations, maxima and minima, partial differentiation, applications.

Sec 1, (690678) 0800-0955 MTWThF, VinH 209  
Sec 2, (490679) 1010-1205 MTWThF, VinH 209

**R 1201. PRE-CALCULUS.** (5 cr, §1008, §1111; prereq 4 yrs high school math including trigonometry)

For students who need a quick review of high school higher algebra and trigonometry before taking a calculus sequence. Inequalities, analytical geometry, complex numbers, binomial

theorem, mathematical induction, functions and graphs, and trigonometric, exponential, and logarithmic functions.

Sec 1, (890680) 0800-0955 MTWThF, VinH 113  
Sec 2, (690681) 1010-1205 MTWThF, VinH 113

**R 1211. CALCULUS I.** (5 cr, §1142, §1511, §1611; prereq 4 yrs high school math including trigonometry ... or grade of C or better in 1201 ... or grade of C or better in 1008 and 1111 ... or equiv)

Analytic geometry and calculus of one variable, applications. Infinite series and sequences.

Sec 1, (490682) 0800-0955 MTWThF, VinH 1  
Sec 2, (290683) 1010-1205 MTWThF, AkerH 209

**R 1221. CALCULUS II.** (5 cr, §1321, §1521H, §1621; prereq grade of C or better in 1211 or equiv)

See 1211.

Sec 1, (190684) 0800-0955 MTWThF, VinH 16  
Sec 2, (990685) 1010-1205 MTWThF, VinH 16

**R 1231. CALCULUS III.** (5 cr, §1331, §1531H, §1621; prereq grade of C or better in 1221 or equiv)

See 1211.

Sec 1, (790686) 0800-0955 MTWThF, CivMinE 210  
Sec 2, (590687) 1010-1205 MTWThF, Arch 10

**R 3142. INTRODUCTION TO LINEAR ALGEBRA.** (390688) (4 cr, §3213, §3221, §3511; prereq grade of C or better in 1231 or equiv; 0905-0955 MWF, 0905-1100 TTh; VinH 2)

Vectors, systems of linear equations, matrices, determinants, eigenvalues, applications. Techniques and some proofs of theorems.

**R 3211. MULTIVARIABLE CALCULUS.** (5 cr, §3521; prereq grade of C or better in 1231 or equiv)  
Partial differentiation, chain rule, implicit functions, applications. Multiple integrals in two and three dimensions.

Sec 1, (190689) 0800-0955 MTWThF, CivMinE 212  
Sec 2, (590690) 1010-1205 MTWThF, CivMinE 210

**R 3221. INTRODUCTION TO LINEAR ALGEBRA AND LINEAR DIFFERENTIAL EQUATIONS.** (5 cr, §3066, §3142, §3511; prereq grade of C or better in 1231 or equiv)  
Vectors, systems of linear equations, matrices, determinants, bases, eigenvalues. Linear differential equations and systems with constant coefficients, initial value problem and general solution, variation of parameters for inhomogeneous equations.

Sec 1, (390691) 0800-0955 MTWThF, Arch 60  
Sec 2, (988760) 1010-1205 MTWThF, Arch 60

**R 3231. VECTOR ANALYSIS.** (190692) (5 cr, §3212, §3531; prereq grade of C or better in 3211 or equiv; 1010-1205 MTWThF; VinH 301)

Scalar and vector products, derivatives, geometry of space curves, del operator, line and surface integrals, divergence and Stokes' theorem, transformation of coordinates, dyadics, applications. Applications to fluid flow and electromagnetic fields.

**5082. FUNDAMENTALS OF ALGEBRA.** (691183) (4 cr; prereq 3511 or 3142 or 3221 or equiv.; 0905-0955 MWF, 0905-1100 TTh; Kolth S138)  
Number theory including fundamental theorem of arithmetic and congruences; at least one general algebraic structure-group, ring, or field; equivalence relations; possibly other topics. Includes proofs by mathematical induction and by contradiction.

**R 5209. THEORY OF NUMBERS.** (090693) (4 cr; prereq 3211 or equiv or #; 1115-1205 MTTh, 1010-1205 WF; VinH 207)  
A rigorous introduction to the elementary theory of numbers up to the classical results concerning congruences to a prime modulus (e.g. Fermat's theorem). Usually covers one or more advanced topics such as continued fractions, Gaussian integers, or quadratic reciprocity.

**R 5242. LINEAR ALGEBRA WITH APPLICATIONS.** (890694) (4 cr, §5232-5233, §5262 or §5282 if content was linear algebra, §5264, §5284; prereq 3221 or 3142 or equiv or #; 0905-0955 MWF, 0905-1100 TTh; AkerH 225)  
Systems of linear equations, finite dimensional linear spaces, bases, linear transformations, matrices, determinants, eigenvalues, reduction to canonical forms, quadratic and bilinear forms, applications.

**R 5457. METHODS OF APPLIED MATHEMATICS.** (690695) (4 cr; prereq [3211, 3066]... or [3211, 3221] or equiv or #; 0905-0955 MWF, 0905-1100 TTh; VinH 211)

Analytic tools used in applications of mathematics; emphasis on technique. Real and complex variables, matrices, ordinary and partial differential equations, calculus of variations, asymptotic expansions.

**R 5512. DIFFERENTIAL EQUATIONS WITH APPLICATIONS I.** (489371) (4 cr; prereq [3211 and 3066] or [3211 and 3221] or equiv or #; 0905-0955 MWF, 0905-1100 TTh; VinH 207)  
Applications, review of special techniques, and numerical approximation for first-order equations. Euler and Runge-Kutta methods with error analysis. Applications and power series solutions for second-order equations.

**R 5567. FOURIER SERIES AND BOUNDARY VALUE PROBLEMS.** (788761) (4 cr, §5571; prereq [3211, 3066] or [3211, 3221] or equiv or #; 1115-1205 MTTh, 1010-1205 WF; Kolth 138)

Partial differential equations of theoretical physics. Fourier Series, proof of convergence, orthogonal systems, Sturm-Liouville systems, solution of boundary value problems by separation of variables, applications.

**5568. ELEMENTARY THEORY OF COMPLEX VARIABLES.** (486020) (4 cr, §5572, §5578, prereq 3231 or 5602, or equiv; 0905-0955 MWF, 0905-1100 TTh; Phys 236A)  
Derivative and integral of a function of a complex variable. Cauchy's integral theorem and formula, residues. Application to evaluation of integrals, conformal mapping.

**R 5601. ADVANCED CALCULUS.** (490696) (4 cr; prereq 3211 or equiv or #; 1115-1205 MTTh, 1010-1205 WF; VinH 211)  
Differentiation of functions of several variables; vector algebra; curves in three dimensions; directional derivative and gradient; inverse transformation and implicit function theorems; change of variables in multiple integrals.

### SECOND TERM

**R 0009. INTERMEDIATE ALGEBRA.** (785410) (No cr; prereq 1 yr high school algebra or grade of C or better in 0006; 1010-1205 MTWThF; Kolth S138)  
See First Term.

**R 1006. FOUNDATIONS OF ARITHMETIC.** (585411) (4 cr; for pre-elementary education students only [no cr for other CLA students]; prereq 1005; 1115-1205 MTTh, 1010-1205 WF; MechE 202)  
Usage of computer will continue. Topic selected from areas such as probability theory, geometry, and number theory.

**R 1008. TRIGONOMETRY.** (4 cr, §1111, §1201; prereq [plane geometry, 2 yrs high school algebra] or [plane geometry, grade of C or better in 0009])  
See First Term.

Sec 1, (385412) 0905-0955 MWF, 0905-1100 TTh, VinH 209  
Sec 2, (185413) 1115-1205 MTTh, 1115-1310 WF, VinH 209

**R 1111. COLLEGE ALGEBRA AND ANALYTIC GEOMETRY.** (5 cr, §1201; prereq [plane geometry, 2 yrs high school algebra] or [plane geometry, grade of C or better in 0009])  
See First Term.

Sec 1, (085414) 0800-0955 MTWThF, VinH 1  
Sec 2, (885415) 1010-1205 MTWThF, VinH 113

**R 1131. FINITE MATHEMATICS.** (491184) (5 cr; prereq 3 1/2 years of high school math or grade of C or better in 1111; 1010-1205 MTWThF; VinH 6)  
For students in pre-business administration and the social and behavioral sciences. Elementary computer programming, financial math, probability, linear algebra, linear programming, Markov chains.

**R 1142. SHORT CALCULUS.** (5 cr, §1211, §1511H, §1611; prereq 3 1/2 yrs high school math or grade of C or better in 1111 or 1201)  
See First Term.

Sec 1, (685416) 0800-0955 MTWThF, Kolth S137  
Sec 2, (485417) 1010-1205 MTWThF, Kolth S137

**R 1201. PRE-CALCULUS.** (5 cr, §1008, §1111; prereq 4 yrs high school math including trigonometry)  
See First Term.

Sec 1, (285418) 0800-0955 MTWThF, VinH 301  
Sec 2, (185419) 1010-1205 MTWThF, VinH 301

**R 1211. CALCULUS I.** (5 cr, §1142, §1511H, §1611; prereq 4 yrs high school math including trigonometry ... or grade of C or better in 1201 ... or grade of C or better in 1008 and 1111 ... or equiv)  
See First Term.

Sec 1, (485420) 0800-0955 MTWThF, VinH 20  
Sec 2, (285421) 1010-1205 MTWThF, VinH 20

**R 1221. CALCULUS II.** (5 cr, §1321, §1521H, §1621; prereq grade of C or better in 1211 or equiv)  
See 1211 First Term.

Sec 1, (185422) 0800-0955 MTWThF, CivMinE 210  
Sec 2, (985423) 1010-1205 MTWThF, Arch 5

**R 1231. CALCULUS III.** (5 cr, §1331, §1531H, §1621; prereq grade of C or better in 1221 or equiv)  
See 1211 First Term.

Sec 1, (785424) 0800-0955 MTWThF, VinH 16  
Sec 2, (585425) 1010-1205 MTWThF, VinH 16

**R 3211. MULTIVARIABLE CALCULUS.** (5 cr, §3521; prereq grade of C or better in 1231 or equiv)  
See First Term.

Sec 1, (385426) 0800-0955 MTWThF, CivMinE 212  
Sec 2, (185427) 1010-1205 MTWThF, CivMinE 210

**R 3221. INTRODUCTION TO LINEAR ALGEBRA AND LINEAR DIFFERENTIAL EQUATIONS.** (5 cr, §3066, §3142, §3511; prereq grade of C or better in 1231 or equiv)  
See First Term.

Sec 1, (085428) 0800-0955 MTWThF, Arch 40  
Sec 2, (885429) 1010-1205 MTWThF, VinH 364

**R 3231. VECTOR ANALYSIS.** (185430) (5 cr, §3212, §3531; prereq grade of C or better in 3211 or equiv; 1010-1205 MTWThF; VinH 1)  
See First Term.

**R 5243. LINEAR ALGEBRA WITH APPLICATIONS.** (085431) (4 cr, §5232-5233, §5283-5284; prereq 5242; 0905-0955 MWF, 0905-1100 TTh; VinH 207)  
See 5242 First Term.

**R 5458. METHODS OF APPLIED MATHEMATICS.** (885432) (4 cr; prereq 5457, or equiv; 0905-0955 MWF, 0905-1100 TTh; VinH 211)  
See 5457 First Term.

**R 5602. ADVANCED CALCULUS.** (685433) (4 cr; prereq 5601; 1115-1205 MTTh, 1010-1205 WF; VinH 207)  
Line and surface integrals; Stokes' theorem; convergence of infinite series; orthogonal functions; uniform convergence; integration and differentiation of series.

**R 5679. PROBABILITY.** (289372) (4 cr, §5681; prereq 3211 or equiv or #; 1115-1205 MTTh, 1010-1205 WF; VinH 211)  
Elementary principles of probability, total and compound probability, expectation, repeated trials, and topics from the following: Stirling's formula, the probability integral, geometrical probability, probability of causes, Bayes' theorem, errors of observation, principle of least squares.

**8990. READING AND RESEARCH.** (788226) (Cr ar)

instructional alternatives; issues in teaching and learning; providing for special student needs; program planning and evaluation.

**R 5386. COMPUTER-ASSISTED MATHEMATICS INSTRUCTION.** (787920) (3 cr; limited to 30 students; prereq 5312 or SeEd 3365, SeEd 3366 or ClSy 5006, one year of calculus or #; 1010-1100 MTWThF; PeiKH 355; A-N only)  
House

The computer as an instructional resource in the mathematics classroom; programming and problem solving using computer as a means of teaching and learning concepts, principles, and skills of mathematics; design of lessons; evaluation of software.

**5680. PRACTICUM IN MATHEMATICS EDUCATION.** (3-9 cr [max 9 cr]; prereq #; A-N only)  
Supervised experience in teaching or related work in school.

Sec 21, (189980) Stochl  
Sec 22, (089981) Post  
Sec 23, (889982) House

**5980. DIRECTED STUDIES IN MATHEMATICS EDUCATION.** (3-9 cr [max 9 cr]; prereq #; A-N only)  
Survey of recent literature; design and preparation of reports on special problems.

Sec 21, (189364) Stochl  
Sec 22, (089365) Post  
Sec 23, (889366) House

**8680. INTERNSHIP: MATHEMATICS EDUCATION.** (Cr ar)  
Participation in supervision, instruction, curriculum development, or research to gain in-service experience in a leadership role; includes a seminar, related project; required for the specialist certificate in mathematics education.

Sec 21, (789361) Stochl  
Sec 22, (589362) Post  
Sec 23, (389363) House

**8980. PROBLEMS: MATHEMATICS EDUCATION.** (Cr ar; prereq 8500 or 8570)

Sec 21, (689983) Stochl  
Sec 22, (489984) Post  
Sec 23, (289985) House

## SECOND TERM

**R 5101. WORKSHOP: ELEMENTARY SCHOOL MATHEMATICS—July 21-August 8.** (691278) (1-12 cr [max 12 cr]; prereq #; not open to mathematics education majors; limited to 35 students; 0800-0955 MTWThF; PeiKH 375; A-N only) Jackson  
Modern trends, methods, and materials used to convey mathematical ideas. *This offering for 3 credits.*

**R 5102. WORKSHOP: MATHEMATICS EDUCATION (Microcomputer Applications in Teaching Algebra)—July 21-August 8.** (491279) (1-12 cr [max 12 cr]; limited to 25 students; 0905-1100 TTh; PeiKH 355; A-N only) Bledsoe  
See First Term. This 1-credit offering will examine instructional approaches to use of microcomputer to teach algebraic concepts at the secondary level: fundamental concepts including variable, equations in one and two variables, slope and function; generalizations including algebraic identities, general equations for the conic sections, and the quadratic formula; skills including solving equations and graphing; use of microcomputer for demonstration, data generation, problem solving, and drill and practice; review of appropriate software.

**R 5355. MATHEMATICS FOR SLOW LEARNING CHILDREN—July 21-August 8.** (186030) (3 cr; prereq 5311 or Elem 3391 or #; limited to 35 students; 1010-1205 MTWThF; PeiKH 375; A-N only) Jackson  
Units of instruction emphasizing mathematical concepts essential for vocational competence; experimental materials and methods designed to improve performance of low achievers.

**5680. PRACTICUM IN MATHEMATICS EDUCATION.** (188750) (3-9 cr [max 9 cr]; prereq #; A-N only) Jackson  
See First Term.

**5980. DIRECTED STUDIES IN MATHEMATICS EDUCATION.** (088751) (3-9 cr [max 9 cr]; prereq #; A-N only) Jackson  
See First Term.

**8680. INTERNSHIP: MATHEMATICS EDUCATION.** (888752) (Cr ar) Jackson  
See First Term.

**8980. PROBLEMS: MATHEMATICS EDUCATION.** (688753) (Cr ar; prereq 8500 or 8570) Jackson

## Mathematics Education (MthE)

125 Peik Hall, 373-3300  
College of Education

### FIRST TERM

**5082. TEACHING ALGEBRA.** (691300) (2 cr; prereq mathematics education major or minor, Math 5082 or 15082 or #; A-N only; 1010-1100 MWF; PeiKH 375) Bledsoe  
Survey of concepts, principles, and processes of the secondary school curriculum; learning difficulties, teaching strategies, and alternatives; mathematical foundations of algebra topics.

**R 5102. WORKSHOP: MATHEMATICS EDUCATION.** (1-12 cr [max 12 cr]; each section limited to 25 students; A-N only) Issues, materials, and instructional techniques, focusing on a single current topic of particular relevance to secondary school and college mathematics teachers.  
All sections meet at Wilder School, 3328 Elliot Avenue South, Minneapolis. Advance application required for all sections by May 15, 1986. Send written request to instructor named, 125 Peik Hall, University of Minnesota, 159 Pillsbury Drive S.E., Minneapolis, MN 55455 specifying section number and dates in application.

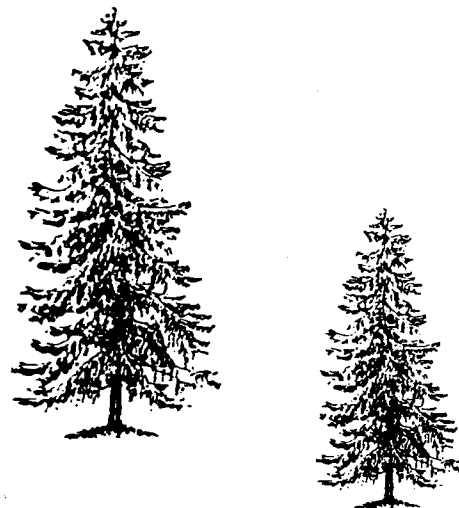
Sec 1, **Leadership Institute for Teachers of Elementary School Mathematics, June 16-20.** (489970) 2 cr, 0800-1625 MTWThF, Post

Sec 2, **Leadership Institute for Teachers of Elementary School Mathematics, June 23-27.** (488186) 2 cr, 0800-1625 MTWThF, Post

Sec 3, **Leadership Institute for Teachers of Elementary School Mathematics, June 30-July 7.** (288187) 2 cr, 0800-1625 MTWThF, Post

Sec 4, **Descriptive Geometry and Measurement, July 7-18.** (291302) 3 cr, 1300-1600 MTWThF, Bledsoe

**5332. CURRENT TRENDS AND ISSUES IN SECONDARY SCHOOL MATHEMATICS INSTRUCTION.** (491301) (3 cr; prereq 5312 or #; A-N only; 1115-1205 MTWThF; PeiKH 375) House  
Recent developments in mathematics curriculum and



## Mechanical Engineering (ME)

125 Mechanical Engineering, 373-3302  
Institute of Technology

### FIRST TERM

#### R 3201. MECHANICAL ENGINEERING SYSTEMS

**ANALYSIS.** (490665) (4 cr, §AEM 3401; limited to 45 students; prereq AEM 3036; 1220-1415 TWThF; MechE 221) Frohrib Modeling and analytic description of mechanical systems. Properties of linear models with emphasis on automatic computation solution. Necessary background includes differential equations.

**R 3205. ENGINEERING SYSTEMS DESIGN.** (190667) (4 cr; limited to 45 students; prereq AEM 3016; 1220-1415 TWThF; MechE 212)

Application of fundamental concepts to the design of typical mechanical components. Engineering approach to the analysis and synthesis of machines and systems. Specification of materials in engineering design. Optimum design criteria.

**R 3301. THERMODYNAMICS.** (990668) (4 cr; limited to 50 students; prereq Chem 1014 or Phys 1281, Math 3221 or equiv; 1010-1205 TWThF; MechE 221) Scott Properties, equations of state, processes, and cycles for various thermodynamic systems. Development of first and second laws of thermodynamics, correlating heat, work, and mass transfer. Equilibrium irreversibility and mixtures.

**R 3702. BASIC MEASUREMENTS LABORATORY II.** (2 crs; each section limited to 16 students; prereq 3701; lect 0905-1000 MW; MechE 221)

Treatment of experimental data, analysis and study of experimental systems via the computer. Static and dynamic characteristics of measurement systems. Fundamental principles of measurement and calibration. Measurement of temperature, pressure, vacuum, humidity, density, viscosity, heating values, speed, power, force, stress-strain, and radioactivity.

Lab 1, (288755) 1010-1205 MW, MechE 370  
Lab 2, (188756) 1430-1625 TTh, MechE 370

**R 5460. INTERNAL COMBUSTION ENGINES.** (190670) (4 cr; limited to 30 students; prereq 3301 or equiv; 1010-1205 TWThF; MechE 321) Murphy

Principles of power production, fuel consumption, and emissions of gasoline and diesel engines; fuel-air cycle analysis, combustion flames, knock phenomena, air flow and volumetric efficiency, mixture requirements, ignition requirements, and performance.

**8770. MECHANICAL ENGINEERING RESEARCH.** (489709) (Cr and hrs ar)

**8771. MECHANICAL ENGINEERING RESEARCH.** (588020) (Cr and hrs ar)

**8772. MECHANICAL ENGINEERING RESEARCH.** (889710) (Cr and hrs ar)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**R 3741. INDUSTRIAL ASSIGNMENT.** (290666) (2 cr per qtr; prereq regis in intern program for 3741) Marple Industrial work assignment in engineering intern program. Evaluation based on formal written report accomplished by student covering the quarter's work assignment.

**R 3742. INDUSTRIAL ASSIGNMENT.** (988757) (2 cr; prereq 3741) Marple  
See 3741.

**R 3743. INDUSTRIAL ASSIGNMENT.** (489676) (2 cr; prereq 3742) Marple  
See 3741.

**5190. ADVANCED ENGINEERING PROBLEMS.** (790669) (2-4 cr; open to upper division students; prereq submission of approved deptl permission form)

Special investigations in various fields of mechanical engineering and related areas including an independent study project.

#### R 5741. INDUSTRIAL ASSIGNMENT AND DESIGN

**PROJECT.** (589328) (4 cr; prereq 3742) Marple Solution of system design problems that require the development of criteria, the evaluation of alternatives and generation of a preliminary design. Final report emphasizes design communication and describes the design decision process, analysis and final recommendations.

#### R 5742. INDUSTRIAL ASSIGNMENT AND DESIGN

**PROJECT.** (788758) (4 cr; prereq 5741) Marple  
See 5741.

### SECOND TERM

**R 3303. APPLIED THERMODYNAMICS.** (785648) (4 cr, §3305; limited to 30 students; prereq 3301 or equiv; 1010-1205 TWThF; MechE 321) Murphy

Application of laws of thermodynamics to chemically reacting systems and engineering systems. Vapor cycles, gas engine cycles, propulsion systems, refrigeration, and air-water vapor mixtures.

**R 5260. ENGINEERING MATERIALS AND PROCESSING.** (4 cr; each section limited to 12 students; prereq Phys 1291, Chem 1004, and 1st-yr calculus; lect 0800-0935 MWF; MechE 221) Introduction to materials and processing including physical and metallurgical properties, consolidation, etc. Material processing including machining, welding, and deformation processes.

Lab 1, (585652) 0800-0955 TTh, MechE 70  
Lab 2, (385653) 1010-1205 TTh, MechE 70  
Lab 3, (389783) 1430-1625 TTh, MechE 70

**R 5342. HEAT TRANSFER.** (885656) (4 cr; limited to 50 students; prereq 3301 and CE 3400 or AEM 3200; 1220-1415 TWThF; MechE 202) Scott

Steady and unsteady conduction of heat. Convection heat transfer in boundary layer and duct flows; forced and free convection; condensation and boiling; heat exchangers. Heat transfer by thermal radiation; radiative properties of black bodies and real surfaces.

**8770. MECHANICAL ENGINEERING RESEARCH.** (489757) (Cr and hrs ar)

**8771. MECHANICAL ENGINEERING RESEARCH.** (289758) (Cr and hrs ar)

**8772. MECHANICAL ENGINEERING RESEARCH.** (189759) (Cr and hrs ar)

## Medical Technology (MedT)

15-170 Phillips-Wangensteen Building, 373-9670  
Medical School

### FIRST TERM

**5082. APPLIED CLINICAL CHEMISTRY.** (285242) (4 cr;

prereq 5063, 5111, #) Application of basic methods and techniques in chemistry in the clinical laboratory.

**5085. APPLIED CLINICAL HEMATOLOGY.** (185243) (4 cr; prereq 5067, 5076, #)

Application of basic methods and techniques in hematology in the clinical laboratory, morphology of blood cells, application of techniques in hemostasis.

**5086. APPLIED CLINICAL IMMUNOHEMATOLOGY.**

(985244) (4 cr; prereq 5066, #) Application of basic methods and techniques in serology and immunology in the clinical laboratory. Blood grouping and cross-matching for transfusions.

**5088. APPLIED DIAGNOSTIC MICROBIOLOGY.** (785245)

(4 cr; prereq 5102, #) Identification of bacteria by microscopic techniques. Correlation with clinical cases. Identification of parasites and fungi.

**5090. SPECIAL LABORATORY METHODS.** (585246) (2 cr; prereq #)

Special assignment on an individual basis in a special area of experience within the clinical laboratory; field experience.

### SECOND TERM

**5082. APPLIED CLINICAL CHEMISTRY.** (487054) (4 cr;

prereq 5063, 5111, #)  
See First Term.

**5085. APPLIED CLINICAL HEMATOLOGY.** (287055) (4 cr; prereq 5067, 5076, #)

See First Term.

**5086. APPLIED CLINICAL IMMUNOHEMATOLOGY.**

(187056) (4 cr; prereq 5066, #)  
See First Term.

**5088. APPLIED DIAGNOSTIC MICROBIOLOGY.** (987057) (4 cr; prereq 5102, #)

See First Term.

**5090. SPECIAL LABORATORY METHODS.** (587059) (2 cr; prereq #)

See First Term.

## Medicinal Chemistry and Pharmacognosy (MChP)

Student Affairs Office,  
5-110 Health Sciences Unit F, 373-7997  
College of Pharmacy

### FIRST TERM

**5970. DIRECTED STUDIES.** (486616) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (986619) (Cr ar; prereq #)

### SECOND TERM

**5970. DIRECTED STUDIES.** (786623) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (186626) (Cr ar; prereq #)

## Medicine (Med)

14-106 Phillips-Wangensteen Building, 373-8202  
Medical School

### SPECIAL TERMS: THREE- OR SIX-WEEK COURSES

#### Elective Courses for Undergraduate Students

**5500. MEDICINE EXTERNSHIP I.** (385247) (9 cr and hrs ar) Peterson

**5501. MEDICINE EXTERNSHIP II.** (085249) (9 cr and hrs ar) Peterson

**5505. INFECTIOUS DISEASE RESEARCH.** (185251) (9 cr and hrs ar) Jordan

**5508. RESEARCH/SPECIAL PROBLEMS IN MEDICINE.** (486681) (cr and hrs ar)

**5509. RESEARCH IN RHEUMATOLOGY.** (085252) (9 cr and hrs ar) Messner

**5511. RESEARCH IN GASTROENTEROLOGY.** (685254) (9 cr and hrs ar) Levitt

**5512. RESEARCH IN HEMATOLOGY.** (485255) (9 cr and hrs ar) Jacob

**5518. RESEARCH IN ENDOCRINOLOGY.** (285256) (9 cr and hrs ar) Oppenheimer

**5521. INFECTIOUS DISEASES, CLINICAL ASPECTS.** (185257) (9 cr and hrs ar) Jordan

**5522. GASTROENTEROLOGY.** (985258) (9 cr and hrs ar) Olson

**5523. MEDICAL ENDOCRINOLOGY AND METABOLISM—June 20-September 5.** (785259) (9 cr; 1515-1700 Th; MoosT 2650) Barbosa

**5525. CARDIOVASCULAR MEDICINE.** (185260) (9 cr and hrs ar) Bache

**5527. CONTEMPORARY PROBLEMS IN INVESTIGATIVE CARDIOLOGY.** (985261) (9 cr and hrs ar) Bache

**5528. CLINICAL HEMATOLOGY.** (785262) (9 cr and hrs ar) Howe

**5531. CLINICAL RHEUMATOLOGY.** (585263) (Cr and hrs ar) Hathaway

**5532. PULMONARY DISEASE.** (385264) (9 cr and hrs ar) Hertz, Bitterman

**5533. CLINICAL ALLERGY.** (085266) (Cr and hrs ar) Blumenthal

**5548. CLINICAL GENETICS.** (885267) (9 cr and hrs ar) King

**5554. FLUID, ELECTROLYTE, ACID-BASE METABOLISM.** (685268) (9 cr and hrs ar) Ma

**5556. MEDICAL NEPHROLOGY.** (885270) (9 cr and hrs ar) Hostetter

**5557. RESEARCH IN NEPHROLOGY.** (685271) (18 cr and hrs ar) Hostetter

**5562. NEPHROLOGY.** (485272) (9 cr and hrs ar) Rao

**5570. CLINICAL MEDICINE IN THE GENERAL CLINICAL RESEARCH CENTER.** (285273) (9 cr and hrs ar) Bantle

**5572. AMBULATORY INTERNAL MEDICINE.** (185274) (9 cr and hrs ar) Spilane

**5575. AMBULATORY CARE MEDICINE AT HENNEPIN COUNTY MEDICAL CENTER.** (688638) (9 cr per period; hrs ar) Bloss

**5576. EXTERNSHIP IN GERIATRICS AT V.A. MEDICAL CENTER.** (588762) (9 cr) Miles  
Students function as interns on a geriatric and intermediate care ward and assume responsibility for two new patients each week. Students are directly responsible to attending staff physicians; attend general medical conferences and patient care conferences, and assigned readings relevant to care of patients.

**5591. INTERNAL MEDICINE FOR THE AMBULATORY OUTPATIENT.** (388763) (9 cr) Howe  
Provides the advanced medical student with a broad exposure to adult medicine as practiced in the outpatient setting of a busy, multispecialty clinic. Development of the student's diagnostic and therapeutic skills. Participation in general internal medicine clinics for approximately five half-days, and various medical subspecialty clinics selected by the student the other five half-days.

**5594. PSYCHIATRY IN MEDICINE: CONSULTATION-LIAISON.** (985275) (9 cr and hrs ar) Popkin

**5596. OCCUPATIONAL HEALTH.** (886841) (4.5 cr, hrs ar)

**5597. RESEARCH IN OCCUPATIONAL HEALTH.** (785276) (9 cr and hrs ar) Johnson

### *Elective Courses for Graduate Students*

**8201. CLINICAL MEDICINE.** (685285) (Cr and hrs ar) Ferris, staff

**8202. CLINICAL CONFERENCE.** (485286) (1 cr and hrs ar) Ferris, staff

**8203. CLINICAL RADIOLOGY CONFERENCE.** (285287) (1 cr and hrs ar) Ferris, staff

**8204. PATHOLOGICAL CONFERENCE.** (185288) (1 cr and hrs ar) Ferris, staff

**8205. ELECTROCARDIOGRAPHIC CONFERENCE.** (985289) (1 cr and hrs ar) Tuna

**8206. NEPHROLOGY SEMINAR.** (285290) (3 cr and hrs ar) Hostetter

**8209. TUMOR CLINICAL CONFERENCE.** (185291) (1 cr and hrs ar) Kennedy, staff

**8210. INFECTIOUS DISEASE SEMINAR.** (985292) (Cr and hrs ar) Jordan

**8211. DISEASES OF THE CARDIOVASCULAR SYSTEM.** (785293) (Cr and hrs ar) Cohn, staff

**8212. DISEASES OF THE CHEST.** (585294) (Cr and hrs ar) Bitterman

**8213. DISEASES OF THE KIDNEY.** (185296) (Cr and hrs ar) Ferris, staff

**8214. DISEASES OF DIABETES, ENDOCRINOLOGY, AND METABOLISM.** (085297) (Cr and hrs ar) Oppenheimer, staff

**8215. DISEASES OF HEMATOLOGY.** (685299) (Cr and hrs ar) Jacob, staff

**8216. DISEASES OF GASTROENTEROLOGY.** (385300) (Cr and hrs ar) Wilson, staff

**8217. DISEASES OF ONCOLOGY.** (185301) (Cr and hrs ar) Kennedy, staff

**8220. RESEARCH IN MEDICINE.** (085302) (Cr and hrs ar) Ferris, staff

**8221. TOPICS IN MEDICINE.** (885303) (Cr and hrs ar) Ferris, staff

**8223. TOPICS IN RELATED BASIC SCIENCE.** (685304) (Cr and hrs ar) Ferris, staff

### **SECOND TERM**

**5500. MEDICINE EXTERNSHIP I: Externship in Medicine.** (488169) (cr ar, hrs ar) Ferris

**5501. RESEARCH/SPECIAL.** (888170) (1-9 cr) Ferris

**5508. PROBLEMS IN MEDICINE.** (186883) (cr and hrs ar)

## **Metallurgical Engineering (MetE)**

*MRRC  
Institute of Technology*

### **FIRST TERM**

**5940. SPECIAL PROBLEMS IN EXTRACTIVE METALLURGICAL ENGINEERING.** (191101) (1-6 cr; prereq sr)

**8923. RESEARCH IN EXTRACTIVE METALLURGICAL ENGINEERING.** (091102) (1-6 cr; prereq #, A-N only)

### **SECOND TERM**

**5940. SPECIAL PROBLEMS IN EXTRACTIVE METALLURGICAL ENGINEERING.** (089284) (1-6 cr; prereq sr)

**8923. RESEARCH IN EXTRACTIVE METALLURGICAL ENGINEERING.** (689272) (cr ar; prereq #, A-N only)

## **Microbiology (MicB)**

*1460 Mayo. 373-8070  
Medical School*

### **FIRST TERM**

**5970. DIRECTED STUDIES.** (188764) (Cr ar; prereq #) Rogers, staff

**5990. UNDERGRADUATE RESEARCH.** (088765) (Cr ar; prereq #) Rogers, staff

**8990. RESEARCH IN MICROBIOLOGY.** (485305) (Cr and hrs ar; prereq #) Plagemann, staff  
Graduate students with the requisite preliminary training may elect research project outside their thesis work.

### **SECOND TERM**

**5970. DIRECTED STUDIES.** (888766) (Cr ar; prereq #) Rogers, staff

**5990. UNDERGRADUATE RESEARCH.** (688767) (Cr ar; prereq #) Rogers, staff

**8990. RESEARCH IN MICROBIOLOGY.** (787061) (Cr and hrs ar; prereq #) Plagemann, staff  
See First Term.

## **Middle Eastern Studies (MidE)**

*192 Klaeber Court. 373-9834  
College of Liberal Arts*

### **FIRST TERM**

**3505. SURVEY: THE MIDDLE EAST.** (791675) (4 cr, \$5505, \$Hist 3505; 1115-1205 MTWThF; HHHctr 15) Farah, Caesar  
Cultural, religious, and scholarly achievements of Middle Eastern peoples from pre-Islamic times to the present. Meets with Hist 3505.

## **Military Science (Mil)**

*108 Armory. 373-2212*

### **FIRST TERM**

**3970. DIRECTED STUDIES.** (389749) (Cr and hrs ar)

### **SECOND TERM**

**3970. DIRECTED STUDIES.** (187713) (Cr and hrs ar)

## **Mortuary Science (Mort)**

*400 Botany. 373-3870  
Health Sciences*

### **FIRST TERM**

**3080. PRACTICUM IN FUNERAL SERVICE.** (987141) (8 cr; prereq have completed all requirements for graduation, with exception of 3080, Δ; S-N grading) Mathews, Stroud  
Practical experience in a funeral home as assigned by the department; reports and assigned readings in funeral service literature.

**r5040. DYING AND DEATH IN CONTEMPORARY SOCIETY—June 17-July 7.** (491105) (3 cr, \$PubH 5040, HSU 5040, \$Hth 5402; limited to 60 students; prereq mortuary science major, education sr, certified teacher, health science major, school of public health nurse or #; 1330-1600 MTWThF; JoAd 2-125) Rothenberger, Slater, Burger  
Basic background information on concepts and attitudes toward death, grief, and bereavement with emphasis on instructional aspects for the elementary and secondary schools and the role of the school in suicide prevention.

### **SECOND TERM**

**3080. PRACTICUM IN FUNERAL SERVICE.** (291106) (7 cr; prereq have completed all requirements for graduation; with exception of 3080, Δ; S-N only) Mathews, Stroud  
See First Term.

## **Music (Mus)**

*100 Ferguson Hall. 373-3645  
College of Liberal Arts*

### **FIRST TERM**

**1001. FUNDAMENTALS OF MUSIC.** (4 cr; prereq non-music majors) Baldwin  
Basic musical elements, functional relationships and structures. Systems of musical notation and analysis. Musical practices of various times and styles.

Sec 1, (190104) 0800-0850 MTWThF, FergH 225  
Sec 2, (990105) 0905-0955 MTWThF, FergH 225

**r1160. VOICE: CLASS LESSONS.** (790106) (2 cr term [max 6 cr]; 1010-1100 MTWThF, FergH 81) Ware  
Fundamentals of vocal production: posture, respiration, phonation, articulation.

**1330. JAZZ IMPROVISATION.** (791109) (2 cr; prereq audition, #; 1010-1100 MWF; FergH 95) Buckner  
A progressive, systematic approach to the theory and practice of jazz improvisation, utilizing small groups including a rhythm section and one or more wind instruments. Meets with 5330.

**r1351. JAZZ CLASS PIANO.** (991108) (2 cr; limited to 16 students; prereq 1153 or #: 0905-0955 MWF; FergH 259) Buckner  
Keyboard skill development in chord-style symbology, reading chord progressions, translating chord symbols into formula voicings, expanded harmonies, aural development, jazz style "comping".

**1440. ENSEMBLE: CONCERTO GROSSO.** (991111) (1 cr; prereq #: 0905-1100 TTh; FergH 180) Kim  
Meets with 3440 and 5440.

**1507. THEORY REVIEW I.** (590107) (3 cr; prereq #: 0905-0955 MTWThF, FergH 105) Damschroder  
Principles of melodic and harmonic structure.

**1517. EAR-TRAINING AND SIGHT-SINGING.** (390108) (1 cr; prereq #: 1010-1100 MTWThF, FergH 105) Damschroder  
Development of aural skills with concentration on sight-singing, interval recognition, melodic and harmonic dictation, and vocal improvisation.

**1804. WORLD MUSIC.** (191107) (4 cr; 1220-1310 MTWThF; FergH 105) Kagan  
Music in universal perspective. Traits, distinguishing styles, and cultural factors that influence musical creativity. Music of different cultures compared to examine forms and traits, to develop listening abilities, and to develop an understanding of human musical expressions.

**3440. ENSEMBLE: CONCERTO GROSSO.** (791112) (1 cr; prereq audition; 0905-1100 TTh; FergH 180) Kim  
Meets with 1440 and 5440.

**R3791. INTRODUCTION TO ELECTRONIC MUSIC.** (087969) (4 cr; prereq 4 cr in music or #; 1010-1205 TWTh; FergH 205) Ultran  
Musical literature to which electronic materials contribute. Listening, discussing, and reading. Exercises in use of equipment.

**3808. MUSIC OF EAST ASIA.** (191115) (4 cr; 1325-1415 MTWThF; FergH 123) Kagan  
Religious, courtly, operatic, chamber, and folk music of China, Japan, Korea, and Tibet. Historical developments in and cultural determinants of style, repertoire, and usage.

**3970. DIRECTED STUDIES.** (190109) (1-15 cr; prereq #, Δ, □; hrs ar; FergH 100) Staff  
Independent research and study under faculty guidance. Subjects selected according to strengths and interests of individual students.

**5330. JAZZ IMPROVISATION.** (191110) (2 cr; prereq Audition, #, 1010-1100 MWF; FergH 95) Buchner. Meets with 1330.

**5377. THE ADOLESCENT SINGING VOICE.** (488768) (3 cr; prereq 3xxx clearance in voice for vocal majors or 6 cr of applied voice for non-vocal majors; 0905-1100 TTh; FergH 149) Ware  
Principles of voice in teaching adolescent singers. Directed teaching, required readings, and study of relevant repertoire.

**5384. CHORAL CONDUCTING.** (591113) (4 cr; prereq #; 1010-1100 MTWThF; FergH 90) Lancaster  
Choral conducting—hand techniques, sound control, articulation, breath control, intonation.

**5440. ENSEMBLE: CONCERTO GROSSO.** (689675) (1 cr; prereq #; 0905-1100 TTh; FergH 180) Kim  
Performance of chamber music of major and minor composers; sonatas, trios, quartets, quintets, other forms. Combination of vocal and instrumental chamber ensemble materials. Meets with 1440 and 3440.

**5490. CHAMBER SINGERS.** (391114) (1 cr; prereq audition; 1115-1205 MTWThF; FergH 90) Lancaster  
Mixed chorus of 16 to 20 voices. Performances each term.

**5603. HISTORY OF OPERA.** (091116) 3 cr; prereq 9 cr in history of music, of art, of theatre, or of Europe from 1600, or #; 1325-1415 MTWThF; FergH 149) Sutton  
Analysis of libretto and music of representative masterpieces. Contemporary periods.

**5950. TOPICS IN MUSIC: THE PHENOMENON OF LISZT.** (891117) (4 cr; prereq 1606 or #; 1010-1205 MW; FergH 225) Laudon  
Liszt as a performer, composer, litterateur, and artistic prophet during seven decades of the 19th century.

**8990.\* SPECIAL PROBLEMS.** (590110) (2-12 cr; prereq 5841; hrs ar; FergH 100) Kagan, Laudon, Sutton

## SECOND TERM

**1001. FUNDAMENTALS OF MUSIC.** (985387) (4 cr; prereq non-music majors; 0905-0955 MTWThF; FergH 225) Anderson  
See First Term.

**1508. THEORY REVIEW II.** (785388) (3 cr; prereq #; 0905-0955 MTWThF, FergH 105) Lubet  
See 1507 First Term.

**1518. EAR-TRAINING AND SIGHT-SINGING.** (585389) (1 cr; prereq #; 1010-1100 MTWThF, FergH 105) Lubet  
See 1517 First Term.

**3970. DIRECTED STUDIES.** (985390) (1-15 cr; prereq #, Δ, □; hrs ar; FergH 100) Staff  
See First Term.

**5182. BAROQUE PERFORMANCE PRACTICE.** (891120) (4 cr; prereq sr or grad, 1606, 3503 or #; 1325-1415 MTWThF; FergH 115) McClary  
Ornamentation, phrasing, articulation, and improvisation in music of period 1550-1759. Instruction books of period; analysis of performance of baroque music in baroque style.

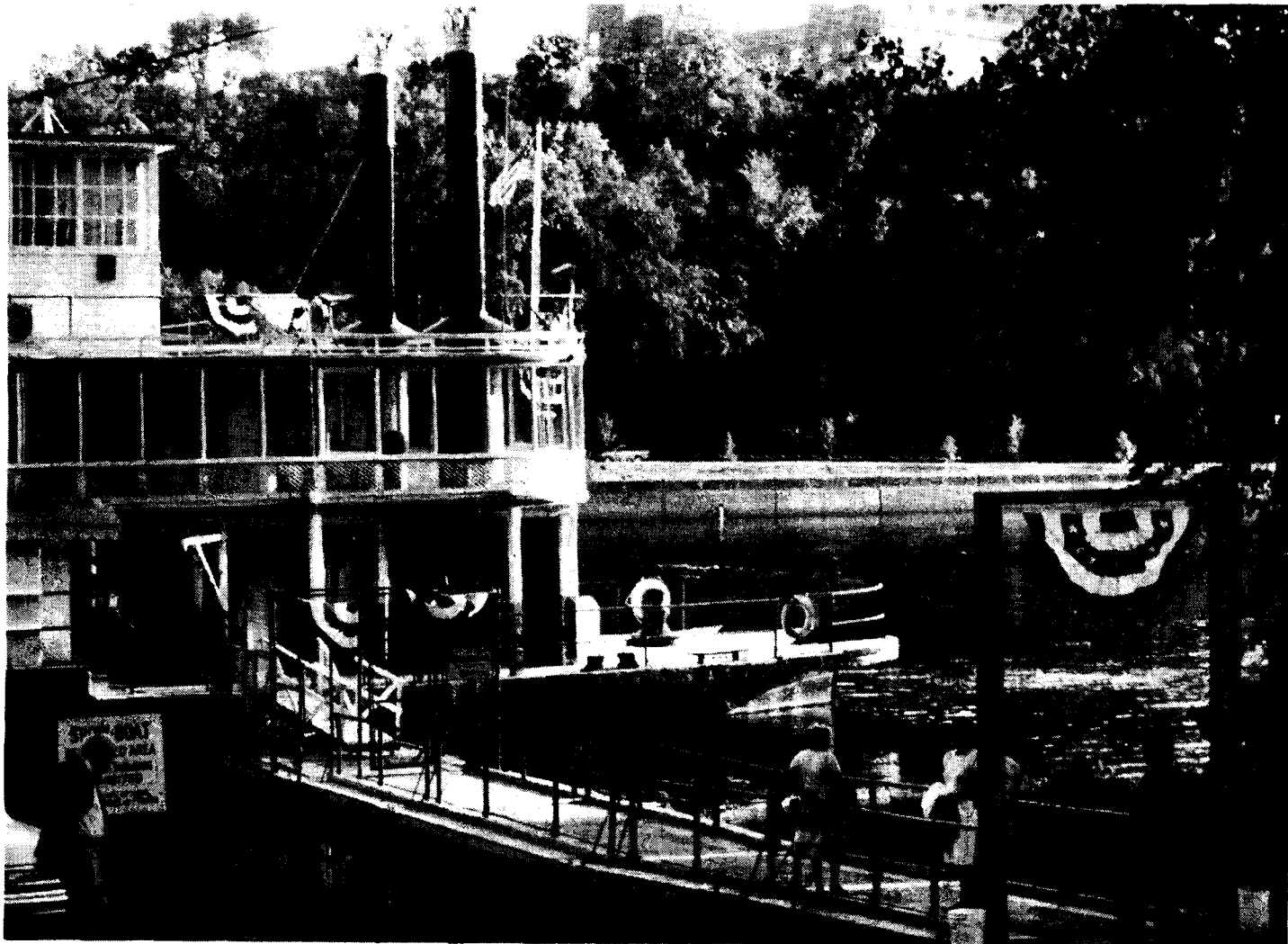
**5541. ADVANCED COUNTERPOINT.** (691118) (2 cr; prereq #; 1115-1205 MTWThF; FergH 123) Fetter  
Practice in writing three and four-voice fugues; contrapuntal devices and problems; analysis of polyphonic works of various periods from Ars Nova to the present day.

**5550. COMPOSITION.** (491119) (2 cr; prereq 3503, #; hrs arr. FergH 128) Fetter  
Original work in various forms.

**5666. STRAVINSKY.** (189350) (4 cr; prereq 12 cr in music, 3506; 1010-1100 MTW, 1010-1205 Th, FergH 149) Jackson  
Changing styles and aesthetic principles of Stravinsky as seen in representative compositions and writings; contributions to artistic life in Europe and America (particularly ballet).

**8990.\* SPECIAL PROBLEMS.** (785391) (2-12 cr; prereq 5841; hrs ar; FergH 100) Anderson, Jackson, Lubet, McClary

*The Minnesota Centennial Showboat offers period plays during the summer.*





## Courses in Applied Music

Offerings in applied music are classified according to eight modes: elective (with or without credit), principal, major, secondary required, secondary elective, principal beyond

requirement, major beyond requirement, minor and three levels: 1xxx (prefix 1), 2xxx (prefix 2), and graduate level (prefix 6). A student may not register for a course in applied music for credit until he or she has passed the required applied entrance examination. The examining

committee will determine the mode(s) for which a student may register. Students should consult with the School of Music, 110 Ferguson Hall, regarding the mode and level of applied music appropriate for fulfillment of specific requirements for their degree program. To

### FIRST TERM COURSES IN APPLIED MUSIC (Musa)

Instrument	Elective	Principal	Major	Secondary Required	Secondary Elective	Principal Beyond Requirement	Major Beyond Requirement	Minor	Instructor
Fee	\$100	—	—	—	\$ 40	\$ 40	\$ 40	\$ 40	
Piano	1101	1201	1301	1401	1501	1601	1701		Freed
Harpichord	1102	1202	1302	1402	1502	1602	1702		Ar
Organ	1103	1203	1303	1403	1503	1603	1703		Ar
Voice	1104	1204*	1304*	1404	1504	1604	1704		Weller
Violin	1105	1205	1305	1405	1505	1605	1705		Kim
Viola	1106	1206	1306	1406	1506	1606	1706		Ar
Cello	1107	1207	1307	1407	1507	1607	1707		Ar
Double Bass	1108	1208	1308	1408	1508	1608	1708		Ar
Flute	1109	1209	1309	1409	1509	1609	1709		Ar
Oboe	1111	1211	1311	1411	1511	1611	1711		Ar
Clarinet	1112	1212	1312	1412	1512	1612	1712		Anderson
Saxophone	1113	1213	1313	1413	1513	1613	1713		Ar
Bassoon	1114	1214	1314	1414	1514	1614	1714		Ar
French Horn	1115	1215	1315	1415	1515	1615	1715		Ar
Trumpet	1116	1216	1316	1416	1516	1616	1716		Ar
Trombone	1117	1217	1317	1417	1517	1617	1717		Ar
Baritone	1118	1218	1318	1418	1518	1618	1718		Ar
Tuba	1119	1219	1319	1419	1519	1619	1719		Ar
Percussion	1121	1221	1321	1421	1521	1621	1721		Ar
Harp	1122	1222	1322	1422	1522	1622	1722		Ar
Guitar	1123	1223	1323	1423	1523	1623	1723		Ar
Accordion					1524				Ar
Sitar					1525				Ar
Piano	3101	3201	3301	3401	3501	3601	3701	3801	Freed
Harpichord	3102	3202	3302	3402	3502	3602	3702	3802	Ar
Organ	3103	3203	3303	3403	3503	3603	3703	3803	Ar
Voice	3104	3204*	3304*	3404	3504	3604	3704	3804	Weller
Violin	3105	3205	3305	3405	3505	3605	3705	3805	Kim
Viola	3106	3206	3306	3406	3506	3606	3706	3806	Ar
Cello	3107	3207	3307	3407	3507	3607	3707	3807	Ar
Double Bass	3108	3208	3308	3408	3508	3608	3708	3808	Ar
Flute	3109	3209	3309	3409	3509	3609	3709	3809	Ar
Oboe	3111	3211	3311	3411	3511	3611	3711	3811	Ar
Clarinet	3112	3212	3312	3412	3512	3612	3712	3812	Anderson
Saxophone	3113	3213	3313	3413	3513	3613	3713	3813	Ar
Bassoon	3114	3214	3314	3414	3514	3614	3714	3814	Ar
French Horn	3115	3215	3315	3415	3515	3615	3715	3815	Ar
Trumpet	3116	3216	3316	3416	3516	3616	3716	3816	Ar
Trombone	3117	3217	3317	3417	3517	3617	3717	3817	Ar
Baritone	3118	3218	3318	3418	3518	3618	3718	3818	Ar
Tuba	3119	3219	3319	3419	3519	3619	3719	3819	Ar
Percussion	3121	3221	3321	3421	3521	3621	3721	3821	Ar
Harp	3122	3222	3322	3422	3522	3622	3722	3822	Ar
Guitar	3123	3223	3323	3423	3523	3623	3723	3823	Ar
Accordion					3524				Ar
Piano	5101	5201	5301	5401	5501	5601	5701		Freed
Harpichord	5102	5202	5302	5402	5502	5602	5702		Ar
Organ	5103	5203	5303	5403	5503	5603	5703		Ar
Voice	5104	5204*	5304*	5404	5504	5604	5704		Weller
Violin	5105	5205	5305	5405	5505	5605	5705		Kim
Viola	5106	5206	5306	5406	5506	5606	5706		Ar
Cello	5107	5207	5307	5407	5507	5607	5707		Ar
Double Bass	5108	5208	5308	5408	5508	5608	5708		Ar
Flute	5109	5209	5309	5409	5509	5609	5709		Ar
Oboe	5111	5211	5311	5411	5511	5611	5711		Ar
Clarinet	5112	5212	5312	5412	5512	5612	5712		Ar
Saxophone	5113	5213	5313	5413	5513	5613	5713		Ar
Bassoon	5114	5214	5314	5414	5514	5614	5714		Ar
French Horn	5115	5215	5315	5415	5515	5615	5715		Ar
Trumpet	5116	5216	5316	5416	5516	5616	5716		Ar
Trombone	5117	5217	5317	5417	5517	5617	5717		Ar
Baritone	5118	5218	5318	5418	5518	5618	5718		Ar
Tuba	5119	5219	5319	5419	5519	5619	5719		Ar
Percussion	5121	5221	5321	5421	5521	5621	5721		Ar
Harp	5122	5222	5322	5422	5522	5622	5722		Ar
Guitar	5123	5223	5323	5423	5523	5623	5723		Ar
Accordion					5524				Ar
Sitar					5525				Ar

\*1430-1530 TTh, 180 Ferguson Hall

register for 3xxx-level credit in applied music, the student must have completed 12 credits at the 1xxx level on the appropriate instrument and must pass a qualifying examination.

Courses in applied music carry 2 credits (minimum of 5 hours of private lessons) per

summer term. Fees for non-music majors are based on individual lessons: \$100 for 0-2 credits. Music and music education majors at the x2xx, x3xx, or x4xx level are exempt from payment of these fees as are MM and D.M.A. students taking applied music at the 83xx level.

Majors at the x5xx, x6xx, or x7xx level pay \$40 for 2 credits.

The music fees are treated as course fees; that is, they are applied in addition to tuition for all students in each summer term.

Call numbers for courses in applied music must be listed on the Course Request form and are available in 100 Ferguson Hall.

## SECOND TERM COURSES IN APPLIED MUSIC (MusA)

Instrument	Elective	Principal	Major	Secondary Required	Secondary Elective	Principal Beyond Requirement	Major Beyond Requirement	Minor	Instructor
Fee	\$100	—	—	—	\$ 40	\$ 40	\$ 40	\$ 40	
Piano	1101	1201	1301	1401	1501	1601	1701		McNab
Harpichord	1102	1202	1302	1402	1502	1602	1702		Ar
Organ	1103	1203	1303	1403	1503	1603	1703		Ar
Voice	1104	1204	1304	1404	1504	1604	1704		Ar
Violin	1105	1205	1305	1405	1505	1605	1705		Ar
Viola	1106	1206	1306	1406	1506	1606	1706		Ar
Cello	1107	1207	1307	1407	1507	1607	1707		Ar
Double Bass	1108	1208	1308	1408	1508	1608	1708		Ar
Flute	1109	1209	1309	1409	1509	1609	1709		Ar
Oboe	1111	1211	1311	1411	1511	1611	1711		Ar
Clarinet	1112	1212	1312	1412	1512	1612	1712		Ar
Saxophone	1113	1213	1313	1413	1513	1613	1713		Ar
Bassoon	1114	1214	1314	1414	1514	1614	1714		Ar
French Horn	1115	1215	1315	1415	1515	1615	1715		Ar
Trumpet	1116	1216	1316	1416	1516	1616	1716		Ar
Trombone	1117	1217	1317	1417	1517	1617	1717		Ar
Baritone	1118	1218	1318	1418	1518	1618	1718		Ar
Tuba	1119	1219	1319	1419	1519	1619	1719		Ar
Percussion	1121	1221	1321	1421	1521	1621	1721		Ar
Harp	1122	1222	1322	1422	1522	1622	1722		Ar
Guitar	1123	1223	1323	1423	1523	1623	1723		Ar
Accordion					1524				Ar
Sitar					1525				Ar
Piano	3101	3201	3301	3401	3501	3601	3701	3801	McNab
Harpichord	3102	3202	3302	3402	3502	3602	3702	3802	Ar
Organ	3103	3203	3303	3403	3503	3603	3703	3803	Ar
Voice	3104	3204	3304	3404	3504	3604	3704	3804	Ar
Violin	3105	3205	3305	3405	3505	3605	3705	3805	Ar
Viola	3106	3206	3306	3406	3506	3606	3706	3806	Ar
Cello	3107	3207	3307	3407	3507	3607	3707	3807	Ar
Double Bass	3108	3208	3308	3408	3508	3608	3708	3808	Ar
Flute	3109	3209	3309	3409	3509	3609	3709	3809	Ar
Oboe	3111	3211	3311	3411	3511	3611	3711	3811	Ar
Clarinet	3112	3212	3312	3412	3512	3612	3712	3812	Ar
Saxophone	3113	3213	3313	3413	3513	3613	3713	3813	Ar
Bassoon	3114	3214	3314	3414	3514	3614	3714	3814	Ar
French Horn	3115	3215	3315	3415	3515	3615	3715	3815	Ar
Trumpet	3116	3216	3316	3416	3516	3616	3716	3816	Ar
Trombone	3117	3217	3317	3417	3517	3617	3717	3817	Ar
Baritone	3118	3218	3318	3418	3518	3618	3718	3818	Ar
Tuba	3119	3219	3319	3419	3519	3619	3719	3819	Ar
Percussion	3121	3221	3321	3421	3521	3621	3721	3821	Ar
Harp	3122	3222	3322	3422	3522	3622	3722	3822	Ar
Guitar	3123	3223	3323	3423	3523	3623	3723	3823	Ar
Accordion					3524				Ar
Piano	5101	5201	5301	5401	5501	5601	5701		McNab
Harpichord	5102	5202	5302	5402	5502	5602	5702		Ar
Organ	5103	5203	5303	5403	5503	5603	5703		Ar
Voice	5104	5204	5304	5404	5504	5604	5704		Ar
Violin	5105	5205	5305	5405	5505	5605	5705		Ar
Viola	5106	5206	5306	5406	5506	5606	5706		Ar
Cello	5107	5207	5307	5407	5507	5607	5707		Ar
Double Bass	5108	5208	5308	5408	5508	5608	5708		Ar
Flute	5109	5209	5309	5409	5509	5609	5709		Ar
Oboe	5111	5211	5311	5411	5511	5611	5711		Ar
Clarinet	5112	5212	5312	5412	5512	5612	5712		Ar
Saxophone	5113	5213	5313	5413	5513	5613	5713		Ar
Bassoon	5114	5214	5314	5414	5514	5614	5714		Ar
French Horn	5115	5215	5315	5415	5515	5615	5715		Ar
Trumpet	5116	5216	5316	5416	5516	5616	5716		Ar
Trombone	5117	5217	5317	5417	5517	5617	5717		Ar
Baritone	5118	5218	5318	5418	5518	5618	5718		Ar
Tuba	5119	5219	5319	5419	5519	5619	5719		Ar
Percussion	5121	5221	5321	5421	5521	5621	5721		Ar
Harp	5122	5222	5322	5422	5522	5622	5722		Ar
Guitar	5123	5223	5323	5423	5523	5623	5723		Ar
Accordion					5524				Ar
Sitar					5525				Ar

## Music Education (MuEd)

100 Ferguson Hall. 373-5400  
College of Education

### FIRST TERM

**R3011. TEACHING MUSIC IN THE ELEMENTARY SCHOOL.** (289999) (4 cr; prereq Mus 1001 and elementary educ major; limited to 30 students; 1010-1100 MTWThF; FergH 107; A-N only) Caswell

For non-music majors; methods and materials in teaching singing, rhythm, music reading, creativity, classroom instruments, fundamentals, appreciation in K-6.

**3851. INTERNSHIP: MUSIC THERAPY.** (888041) (6 cr; prereq #: S-N only) Furman  
Six-month resident internship in music therapy at an affiliated, approved hospital or clinic.

**3852. INTERNSHIP: MUSIC THERAPY.** (288044) (6 cr; prereq 3851; S-N only) Furman  
See 3851.

**5603. TECHNIQUES AND MATERIALS: ORFF-SCHULWERK APPROACH—June 17-July 3.** (091200) (3 cr; 1325-1520 MTWThF; FergH 107; A-N only) Caswell  
Demonstration and class practice in teaching and performance skills; the recorder; movement, improvisation, singing, and creation of musical forms; techniques to encourage children to create and improvise songs, instrumental music, and related bodily movement; class exercises in adapting indigenous and ethnic music material for school use.

**5657. TECHNIQUES AND MATERIALS: INSTRUMENTAL CONDUCTING—June 17-July 3.** (891201) (3 cr; 1010-1205 MTWThF, FergH 85; A-N only) Schultz  
Basic conducting and rehearsal techniques for school bands and orchestras; selection of instrumental materials; organization of school ensembles, elementary and secondary.

**5750. WORKSHOP: MUSIC EDUCATION: Seminar in Music Therapy—June 17-July 3.** (691202) (1-12 cr [max 12 cr]; 1220-1310 MWTTh; FergH 151; A-N only) Furman  
Selected topics in music education. This 1-credit workshop focuses on current controversies, issues, and values encountered in the profession of music therapy; principles, theories, and models of music therapy; literature review.

**5821. HISTORY OF MUSIC THERAPY.** (591676) (3 cr; 0905-0955 MTWThF; FergH 151; A-N only) Furman  
Historical development of the music therapy profession, outstanding persons and their contributions to the field of music therapy. The development of music therapy technique for the increasing number of treatment populations.

**5831. MUSIC FOR EXCEPTIONAL CHILDREN—June 17-July 3.** (391677) (3 cr; prereq #: 1010-1205 MTWThF; FergH 151; A-N only) Furman  
Trends; methods and materials for a functional program of singing, playing, rhythm, listening, and creative activities for mentally and physically handicapped and gifted pupils.

**5970. INDEPENDENT STUDY.** (1-4 cr; prereq education or graduate student; hrs ar; FergH 100; A-N only)  
An independent study project organized by the student with the appropriate instructor.

Sec 21, (190000) Caswell  
Sec 22, (090001) Schultz  
Sec 23, (988001) Furman

**8990. RESEARCH PROBLEMS.** (1-12 cr; prereq knowledge of elem statistics; hrs ar; FergH 100)

Sec 21, (089002) Caswell  
Sec 22, (690003) Schultz  
Sec 23, (788002) Furman

### SECOND TERM

**R3011. TEACHING MUSIC IN THE ELEMENTARY SCHOOL.** (885026) (4 cr; limited to 30 students; prereq Mus 1001 and elementary educ major; 1010-1100 MTWThF; FergH 107; A-N only) Borg  
See First Term.

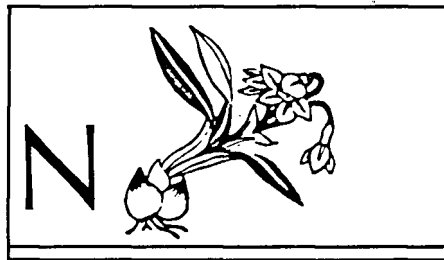
**5647. TECHNIQUES AND MATERIALS:—July 21-August 1.** (291204) (3 cr; \$5534; prereq #: 0905-1205 MTWThF; FergH 7A; A-N only) Schultz  
Contemporary approaches to teaching in elementary, junior high, and senior high school; emphasis on performing techniques; playing of teaching materials, solo and ensemble repertoire.

**5970. INDEPENDENT STUDY.** (1-4 cr; prereq education or graduate student; hrs ar; A-N only)  
See First Term.

Sec 21, (688008) Borg  
Sec 22, (488009) Schultz

**8990. RESEARCH PROBLEMS.** (4-12 cr; prereq knowledge of elem statistics; hrs ar)

Sec 21, (888010) Borg  
Sec 22, (688011) Schultz



## Neurology (Neur)

12-100 Phillips-Wangensteen Building. 373-8790  
Medical School

### SPECIAL TERMS: SIX- AND TWELVE-WEEK COURSES

**5120. SELECTED PROBLEMS IN NEUROLOGY.** (785309) (Cr ar; prereq regis med) Staff

**5510. EXTERNSHIPS IN CLINICAL NEUROLOGY.** (185310) (Cr ar; prereq regis med) Klassen, staff

**5541. PEDIATRIC NEUROLOGY—NEUROCHEMISTRY.** (985311) (Cr ar; prereq regis med) Swaiman

**5542. PEDIATRIC NEUROLOGY.** (689661) (Cr ar; prereq regis med) Shapiro

**5544. CLINICAL ELECTROENCEPHALOGRAPHY.** (785312) (Cr ar; prereq regis med) Torres

**5545. ELECTROMYOGRAPHY.** (585313) (Cr ar; prereq regis med) Kennedy

**5570. IMMUNOLOGY.** (385314) (Cr ar; prereq regis med) Ansari

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**5122. PEDIATRIC NEUROLOGY.** (388181) (Cr and hrs ar)

**8200. CLINICAL NEUROLOGY.** (185315) (Cr ar) Klassen, staff

**8201. CLINICAL PEDIATRIC NEUROLOGY.** (085316) (Cr ar) Swaiman, staff

**8202. RESEARCH.** (885317) (Cr ar) Klassen, staff

**8203. APPLIED ELECTROENCEPHALOGRAPHY.** (685318) (Cr ar) Torres

**8204. APPLIED ELECTROMYOGRAPHY.** (485319) (Cr ar) Kennedy

**8205. APPLIED NEUROPATHOLOGY.** (885320) (Cr ar) Mastro

**8236. RESEARCH: NEUROPATHOLOGY.** (685321) (Cr ar) Mastro

**8705. NEUROLOGICAL-NEUROSURGICAL CONFERENCE.** (485322) (1 cr, \$Rad 5163, \$Surg 8318) Staff

## Neurosurgery (NSu)

B-590 Mayo. 373-8785  
Medical School

### SPECIAL TERMS: THREE- AND SIX-WEEK COURSES

#### Elective Courses for Undergraduate Students

**5500. NEUROSURGERY EXTERNSHIP (University Hospitals).** (285323) (4.5 or 9 cr; prereq regis med; MTWThF) Chou, Seljeskog, Erickson, Maxwell, Haines, Turner

**5510. NEUROSURGERY EXTERNSHIP (Veterans Administration Hospital).** (785326) (4.5 or 9 cr; prereq regis med; MTWThF) Maxwell, Dennis A. Turner

**5511. NEUROSURGERY EXTERNSHIP (Hennepin County Medical Center).** (585327) (4.5 or 9 cr; prereq regis med; MTWThF) Rockswold

**5512. NEUROSURGERY EXTERNSHIP (St. Paul-Ramsey Medical Center).** (385328) (4.5 or 9 cr; prereq regis med; MTWThF) Reynaldo Castillo

**5520. NEUROSURGERY INVESTIGATION.** (585330) (9 cr; prereq regis med; MTWThF; Diehl F109-110 and G134-144) Ebner

**5530. NEUROPSYCHOLOGY.** (085333) (9 cr; prereq regis med; ar; Mayo C667) Meier

**5531. ADVANCED NEUROPSYCHOLOGICAL SEMINAR.** (986667) (2 cr; hr ar) Meier

**5532. CLERKSHIP IN NEUROPSYCHOLOGICAL ASSESSMENT.** (586669) (1-4 cr; hr ar) Meier

**5533. CASE CONFERENCE IN NEUROPSYCHOLOGY.** (986670) (1 cr; hr ar) Meier

**5534. INTRODUCTION TO NEUROPSYCHOLOGICAL ASSESSMENT.** (786671) (3 cr; hr ar) Meier

**5535. CASE CONFERENCE IN CLINICAL PSYCHOLOGY.** (586672) (1-2 cr; hr ar) Meier

**5550. NEUROPHYSIOLOGICAL LITERATURE SEMINAR.** (685335) (1 cr; prereq Medical School course in physiology or equiv with #; hrs ar) Ebner

Study of selected papers covering several topics in neurophysiology. Correlations between neurological and neurosurgical problems and basic concepts in neurophysiology emphasized.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

#### Required Courses for Graduate Students

**8305. NEUROSURGICAL DIAGNOSIS.** (485336) (4 cr; MTWThF; Mayo B524) Chou, Seljeskog, Erickson, Maxwell, Haines, Turner

Neurosurgical fellow assists in instruction of clinical clerks and interns, studies problems in diagnosis at University and affiliated hospitals.

**8308. NEUROSURGICAL PROBLEMS AND MANAGEMENT.** (285340) (4 cr; MTWThF; Mayo B401) Chou, Seljeskog, Erickson, Maxwell, Haines, Turner  
Neurosurgical fellow acts as house surgeon at University and affiliated hospitals.

**8311. OPERATIVE NEUROSURGERY.** (585344) (4 cr; MTWThF; Mayo B401) Chou, Seljeskog, Erickson, Maxwell, Haines, Turner  
Neurosurgical fellow acts as first assistant for operations at University and affiliated hospitals and later may be permitted to operate.

**8316. NEUROSURGICAL RESEARCH.** (185346) (6 cr; MTWThF; Diehl F109-110 and G134-144) Chou, Seljeskog, Erickson, Haines, Turner, Ebner  
Problems in experimental or clinical surgery.

**8318. NEURORADIOLOGICAL CONFERENCE.** (085347) (1 cr; 1325-1415 F; Mayo C231-Todd Amph) Chou, Seljeskog, Erickson, Maxwell, Haines, Turner  
A review of X-ray films and case histories on neurosurgical service.

**8320. NEUROSURGICAL CONFERENCE.** (085350) (2 cr; 0800-1100 Sat; Mayo B507) Chou, Seljeskog, Ebner, Erickson, Maxwell, Haines, Turner  
In-depth review of selected topics in basic and clinical neurosurgery.

**8322. NEUROSURGERY-OPHTHALMOLOGY**

**SEMINAR—PART I.** (585361) (1 cr; 0800-0850 T; offered Su and W; Sta 51, Mayo 524) Staff  
Review and discussion of topics.

**8323. NEUROSURGERY-OPHTHALMOLOGY**

**SEMINAR—PART II.** (785360) (1 cr; prereq 8322; T; offered F and S) Staff  
Advanced review and discussion of topics.

**8324. READINGS: NEUROBIOLOGY.** (385362) (1 cr; 1600-1800 Th; DVCCRC 114) Ebner

**8330. NEUROSURGERY LITERATURE SEMINAR.** (985356) (2 cr; 1st and 2nd Th evenings) Staff  
Review and discussion of current literature relating to neurosurgery and the neurosciences.

## Nursing (Nurs)

5-140 Health Sciences Unit F. 373-3462  
School of Nursing

### FIRST TERM

**5799. SELF-DIRECTED STUDY.** (787142) (Cr ar; prereq any two of the following: 5611, 5612, 5613, 5614, written contract with instructor, #; may be used to meet any portion of nursing elective cr requirement) Staff

Sec 1. Opportunity for students to engage in learning experiences not provided for in established nursing elective courses.

**8001. SPECIAL EDUCATIONAL EXPERIENCES IN NURSING.** (687358) (Cr ar; prereq  $\Delta$ ) Staff

Various learning experiences planned to meet individual needs.

**8009. SPECIAL TOPICS IN NURSING.** (487362) (Cr ar; prereq #) Staff

**8060. ADVANCED CLINICAL NURSING.** (987379) (Cr ar; prereq #) Staff

**8509. SPECIAL TOPICS IN NURSING EDUCATION.** (987382) (Cr ar; prereq #) Staff

**8609. SPECIAL TOPICS IN NURSING SUPERVISION.** (587384) (Cr ar; prereq #) Staff

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

The following 5000-level courses are offered for RN students only.

**8515. SYNTHESIS IN COMPLEX NURSING SITUATIONS.** (5 cr; prereq 5407, 5611, 5612, 5613, 5614, FScN 3602; hrs ar) Clinical course designed to allow students to synthesize the knowledge and skills acquired in the four prerequisite synthesis courses into comprehensive and effective care of individuals and groups experiencing complex disruptive life events.

Clinical 1. (086286) ar  
2. (886287) ar

**8516. SYNTHESIS IN COMPLEX NURSING SITUATIONS II.** (5 cr; prereq 5407, 5611, 5612, 5613, 5614; FScN 3602; hrs ar) Clinical course designed to enable students to synthesize the knowledge and skills acquired in the four prerequisite synthesis courses into comprehensive and effective care of individuals and groups experiencing complex disruptive life events.

Clinical 1. (486289) ar  
2. (886290) ar

**5799. SELF-DIRECTED STUDY.** (187414) (Cr ar; prereq any two of the following: 5611, 5612, 5613, 5614...written contract with instructor, #; may be used to meet any portion of nursing elective cr requirement) Staff  
Sec 2. See First Term.

**5999. CLINICAL STUDY.** (189521) (1 cr; prereq 5407, any two of the following: 5611, 5612, 5613, 5614)  
Opportunity to utilize the research process in the design and implementation of a limited study that focuses on implications for nursing practice.

**8011. MORAL AND ETHICAL POSITIONS IN NURSING.** (087423) (3 cr; prereq  $\Delta$ ; 1215-1500 Th) Weise  
Influence of moral and ethical positions on behavior and decision making in nursing. Emphasis on bases for positions taken, such as selected moral and ethical theories, rights and responsibilities, and conflict.

**8014. RESEARCH IN NURSING.** (287427) (3 cr; prereq inferential statistics,  $\Delta$ ; 0915-1200 W) Feldman  
Research processes and methodologies appropriate to nursing. Analysis of research reports.

**8030. NURSING INTERVENTION MODELS.** (185539) (8 cr; prereq 8011 or 18011, 8012)  
Developing, providing and evaluating nursing intervention with a specified client population.

Sec 1. (187431) 0915-1100, 1215-1400 T, HSUnitF, Burns, (Med-Surg clin ar)  
Sec 2. (891280) 1215-1400 TTh, HSUnitF, Gordon, (Psych clin ar)

**8050. PROBLEMS IN NURSING.** (1-9 cr; prereq #) Staff

Individual study of a problem.

Sec 1. (887374) ar, Corcoran  
Sec 2. (491282) ar, Crisham  
Sec 3. (291283) ar, Dineen  
Sec 4. (191284) ar, Donaldson  
Sec 5. (991285) ar, Fahy  
Sec 6. (791286) ar, Feldman  
Sec 7. (591287) ar, Gordon  
Sec 8. (391288) ar, Kintgen-Andrews  
Sec 9. (191289) ar, Rode  
Sec 10. (591290) ar, Snyder  
Sec 11. (391291) ar, Sullivan  
Sec 12. (191292) ar, ar

**8315. NURSE-MIDWIFERY MANAGEMENT: INTRAPARTAL AND POSTPARTAL.** (691281) (8-10 cr; prereq 8314; 0915-1300 W) Dineen

Theory and clinical experience in management and care of the laboring woman/couple through the six-week restorative period. Early care of the newborn in an integrated component.

**8451. TEACHING NURSING.** (988869) (4 cr; prereq any sec of 8030, 1 course in learning theory and #; 0915-1500 T) Kintgen-Andrews

Use of theories of learning to develop an intervention model for teaching nursing. Testing the intervention model in simulated situations.

### SECOND TERM

**8001. SPECIAL EDUCATIONAL EXPERIENCES IN NURSING.** (087521) (Cr ar; prereq  $\Delta$ ) Staff  
See First Term.

**8009. SPECIAL TOPICS IN NURSING.** (687523) (Cr ar; prereq #) Staff

**8051. SPECIAL TOPICS IN NURSING RESEARCH.** (087955) (1-9 cr) Staff  
Seminar and/or individual study in nursing research.

**8060. ADVANCED CLINICAL NURSING.** (187672) (3-9 cr; prereq  $\Delta$ , #) Staff

**8509. SPECIAL TOPICS IN NURSING EDUCATION.** (987673) (Cr ar; prereq #) Staff

**8609. SPECIAL TOPICS IN NURSING SUPERVISION.** (787674) (Cr ar; prereq #) Staff

## Nutrition (Nutr)

225 Food Science and Nutrition, St. Paul. 373-1071  
Agriculture and Home Economics

### FIRST TERM

**8990. GRADUATE RESEARCH.** (38916) (2-5 cr; prereq #)

### SECOND TERM

**8990. GRADUATE RESEARCH.** (589135) (2-5 cr; prereq #)



## Obstetrics and Gynecology (Obst)

12-211 Moos Tower. 373-8851  
Medical School

**SPECIAL TERMS: JUNE 20-JULY 29 AND AUGUST 1-SEPTEMBER 9**

### Elective Courses for Undergraduate Students

**5500. EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY.** (385376) (9 cr; prereq Years 3 and 4) Julian, staff  
Clinical experience that includes total care of inpatients and outpatients on obstetrics and gynecology service at Hennepin County Medical Center, North Memorial Hospital, St. Joseph's Hospital, St. Mary's Hospital, St. Paul-Ramsey Medical Center, United Hospitals, Group Health, Fairview Hospital, University Hospitals, and St. Luke's Hospital, Duluth. Emphasis on medical aspects of obstetrics and gynecology.

**5520. OBSTETRICS AND GYNECOLOGY EXTERNSHIP IN CLINICAL PRACTICE.** (185377) (4.5 cr; prereq Years 3 and 4) Julian, staff  
Practical community experience in obstetrics and gynecology under preceptorship of one or more practicing members of clinical staff. Both office and hospital practice included.

**5540. ADVANCED EXTERNSHIP IN OBSTETRICS AND GYNECOLOGY.** (085378) (Cr ar; prereq 5500) Julian, staff  
Full-time clinical experience as acting intern on obstetrical and gynecological service at Hennepin County Medical Center, St. Paul-Ramsey Medical Center, or University Hospitals.

**5560. RESEARCH IN REPRODUCTION.** (885379) (Cr ar; prereq 5500) Julian, staff  
Topics selected for each student.

**5575. GYNECOLOGICAL PATHOLOGY AND DIAGNOSTIC CYTOLOGY.** (185380) (9 cr; prereq 5500) Julian, Okagaki, Brooker

Review of daily gynecological histopathology material of surgical and clinical cases from the Ob-Gyn Service. Includes diagnostic cytology of Pap smears encountered in actual practice.

**5590. PRECEPTORSHIP IN OBSTETRICS AND GYNECOLOGY.** (085381) (9 cr; prereq 5500) Julian  
Full-time preceptorship in clinical obstetrics and gynecology, in outstate Minnesota, offered by AHEC. Student will receive per diem expenses. Similar to 5520, but in smaller community.

### Courses for Graduate Students

**8201. ADVANCED OBSTETRICS AND GYNECOLOGY.** (685500) (Cr ar) Tagatz, staff

**8205. ADVANCED OBSTETRICS AND GYNECOLOGY.** (485501) (Cr ar) Tagatz, staff

**8209. ADVANCED OBSTETRICS AND GYNECOLOGY.** (285502) (Cr ar) Tagatz, staff

**8210. ADVANCED OBSTETRICS AND GYNECOLOGY.** (185503) (Cr ar) Tagatz, staff

**8213. ADVANCED OBSTETRICS AND GYNECOLOGY.** (185511) (Cr ar) Tagatz, staff

**8217. SEMINAR IN OBSTETRICS AND GYNECOLOGY.** (885513) (Cr ar; prereq 8216) Tagatz, staff

**8221. SEMINAR IN OBSTETRICS AND GYNECOLOGY.** (485515) (Cr ar; prereq 8219) Tagatz, staff

- 8222. GYNECOLOGICAL ONCOLOGY.** (285516) (Cr ar; prereq 8221) Tagatz, staff
- 8223. GYNECOLOGICAL ONCOLOGY.** (985518) (Cr ar; prereq 8222) Tagatz, staff
- 8224. GYNECOLOGICAL ENDOCRINOLOGY—PART I.** (185520) (Cr ar; prereq 8223) Tagatz, staff
- 8225. GYNECOLOGICAL ENDOCRINOLOGY—PART II.** (585523) (Cr ar; prereq 8224) Tagatz, staff
- 8226. OBSTETRICAL PHYSIOLOGY AND ANESTHESIOLOGY.** (885530) (Cr ar; prereq 8225) Tagatz, staff
- 8230. RESEARCH IN REPRODUCTION.** (285533) (Cr ar; prereq 8229) Tagatz, staff

## Operations Management (OM)

735 Management/Economics Building, 373-4377  
School of Management

Refer to registration instructions for undergraduate School of Management courses on page 107.

### FIRST TERM

- 83000. INTRODUCTION TO OPERATIONS MANAGEMENT.** (288769) (4 cr; limited to 50 students; A-N only; 1010-1205 MTWTh; BlegH 145)  
Concepts and principles in the management of operating functions, taught from a managerial point of view. Examples from service industries, nonprofit organizations, and manufacturing. Relationships to other business functions and the environment. Overview of operations, planning operating processes, productivity measurement, standards, allocation of resources, forecasting, concepts of quality, inventory management, principles of scheduling, and operational control information systems.
- 8990. READINGS IN OPERATIONS MANAGEMENT.** (688770) (Cr ar; prereq consent of adviser and #, 2nd year grad student, requisite introductory courses; A-N only)
- 8995. GRADUATE RESEARCH IN OPERATIONS MANAGEMENT.** (488771) (Cr ar; prereq consent of adviser and #, 2nd year grad student, requisite introductory courses; A-N only)  
Research projects on a specific problem completed in cooperation with a business firm.

### SECOND TERM

- 83000. INTRODUCTION TO OPERATIONS MANAGEMENT.** (190836) (4 cr; limited to 50 students; A-N only; 1010-1205 MTWTh; BlegH 145)  
See First Term.
- 8990. READINGS IN OPERATIONS MANAGEMENT.** (090838) (Cr ar; prereq consent of adviser and #, 2nd-yr grad student, requisite introductory courses and Grad Sch Mgmt approval; A-N only)
- 8995. GRADUATE RESEARCH IN OPERATIONS MANAGEMENT.** (190840) (Cr ar; prereq consent of adviser and #, 2nd-yr grad student, requisite introductory courses and Grad Sch Mgmt approval; A-N only)  
See First Term.

## Ophthalmology (Oph)

9th floor, Phillips-Wangensteen Building, 373-8425  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

- 5100. INTRODUCTION TO OPHTHALMOLOGIC PATHOLOGY.** (785536) (1 cr) Cameron
- 5180. EXTERNSHIP.** (489662) (Cr and hrs ar)
- 5190. RESEARCH PROBLEMS.** (289663) (Cr and hrs ar)
- 8101. CLINICAL OPHTHALMOLOGY.** (185539) (8 cr) Staff

- 8131. PRACTICAL OCULAR SURGERY.** (585540) (3 cr) Staff
- 8142. PATHOLOGY LABORATORY.** (185542) (2 cr) Cameron
- 8152. OPHTHALMOLOGY LABORATORY.** (085543) (15 cr) Doughman
- 8155. SPECIAL TOPICS.** (685545) (Cr ar) Staff

### SECOND TERM

- 5180. EXTERNSHIP.** (589782) (Cr and hrs ar)
- 5190. RESEARCH PROBLEMS.** (089091) (Cr and hrs ar)

## Oral and Maxillofacial Surgery (OSur)

7-174 Moos Tower, 373-0310  
School of Dentistry

### FIRST TERM

- 5257. AMBULATORY GENERAL ANESTHESIA.** (585067) (1 cr) Gatto and staff  
A clinical rotation involving experience in outpatient management utilizing intravenous sedation and general anesthesia.
- 5270. ORAL AND MAXILLOFACIAL RADIOLOGY REVIEW.** (387905) (1 cr) Kwon  
Weekly review and discussion of radiographs taken at the University Hospital relating to oral surgery procedures.
- 5275. ORAL PATHOLOGY REVIEW.** (187906) (1 cr) Jaspers  
Evaluation and microscopic interpretation of diagnostic tissue from oral and peri-oral areas. Other diagnostic information such as clinical appearance, history, and radiologic films is utilized. Course is based on individual participation in a seminar format.
- 8250. ADVANCED ORAL SURGERY.** (385068) (1 cr) Jaspers  
Assigned clinics in University Hospitals, Veterans Administration Hospital, Hennepin County Medical Center, and School of Dentistry; rotation in general anesthesiology at University Hospitals.

- 8251. SEMINAR: ORAL SURGERY.** (185069) (1 cr) Jaspers  
Oral surgical subjects on a seminar basis.
- 8252. RESEARCH IN ORAL SURGERY.** (585070) (Cr ar) El Deeb  
Research in fields related to oral surgery.
- 8253. PROBLEMS IN ORAL SURGERY.** (385071) (1 cr) Kwon  
Current literature review.
- 8255. GENERAL SURGERY.** (185072) (1 cr) Winter and staff  
Clinical rotation on the general surgical service at Fairview Hospital, Minneapolis. Includes seminars, clinics, and operating room experience.
- 8258. ANESTHESIA II SEMINAR.** (085073) (1 cr) Gatto and staff  
Outpatient general anesthesia topics and related subjects.

### SECOND TERM

- 5257. AMBULATORY GENERAL ANESTHESIA.** (787013) (1 cr) Gatto and staff  
See First Term.
- 5270. ORAL AND MAXILLOFACIAL RADIOLOGY REVIEW.** (087907) (1 cr) Kwon  
See First Term.
- 5275. ORAL PATHOLOGY REVIEW.** (887908) (1 cr) Jaspers  
Evaluation and microscopic interpretation of diagnostic tissue from oral and peri-oral areas. Other diagnostic information such as clinical appearance, history, and radiologic films is utilized. Course is based on individual participation in a seminar format.
- 8250. ADVANCED ORAL SURGERY.** (587014) (1 cr) Jaspers  
See First Term.
- 8251. SEMINAR: ORAL SURGERY.** (387015) (1 cr) Jaspers  
See First Term.
- 8252. RESEARCH IN ORAL SURGERY.** (187016) (Cr ar) El Deeb  
See First Term.
- 8253. PROBLEMS IN ORAL SURGERY.** (087017) (1 cr) Jaspers  
See First Term.

- 8255. GENERAL SURGERY.** (887018) (1 cr) Winter and staff  
See First Term.
- 8258. ANESTHESIA II SEMINAR.** (687019) (1 cr) Gatto and staff  
See First Term.

## Oral Biology (OBio)

17-226 Moos Tower, 373-3269  
School of Dentistry

### FIRST TERM

- 8001. RESEARCH IN ORAL BIOLOGY.** (485059) (Cr ar) Shapiro
- 8002. TUTORIAL IN ORAL BIOLOGY.** (885060) (Cr ar [may be repeated for cr]; 2 hrs per wk = 1 cr) Shapiro
- 8024. TOPICS IN ORAL BIOLOGY.** (685061) (1-3 cr [may be repeated for cr]; prereq #)

### SECOND TERM

- 8001. RESEARCH IN ORAL BIOLOGY.** (887004) (Cr ar) Shapiro
- 8002. TUTORIAL IN ORAL BIOLOGY.** (687005) (Cr ar [may be repeated for cr]; 2 hrs per wk = 1 cr) Shapiro
- 8024. TOPICS IN ORAL BIOLOGY.** (487006) (1-3 cr [may be repeated for cr]; prereq #)
- 8030. SEMINAR.** (988211) (1 cr)  
Faculty and student participation in discussion of current topics in oral biology.

## Oral Pathology (OPat)

16-206 Moos Tower, 373-3248  
School of Dentistry

### FIRST TERM

- 8001. RESEARCH IN ORAL PATHOLOGY.** (991770) (Cr ar)
- 8004. HISTOPATHOLOGY.** (485062) (1 cr) Vickers  
Weekly presentation of various pathologic cases in which methods of diagnosis are stressed. Clinical or radiographic aspects utilized. Covers the spectrum of oral and paraoral pathology.
- 8006. CURRENT LITERATURE REVIEW.** (285063) (1 cr) Vickers
- 8011. SURGICAL ORAL PATHOLOGY.** (791708) (Cr ar)
- 8014. EXFOLIATIVE CYTOLOGY OF THE ORAL MUCOSA.** (185064) (2 cr) Witkop  
Comparative histology of skin and normal mucosa; cytology maturation of oral mucosa compared to vaginal mucosa, techniques, stains, and smears, menstrual cycle; benign lesions of oral mucosa, toothbrushing effects; introduction to grading system for malignant lesions; X-ray and drug effects on oral mucosa; oral squamous cell carcinoma; in situ and basal cell carcinoma.

### SECOND TERM

- 8001. RESEARCH IN ORAL PATHOLOGY.** (591709) (Cr ar)
- 8004. HISTOPATHOLOGY.** (287007) (1 cr) Vickers  
See First Term.
- 8006. CURRENT LITERATURE REVIEW.** (187008) (1 cr) Vickers
- 8011. SURGICAL ORAL PATHOLOGY.** (991710) (Cr ar)
- 8014. EXFOLIATIVE CYTOLOGY OF THE ORAL MUCOSA.** (987009) (2 cr) Witkop  
See First Term.



## Oral Radiology (ORad)

7-536 Moos Tower. 373-0268  
School of Dentistry

### FIRST TERM

8900. ORAL RADIOLOGY RESEARCH. (785066) (Cr ar; prereq #) Kuba

### SECOND TERM

8900. ORAL RADIOLOGY RESEARCH. (987012) (Cr ar; prereq #) Kuba

## Orthodontics (Otho)

6th floor, Moos Tower. 373-3251  
School of Dentistry

### FIRST TERM

#### Required Courses for Graduate Students

5004. CLINICAL ORTHODONTICS. (885074) (Cr ar; prereq #) Staff  
Students are assigned patients for the complete management of orthodontic and orthodontically related occlusal problems under direct staff supervision. Credits from this course may not be used for degree programs.

8203. GROWTH AND DEVELOPMENT. (685075) (Cr ar; prereq #) Staff  
Head growth, development, osteology and myology. Includes both normal and abnormal morphology and function; cephalometric methods.

8207. DIAGNOSIS AND TREATMENT PLANNING. (485076) (Cr ar; prereq #) Staff  
Etiology, treatment, and prognosis of clinical orthodontic patients.

8211. ORTHODONTIC SEMINAR. (285077) (Cr ar; prereq #) Staff  
Review of current literature and discussion of current research and its implications.

8215. RESEARCH IN ORTHODONTICS. (185078) (Cr ar; prereq #) Staff

8219. TOPICS IN ORTHODONTICS. (985079) (Cr ar; prereq #) Staff  
Studies in special topics for advanced students.

### SECOND TERM

5004. CLINICAL ORTHODONTICS. (887021) (Cr ar; prereq #) Staff  
See First Term.

8203. GROWTH AND DEVELOPMENT. (687022) (Cr ar; prereq #) Staff  
See First Term.

8207. DIAGNOSIS AND TREATMENT PLANNING. (487023) (Cr ar; prereq #) Staff  
See First Term.

8211. ORTHODONTIC SEMINAR. (287024) (Cr ar; prereq #) Staff  
See First Term.

8215. RESEARCH IN ORTHODONTICS. (187025) (Cr ar; prereq #) Staff  
See First Term.

8219. TOPICS IN ORTHODONTICS. (987026) (Cr ar; prereq #) Staff  
See First Term.

## Orthopaedic Surgery (OrSu)

Bridge Area, 5th floor Boynton Health Service.  
373-8452  
Medical School

### SPECIAL TERMS: THREE- AND SIX-WEEK COURSES

#### Elective Courses for Undergraduate Students

5180. ORTHOPAEDICS I. (585554) (Cr ar; prereq regis med)

5185. ORTHOPAEDICS II. (385555) (Cr ar; prereq regis med)

5186. RESEARCH PROBLEMS IN ORTHOPAEDIC SURGERY. (885558) (Cr ar; prereq regis med)

5187. EXTERNSHIP IN ORTHOPAEDIC SURGERY AND FRACTURES. (685559) (Cr ar; prereq regis med)  
St. Paul-Ramsey Medical Center.

5188. EXTERNSHIP IN ORTHOPAEDIC SURGERY AND FRACTURES. (685562) (Cr ar; prereq regis med)  
Gillette Children's Hospital, St. Paul.

5190. EXTERNSHIP IN ORTHOPAEDIC SURGERY AND FRACTURES. (285564) (Cr ar; prereq regis med)  
Veterans Hospital.

5191. ORTHOPAEDIC EXTERNSHIP AT HENNEPIN COUNTY MEDICAL CENTER. (985566) (Cr ar; prereq regis med)

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register Once in Term I)

#### Required Courses for Graduate Students

8401. ORTHOPAEDIC CONFERENCE. (785567) (3 cr) Thompson, Bradford, House, Premer, Robinson, Hunter, Craig, Ogilvie  
Review of X-ray films and case histories of patients on the orthopaedic inpatient or outpatient service.

8403. FRACTURES. (585571) (5 cr) Gustilo, staff  
Orthopaedic fellow acts as house surgeon on the fracture service at Hennepin County Medical Center.

8404. FRACTURES. (385572) (5 cr) Comfort, staff  
Orthopaedic fellow acts as house surgeon on the fracture service at St. Paul-Ramsey Medical Center.

8405. ORTHOPAEDIC DIAGNOSIS. (085574) (3 cr) Thompson, Bradford, House, Robinson, Hunter, Craig, Ogilvie, Arendt  
Orthopaedic fellow assists in instruction of medical students and interns and studies problems in diagnosis in the Outpatient Department and in the University Hospitals.

8407. PEDIATRIC ORTHOPAEDICS. (685576) (5 cr) Vanden Brink, staff  
Orthopaedic fellow acts as house surgeon at Gillette Children's Hospital.

8408. ORTHOPAEDIC PROBLEMS AND MANAGEMENT. (485577) (5 cr) Thompson, Bradford, House, Premer, Robinson, Hunter, Craig, Ogilvie, Arendt  
Orthopaedic fellow acts as house surgeon at University and Veterans Hospitals.

8409. ORTHOPAEDIC PROBLEMS AND MANAGEMENT. (485580) (5 cr) Winter, Lonstein  
Orthopaedic fellow acts as house surgeon on the orthopaedic service at Fairview Hospital.

8410. ORTHOPAEDIC PATHOLOGY. (985583) (2 cr) Thompson, Bradford, House, Premer, Robinson, Hunter, Craig, Ogilvie, Arendt  
Seminar for systematic review of pathology of ossified tissues and soft tissues of the extremities.

8411. ORTHOPAEDIC OPERATIVE SURGERY. (185587) (5 cr) Thompson, Bradford, House, Premer, Robinson, Hunter, Craig, Ogilvie, Arendt  
Orthopaedic fellow acts as first assistant at operations at University and affiliated hospitals and later may be permitted to operate.

8412. ORTHOPAEDIC ANATOMY. (085591) (2 cr) House  
Orthopaedic fellow dissects upper and lower extremities and aids in instruction of medical students in anatomy of the extremities.

8416. ORTHOPAEDIC RESEARCH. (685593) (5 cr) Thompson, Bradford, House, Robinson, Hunter, Craig, Ogilvie, Arendt  
Problems in experimental or clinical surgery, University Hospitals.

## Otolaryngology (Otol)

8-240 Phillips-Wangensteen Building. 373-8846  
Medical School

### SPECIAL TERMS: THREE-, SIX-, AND TWELVE-WEEK COURSES

5500. GENERAL—ENT ELECTIVE. (585599) (4.5 cr)

5501. ACTING INTERNSHIP—ENT ELECTIVE. (285600) (9 cr)

5503. RESEARCH: BASIC SCIENCE—ENT ELECTIVE. (185601) (9 or 18 cr)

### SPECIAL TERM: EIGHT-WEEK COURSES

8220. RESEARCH. (985602) (18 cr)

8230. CLINICAL OTORHINOLARYNGOLOGY. (585604) (6 cr)

8231. SURGERY OF EAR, NOSE, THROAT. (185606) (4 cr)

8232. MAXILLOFACIAL SURGERY. (085607) (1 cr)

8233. PLASTIC, RECONSTRUCTIVE SURGERY: HEAD, NECK. (885608) (1 cr)

8234. ANATOMY: HEAD, NECK, TEMPORAL BONE DISSECTION. (685609) (2 cr)

8235. ROENTGENOLOGY OF HEAD, NECK. (885611) (2 cr)

8236. PHARMACOLOGY. (685612) (2 cr)

8237. ENDOSCOPY. (485613) (2 cr)

8238. PATHOLOGY OF EAR, NOSE, THROAT. (285614) (2 cr)

8239. OTONEUROLOGY. (985616) (2 cr)

8240. ALLERGY. (785617) (2 cr)

8241. TUMOR CLINIC. (385619) (1 cr)

8242. AUDIOLOGY AND SPEECH PATHOLOGY. (785620) (2 cr)

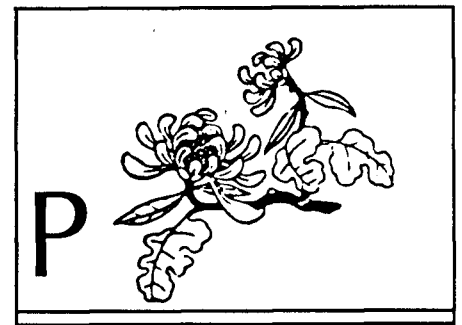
8243. INTRODUCTION: RESEARCH METHODOLOGY. (385622) (2 cr)

8244. SEMINAR: CURRENT LITERATURE. (185623) (1 cr)

8245. MASTER'S THESIS RESEARCH. (885625) (Cr ar)

8246. PH.D. THESIS RESEARCH. (485627) (Cr ar)

8248. READINGS IN AUDITORY (AUDIOLOGY) PHYSIOLOGY. (285628) (Cr ar)



## Pathobiology (Path)

D-242 Mayo. 373-8623  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

#### Courses for Graduate Program

5101. PATHOLOGY. (Cr ar; prereq pathobiology grad student or Δ; lect 0915-1000 MTTf; MoosT 2650) Staff

Lab 1, (987933) 1015-1200 MTh, MoosT 3331, 3337, 3343, 3349

Lab 2, (787934) 1315-1500 MTh, MoosT 3331, 3337, 3343, 3349

5104. AUTOPSIES. (485630) (Cr ar; prereq regis grad med or #) Staff

5113. **SURGICAL PATHOLOGY.** (185632) (Cr ar; prereq regis grad med or #) Dehner

5140. **SEMINAR: EXPERIMENTAL CHRONOBIOLOGY.** (585635) (1 cr; prereq #) Halberg

5141. **PROBLEMS IN EXPERIMENTAL AND CLINICAL CHRONOBIOLOGY.** (185637) (Cr ar; prereq #) Halberg

5169. **RESEARCH: HUMAN GENETICS.** (085638) (Cr ar; prereq #) Eaton

5170. **ADVANCED PROBLEMS IN MEDICAL GENETICS.** (885639) (Cr ar; prereq #) Eaton, staff

8201. **RESEARCH.** (185640) (Cr ar; prereq #) Benson, staff  
Students with the necessary preliminary training may elect research either as a major or minor in pathobiology.

8207. **RESEARCH IN EXPERIMENTAL AND CLINICAL CHRONOBIOLOGY.** (085641) (Cr ar; prereq #) Halberg

8273. **ADVANCED IMMUNOBIOLOGY.** (885642) (6 cr; prereq #) Kersey or Azar

## Pediatric Dentistry (Pedo)

6-150 Moos Tower. 373-0301  
School of Dentistry

### FIRST TERM

5414. **ADVANCED CLINICAL PEDODONTICS.** (285080) (Cr ar; prereq #) Feigal, others  
Assignment of patients for treatment of difficult or unusual pedodontic problems under direct faculty supervision.

8001. **RESEARCH IN PEDIATRIC DENTISTRY.** (185081) (Cr ar; prereq #) Messer, others

8290. **HOSPITAL PEDODONTICS I.** (985082) (Cr ar; prereq #) Walker, others  
Diagnosis and treatment of difficult and unusual problems in children with various handicapping conditions in the Children's Physical Medicine and Rehabilitation Center under direct faculty supervision. Includes pre-op and post-op discussion of faculty-supervised general anesthetic cases and seminar discussion of operating room techniques and procedures, pharmaceutical adjuncts for dental procedures.

8291. **HOSPITAL PEDODONTICS II.** (785083) (Cr ar; prereq #) Till, others  
Diagnosis and treatment of pedodontic problems under direct faculty supervision at Hennepin County Medical Center. Includes participation on a rotation basis in seminars in pediatrics and anesthesia conducted by staff. Pre-op and post-op seminar discussion and evaluation of treatment plans.

8294. **PEDODONTIC DIAGNOSIS AND TREATMENT PLANNING.** (585084) (Cr ar; prereq #) Feigal, others  
Systematic approach to diagnosis and treatment planning for various pedodontic problems.

### SECOND TERM

5414. **ADVANCED CLINICAL PEDODONTICS.** (587028) (Cr ar; prereq #) Feigal, others  
See First Term.

8001. **RESEARCH IN PEDIATRIC DENTISTRY.** (387029) (Cr ar; prereq #) Messer, others

8290. **HOSPITAL PEDODONTICS I.** (587031) (Cr ar; prereq #) Walker, others  
See First Term.

8291. **HOSPITAL PEDODONTICS II.** (387032) (Cr ar; prereq #) Till, others  
See First Term.

8293. **ADVANCED PEDODONTIC TECHNIQUES.** (187033) (Cr ar; prereq #) Feigal, others  
Description and exercises in advanced pedodontic skills and techniques.

8295. **INDEPENDENT PEDODONTIC STUDY.** (887035) (Cr ar; prereq #) Till, others  
Review of pertinent literature and preparation of a position paper on an assigned topic.

8298. **INTERDISCIPLINARY CARE OF THE CLEFT PALATE PATIENT.** (286603) (1 cr; prereq #) Moller  
Comprehensive surgical, dental, and speech and hearing evaluation and management of patients with cleft lip and palate.

## Pediatrics (Ped)

13-112 Phillips-Wangensteen Building. 373-8114  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

#### Elective Courses

5501. **PEDIATRIC CLERKSHIP (University Hospitals, Hennepin County Medical Center, St. Paul-Ramsey Medical Center, St. Paul Children's Hospital; may also be taken with a private pediatric (must register for 5503, to be arranged with course director) practitioner.** (685643) (Cr ar) Satran

5503. **PEDIATRIC CLERKSHIP WITH PRIVATE PEDIATRIC PRACTITIONER.** (889092) (Cr ar) Satran

5504. **PEDIATRIC CLINICAL ASPECTS OF PEDIATRIC PSYCHOLOGY (University Hospitals).** (188773) (Cr ar) Chang

5512. **PEDIATRIC ACTING INTERNSHIP.** (285645) (Cr ar) Satran

5515. **CHILD DEVELOPMENT AT ST PAUL-RAMSEY MEDICAL CENTER.** (185646) (Cr ar) Davis

5520. **PEDIATRIC OUTPATIENT.** (985647) (Cr ar; prereq #) Satran

5523. **OUTPATIENT EXTERNSHIP AT COMMUNITY UNIVERSITY HEALTH CARE CENTER.** (585649) (Cr ar; prereq 5501, 5503, 5512, Med 5502) Smelker

5534. **PEDIATRIC CARDIOLOGY AT UNIVERSITY HOSPITALS.** (785651) (Cr ar; prereq 5501, 5503, 5512, Med 5502) Moller

5535. **INFECTIOUS DISEASE.** (185654) (Cr ar; prereq 5501, 5503, 5512, Med 5502) Ferrieri

5536. **PEDIATRIC HEMATOLOGY-ONCOLOGY AT UNIVERSITY HOSPITALS.** (085655) (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Nesbit

5537. **PEDIATRIC ENDOCRINOLOGY AND METABOLISM (University Hospitals).** (288772) (Cr ar) Ulstrom

5538. **PEDIATRIC GASTROENTEROLOGY.** (685657) (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Sharp

5539. **NEONATAL MEDICINE EXTERNSHIP.** (485658) (Cr ar; prereq 5501, 5502 or Med 5502) Boros or Thompson

5540. **PEDIATRIC NEUROLOGY.** (285659) (Cr ar) Swaiman

5543. **PEDIATRIC NEPHROLOGY.** (685660) (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Michael

5544. **PULMONARY DISEASE IN PEDIATRICS.** (485661) (Cr ar; prereq 5501, 5503, 5512 or Med 5502) Warwick

5548. **PEDIATRIC GENETICS.** (285662) (9 cr; prereq 5501, 5503, 5512 or Med 5502) Pierpont

5553. **ADOLESCENT MEDICINE (University Hospitals).** (189664) (9 cr) Blum

5555. **NEONATAL CLERKSHIP (St. Joseph's Hospital, Marshfield, WI).** (989665) (Cr ar) Opitz

5556. **CLINICAL PEDIATRICS CLERKSHIP (Marshfield Clinic, WI).** (789666) (Cr ar) Blau

5560. **RESEARCH/SPECIAL PROBLEMS IN PEDIATRICS.** (988189) (Ar cr; prereq regis med) (S-N only)

8200. **GRADUATE SEMINAR: PEDIATRICS.** (985664) (1.5 cr) Staff

8202. **PEDIATRICS CLINICS.** (585666) (Cr ar; prereq #) Staff

8204. **RESIDENCY IN PEDIATRICS.** (185668) (Cr ar; prereq #) Staff

8206. **PEDIATRIC SPECIAL INTEREST.** (385670) (Cr ar; for grad students who have completed at least 11.2 yrs of general grad pediatric training; prereq #) Staff

8208. **PEDIATRIC RESEARCH.** (085672) (Cr ar; prereq #) Krvit, staff

## Periodontics (Pero)

7-368 Moos Tower. 373-9757  
School of Dentistry

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

8000. **ADVANCED CLINICAL PERIODONTOLOGY.** (385085) (Cr ar) Pihstrom  
Practical work in clinic in examination, diagnosis, treatment planning, and various phases of treatment of patients with periodontal disease.

8100. **RESEARCH IN PERIODONTOLOGY.** (185086) (Cr ar) Bandt, Herzberg  
Opportunity to take part in many phases of laboratory work under way in periodontal research.

8200. **LECTURES IN PERIODONTOLOGY.** (085087) (Cr ar) Pihstrom  
Tissues involved in periodontal disease. Etiology and treatment of periodontal disease.

8300. **SEMINAR: PERIODONTOLOGY.** (885088) (Cr ar) Pihstrom  
Basic structural components of the periodontium as well as fundamental periodontal treatment procedures. The epithelial attachment, periodontal ligament, cementum, alveolar bone, and periodontal pathology. Oral hygiene and scaling and root planing. Literature reviews are required of each student. Second-year students present case reports.

## Pharmaceutics (Phm)

9-104 Health Sciences Unit F. 373-2197  
College of Pharmacy

### FIRST TERM

8200. **RESEARCH PROBLEMS.** (189230) (cr ar; prereq #)

## Pharmaceutics, Undergraduate (Phmc)

Student Affairs Office,  
5-110 Health Sciences Unit F. 373-7997  
College of Pharmacy

### FIRST TERM

5970. **DIRECTED STUDIES.** (286617) (1-5 cr; prereq #)

5999. **SPECIAL PROBLEMS.** (286620) (Cr and hrs ar; prereq #)

### SECOND TERM

5970. **DIRECTED STUDIES.** (586624) (1-5 cr; prereq #)

5999. **SPECIAL PROBLEMS.** (086627) (Cr and hrs ar; prereq #)

## Pharmacology (Phcl)

3260 Millard Hall, 373-3085  
Medical School

### FIRST TERM

5109. **PROBLEMS IN PHARMACOLOGY.** (685674) (Cr and hrs ar; prereq #) Shideman, staff

8203. **RESEARCH IN PHARMACOLOGY.** (988774) (Cr and hrs ar; prereq #) Shideman, staff

### SECOND TERM

5109. **PROBLEMS IN PHARMACOLOGY.** (687070) (Cr and hrs ar; prereq #) Shideman, staff

8203. **RESEARCH IN PHARMACOLOGY.** (788775) (Cr and hrs ar; prereq #) Shideman, staff

## Pharmacy Practice (Phar)

Student Affairs Office,  
5-110 Health Sciences Unit F. 373-7997  
College of Pharmacy

### FIRST TERM

**5290. SPECIALTY CLERKSHIPS.** (189235) (Cr ar) Cipolle  
Practice experience with specialized populations.

**5970. DIRECTED STUDIES.** (289226) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (189227) (Cr ar; prereq #)

### SPECIAL TERM: JUNE 23-SEPTEMBER 12

**5391. PHARM.D. COMMUNITY EXTERNSHIP.** (686629) (4-8 cr; prereq Pharm.D. III student; S-N only) Cooper

**5393. PHARM.D. HOSPITAL EXTERNSHIP.** (086630) (4-8 cr; prereq Pharm.D. III student; S-N only) Cooper

**5550. PHARMACY PRACTICE CLERKSHIP: ACUTE CARE.** (886631) (4-12 cr; prereq Pharm.D. IV student; S-N only)

**5551. PHARMACY PRACTICE CLERKSHIP: CLINICAL PHARMACOKINETICS.** (686632) (4 cr; prereq Pharm.D. IV student; S-N only)

**5552. PHARMACY PRACTICE CLERKSHIP: PEDIATRICS.** (486633) (4 cr; prereq Pharm.D. IV student; S-N only)

**5553. PHARMACY PRACTICE CLERKSHIP: CLINICAL ELECTIVE.** (286634) (4-12 cr; prereq Pharm.D. IV student; S-N only)

**5554. PHARMACY PRACTICE CLERKSHIP: SPECIAL PROJECTS.** (186635) (4-12 cr; prereq Pharm.D. IV student; S-N only)

### SECOND TERM

**5290. SPECIALTY CLERKSHIPS.** (389234) (Cr ar) Cipolle  
See First Term.

**5970. DIRECTED STUDIES.** (089222) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (889223) (Cr ar; prereq #)

## Philosophy (Phil)

355 Ford Hall. 373-3612  
College of Liberal Arts

### FIRST TERM

**1001. LOGIC.** (490200) (5 cr; 0905-0955 MTWThF; MurH 308) Dahl  
Application of formal techniques for evaluating arguments.

**1003. INTRODUCTION TO ETHICS.** (691121) (5 cr; 1010-1100 MTWThF; FordH 120) Doian  
Problems that arise when human beings attempt to think systematically about conduct and value.

**3001. GENERAL HISTORY OF WESTERN PHILOSOPHY.** (491122) (5 cr; 1010-1205 TWTh; BlegH 335) Hopkins  
Greek philosophy, pre-Socratics, Socrates, Plato, Aristotle.

**3201. SYMBOLIC LOGIC I.** (787948) (5 cr, \$5201; 0905-0955 MTWThF; FordH 150) Hanson  
Development of a formalized language. Syntax and semantics of sentential and first order predicate logic, deductive systems. Meets with 5201.

**3970. DIRECTED STUDIES.** (290201) (1-5 cr; prereq #, Δ, □) Staff

**5201. SYMBOLIC LOGIC I.** (587949) (5 cr, \$3201; 0905-0955 MTWThF; FordH 150) Hanson  
Development of a formalized language. Syntax and semantics of sentential and first order predicate logic, deductive systems. Meets with 3201.

**5970. DIRECTED STUDIES.** (990203) (1-5 cr; prereq #, Δ, □, CLA approval) Staff

**8970. DIRECTED STUDY AND RESEARCH.** (390206) (1-4 cr; prereq passed written prelim exam for the PhD in philosophy) Staff

### SECOND TERM

**1001. LOGIC.** (885446) (5 cr; 1010-1100 MTWThF; FordH 120) Lewis  
See First Term.

**1002. INTRODUCTION TO PHILOSOPHY.** (886130) (5 cr; 1010-1205 TWTh; ScottH 4) Root  
Problems, principal methods, and schools of philosophy; historical and contemporary views.

**3003. GENERAL HISTORY OF WESTERN PHILOSOPHY.** (291123) (5 cr; 1115-1310 TWTh; FordH 150) Gunderson  
Modern philosophy from Descartes through Hume.

**3302. MORAL PROBLEMS OF CONTEMPORARY SOCIETY.** (287945) (5 cr; 0905-1100 TWTh; BlegH 330) Hopkins  
Analyses of selected moral problems of current interest.

**3970. DIRECTED STUDIES.** (585456) (1-5 cr; prereq #, Δ, □) Staff

**5970. DIRECTED STUDIES.** (385457) (1-5 cr; prereq #, Δ, CLA approval) Staff

**8970. DIRECTED STUDY AND RESEARCH.** (085459) (1-4 cr; prereq passed written prelim exam for the PhD in philosophy) Staff

## Physical Education (PE)

224 Cooke Hall. 373-4637  
College of Education

Students interested in meeting a college requirement for physical education or in taking activity courses for elective credit may register for PE 1007, 1014, 1015, 1032, 1038, 1044, 1047, 1048, 1050, 1073, 1107, 1138, 1205.

### Professional Physical Education—

Courses are offered at the undergraduate and graduate levels in physical education. Many of these courses apply toward the licensure requirements for teaching physical education in the state of Minnesota. Courses are also offered that will apply toward the athletic coaching licensure requirements. Courses applicable toward requirements in the various programs that are offered this summer include the following:

1. An Advanced Degree in Physical Education—PE 5122, 5130, 5134, 5136, 5140, 5152, 5160, 5620, 5720, 5740, 5980, 5981, 5983, 8980, 8981
2. Undergraduate Major in Physical Education—PE 3110, 3111, 3115
3. State of Minnesota Coaching License—PE 3110, 3111, 3115, 3143, 5620
4. State of Minnesota Developmental/Adapted Physical Education License—PE 5130, 5152, 5980, 5981

**Elementary School Majors—PE 3327** is offered to accommodate elementary education majors and classroom teachers.

All activity courses listed below are high intensity (participation requiring a high level of energy expenditure) except those otherwise indicated. It is therefore recommended that students who have questions about their ability to participate safely in the physical activities involved in a course seek advice from a physician.

### PHYSICAL ACTIVITY PROGRAM COURSES (PE)

(Open to all students)

### FIRST TERM

**R 1007. SWIMMING.** (1 cr; each section limited to 22 students)  
Course for nonswimmers includes aquatic breathing, floating, bobbing, treading, finning, human stroke, elementary backstroke, sidestroke, front crawl.

Sec 1, (490004) 0905-0955 MTWTh, NorrisH 58  
Sec 2, (891389) 1010-1100 MTWTh, NorrisH 58

**R 1014. CONDITIONING.** (1 cr; each section limited to 40 students)

Improvement of physical fitness and general appearance through the use of running, circuit training, and progressive exercises of various types.

Sec 1, (290019) 0800-0850 MTWTh, StadS 264, FieldHse/Stadium  
Sec 2, (690020) 1115-1205 MTWTh, StadS 264, FieldHse/Stadium

**R 1015. WEIGHT TRAINING.** (290005) (1 cr; limited to 30 students; 0905-0955 MTWTh; StadN 202)  
Emphasizes the fundamentals of weight training including skills, techniques, individualized exercise prescription, and theory.

**R 1032. BADMINTON.** (886161) (1 cr; limited to 24 students; 0800-0850 MTWTh; CookeH 325)  
Fundamental skills, rules, etiquette, and strategy for both singles and doubles.

**R 1038. TENNIS.** (1 cr; each section limited to 28 students)  
Includes fundamental strokes such as service, forehand and backhand, drives and volley; court positions and strategy for singles and doubles; rules, terminology, and etiquette.

Sec 1, (490021) 0800-0850 MTWTh, BFAB 101, Tennis Courts  
Sec 2, (290022) 1010-1100 MTWTh, BFAB 101, Tennis Courts  
Sec 3, (190023) 1115-1205 MTWTh, BFAB 101, Tennis Courts

**R 1047. ARCHERY.** (191390) (1 cr; moderate intensity; limited to 25 students; 1220-1310 MTWTh; NorrisH 60)  
Instruction in fundamentals; history, safety, formal and informal tournaments and competition.

**R 1048. BOWLING.** (486163) (1 cr; moderate intensity; limited to 32 students; 0800-0850 MTWTh; CMU B55)  
For the beginning student. Fundamentals of stance, approach, and delivery; scoring; terminology; etiquette.

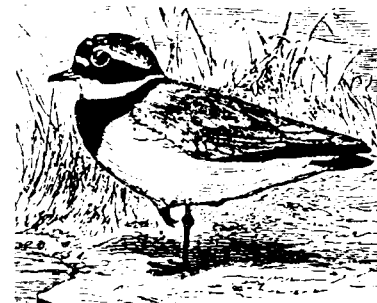
**R 1050. GOLF.** (1 cr; moderate intensity; each section limited to 24 students)  
Emphasizes fundamentals of grip, stance, and swing in addition to etiquette and rules.

Sec 1, (590026) 0905-0955 MTWTh, StadS 267, Golf Course  
Sec 2, (190028) 1010-1100 MTWTh, StadS 267, Golf Course

**R 1073. SOFTBALL.** (091391) (1 cr; limited to 40 students; 1115-1205 MTWTh; Field House, BFAB Field)  
Fundamental skills and tactics; throwing, catching, batting, running, basic conditioning, and game play.

**R 1138. TENNIS.** (1 cr; prereq 1038 or equiv; each section limited to 28 students)  
Improvement of basic skills, increased emphasis on single and doubles strategy and competitive play.

Sec 1, (691393) 0905-0955 MTWTh, BFAB 101, Tennis Courts  
Sec 2, (491394) 1220-1310 MTWTh, BFAB 101, Tennis Courts



## PROFESSIONAL COURSES (PE)

### FIRST TERM

**3110. HUMAN ANATOMY.** (990007) (3 cr; 0905-0955 MTWThF; CookeH 214; A-N only) Serfass  
Emphasizes bones, nerves, and muscles and their significance in physical education.

**3111. MECHANICS OF MOVEMENT.** (291395) (3 cr; prereq Anat 1027; 1010-1100 MTWThF; CookeH 206; A-N only) Whitney  
Structure of the body; principles and mechanics of bodily movements.

**R3327. TEACHING PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL.** (588776) (3 cr; prereq elem education major; limited to 35 students; 0800-0850 MTWThF; NorrisH M153, M153A; A-N only) Lampe  
Overview of the elementary school physical education program; primarily a laboratory course, with participation in representative physical education activities for children; opportunities for observation of children, microteaching, skill analysis, and group discussion.

**3625. SUPERVISED PRACTICAL EXPERIENCE.** (388178) (1-6 cr [max 6 cr]; prereq  $\Delta$ ; S-N only) Stoner  
On-the-job experience under a specialist in the particular area of study.

**5122. APPLIED PHYSIOLOGY.** (191396) (3 cr; prereq PubH 3386 or Phsl 3051 or equiv; 1115-1205 MTWThF; CookeH 214; A-N only) Serfass  
Application of concepts in human physiology to exercise physiology, sports training, and physical activities, with particular reference to respiratory and cardiovascular systems.

**5152. CURRICULUM DEVELOPMENT.** (587983) (3 cr; prereq 5151 or equiv; 0905-0955 MTWThF; CookeH 206; A-N only) Young  
Trends, issues, and problems at selected levels of interest; elementary, secondary, junior college; for experienced teachers.

**5160. EVALUATION IN PHYSICAL EDUCATION.** (786167) (3 cr; prereq 3150 or equiv; 0800-0850 MTWThF; CookeH 215; A-N only) Shick  
General principles and techniques of evaluation.

**5620. PRACTICUM: PREVENTION AND CARE OF ATHLETIC INJURIES—June 23-July 3.** (790008) (3 cr; A-N only; prereq Anat 1027 or equiv; 1330-1600 MTWThF; BFAB 144) Locy  
An overview of problems (recognition, principles, and responsibilities) related to athletic injuries in secondary and college programs; demonstration and practice in training techniques and familiarity with the use of instruments for athletic rehabilitation.

**5720. TOPICS IN PHYSICAL EDUCATION: Technology Applied to Sport and Physical Education—July 7-18.** (586168) (1-12 cr [max 12 cr]; prereq #; 1300-1630 MTWThF; CookeH 215; A-N only) Stoner  
Current issues related to physical education and sport. This offering for 3 credits.

**5740. WORKSHOP: COACHING OF INDIVIDUAL, DUAL, OR TEAM SPORTS (Basketball)—June 16-20.** (386169) (1-12 cr [max 12 cr]; 1230-1630 MTWThF; CookeH 214, A-N only) Queen  
Instruction at the advanced level including analyses of skills, game strategies, techniques of coaching, and methods of training and conditioning. This offering for 3 credits.

**5980. RESEARCH METHODOLOGY.** (590009) (3 cr,  $\S$ H1th 5980; prereq education or graduate student; 1010-1100 MTWThF; CookeH 214; A-N only) Shick  
Methods and design for research in health, physical education, and recreation.

**5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #; A-N only)  
Focus on teaching of physical education.

Sec 21, (990010) Serfass  
S.c 22, (790011) Shick  
Sec 23, (590012) Stoner  
Sec 24, (991397) Young

**5983. READINGS: PHYSICAL EDUCATION.** (Cr ar [max 9 cr]; prereq education or graduate student; A-N only)  
Independent study under tutorial guidance.

Sec 21, (390013) Serfass  
Sec 22, (190014) Shick  
Sec 23, (090015) Stoner  
Sec 24, (791398) Young

# Physical Education workshops and short courses

**Prevention and Care of Athletic Injuries (PE 5620)** is offered June 23-July 3 as a concentrated two-week practicum. Instructor for the course is Doug Locy, assistant athletic trainer, University of Minnesota.

**Coaching Individual, Dual, or Team Sports: Basketball (PE 5740)** is a five-day (June 16-20) concentrated workshop on coaching basketball. Instructor for the course is Tony Queen, boys' basketball coach at Minneapolis North High School. The course offers both practical and theoretical instruction in the techniques of coaching basketball. A written assignment and a final examination are required.

**Technology Applied to Physical Education and Sport (PE 5720)** is a two-week (July 7-18) concentrated topics course on the application of technology to the teaching and conduct of physical education and sport. Professor Lela June Stoner is the instructor for the course. Audio-visual, computer, and equipment technology are features of the course.

**Nutrition and Exercise (PE 5720)** is a two-week concentrated second term workshop (July 21-August 1) taught jointly with Home Economics Education (HEEd 5001). Instructors Allen S. Levine, adjunct associate professor of Food Science and Nutrition and Robert C. Serfass, associate professor of Physical Education will cover application of basic nutrition to exercise, athletics, diet, and weight control. The course is designed for athletic coaches, teachers, health professionals, and others interested in the relationship between nutrition and exercise. Specific topics include the energy foods, vitamins, minerals, water, energy requirements of exercise, exercise and weight control, and ergogenic aids.

**8961. RESEARCH PROBLEMS.** (Cr and hrs ar; prereq 8980 or #; S-N only)  
Individual problems.

Sec 21, (890016) Serfass  
Sec 22, (690017) Shick  
Sec 23, (490018) Stoner  
Sec 24, (591399) Young

## PHYSICAL ACTIVITY PROGRAM COURSES (PE)

(Open to all students)

### SECOND TERM

**R1007. SWIMMING.** (685027) (1 cr; limited to 22 students; 0800-0850 MTWTh, Norris 58)  
See First Term.

**R1014. CONDITIONING.** (286178) (1 cr; limited to 40 students; 1115-1205 MTWTh, StadS 264, Northrop Field, FieldHse)  
See First Term.

**R1015. WEIGHT TRAINING.** (485028) (1 cr; limited to 30 students; 0905-0955 MTWTh; StadN 202)  
See First Term.

**R1038. TENNIS.** (1 cr; each section limited to 28 students)  
See First Term.

Sec 1, (285029) 0800-0850 MTWTh, BFAB 101, Tennis Courts  
Sec 2, (685030) 0905-0955 MTWTh, BFAB 101, Tennis Courts  
Sec 3, (485031) 1010-1100 MTWTh, BFAB 101, Tennis Courts

**R1044. SELF-DEFENSE—July 28-August 22.** (491413) (1 cr; limited to 40 students; 0905-0955 MTWThF; NorrisH 153, 153A) Brandl, Bendickson  
Fundamental skills; development of basic skills, techniques, and values to be derived from active participation in physical activity.

**R1050. GOLF.** (1 cr; moderate intensity; each section limited to 24 students) Larson  
See First Term.

Sec 1, (186182), 0905-0955 MTWTh, StadS 267, Golf Course  
Sec 2, (986183), 1010-1100 MTWTh, StadS 267, Golf Course

**R1107. SWIMMING.** (291414) (1 cr; limited to 22 students; prereq 1007 or equiv; 0905-0955 MTWTh; NorrisH 58)  
Deep water skills, elementary backstroke, side stroke, front crawl, elementary diving, and distance swimming.

**R1138. TENNIS.** (191415) (1 cr; limited to 28 students; prereq 1038 or equiv; 1115-1205 MTWTh; BFAB 101, Tennis Courts)  
See First Term.

**R1205. SCUBA AND SKIN DIVING.** (791417) (1 cr; limited to 18 students; prereq 1107 or equiv; 0800-0955 TTh; CookeH 15) Whortenburg  
Initial course, University of Minnesota card of certification will be issued to those who successfully complete the course.

## PROFESSIONAL COURSES (PE)

### SECOND TERM

**R3115. PHYSIOLOGICAL APPLICATION TO SPORTS—July 21-August 8.** (388777) (3 cr,  $\S$ PubH 3385, 3386 or PE 3385, 3386; limited to 40 students; prereq Phsl 3051 or #: 0800-0955

MTWThF; CookeH 206; A-N only) Alexander  
Muscular contraction for strength development programs;  
contributions of training programs to endurance, speed, and skill  
acquisition; influence of training on the cardiovascular system,  
fatigue, and recovery; early season training, pregame meals  
and ergogenic aids in athletics. Required for Minnesota  
Coaching endorsement.

**3143. ORGANIZATION AND MANAGEMENT OF SPORT—July 21-August 8.** (391419) (3 cr; prereq 2 cr coaching course; 1115-1300 MTWThF; CookeH 206; A-N only) Krotee  
Principles, policies, and procedures involved in the coaching of interscholastic sports.

**3327. TEACHING PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL.** (391422) (3 cr; prereq elementary education major; 1220-1310 MTWThF; Norrish M153, M153A; A-N only) Plack  
See First Term.

**5130. MOTOR LEARNING AND HUMAN PERFORMANCE.** (191423) (3 cr; prereq 3113 or #; 0800-0955 MTWThF; CookeH 215; A-N only) Plack  
Mechanisms of human motor skill learning; emphasis on theories of motor learning and control of movement, motor memory, and individual differences.

**5136. PSYCHOLOGY OF COACHING.** (886192) (3 cr; prereq 3113 or #; 1010-1100 MTWThF; CookeH 215; A-N only) Krotee  
Psychological aspects of coaching at the elementary, secondary, and college levels.

**#5720. TOPICS IN PHYSICAL EDUCATION: Nutrition and Exercise—July 21-August 1.** (091424) (1-12 cr [max 12 cr]; limited to 30 students; 1300-1600 MTWThF; VoTech R385; A-N only) Serfass, Levine  
Current issues as they relate to physical education and sport. This offering for 3 credits meets with HEEEd 5001.

**5981. PROBLEMS.** (Cr and hrs ar; prereq MEd candidate, #; A-N only)  
See First Term.

Sec 21, (185033) Alexander  
Sec 22, (985034) Krotee  
Sec 23, (785035) Plack

**5983. READINGS: PHYSICAL EDUCATION.** (Cr ar [max 9 cr]; prereq education or graduate student; A-N only)  
See First Term.

Sec 21, (385037) Alexander  
Sec 22, (185038) Krotee  
Sec 23, (085039) Plack

**8980. RESEARCH PROBLEMS.** (088779) (1 cr [max 2 cr]; prereq 5980, PsyF 5110 or EPsy 5260 or #; 1115-1205 TTh; CookeH 214; S-N only) Alexander  
Designing and reporting on individual problems. Required of all M.A. and Ph.D. candidates.

**8981. RESEARCH PROBLEMS.** (Cr and hrs ar; prereq 8980 or #; S-N only)  
See First Term.

Sec 21, (185041) Alexander  
Sec 22, (085042) Krotee  
Sec 23, (885043) Plack

## Physical Medicine and Rehabilitation (PMed)

860 Mayo, 373-8990  
Medical School

### FIRST TERM

**5396, 5397, 5398. FIELDWORK EDUCATION.** (185680) (785682) (486597) (Cr ar; for OT students) Eliason  
Six months of supervised training in affiliated hospitals and community centers.

**8103. PHYSICAL THERAPY CLINIC.** (385684) (Cr ar; prereq physical therapy) Ellingham, Pauley

**8130. CURRENT LITERATURE SEMINAR IN PHYSICAL THERAPY.** (688641) (1 cr; prereq #) Scudder, Amundsen

**8170. SPECIAL TOPICS.** (185663) (1 cr; prereq #) Amundsen, staff

**8185. PROBLEMS IN PHYSICAL THERAPY.** (785665) (Cr ar; prereq physical therapy) Amundsen, staff

**8193. RESEARCH PROBLEMS IN PHYSICAL THERAPY.** (385667) (Cr ar; prereq 8192 or #) Amundsen, Allison

**8195. RESEARCH IN PHYSICAL THERAPY.** (085669) (Cr ar; prereq #) Amundsen, staff

**8200. PHYSICAL MEDICINE SERVICE.** (285676) (Cr and hrs ar) Moret

**8205. READINGS.** (985678) (1 cr; 0900-0955 M; Mayo 825) Kottke

**8206. CONFERENCE ON PHYSICAL MEDICINE AND REHABILITATION.** (189526) (Cr ar; 0800-0900 F) Moret

**8207. BASIC AND APPLIED PHYSIATRY.** (187971) (Cr ar; 0800-0900 M) Staff

**8210. RESEARCH IN PHYSICAL MEDICINE.** (589183) (ar cr)

**8212. ELECTRODIAGNOSIS AND ELECTROMYOGRAPHY.** (389184) (Cr and hrs ar; prereq #) Benninghoff

**8214. READINGS IN ELECTROMYOGRAPHY.** (286276) (max 3 cr; prereq #; 9:00-10:00 F) Benninghoff

**8220. SEMINAR IN PHYSICAL MEDICINE AND REHABILITATION.** (089527) (Cr ar; 0800-0900 W) Staff

### SECOND TERM

**5255. CLINICAL TRAINING.** (888640) (3 cr; limited to PT students in the professional program; hrs ar at affiliated hospitals) Ellingham  
Five weeks of supervised practice at affiliated hospitals.

**8103. PHYSICAL THERAPY CLINIC.** (487071) (Cr ar; prereq physical therapy) Ellingham, Pauley

**8130. CURRENT LITERATURE SEMINAR IN PHYSICAL THERAPY.** (488639) (1 cr; prereq #) Scudder, Amundsen

**8170. SPECIAL TOPICS.** (287072) (1 cr; prereq #) Amundsen, staff

**8185. PROBLEMS IN PHYSICAL THERAPY.** (187073) (Cr ar; prereq physical therapy) Amundsen, staff

**8193. RESEARCH PROBLEMS IN PHYSICAL THERAPY.** (987074) (Cr ar; prereq physical therapy) Amundsen, Allison

**8195. RESEARCH IN PHYSICAL THERAPY.** (787075) (Cr ar; prereq #) Amundsen, staff

## Physics (Phys)

148 Physics, 373-5468  
Institute of Technology

### FIRST TERM

**r 1041. INTRODUCTORY PHYSICS.** (788811) (4 cr [no cr for IT students except arch, pre-arch, environmental design], 5 other introductory physics courses; prereq high school algebra and plane geometry; limited to 130 students; 8 class hrs per wk; 0800-0955 MWF, 0800-0850 TTh; Phys 170)

Lectures and problem sessions. Primarily for students interested in topics useful in technical areas. Mechanics, fluids and gases, heat, waves.

**r 1045. INTRODUCTORY PHYSICS LABORATORY.** (588812) (1 cr [no cr for IT students except arch, pre-arch, environmental design]; limited to 114 students; prereq 1041 or 11041; S-N only)  
Laboratory experiments offered in conjunction with 1041. Lab time assigned first two days of class.

**3970. DIRECTED STUDIES.** (989214) (1-5 cr; prereq #,  $\Delta$ )  
Independent directed study in areas arranged by the student and a faculty member.

**5124. EXPERIMENTAL PROJECT.** (786833) (cr ar; prereq 5123, #)

**5940. PHYSICS FOR HIGH SCHOOL TEACHERS: EXPERIMENTAL FOUNDATIONS OF OPTICS—July 7-26.** (391193) (4 cr; [no cr for physics grad students or minors]; prereq general physics, #; may be repeated for credit. Qualified students may register for graduate credit at the University of Minnesota; 0900-1700 MTWThF; offered at Bakken Library.)  
An in-depth examination of a conceptual theme in physics and its experimental foundations. Typical themes are kinematics and dynamics from Aristotle through Einstein; the nature of charge; the nature of light, energy and thermodynamics; electricity, magnetism, and quantized fields; the structure of matter.

**5970. DIRECTED STUDIES.** (689692) (1-5 cr; prereq #,  $\Delta$ )  
Independent, directed study in physics in areas arranged by the student and a faculty member.

**5990. DIRECTED RESEARCH.** (387936) (Cr ar; prereq 3rd yr,  $\Delta$ )  
Problems, experimental or theoretical, of special interest to student. Written reports.

## FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**r 1271. GENERAL PHYSICS.** (690700) (4 cr; prereq Math 1221 or Math 1221 or Math 1521 or Math 1521 or Math 1621 or Math 1621; may be taken with or without lab 1275; limited to 166 students; 0800-0850 MTWThF; Phys 166)  
Calculus-level general physics course. Mechanics.

**r 1275. GENERAL PHYSICS LABORATORY.** (189373) (1 cr; limited to 76 students; prereq 1271 or 1311 or 11271; 2 lab hrs per wk ar; S-N only)  
Laboratory exercises in mechanics. Lab time assigned first two days of class.

**r 1281. GENERAL PHYSICS.** (490701) (4 cr; limited to 100 students; prereq 1271, Math 1231 or Math 1231 or Math 1531 or Math 1531 or Math 1621 or Math 1621; may be taken with or without lab 1285; 1010-1100 MTWThF; Phys 170)  
Calculus-level general physics course. Heat and electricity.

**r 1285. GENERAL PHYSICS LABORATORY.** (989374) (1 cr; limited to 76 students; prereq 1275, 1281 or 1331 or 11281; 2 lab hrs per wk ar; S-N only)  
Laboratory exercises in heat and electricity. Lab time assigned first two days of class.

**r 1291. GENERAL PHYSICS.** (290702) (4 cr; limited to 100 students; prereq 1281; may be taken with or without lab 1295; 1010-1100 MTWThF; Phys 150)  
Calculus-level general physics course. Magnetism and optics.

**r 1295. GENERAL PHYSICS LABORATORY.** (789375) (1 cr; limited to 76 students; prereq 1285, 1291 or 1341 or 11291; 2 lab hrs per wk ar; S-N only)  
Laboratory exercises in magnetism and optics. Lab time assigned first two days of class.

### SECOND TERM

**r 1042. INTRODUCTORY PHYSICS.** (388813) (4 cr [no cr for IT students except arch, pre-arch, environmental design]; limited to 130 students; 5 other introductory physics courses; prereq 1041, high school algebra and plane geometry; 0800-0955 MWF, 0800-0850 TTh; Phys 170)  
Lectures and problem sessions. Primarily for students interested in topics useful in technical areas. Electricity and magnetism, light, optical instruments, atoms and spectra, nuclei, radioactivity.

**r 1046. INTRODUCTORY PHYSICS LABORATORY.** (188814) (1 cr; [no cr for IT students except arch, pre-arch, environmental design]; limited to 114 students; prereq 1042 or 11042; S-N only)  
Laboratory experiments offered in conjunction with 1042. Lab time assigned first two days of class.

**3970. DIRECTED STUDIES.** (789215) (1-5 cr; prereq #,  $\Delta$ )  
See First Term.

**5124. EXPERIMENTAL PROJECT.** (191194) (Cr ar; prereq 5123, #)

**r 5954. PRACTICAL PHYSICS FOR PHYSICS TEACHERS.** (091195) (5 cr [no cr for physics grad students or minors]; limited to 30 students; prereq college level introductory physics; 8 lect hrs and 10 lab hrs per wk; 0905-1100 MTWThF; Phys 166) Jones  
Review of basic principles of physics for secondary teaching. Emphasis on laboratory work with simple inexpensive demonstration/laboratory devices that adapt readily to high school physics classes.

**5970. DIRECTED STUDIES.** (489693) (1-5 cr; prereq #,  $\Delta$ )  
See First Term.

**5990. DIRECTED RESEARCH.** (587935) (Cr ar; prereq 3rd yr,  $\Delta$ )  
See First Term.





## Physiology (Phsl)

6-255 Millard Hall, 373-3320  
Medical School

### FIRST TERM

**3051. HUMAN PHYSIOLOGY.** (185685) (5 cr; primarily for baccalaureate nursing students and physical therapy students; prereq biology and 1 yr college chemistry; 1325-1415 MW, 1115-1205 and 1430-1625 TTh, 1325-1520 F, MoosT 2-530; lab 1430-1730 MW, MoosT 3-110) Staff  
Introduction to human physiology.

**5113. PROBLEMS IN PHYSIOLOGY.** (185671) (Cr and hrs ar) Staff  
Topics assigned for laboratory study; conferences and readings.

**5552. READINGS IN PHYSIOLOGY.** (885673) (Cr and hrs ar) Staff  
Topics selected for each student; written reviews prepared and discussed.

**5553. RESEARCH IN PHYSIOLOGY.** (485675) (Cr and hrs ar) Staff

**8113. PROBLEMS IN PHYSIOLOGY.** (185677) (Cr and hrs ar) Staff  
Topics assigned for laboratory study; conferences and readings.

**8202. READINGS IN PHYSIOLOGY.** (985681) (Cr and hrs ar) Staff  
Topics selected for each student; written reviews prepared and discussed.

**8203. RESEARCH IN PHYSIOLOGY.** (785679) (Cr and hrs ar) Staff

### SECOND TERM

**5552. READINGS IN PHYSIOLOGY.** (587675) (Cr and hrs ar) Staff  
See First Term.

**5553. RESEARCH IN PHYSIOLOGY.** (387676) (Cr and hrs ar) Staff

**8202. READINGS IN PHYSIOLOGY.** (187677) (Cr and hrs ar) Staff  
See First Term.

**8203. RESEARCH IN PHYSIOLOGY.** (087678) (Cr and hrs ar) Staff

## Plant Pathology (PIPa)

304 Stakman Hall, St. Paul, 373-0852  
College of Agriculture

### FIRST TERM

**3090. RESEARCH IN PLANT PATHOLOGY.** (889755) (Cr ar; prereq 3001 or equiv or #); Staff

**8090. ADVANCED PROCEDURES AND RESEARCH IN PLANT PATHOLOGY.** (289839) (Cr ar) Staff  
Special assignment in laboratory and field problems in pathological research.

**8095. ADVANCED PROCEDURES AND RESEARCH IN MYCOLOGY.** (788176) (1-6 cr) E L Stewart  
Special assignment of work in laboratory and field problems in mycological research.

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**5650. CLINICAL PLANT PATHOLOGY.** (191124) (2, 4 or 6 cr; prereq 3001 or 5002 or #; BorH 295) MacDonald, staff  
Field laboratory and clinical experience in Plant Disease Clinic in diagnosis treatment, and control of plant disease of field crops, vegetable crops, turf, ornamentals, and trees.

### SECOND TERM

**3090. RESEARCH IN PLANT PATHOLOGY.** (689756) (Cr ar; prereq 3001 or equiv or #)

**8090. ADVANCED PROCEDURES AND RESEARCH IN PLANT PATHOLOGY.** (991125) (Cr ar) Staff  
See First Term.

**8095. ADVANCED PROCEDURES AND RESEARCH IN MYCOLOGY.** (885933) (1-6 cr) E L Stewart  
See First Term.

## Plant Physiology (PIPh)

220 Biological Science, 373-2221  
College of Agriculture

### FIRST TERM

**5970. SPECIAL PROBLEMS IN PLANT PHYSIOLOGY.** (789702) (Cr ar; prereq  $\Delta$ )

### SECOND TERM

**5970. SPECIAL PROBLEMS IN PLANT PHYSIOLOGY.** (389704) (Cr ar; prereq  $\Delta$ )

## Political Science (Po)

1414 Social Science, 373-2651  
College of Liberal Arts

### FIRST TERM

**1001. AMERICAN GOVERNMENT AND POLITICS.** (090225) (5 cr; 1010-1205 TWTh; BlegH 155) Walcott  
Principles, organization, processes, functions of government, and the interplay of political forces in the United States. Attention throughout to current issues.

**1025. WORLD POLITICS.** (091293) (4 cr; 0905-0955; MTWThF; BlegH 235) Wendt  
Contemporary international relations; forms of state interaction; problem of conflict and cooperation.

**1041. CONTEMPORARY POLITICAL IDEOLOGIES.** (486275) (4 cr; 1115-1205 MTWThF; BlegH 105) Fogelman  
Major modern ideologies such as liberalism, democracy, conservatism, socialism, communism, fascism, nationalism, imperialism, racism. Adequacy of alternative ideologies for analysis and solution of political and social problems.

**3070. DIRECTED FIELD STUDIES.** (589720) (1-4 cr; prereq #,  $\Delta$ )

**3080. INTERNSHIP.** (989245) (4 cr [max 8 cr]; prereq  $\Delta$ ; S-N only)  
Internship with government or community organizations, arranged by the department and awarded competitively.

**3110H. HONORS WORK IN SELECTED FIELDS.** (488141) (3 or 6 cr per term [6 cr max]; open only to political science honors program majors; prereq 3109H)  
Individual research and writing of departmental honors thesis.

**3308. THE UNITED STATES CONGRESS.** (891294) (4 cr; prereq 1001 or equiv or #; 1010-1100; MTWThF; BlegH 115) Backstrom  
Internal organization, committee system, party leadership, norms, recruitment; legislative policymaking; relationship with the president and bureaucracy; interest group, political party, and constituency influences on the congressional process.

**3310. TOPICS IN AMERICAN POLITICS—Politics, Hollywood Style: Images of Politics in the American Film.** (590253) (4 cr; prereq 1001 or equiv or #; 1010-1205 MWF; AndH 210) Shaw  
Analysis and evaluation of the images of American politics in selected, American-made commercial films, which will be viewed in class.

**3810. TOPICS IN INTERNATIONAL POLITICS AND FOREIGN POLICY: NUCLEAR WEAPONS AND NUCLEAR WAR.** (691295) (4 cr;  $\S$ IntR 3105; 1115-1205; MTWThF; BlegH 135) Goldman  
Development of nuclear weapons; policies and doctrines of deployment and use of nuclear weapons; social, economic, political costs of the arms race and use of nuclear weapons; efforts to control the arms race and reduce threats of nuclear war.

**3970. DIRECTED STUDIES.** (789747) (1-6 cr; prereq #,  $\Delta$ ,  $\square$ )

**5478. GOVERNMENT AND POLITICS OF AFRICAN COUNTRIES.** (986278) (4 cr; prereq 3051 or non-political science grad student or #; 1220-1310 MTWThF; BlegH 105) Nimtz  
Political institutions and behavior in sub-Saharan African countries in their social and cultural settings; class and tribal structure; parties and elections; source and nature of ideologies; economic and social policies.

### SECOND TERM

**1001. AMERICAN GOVERNMENT AND POLITICS.** (186280) (5 cr; 0905-0955 MTWThF; BlegH 130) Willoughby  
Principles, organization, processes, functions of government, and the interplay of political forces in the U.S. Attention throughout to current issues.

**1025. WORLD POLITICS.** (986281) (4 cr; 1010-1100 MTWThF; BlegH 135) Duval  
Contemporary international relations; forms of state interaction; problems of conflict and cooperation.

**1054. INTRODUCTION TO COMPARATIVE POLITICS.** (491296) (4 cr; 1220-1310; MTWThF; BlegH 240) Strom  
Politics of democratic, communist, and third world nations; examines the causes and consequences of different forms of political life.

**3051. INTRODUCTION TO POLITICAL ANALYSIS.** (786282) (5 cr; 1010-1100 MTWThF; BlegH 205) Edwards  
Formation of political communities, political participation, policymaking, compliance, legitimacy, political development, types of political systems. Empirical and normative problems. Comparisons among major countries.

**3070. DIRECTED FIELD STUDIES.** (089723) (1-4 cr; prereq #,  $\Delta$ )

**3080. INTERNSHIP.** (589264) (4 cr [max 8 cr]; prereq  $\Delta$ ; S-N only)  
See First Term.

**3110H. HONORS WORK IN SELECTED FIELDS.** (586283) (3 or 6 cr per term [6 cr max]; open only to political science honors program majors; prereq 3109H)  
See First Term.

**3321. ISSUES IN AMERICAN PUBLIC POLICY.** (386284) (4 cr; 0905-0955 MTWThF; BlegH 255) Gray  
Major public policy issues in such areas as social welfare and education; political forces molding policy choices and impact of such choices.

**3477 (formerly 3773). POLITICAL DEVELOPMENT.** (291297) (4 cr; prereq 1054 or 3051 or #; 0905-1100; TWTh; HH Ctr 30) Barnett  
Political processes and problems associated with economic development processes; the political economy of underdevelopment and development; problems of state building and the development of political institutions.

**3970. DIRECTED STUDIES.** (189784) (1-6 cr; prereq #,  $\Delta$ ,  $\square$ )

**5303. THE AMERICAN DEMOCRACY.** (191298) (4 cr; prereq 1001 or equiv or #; 0800-0955; TWTh; BlegH 215) Flanigan  
The American political system, its institutions and processes. Political decision making, influence, and elites. Ideals and reality of democracy in the United States.

**5410. ADVANCED TOPICS IN GOVERNMENT AND POLITICS: Comparative Political Economy.** (186285) (4 cr; prereq 3051 or non-political science graduate student or #; 1010-1205 TWTh; BlegH 235) Freeman  
Analyses of the interrelationships of policy and economy with emphasis on topics of special interest to political scientists, for example the impact of elections on fiscal and monetary policies, and political business cycle and the roles of the public and private sector in promoting and ameliorating the distributional consequences of economic growth.

**5741. POLITICAL BEHAVIOR OF WOMEN.** (991299) (4 cr; prereq 1001 or equiv or 3051 or #; 0905-0955; MTWThF; BlegH 245) Ros Schive  
Women as political actors. Mass political behavior, women's political movement, women in political parties and elective office, the status of women in different societies.

## Portuguese (Port)

34 Folwell Hall. 373-7998  
College of Liberal Arts

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hour of credit, the equivalent of a full year's sequence in language. **Students must enroll** in all three courses and may not enroll in other summer courses. Prospective students should talk to an adviser before registering for intensive language courses.

**1001-1002-1003. BEGINNING PORTUGUESE.** (15 cr for both terms; limited to 25 students; 0800-1100 MTWThF; FolH 305) Emphasis on speaking and understanding Portuguese; pronunciation (Brazilian speech stressed); gradual introduction to writing and reading skills; basic grammar, cultural aspects of language and civilizations of Portuguese-speaking world.

R1001, Sec 5, (790963) June 17-July 9, 5 cr  
R1002, Sec 5, (590964) July 10-July 31, 5 cr  
R1003, Sec 5, (390965) August 1-August 22, 5 cr

## Prosthodontics (Pros)

9-176 Moos Tower. 376-4172  
School of Dentistry

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)

**8001. RESEARCH IN PROSTHODONTICS.** (685089) (Cr ar [may be repeated for cr]) Goodkind Arranged with individual students upon application, after completion of a critical review of current and historical literature pertaining to the problem.

**8006. ADVANCED CLINICAL PROSTHODONTICS II.** (085090) (Cr ar [may be repeated for cr]; prereq #) Goodkind Experience in prosthodontic treatment of patients having systemic complications.

**8034. ADVANCED CLINICAL MAXILLOFACIAL PROSTHETICS.** (885091) (Cr ar) Goodkind Factors involved in diagnosis and organization of a treatment plan for the maxillofacial patient and practical experience in associated clinical and laboratory procedures.

## Psychology (Psy)

N-218 Elliott Hall. 373-4155  
College of Liberal Arts

### FIRST TERM

**1001. INTRODUCTION TO PSYCHOLOGY.** (190398) (5 cr; 0800-0955 MTWThF; AndH 310) Staff Introduction to study of human behavior. Prerequisite for all advanced courses in psychology.

**R 1004. INTRODUCTORY LABORATORY PSYCHOLOGY.** (4 cr; each section limited to 24 students; prereq soph, 1001 or 11001)

Experiments illustrating contemporary subject matter such as sensory psychology, psychophysics, perception, motivation, verbal behavior, animal and human learning, problem solving, and psychological measurement.

Sec 1, (090399) 0905-1205 MF, 0905-1100 W, E1H 150  
Sec 2, (790400) 1325-1625 MF, 1325-1520 W, E1H 150  
Sec 3, (590401) 0905-1205 MF, 0905-1100 W, E1H 160  
Sec 4, (886497) 1325-1625 MF, 1325-1520 W, E1H 160

**1011. CAREER DECISION MAKING.** (686470) (2 cr; cannot be applied toward any CLA degree; 1315-1445 TTh; ChDev 105)

Designed to help CLA students identify their interests, values, and skills in regard to career options. Individual and group projects, investigating possible vocations and learning effective job seeking techniques.

**3011. INTRODUCTION TO PSYCHOLOGY OF LEARNING.** (390402) (4 cr; prereq 1001, 1005 or Biol 1107 or #; 1115-1205 MTWThF; E1H N119) Peterson Basic methods in study of learning. Fundamental concepts and principles governing the learning process.

**3051. INTRODUCTION TO COGNITIVE PSYCHOLOGY.** (191303) (4 cr; prereq 1001 and 1005 or 11005; 1005-1055 MTWThF; E1H N119) Willingham Discussion of the basic research problems and theoretical concepts in the study of cognitive factors in perception and memory.

**3101. INTRODUCTION TO PERSONALITY.** (791305) (4 cr, \$5101; prereq 1001; 0905-0955 MTWThF; E1H N391) Telegen Concepts and issues in personality, personality theory, personality research, and personality assessment.

**3201. INTRODUCTION TO SOCIAL PSYCHOLOGY.** (087972) (4 cr; prereq 1001; 0905-0955 MTWThF; E1H N119) Snyder Theories and research in social psychology. Effects upon the individual's attitudes and behavior of other persons, mass communications, and group membership.

**3902. MAJOR PROJECTS IN PSYCHOLOGY.** (191695) (2 cr; prereq 1001, 1004-5, 3801, jr or sr psychology major or #; hr ar)

**3970. DIRECTED STUDIES.** (190403) (1-8 cr; prereq #, Δ, □) Bouchard Independent reading leading to written paper or oral or written examination.

**3990. DIRECTED RESEARCH.** (688154) (1-8 cr; prereq #, Δ, □) Bouchard Individual empirical research projects leading to written report.

**5014. PSYCHOLOGY OF HUMAN LEARNING AND MEMORY.** (991304) (4 cr; prereq 1005 or 3011 or 3051 or #, except student in honors sequence, grads; 0905-0955 MTWThF; E1H N227) Fox, Edwall Processes and principles in human learning and memory. Feedback, instruction and learning, individual differences in learning, cognitive processes in learning and retention, theories of human memory.

**5201. SOCIAL PSYCHOLOGY.** (489354) (4 cr; prereq 1001, 3201 or honors or grad or #; 1010-1100 MTWThF; E1H N391) Staff Classical and contemporary theories and research in social psychology with emphasis on social influence and group dynamics.

**5202. ATTITUDES AND SOCIAL BEHAVIOR.** (687974) (4 cr; prereq 1001, 3201, or #; 1315-1405 MTWThF; WullH 230) Borgida Survey of attitude theory, measurement and attitude change research in social psychology; focus on structure, function, and formation of attitudes, relationship between attitudes and various social behaviors; attitude change.

**5901H. HONORS PROJECT.** (489094) (1-8 cr; prereq sr, #) Staff Critical literature review or empirical study.

**8519. PRACTICUM IN REHABILITATION COUNSELING.** (090404) (3 cr; prereq 8503 or #; hrs ar) Counseling experience with physically and emotionally disabled clients in approved public and private rehabilitation agencies.

**8520. FIELDWORK IN APPLIED PSYCHOLOGY.** (090405) (1-6 cr; prereq #; hrs ar)

**8580. INTERNSHIP IN COUNSELING PSYCHOLOGY.** (690406) (1-6 cr; prereq #; hrs ar)

**8620. PRACTICUM IN CLINICAL PSYCHOLOGY.** (490407) (1-6 cr; prereq #; hrs ar) Field experience in professional work in clinical settings.

**8670. INTERNSHIP IN CLINICAL PSYCHOLOGY.** (290408) (2-4 cr; prereq PhD candidate in clinical psychology program and consent of director of clinical psychology training program; hrs ar)

**8980. DIRECTED TEACHING IN PSYCHOLOGY.** (190409) (1-6 cr; prereq #) Bouchard

**8990.\* RESEARCH PROBLEMS.** (490410) (1-6 cr; hrs ar) Bouchard

### SECOND TERM

**1001. INTRODUCTION TO PSYCHOLOGY.** (685464) (5 cr; 0800-0955 MTWThF; MoosT 2620) See First Term.

**R 1005. INTRODUCTORY LABORATORY PSYCHOLOGY.** (4 cr; each section limited to 24 students; prereq soph, 1004) See 1004 First Term.

Sec 1, (285466) 0905-1205 MF, 0905-1100 W, E1H 50  
Sec 2, (185467) 1325-1625 MF, 1325-1520 W, E1H 60  
Sec 3, (985468) 0905-1205 MF, 0905-1100 W, E1H 60

**3604. INTRODUCTION TO ABNORMAL PSYCHOLOGY.** (186294) (4 cr; \$5604; prereq 1001; 0900-1100 TTh, WullH 130) Dupue

Surveys the field of abnormal psychology. Etiologies of behavioral disorders; available treatment.

**3617. INTRODUCTION TO CLINICAL PSYCHOLOGY.** (591306) (4 cr; prereq 3604, 3801, or 5604; 1005-1055 MTWThF; E1H N119) Almagor Survey of historical developments and contemporary issues in clinical psychology. Focuses upon relevant research and clinical trends in psychological assessment methods and various prevention and intervention strategies.

**3801. INTRODUCTION TO STATISTICAL METHODS.** (391307) (4 cr; prereq 1001, Math 0009; 0905-0955 MTWThF; E1H N119) Cudeck Quantification in research problems in psychology. Descriptive and inferential statistics, hypothesis testing, nonparametric statistics. Examples from various areas in psychology.

**3902. MAJOR PROJECTS IN PSYCHOLOGY.** (091696) (2 cr; prereq 1001, 1004-5, 3801, jr or sr psychology major or #; hr ar)

**3970. DIRECTED STUDIES.** (785469) (1-8 cr; prereq #, Δ, □; hrs ar) Bouchard See First Term.

**3990. DIRECTED RESEARCH.** (488155) (1-8 cr; prereq #, Δ, □) Bouchard See First Term.

**5011. THEORIES OF LEARNING AND COGNITION.** (185470) (4 cr; prereq 3011, except for students in honors sequence and grad students; 1115-1205 MTWThF; E1H N119) Peterson Major theories of learning and contemporary theories of information processing and cognition.

**5054. PSYCHOLOGY OF LANGUAGE.** (986295) (4 cr; prereq 3011, except for students in honors sequence and grad students; 1010-1100 MTWThF; E1H 491) Fletcher Theories and experimental evidence in past and present conceptions of psychology of language.

**5751. PSYCHOLOGY OF ADVERTISING.** (289095) (4 cr, \$Jour 5251; prereq 1001, 1115-1205 MTWThF; MurH 308) Jones

Psychological principles, research techniques, and applications in advertising and selling. Relevant consumer attitudes and behavior. Psychological mechanisms upon which effectiveness of advertisements and commercials depends. Meets with Jour 5251.

**5901H. HONORS PROJECT.** (189096) (1-8 cr; prereq sr, #) Staff See First Term.

**8519. PRACTICUM IN REHABILITATION COUNSELING.** (785472) (3 cr; prereq 8503 or #; hrs ar) See First Term.

**8520. FIELDWORK IN APPLIED PSYCHOLOGY.** (089494) (1-6 cr; prereq #; hrs ar)

**8560. INTERNSHIP IN COUNSELING PSYCHOLOGY.** (185475) (1-6 cr; prereq #; hrs ar)

**8620. PRACTICUM IN CLINICAL PSYCHOLOGY.** (885477) (1-6 cr; prereq #; hrs ar) See First Term.

**8670. INTERNSHIP IN CLINICAL PSYCHOLOGY.** (685478) (2-4 cr; prereq PhD candidate in clinical psychology program and consent of director of clinical psychology training program; hrs ar)

**8980. DIRECTED TEACHING IN PSYCHOLOGY.** (485479) (1-6 cr; prereq #) Bouchard

**8990.\* RESEARCH PROBLEMS.** (685481) (1-6 cr; hrs ar) Bouchard

## Public Affairs (PA)

909 Social Sciences. 376-9666  
Humphrey Institute of Public Affairs

### FIRST TERM

**5102. LEGAL ENVIRONMENT OF PUBLIC AFFAIRS.** (190966) (3 cr, 0800-0955 MW, HHHCtr 60) Hanson The legal context of public policy and decision making. Role of the courts in public participation, policy making, and administration. Introduction to legal reasoning and the use of law and legal resources in resolving policy issues and in managing administrative processes.

**5960. CREATIVITY IN PUBLIC AFFAIRS.** (890968) (3 cr, 1530-1730 TTh, HHCtr 60) Bolan  
Analytical and skill-building course focusing on innovation and creativity in public affairs. Initial part of the course will examine alternative theories of creativity including explanations of the course of creativity, the social conditions most conducive to creativity and the problems and potentials of the innovator in public and private contexts. With this base, the course will address varying approaches and techniques of creative thinking including experiments and exercise designed to enhance the student's individual creative skills in public planning and policy-making contexts.

**8900. PUBLIC AFFAIRS INTERNSHIP.** (690969) (1 cr.)  
Prerequisite: Completion of core courses  
Supervised fieldwork in an approved local, state, federal agency, private or nonprofit organization. A formal report of the internship experience is required.

**8910. INDEPENDENT STUDY.** (090970) (Cr ar)  
Individual reading or research project.

## SECOND TERM

**5211. GROUP TECHNIQUES IN PUBLIC AFFAIRS AND PLANNING.** (391680) (4 cr graduate status or written permission, 1530-1730 TTh, HHCtr 25) Bryson  
Skill-building survey course covering the nature, roles, uses, and limitations on group techniques in public affairs and planning. Topics covered include: role functions; group cohesion, norms and power; communication, NGT and variants; creativity; decision making, team building; bargaining and negotiation; conflict resolution.

**5831. THE FOREIGN ECONOMIC POLICIES OF THE INDUSTRIAL STATES.** (091679) (4 cr 1115-1230 TWTW HHCtr 30) Kudrle  
The analysis of policy problems facing decision-makers in the industrial countries in the areas of trade, investment, monetary and international economic affairs. Close attention paid to domestic political context.

**8900. PUBLIC AFFAIRS INTERNSHIP.** (690972) (1 cr; completion of core courses.)  
Supervised fieldwork in an approved local, state, federal agency, private or nonprofit organization. A formal report on the internship experience is required.

**8910. INDEPENDENT STUDY.** (490973) (Cr ar)  
Individual reading or research project.

## SPECIAL TERM: AUGUST 18-SEPTEMBER 19

**Econ 3101. MICROECONOMIC THEORY.** (4 cr; prereq Econ 1001, 1002, 1 qtr calculus, grad student or #) Kudrle  
Microeconomics with a public policy emphasis. For incoming graduate students in public affairs. Course is a prerequisite to the school's core sequence in policy analysis.

Sec 2, (885348) 0905-0955 MTWThF, HHCtr 35

## Public Health (PubH)

1250/1260 Mayo. 373-8060  
School of Public Health

### FIRST TERM

**R3001. PERSONAL AND COMMUNITY HEALTH.** (286939) (3 cr, §3004, §GC 3114; meets with 3003, 3004; 1010-1205 MWF; MoosT 2-690) Rothenberger  
Fundamental principles of health conservation and disease prevention.

**R3003. FUNDAMENTALS OF ALCOHOL AND DRUG ABUSE.** (986247) (2 cr, §3004; meets with 3001, 3004; 1010-1205 TTh; MoosT 2-690) Rothenberger  
Lecture, discussion, and readings on the scientific, sociocultural, and attitudinal aspects of alcohol and other drug abuse problems. Emphasis on incidence, prevalence, high risk populations, prevention, and intervention.

**R3004. BASIC CONCEPTS IN PERSONAL AND COMMUNITY HEALTH.** (866940) (5 cr, §3001, §3033, §GC 3114; 1010-1205 MTWThF; MoosT 2-690) Rothenberger  
Introduction to scientific, sociocultural, and attitudinal aspects of communicable and degenerative diseases, environmental and occupational health hazards, alcohol and drug problems; emphasis on role of education in health conservation, disease control, and drug abuse.

**5004. FIELD INSTRUCTION IN PUBLIC HEALTH.** (189218) (Cr ar; prereq #)  
Generalized, function-oriented or discipline-oriented community

experience under academic and professional supervision. Emphasis on application of acquired knowledge and skills relevant to health issues and problems.

**5005. TOPICS IN PUBLIC HEALTH.** (486941) (Cr ar; prereq advance proposal and #) Staff  
Individualized, directed instruction. Selected readings in public health with discussion based on these readings.

**5006. INTRODUCTION TO COMMUNITY HEALTH.** (286942) (5 cr, §5016; prereq pharmacy student, nursing student, other health professional or #: 0800-0955 MTWThF; MoosT 2-690) Stauffer  
Lectures, discussions, seminars, individualized readings on critical and current issues in community health, emphasizing public health programs and controversies.

**5015. TOPICS IN INTERDISCIPLINARY STUDIES.** (186943) (Cr ar; prereq #) Staff  
Individualized, directed instruction. Selected readings in interdisciplinary studies with discussion based on these readings.

**5040. DYING AND DEATH IN CONTEMPORARY SOCIETY—July 17-July 7.** (791319) (3 cr, Mont 5040, HSU 5040; prereq health science major, public health grad student, education Sr., certified teacher, mortuary science major or #: 1330-1600 MTWThF, JOAd 2125) Rothenberger, Stater  
Background information on concepts, attitudes, ethics, and lifestyle management related to dying, death, grief, and bereavement. Emphasis on preparing community health and helping professionals and educators for educational activities in this area.

**5081. INTERNSHIP IN FAMILY AND COMMUNITY STUDIES.** (889725) (Cr ar; prereq health education major)  
One quarter of full-time supervised health education internship in community and family settings.

**5082. INTERNSHIP IN OCCUPATIONAL HEALTH STUDIES.** (987995) (Cr ar; prereq health education student) Veninga  
One quarter of full-time supervised health education internship in a workplace and/or occupational health.

**5083. INTERNSHIP IN HEALTH POLICIES AND PLANNING.** (787996) (Cr ar; prereq health education student) Staff  
One quarter of full-time supervised health education internship in educational aspects of health planning and/or health policy development.

**5090. RESEARCH TOPICS IN HEALTH EDUCATION.** (587997) (4-8 cr; prereq health education student) Carlaw, Veninga  
Scholarly review of health education research and experience in a selected area for a Plan B project.

**5096. TOPICS—RESEARCH.** (387998) (Cr ar; prereq health education student) Carlaw, staff  
Original research in or secondary analysis of data sets related to health education.

**5097. TOPICS—SELECTED READINGS.** (187999) (Cr ar; prereq health science grad student) Carlaw, staff  
Study of a topic in health education not covered in available courses.

**5150. TOPICS IN ENVIRONMENTAL HEALTH.** (186957) (Cr ar; prereq #) Staff  
Selected readings with discussions of problems.

**5154. FIELD EXPERIENCE IN ENVIRONMENTAL HEALTH.** (191320) (1-6 cr; EH major only) Staff  
Assignments to work with organizations with environmental health concerns under the joint supervision of a faculty adviser and staff of the organization.

**5326. RESEARCH IN ANIMAL/HUMAN HEALTH.** (089429) (Cr ar; prereq VPH major or #) Staff  
Research in the relationship of animal health to human health.

**5400. INTRODUCTION TO QUANTITATIVE METHODS IN THE BIOLOGICAL AND HEALTH SCIENCES.** (586946) (4 cr; for students majoring in the biological and health sciences; prereq Biol 1009, Chem 1004, Math 1111 or 1201 or #: 0800-0930 MTWThF; PWB 5-224) Le  
Basic quantitative methods for the design and analysis of clinical and laboratory studies in biology and the health sciences.

**5446. BIOCOMPUTING CONSULTING SEMINAR.** (386947) (3 cr; prereq biometry major, 5432, 5452 or #) Staff  
Overview of computer hardware, operating systems, languages, and program packages for health science applications. Case examples illustrate roles and responsibilities of the project manager in analyzing the requirements of the health science client, designing and specifying computer interfaces, and supervising the development, training, documentation, and evaluation.

**5456. BIOMETRY CONSULTING SEMINAR.** (186948) (Cr ar; prereq biometry major) Boen, staff  
Consultant and consultee interaction; communication and formulation of the biometric problem. Role and responsibility of the biometrician. Robustness and relevance of frequently used analytical techniques. Internship experiences.

**5470. TOPICS IN BIOMETRY.** (086949) (Cr ar; prereq #) Staff  
Selected readings with discussion based on these readings.

**5510. RESEARCH METHODOLOGY IN PUBLIC HEALTH NURSING.** (1-3 cr; prereq #) Staff  
Guidance in development of study design, implementation, and analysis.

Sec 1, (586249) Aroskar  
Sec 2, (986250) Berkseth  
Sec 3, (786251) Ostwald  
Sec 4, (586252) McGovern  
Sec 5, (386253) Spradley  
Sec 6, (186254) Salmon  
Sec 7, (991321) Froberg  
Sec 8, (791322) Olson

**5513. TOPICS: ADULT HEALTH.** (089219) (1-3 cr; prereq #) Ostwald  
Individualized, directed instruction of selected problems and current issues in adult health for public health nurses.

**5519. HEALTH MAINTENANCE IN THE COMMUNITY: CONTINUUM OF CARE.** (291462) (Cr ar; prereq #) Ostwald  
Exploration of comprehensive multidisciplinary, multisystems approaches to maintenance of wellness in populations with long-term health problems. Independent study.

**5530. PUBLIC HEALTH NURSING PRACTICUM.** (189426) (1-4 cr; prereq #; hr ar) Aroskar  
Guided application of education and/or management concepts and theories to the delivery of indirect public health nursing services in community-based settings.

**5532. PUBLIC HEALTH NURSING SEMINAR II: RESEARCH STUDIES IN PUBLIC HEALTH NURSING.** (486258) (1 cr; prereq #) Ostwald  
Seminar for presentation and critique of completed research. Required of all public health nursing (MPH) students.

**5547. TOPICS: PUBLIC HEALTH PRACTICE WITH CHILD POPULATIONS.** (489225) (1-3 cr; prereq #) Berkseth  
Selected topics in public health.

**5552. NURSING ADMINISTRATION SEMINAR III.** (588132) (1-3 cr; 0915-1200 TTh, MoosT 2693) Spradley  
Analysis of the "state of the art" of nursing administration in the context of the external organization environment. Synthesis with public health practice.

**R5575. TOPICS IN PUBLIC HEALTH NURSING.** (086966) (Cr ar; prereq #) Staff  
Individualized learning experiences arranged with Public Health Nursing faculty.

**5592. PLANNING AND COORDINATING AN EMPLOYEE HEALTH SERVICE PROGRAM—June 17-July 18.** (589118) (3 cr; prereq occupational health nursing students; 0915-1100 MW; PWB 5-206) McGovern  
Role development of the occupational health nurse. Specialists related to various organizational structures, employee benefits program, and the health needs of workers. Students participate in evaluation component of an employee health program.

**R5597. TOPICS: INJURY PREVENTION IN THE WORKPLACE, COMMUNITY AND HOME.** (889190) (1-3 cr; prereq #) Gerberich  
Selected projects: provides an opportunity for students to pursue projects relevant to injury problems.

**5614. FIELD EXPERIENCE IN MATERNAL, CHILD HEALTH.** (786962) (Cr ar; prereq MCH grad student; S-N only) ten Bensel  
Field experiences are selected by the student to meet career goals.

**5649. TOPICS IN MATERNAL, CHILD HEALTH.** (Cr ar; prereq #) ten Bensel  
Selected readings in maternal and child health with discussion based on these readings.

Sec 1, (586963)  
Sec 2, (788078)

**5654. TOPICS: DENTAL PUBLIC HEALTH.** (886953) (Cr ar; prereq students in dental public health or #) Staff  
Selected readings with discussion based on these readings.

**5657. INDEPENDENT STUDY: DENTAL PUBLIC HEALTH.** (886954) (Cr ar; prereq student in dental public health or #) Block, staff  
Independent study, under tutorial guidance, of selected problems and current issues in the field of dental health and dental health services.

**5660. FIELD EXPERIENCE: DENTAL PUBLIC HEALTH.** (486955) (Cr ar; prereq student in dental public health or #) Supervised field experience in selected community or public health agencies and institutions.

**5663. ADMINISTRATIVE RESIDENCY IN DENTAL PUBLIC HEALTH.** (286956) (Cr ar; prereq student in dental public health or #) Block, staff, clinical preceptors  
Eleven months of field work in an approved community or public health agency, delivery of dental services and implementation of programs, solution of management problems, and special projects. Preparation of formal report.

**5703. PUBLIC HEALTH ADMINISTRATION CLERKSHIP.** (386964) (Cr ar; prereq student in public health administration or #)  
Assignment to State Health Department or other health agency for supervised work on a project of limited scope and preparation of a formal report.

**5704. FIELD EXPERIENCE: PUBLIC HEALTH ADMINISTRATION.** (186965) (Cr ar; prereq student in the public health administration or #) Block  
Supervised field experience at a management level in selected community or public health agencies and institutions.

**5707. INDEPENDENT STUDY: PUBLIC HEALTH ADMINISTRATION.** (989424) (1-12 cr; prereq public health administration student or #; S-N only)  
Independent study under tutorial guidance of selected problems and current issues in public health administration.

**5723. ADMINISTRATION RESIDENCY.** (988807) (Cr ar; prereq public health administration grad student or #)  
Ten months of field work in approved health care planning or operating organization, rotation through departments, solution of management problems, special projects. Preparation of thesis and formal reports.

**5739. TOPICS: PUBLIC HEALTH ADMINISTRATION.** (789425) (Cr ar; prereq student in public health administration or #) Block  
Selected readings with discussion based on these readings.

**5758. HOSPITAL AND OTHER HEALTH CARE ORGANIZATIONS FINANCIAL STATEMENT ANALYSIS.** (389427) (4 cr; prereq 5757; 1800-2100 Th; MoosT 2-520) Oszustowicz  
Case studies and readings involving review and analysis of actual hospital financial statements, third-party payer cost reports, and other financial documents. Students apply key financial ratios to financial statement analysis to test their ability to apply course material presented in the winter and spring quarters and to become familiar with basic financial documents.

**5770. TOPICS: HOSPITAL AND HEALTH CARE ADMINISTRATION.** (2 cr; prereq hospital administration student or #) Weckwerth, staff  
Selected readings in hospital and health care with discussion based on these readings.

Sec 1, (289422) 1515-1700 TTh, MoosT 2520, Weckwerth  
Sec 2, (089074) ar

**5774. ADMINISTRATIVE AND PROFESSIONAL RELATIONSHIPS WITHIN THE AMBULATORY CARE FACILITY—July 14-25.** (389119) (15 cr; prereq 5773) Weckwerth, staff  
A 12-month program of on-campus and independent study that includes periodic seminars and monthly sessions with clinical preceptors. Change theory, ethics, epidemiology, prepaid systems, legal aspects, planning.

**5776. ADMINISTRATIVE AND PROFESSIONAL RELATIONSHIPS WITHIN THE HEALTH CARE FACILITY—July 14-25.** (189423) (15 cr; prereq 5775) Weckwerth, staff  
A 12-month program consisting of an on-campus residential session and off-campus independent study that includes seminars and monthly classes under program preceptors. Board of trustees, medical staff, nursing, hospital law, medical records, planning, community health systems, continuing health education, change theory.

**5778. MANAGING MULTIPLE FORCES: INTERNAL AND EXTERNAL ASPECTS OF PATIENT CARE ADMINISTRATION—July 14-25.** (186960) (25 cr; prereq present employment as administrator of patient care [director of nursing or equivalent], 5778 and #) Weckwerth, Manthey, staff  
A 12-month program of an on-campus and independent study which begins with a two-week introductory residential session. Seminars on planning, organizing and staffing, directing and controlling are scheduled during initial phase of course. Students return to campus the following summer to share and demonstrate the research projects they have prepared with their peers.

# School of Public Health

**Twenty-first Anniversary Graduate Summer Session in Epidemiology**—An intensive program in epidemiology will be offered by the School of Public Health and the Department of Conferences June 22 through July 12 on the Minneapolis campus. This program, which carries graduate credit, is designed for teachers and students in schools of medicine, public health, veterinary medicine, and dentistry and professionals in health research and program agencies. Course offerings will be arranged in programmatic clusters, which include: Infectious Diseases, Chronic Diseases, Environmental and Occupational Diseases, Methods, and Hospital Associated Diseases. These 13 courses are accredited (Category I) through the American College of Preventive Medicine for the AMA Physicians Recognition Award. *Registration is limited and cannot be made through regular Summer Session channels.* Inquiries should be addressed to Leonard M. Schuman, M.D., Director, Graduate Summer Session in Epidemiology, School of Public Health, 1260 Mayo Memorial Building, Box 197, University of Minnesota, Minneapolis, MN 55455 (612/373-8029).

**Fourth Annual Occupational Health and Safety Institute**—This institute is an intensive, interdisciplinary course of study designed for professionals currently or soon-to-be practicing in the field of occupational health and safety. This year's institute will be held September 8-19 on the St. Paul campus. Ten individual, graduate level courses will be conducted over the two-week period. Courses include: Occupational Safety, Injury Prevention, Industrial Hygiene Engineering, Ergonomics, Environmental Toxicology, Health Statistics, Occupational Health Nursing, Occupational Medicine, Principles of Management and the Interdisciplinary Seminar. These ten courses are accredited (Category I) through the American College of Preventive Medicine for the AMA Physicians Recognition Award; the American Board of Industrial Hygiene and approved for Nursing contact Session channels. For further information contact: Ruth K. McIntyre, Director, Program in Continuing Education, Midwest Center for Occupational Health and Safety, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, Minnesota 55101 (612/221-3992).

**5786. ADMINISTRATIVE AND PROFESSIONAL RELATIONSHIPS WITHIN MENTAL HEALTH RELATED ORGANIZATIONS—July 14-25.** (589491) (15 cr; prereq 5785) Weckwerth, staff

A 12-month program beginning with an on-campus residential session (2 weeks) and involving off-campus independent study that includes periodic seminars and monthly dialogue with program preceptors. Governance, legal aspects, public education and information, evaluation of mental health programs, prevention and primary treatment in mental health, current trends and concepts, public relations and the legislative process.

**5797. NURSING ADMINISTRATION: EXECUTIVE PRACTICE.** (789179) (3 cr; prereq admission to ISP/PCA/MPH—Nursing Administration Master's Program or #) Madden

Examination of theories, models and the nature of executive work relevant to nursing administration. Literature critique, practice principles, discussion and analysis that will culminate in the development of individual frameworks for administrative practice in patient care delivery.

**5798. RESEARCH METHODS.** (189180) (3 cr; prereq admission to ISP/PCA/MPH—Nursing Administration Master's Program or #) Fleming  
Introduction to research processes and methods; processes of systematic inquiry based on scientific inquiry; building research skills. Nursing administration focus in applied administration research.

**5900. FIELD COURSE I: PUBLIC HEALTH NUTRITION.** (488804) (1-12 cr; prereq public health nutrition student) Splett, Staff  
Placement in approved agency with opportunity for experience in nutritional aspects of public health programs.

**5906. FIELD COURSE II: PUBLIC HEALTH NUTRITION.** (686744) (1-8 cr; prereq public health nutrition student) Splett  
Students desiring more than one concurrent field placement. Placement in a second approved agency with opportunity for experience in nutritional aspects of public health programs.

**5909. TOPICS IN PUBLIC HEALTH NUTRITION.** (288905) (1-12 cr; prereq public health nutrition student or #) Brown, Staff  
Independent study.

**8002. FIELD OBSERVATIONS OF SELECTED PUBLIC HEALTH PRACTICES.** (986944) (Cr ar; prereq #)

**8150. RESEARCH: ENVIRONMENTAL HEALTH.** (986958) (1-6 cr) Staff

**8330. RESEARCH: EPIDEMIOLOGY.** (786959) (Cr ar) Staff  
Opportunities offered by the School of Public Health and various cooperating organizations for qualified students to pursue research work.

**8400. SEMINAR IN BIOMETRY.** (386950) (Cr ar) Staff

**8449. TOPICS IN BIOMETRY.** (186951) (Cr ar; prereq 5450 and #) Staff  
Studies in special topics for advanced students.

**8450. RESEARCH IN BIOMETRY.** (086952) (Cr ar) Staff  
Opportunities for qualified students to pursue research work.

**8510. DIRECTED RESEARCH.** (591323) (Cr ar; prereq 5510) Staff  
Guided study in research designs.

**8511. DIRECTED RESEARCH.** (391324) (3 cr; prereq 5510, 8510) Staff  
Guided completion of a research study.

**r 8597. RESEARCH: INJURY PREVENTION IN THE WORKPLACE, COMMUNITY AND HOME.** (689191) (3-6 cr; #) Gerberich  
Provides an opportunity for students to develop independent and comprehensive research efforts relevant to injury prevention.

**8763. EXTERNAL FORCES AFFECTING HEALTH SERVICES DELIVERY.** (286259) (3 cr; prereq PhD students in hospital administration) Weckwerth  
Development of concepts, models, and principles of financing, social policy making, organizing, and human resource development for health services delivery, including written papers, oral presentations, and cross examination.

**8764. RESEARCH APPLICATIONS TO HEALTH SERVICES DELIVERY.** (686260) (3 cr; prereq 8763) Weckwerth  
Tutorial guidance and supervised course development covering research design, application, analysis, and presentation in health services delivery.

**8782. RESEARCH PRACTICUM.** (3 cr; prereq PhD student in hospital administration) Litman, Weckwerth, Staff  
Field experience in health care research. Supervised independent and team research on selected topics and problems in the field of health care.

Sec 1, (289727) ar  
Sec 2, (486261) ar

**8796. TOPICS IN HEALTH ECONOMICS.** (986961) (3 cr; prereq hospital administration student or #; 0800-1205 TTh; MayoC 381) Dahi  
General principles of health economics applied to current issues in health. Implications for health policy derived and discussed.

## FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register Once in Term I)

**5746. CLERKSHIP.** (589426) (3 cr for 10 wks; prereq 5744) Bieler, Staff  
Survey and solution of management problem within a local health services organization and preparation of formal report.

## SECOND TERM

**5004. FIELD INSTRUCTION IN PUBLIC HEALTH.** (389220) (Cr ar; prereq #)  
See First Term.

**5005. TOPICS IN PUBLIC HEALTH.** (886967) (Cr ar; prereq advance proposal and #) Staff  
See First Term.

**5015. TOPICS IN INTERDISCIPLINARY STUDIES.** (686968) (Cr ar; prereq #) Staff  
See First Term.

**5081. INTERNSHIP IN FAMILY AND COMMUNITY STUDIES.** (891697) (Cr ar; prereq health education major)  
See First Term.

**5083. INTERNSHIP IN HEALTH POLICIES AND PLANNING.** (488219) (Cr ar; prereq health education student) Staff  
See First Term.

**5090. RESEARCH TOPICS IN HEALTH EDUCATION.** (186215) (4-8; prereq health education student) Carlaw, Veninga  
See First Term.

**5096. TOPICS—RESEARCH.** (986216) (Cr ar; prereq health education student) Carlaw, staff  
See First Term.

**5097. TOPICS—SELECTED READINGS.** (588213) (Cr ar; prereq health science grad student) Carlaw, staff  
See First Term.

**5150. TOPICS IN ENVIRONMENTAL HEALTH.** (386981) (Cr ar; prereq #) Staff.

**5154. FIELD EXPERIENCE IN ENVIRONMENTAL HEALTH.** (991349) (1-6 cr; EH major only) Staff  
See First Term.

**5326. RESEARCH IN ANIMAL/HUMAN HEALTH.** (786993) (Cr ar; prereq VPH major or #) Staff  
See First Term.

**5446. BIOCOMPUTING CONSULTING SEMINAR.** (386971) (3 cr; prereq biometry major, 5432, 5452 or #) Gatewood  
See First Term.

**5456. BIOMETRY CONSULTING SEMINAR.** (486972) (Cr ar; prereq biometry major) Boen  
See First Term.

**5470. TOPICS IN BIOMETRY.** (286973) (Cr ar; prereq #) Staff  
See First Term.

**5510. RESEARCH METHODOLOGY IN PUBLIC HEALTH NURSING.** (1-3 cr; prereq #) Staff

Sec 1, (786217) Aroskar  
Sec 2, (586218) Berkseth  
Sec 3, (191463) Ostwald  
Sec 4, (186223) McGovern  
Sec 5, (086224) Spradley  
Sec 6, (886225) Salmon  
Sec 7, (686226) Froberg  
Sec 8, (291350) Olson

See First Term.

**5513. TOPICS: ADULT HEALTH.** (189221) (1-3 cr; prereq #) Ostwald  
See First Term.

**5519. HEALTH MAINTENANCE IN THE COMMUNITY: CONTINUUM OF CARE.** (286228) (Cr ar; prereq #) Ostwald  
See First Term.

**5531. PUBLIC HEALTH NURSING PRACTICUM.** (486969) (1-4 cr; prereq #; hr ar; S-N only) Aroskar  
See First Term.

**5532. PUBLIC HEALTH NURSING SEMINAR II: RESEARCH STUDIES IN PUBLIC HEALTH NURSING.** (589233) (1 cr; prereq #; hr ar) Ostwald  
See First Term.

**5547. TOPICS: PUBLIC HEALTH PRACTICE WITH CHILD POPULATIONS.** (689224) (1-3 cr; prereq #) Berkseth  
See First Term.

**5575. TOPICS: PUBLIC HEALTH NURSING.** (986992) (Cr ar; prereq #) Staff  
See First Term.

**r 5597. TOPICS: INJURY PREVENTION IN THE WORKPLACE, COMMUNITY, AND HOME.** (489192) (1-3; prereq #) Gerberich  
See First Term.

**5614. FIELD EXPERIENCE: MATERNAL, CHILD HEALTH.** (186988) (Cr ar; prereq MCH grad student; S-N only) ten Benschel, Splett  
See First Term.

**5649. TOPICS: MATERNAL AND CHILD HEALTH.** (Cr ar; prereq #) ten Benschel  
See First Term.

Sec 1, (986989)  
Sec 2, (588079)

**5654. TOPICS: DENTAL PUBLIC HEALTH.** (586977) (Cr ar; prereq students in dental public health or #) Staff  
See First Term.

**5657. INDEPENDENT STUDY: DENTAL PUBLIC HEALTH.** (386978) (Cr ar; prereq student in dental public health or #) Block, staff  
See First Term.

**5660. FIELD EXPERIENCE: DENTAL PUBLIC HEALTH.** (186979) (Cr ar; prereq student in dental public health or #) Block, staff  
See First Term.

**5663. ADMINISTRATIVE RESIDENCY IN DENTAL PUBLIC HEALTH.** (586980) (Cr ar; prereq student in dental public health or #) Block, staff, clinical preceptors  
See First Term.

**5703. PUBLIC HEALTH ADMINISTRATION CLERKSHIP.** (286990) (Cr ar; prereq student in public health administration or #)  
See First Term.

**5704. FIELD EXPERIENCE: PUBLIC HEALTH ADMINISTRATION.** (186991) (Cr ar; prereq student in the public health administration or #) Block  
See First Term.

**5707. INDEPENDENT STUDY: PUBLIC HEALTH ADMINISTRATION.** (989438) (1-12 cr; prereq public health administration student or #; S-N only)  
See First Term.

**5723. ADMINISTRATION RESIDENCY.** (588809) (Cr ar; prereq public health administration grad student or #)  
See First Term.

**5739. TOPICS: PUBLIC HEALTH ADMINISTRATION.** (789439) (Cr ar; prereq student in public health administration or #) Block  
See First Term.

**5770. TOPICS: HOSPITAL AND HEALTH CARE ADMINISTRATION.** (089771) (Cr ar; prereq hospital administration student or #)  
See First Term.

**5773. MANAGEMENT AND ORGANIZATION WITHIN THE AMBULATORY CARE FACILITY—July 20-AUGUST 1.** (789120) (15 cr; prereq current employment as ambulatory care administrator, and #) Weckwerth, staff  
A 12-month program of on-campus and independent study that includes periodic seminars and monthly sessions with clinical preceptors. Management, organizational behavior, problem solving, executive role, personnel management, financial management, governance, clinicians, productivity, and efficiency.

**5775. MANAGEMENT AND ORGANIZATION IN HOSPITAL AND HEALTH CARE FACILITIES—July 20-August 1.** (486986) (15 cr; prereq current employment as health care facility administrator or #) Weckwerth, staff  
A 12-month program consisting of an on-campus residential session and off-campus independent study that includes a seminar and monthly classes under program preceptors. Principles of management, executive role, hospital development and organization, functions of personnel, financial control, business office, and patient care services.

**5777. EXTERNAL FORCES AFFECTING HEALTH CARE DELIVERY—August 11-22.** (286987) (25 cr; prereq 5774, 5776, 5786, 5788 or #) Weckwerth, staff  
A 10-month program consisting of an on-campus residential session and off-campus independent study that includes seminars covering financing, human resources, organizing, social policy, and project planning and design. Requires a project that can be either a management study or a research thesis. Each student must verbally present and defend the project at a week-long symposium at end of course.

**5778. PATIENT CARE MANAGEMENT AND ORGANIZATION WITHIN THE HOSPITAL AND HEALTH CARE ORGANIZATION—July 20-August 1.** (189437) (25 cr; prereq present employment as administrator of patient care [director of nursing or equivalent] or #) Weckwerth, Manthey, staff  
A 12-month program consisting of an on-campus residential session in the summer, one week in March, and independent study that includes periodic seminars and monthly sessions with clinical preceptors. Management, organizational behavior, problem solving, executive role, personnel management, financial management, governance, labor relations, and patient care services.

**r 5785. ADMINISTRATIVE AND PROFESSIONAL RELATIONSHIPS WITHIN MENTAL HEALTH RELATED ORGANIZATIONS—July 20-August 1.** (389492) (15 cr; prereq 5785) Weckwerth, staff  
A 12-month program beginning with an on-campus residential session (2 weeks) and involving off-campus independent study that includes periodic seminars and monthly dialogue with program preceptors. Governance, legal aspects, public education and information, evaluation of mental health programs, prevention and primary treatment in mental health, current trends and concepts, public relations and the legislative process.

**5900. FIELD COURSE I: PUBLIC HEALTH NUTRITION.** (288870) (1-12 cr; prereq public health nutrition student) Splett  
See First Term.

**5903. NUTRITIONAL ASSESSMENT.** (191700) (2 cr; prereq 3xxx level nutrition course or equiv or #: 1325-1515 MTWTh; MoosT 2-580) Brown  
Theoretical base and application of nutritional assessment methods to communities and individuals.

**5906. FIELD COURSE II: PUBLIC HEALTH NUTRITION.** (786816) (1-8 cr; prereq public health nutrition student) Splett  
See First Term.



**5909. TOPICS IN PUBLIC HEALTH NUTRITION.** (788808) (1-12 cr; prereq #) Brown, Staff  
See First Term.

**8002. FIELD OBSERVATIONS OF SELECTED PUBLIC HEALTH PRACTICES.** (886970) (Cr ar; prereq #)

**8150. RESEARCH: ENVIRONMENTAL HEALTH.** (186982) (1-6 cr) Staff

**8330. RESEARCH: EPIDEMIOLOGY.** (086983) (Cr ar) Staff  
See First Term.

**8387. RESEARCH IN PHYSIOLOGICAL HYGIENE AND RELATED AREAS.** (489788) (Cr ar; prereq physiological hygiene major and #) Staff

**8400. SEMINAR IN BIOMETRY.** (186974) (Cr ar) Staff

**8449. TOPICS IN BIOMETRY.** (986975) (Cr ar; prereq 5450 and #) Staff  
See First Term.

**8450. RESEARCH IN BIOMETRY.** (786976) (Cr ar) Staff  
See First Term.

**8510. DIRECTED RESEARCH.** (691698) (Cr ar; prereq 5510) Staff  
Guided study in research designs.

**8511. DIRECTED RESEARCH.** (491699) (3 cr; prereq 5510, 8510) Staff  
Guided completion of a research study.

**8597. RESEARCH: INJURY PREVENTION IN THE WORKPLACE, COMMUNITY AND HOME.** (289193) (3-6 cr; #) Gerberich  
See First Term.

**8783. EXTERNAL FORCES AFFECTING HEALTH SERVICES DELIVERY.** (486230) (3 cr; prereq PhD students in hospital administration) Weckwerth  
See First Term.

**8784. RESEARCH APPLICATIONS TO HEALTH SERVICES DELIVERY.** (286231) (3 cr; prereq 8783) Weckwerth  
See First Term.

**8782. RESEARCH PRACTICUM.** (3 cr; prereq PhD student in hospital administration) Litman, Weckwerth, Staff  
See First Term.

Sec 1, (689790) ar  
Sec 2, (186232) ar

**5105. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (St. Luke's Hospital, Duluth).** (587093) (Cr and hrs ar; prereq regis med) Ahrens, staff

**5140. SPECIAL PROBLEMS: ROENTGENOLOGY.** (387094) (Cr and hrs ar; prereq regis med) Gedgaudas, staff

**5240. SPECIAL PROBLEMS: NUCLEAR MEDICINE.** (487095) (Cr and hrs ar; prereq regis med) Loken, staff

**5530. EXTERNSHIP: NUCLEAR MEDICINE.** (087096) (Cr and hrs ar; prereq regis med) Loken, staff

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register Once in Term I)

#### Required Courses for Graduate Students

**0121. MEDICAL ROENTGENOLOGIC CONFERENCE.** (487095) (No cr; 1130-1200 T; Mayo C321-Todd Amph) Gedgaudas, staff

Weekly meetings with the medical staff at which all the important medical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.

**0122. PEDIATRIC ROENTGENOLOGIC CONFERENCE.** (187100) (No cr; 0930-1000 MTWThF; Mayo B167-Rigler Library) Day

Daily meetings with the pediatric staff at which all the important pediatric cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.

**0123. SURGICAL ROENTGENOLOGIC CONFERENCE.** (087101) (No cr; 0905-0955 S; Mayo C321-Todd Amph) Amplatz

Weekly meetings with the surgical staff at which all the important surgical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.

**0124. NEUROSURGICAL ROENTGENOLOGIC CONFERENCE.** (887102) (No cr; 1325-1415 F; Mayo C321-Todd Amph) Elias

Weekly meetings with the neurosurgical staff at which all the important neurosurgical cases that have used X-ray diagnostic procedures are reviewed from both the clinical and roentgenologic points of view.

**0125. CARDIOVASCULAR ROENTGENOLOGIC CONFERENCE.** (687103) (No cr; 1200-1300 Th; Mayo B167-Rigler Library) Amplatz

**8100. GASTROINTESTINAL ROENTGENOLOGY.** (487104) (Cr ar; prereq #) Feinberg

**8101. UROLOGIC ROENTGENOLOGY.** (287105) (Cr ar; prereq #) Goldberg

**8102. NEUROLOGICAL ROENTGENOLOGY.** (187106) (Cr ar; prereq #) Elias

**8103. CARDIOVASCULAR ROENTGENOLOGY.** (987107) (Cr ar; prereq #) Amplatz

**8104. PEDIATRIC ROENTGENOLOGY.** (787108) (Cr ar; prereq #) Day

**8105. PULMONARY ROENTGENOLOGY.** (587109) (Cr ar; prereq #) Gedgaudas, staff

**8150. RESEARCH: ROENTGENOLOGY.** (987110) (Cr ar) Gedgaudas, staff  
Problems in roentgen diagnosis.

**8200. NUCLEAR MEDICINE.** (787111) (Cr ar) Loken, staff

**8450. RESEARCH: RADIATION BIOLOGY, NUCLEAR MEDICINE.** (687098) (Cr ar) Staff

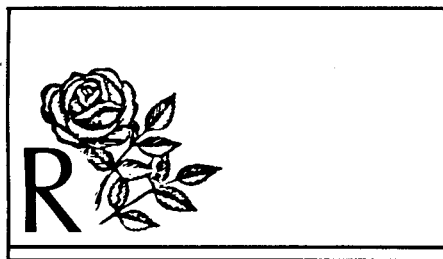
## Recreation, Park, and Leisure Studies (Rec)

203 Cooke Hall, 373-4264  
College of Education

### FIRST TERM

**3700. SENIOR INTERNSHIP.** (290733) (1-15 cr; prereq sr, recreation major or minor,  $\Delta$ ; hrs ar; S-N only) McAvoy, Schlieen  
Supervised experiences in selected agencies.

**R 5230. RECREATION AND MENTAL RETARDATION.** (186108) (3 cr; prereq 5210, 5220, or #; limited to 30 students; 1800-2045 TTh; CookeH 206; A-N only) Schlieen  
Issues relating to leisure services for persons with mental retardation problems; approaches to programming in the institution and in the community.



## Radiology (Rad)

B 238 Mayo, 373-8570  
Medical School

### SPECIAL TERM: THREE-WEEK COURSES

#### Elective Courses for Third- and Fourth-Year Students

**5101. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (University Hospitals).** (887097) (Cr and hrs ar; prereq regis med) Gedgaudas, staff

**5102. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (Veterans Administration Hospital).** (187090) (Cr and hrs ar; prereq regis med) Reinke

**5103. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (Hennepin County Medical Center).** (987091) (Cr and hrs ar; prereq regis med) Tsai

**5104. EXTERNSHIP: DIAGNOSTIC RADIOLOGY (St. Paul-Ramsey Medical Center).** (787092) (Cr and hrs ar; prereq regis med) L'Heureux

## Canoe a wild river in Recreation, Park, and Leisure Studies

A canoe trip on a wild river is featured in Programming in Outdoor Education (Rec 5310). This course offers an interdisciplinary approach to the use of leisure and educational resources of a wild river with emphasis on preparation for leadership in outdoor recreation and education. This class, offered June 16 through June 21 will be conducted the first day on campus in Cooke Hall, followed by a six-day canoe trip down the St. Croix and Namekagon rivers, part of the federal wild and scenic river systems. The class and trip stress the practical application of outdoor education methods, materials, and facilities. Further emphasis is on the development of practical environmental interpretation skills.

Advanced application is required. Contact Professor Leo McAvoy, 209 Cooke Hall, University of Minnesota, 1900 University Avenue S.E., Minneapolis, MN 55455 (612/373-4232) for further information and to preregister for the course. In addition to tuition, there is a charge of \$40 for food, transportation, and some equipment. Deadline for preregistration and payment of all fees is June 10.

**r5310. PROGRAMMING IN OUTDOOR EDUCATION.** (386110) (4 cr; prereq 5300 or #; limited to 18 students; meet 0800 M, June 16, CookeH 206 for organization and departure; field trip through 1800, June 21; A-N only) McAvoy  
Methods, materials, and setting appropriate for developing and conducting outdoor education and environmental interpretation programs; emphasis on development of practical skills on a six-day field canoe trip on Namekagon and St. Croix Rivers. Advance application required by June 10, 1986.

**5630. PRACTICUM: THERAPEUTIC RECREATION.** (190734) (3-9 cr; prereq recreation MEd or graduate student; hrs ar; S-N only) Schleien  
Supervised experiences in program operation; administrative and supervisory duties.

**5640. PRACTICUM: LEISURE SERVICES.** (890735) (3-9 cr; prereq recreation MEd or graduate student; hrs ar; S-N only) McAvoy  
Supervised experiences in program operation; administrative and supervisory duties.

**5981. PROBLEMS.** (888783) (Cr and hr ar; prereq MEd candidate, #; A-N only) McAvoy  
Focus on conduct of recreation programs.

**5983. READINGS: RECREATION.** (790736) (1-3 cr; prereq MEd or grad student or Δ; hrs ar; A-N only) Schleien  
Independent study under tutorial guidance.

**8981. RESEARCH PROBLEMS.** (086109) (Cr ar; prereq 8980 or #; S-N only) McAvoy  
Individual problems.

## SECOND TERM

**3700. SENIOR INTERNSHIP.** (685044) (1-15 cr; prereq sr, recreation major or minor, Δ; hrs ar; S-N only) Schultz, Forss  
See First Term.

**5250. FINANCING LEISURE SERVICES—July 21-August 15.** (290974) (3 cr; prereq 3550 or Δ; 0800-0955 MTWTh; CookeH 206) Schultz

**5630. PRACTICUM: THERAPEUTIC RECREATION.** (485045) (3-9 cr; prereq recreation MEd or graduate student; hrs ar; S-N only) Schultz  
See First Term.

**5640. PRACTICUM: LEISURE SERVICES.** (285046) (3-9 cr; prereq recreation MEd or graduate student; hrs ar; S-N only) Schultz  
See First Term.

**5983. READINGS: RECREATION.** (185047) (1-3 cr; prereq MEd or grad student or Δ; hrs ar; A-N only) Schultz  
See First Term.

## Rhetoric (Rhet)

202 Haecker Hall, St. Paul. 373-0917  
College of Agriculture

### FIRST TERM

**r1147. EFFICIENT READING.** (689840) (4 cr; limited to 30 students; 0905-1100 TW; FolH 102) Bennett  
The adult reading process is explored with emphasis on comprehension, speed, and vocabulary development. For persons of average or above-average reading ability who wish to develop and refine college-level reading skills. Not a basic course. Meets concurrently with 5147.

**r1151. WRITING IN YOUR MAJOR.** (185945) (4 cr; limited to 23 students; prereq soph, completion of fr communication requirements; 0905-0955 MTWThF; HckrH 302) Walzer  
Students investigate and write on subjects related to their majors. The criterion of appropriateness: good writing meets the expectation of readers and the conventions of a particular form. Assignments such as literature review, abstract, fact sheet, instructions, and feature article.

**r1222. PUBLIC SPEAKING.** (489841) (4 cr; limited to 18 students; prereq completion of fr communication requirements; 1010-1100 MTWThF; HckrH 222) Cuffe  
A practical course in the fundamentals of speechmaking. Emphasis upon organizing and delivering the speech.

**3374. HUMANITIES: SPECIAL PROBLEMS.** (188196) (1-2 cr; prereq #, Δ) Bennett, Walzer, others  
Primarily for supervised reading and research on topics not covered in regularly scheduled humanities offerings.

**r3562. WRITING IN YOUR PROFESSION.** (4 cr; each section limited to 23 students; prereq jr, completion of fr communication requirements, 1151)  
Projects in professional writing. Relationship between structuring information to meet the needs of particular readers

and writing effectively. Assignments such as the feasibility report, proposal, memorandum, letter of application, and resume.

Sec 1, (289842) 0800-0850 MTWThF, HckrH 111, Ferguson

Sec 2, (387984) 0905-0955 MTWThF, HckrH 111, Scanlan

**5100. TECHNICAL COMMUNICATION: SPECIAL PROBLEMS.** (289680) (Cr ar; prereq #, Δ) Connolly, McDowell, others

Designed for supervised reading, research, and work on advanced technical communication projects not covered in regularly scheduled courses.

**r5147. EFFICIENT READING.** (189843) (4 cr; limited to 10 students; 0905-1100 TW; FolH 102) Bennett  
The adult reading process is explored with emphasis on comprehension, speed, and vocabulary development. For persons of average or above-average reading ability who wish to develop and refine college-level reading skills. An evaluative paper is required. Meets concurrently with 1147.

**5180. INTERNSHIP IN TECHNICAL COMMUNICATION.** (189681) (2-6 cr; prereq #, Δ) Connolly, McDowell, others  
Designed to give technical communication majors on-the-job experience at the University or in industry or government.

## SECOND TERM

**r1222. PUBLIC SPEAKING.** (990783) (4 cr; limited to 18 students; prereq completion of fr communication requirements; 0905-0955 MTWThF; HckrH 222) Johnson  
See First Term.

**r1310. HUMANITIES: THE LAND IN AMERICAN EXPERIENCE.** (885950) (4 cr; limited to 40 students; 0905-0955 MTWThF; HckrH 100) Scanlan

American attitudes toward the land from colonial times to the present as expressed in social history, literature, and the fine arts. Social thought and the relationship between farm and city, wilderness and countryside. The changing appearance of America.

**3374. HUMANITIES: SPECIAL PROBLEMS.** (685951) (1-2 cr; prereq #, Δ) Bennett, Horberg, others  
See First Term.

**r3562. WRITING IN YOUR PROFESSION.** (4 cr; each section limited to 23 students; prereq jr, completion of fr communication requirements, 1151)  
See First Term.

Sec 1, (187980) 1010-1100 MTWThF, HckrH 111, Horberg  
Sec 2, (987981) 1115-1205 MTWThF, HckrH 111, Kantar

**5100. TECHNICAL COMMUNICATION: SPECIAL PROBLEMS.** (989682) (Cr ar; prereq #, Δ) Connolly, McDowell, others  
See First Term.

**r5136. SPECIAL PROBLEMS IN AGRICULTURAL COMMUNICATIONS.** (190975) (cr ar; prereq #) Wells  
Communications problems related to specific aspects of student's major field of study.

**r5170. MANAGERIAL COMMUNICATIONS.** (990976) (4 cr; limited to 20 students; prereq freshman communication or equiv; 1600-1800 TTh; CentLib 4) Hayes  
Systematic analysis of communication techniques and procedures for the manager. Emphasis on manager's ability to achieve vertical and horizontal understanding and acceptance. Readings, guest speakers, and a term project.

**5180. INTERNSHIP IN TECHNICAL COMMUNICATION.** (789683) (2-6 cr; prereq #, Δ) Connolly, McDowell, others  
See First Term.

## Russian (Russ)

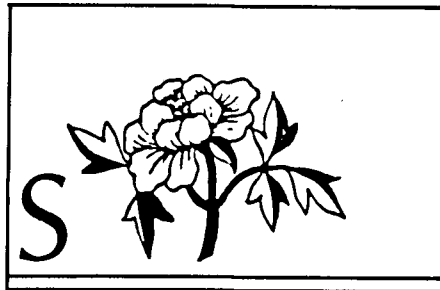
253 Elliott Hall. 373-5079  
College of Liberal Arts

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll in all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**1101-1102-1103. BEGINNING INTENSIVE RUSSIAN.** (15 cr for both terms; 0800-1100 MTWThF; KoltH S132)  
Speaking, reading, and understanding Russian through acquisition of basic patterns of speech.

1101, Sec 5, (090502) June 17-July 9, 5 cr  
1102, Sec 5, (890503) July 10-31, 5 cr  
1103, Sec 5, (690504) August 1-22, 5 cr



## Scandinavian (Scan)

210 Folwell Hall. 373-2560  
College of Liberal Arts

### FIRST TERM

**3602. THE SCANDINAVIAN FAIRY TALE AS LITERATURE.** (190983) (4 cr; 1115-1205 MTWThF; FolH 304) Mishler  
Examined in context of German romanticism. Emphasis on H.C. Andersen and 20th-century authors who write in his tradition.

**3970. DIRECTED STUDIES.** (885947) (1-5 cr; prereq #, Δ, □)

**5970. DIRECTED STUDIES.** (685948) (1-15 cr per qtr; prereq #, Δ, CLA approval)

### SECOND TERM

**3605. THE SCANDINAVIAN AND FINNISH SHORT STORY.** (790980) (4 cr; 0905-0955 MTWThF; FolH 204) Vähämäki  
Stories by important 19th- and 20th-century authors. Reading in English for nonmajors.

**3970. DIRECTED STUDIES.** (590981) (1-5 cr; prereq #, Δ, □)

**5970. DIRECTED STUDIES.** (390982) (1-15 cr; prereq #, Δ, CLA approval)

## Secondary Education (SeEd)

125 Peik Hall. 373-3300  
College of Education

### FIRST TERM

**3600.<sup>1</sup> STUDENT TEACHING.** (189986) (Cr ar; prereq Δ; S-N only) E Anderson  
Supervised teaching for students wishing to elect credits in student teaching in addition to regular requirements.

**5151. SCHOOL-BASED PROJECTS IN SOCIAL STUDIES EDUCATION.** (1-12 cr [max 12 cr]; A-N only)  
Opportunity to work individually or in teams on curricular, instructional, or evaluation problems within the school.

Sec 21, (086112) Glenn  
Sec 22, (186125) Mackey

**5153. NEW PERSPECTIVES IN THE SOCIAL STUDIES: Teaching Gifted Students—June 17-July 1.** (989987) (1-3 cr [max 12 cr]; 1300-1600 MTWThF; PeikH 165; A-N only) Mackey  
Issues, materials, and techniques related to topics of particular relevance to social studies teachers. This 3-credit offering introduces teaching strategies, instructional development and curriculum modification techniques to differentiate curriculum and instruction for gifted students; development of units in social studies for use with gifted/creative/tailed students in elementary and secondary classrooms.

<sup>1</sup>Student teaching is open only to students in regular degree programs of the College of Education. Application must be made by May 1. Forms and instructions are available in 203 Burton Hall.

**5176. CLASSROOM RESEARCH IN ENGLISH EDUCATION AND READING.** (891456) (3 cr; 1010-1100 MTWThF; Pih 111; A-N only) Graves  
Review and analysis of current studies; design and analyses for school-based research.

**5185. SCHOOL AND PROFESSIONAL BASED EXPERIENCES IN SECOND LANGUAGES AND CULTURES.** (1-12 cr [max 12 cr]; prereq MEd students only; A-N only)  
Opportunity for teachers to work together on curricular, instructional, or evaluation problems; internship experiences; participation in professional activities.  
Sec 21, (687943) Jorstad  
Sec 22, (787951) Lange

**r5191. WORKSHOP: TEACHING OF SECOND LANGUAGES AND CULTURES.** (1-10 cr [max 10 cr]; Sections 2, 3, 4 limited to 10 students each; A-N only)  
Related specifically to the needs of the inservice teacher.

**Sec 1, Methods of Teaching Language for Specific Purposes, June 17-July 8.** (588177) (3 cr; 1220-1415 MTWThF; PeikH 215) Jorstad  
Using needs analysis; curriculum development; teaching reading processes; organizing rhetorical principles; teaching writing and oral skills; testing and teacher education; application to the classroom in the U.S. and abroad.

**Sec 2, Proficiency Evaluation/Curriculum Development (French only), June 23-July 11.** (691457) (6 cr; 1230-1730 MTWThF, COLP Center, FolH 51) Barnes  
Development of awareness of techniques and strategies for evaluation of oral proficiency through an oral interview in relation to the ACTFL Proficiency Guidelines; procedures for evaluation in listening, reading, and writing; implications for development of curriculum in second language programs.

**Sec 3, Proficiency Evaluation/Curriculum Development (German only), June 23-July 11.** (891683) (6 cr; 1230-1730 MTWThF, COLP Center, FolH 51) Lange  
**Sec 4, Proficiency Evaluation/Curriculum Development (Spanish Only), June 23-July 11.** (691684) (6 cr; 1230-1730 MTWThF; COLP Center, FolH 51) Klee

**5227. TEACHING ABOUT THE NEWSPAPER IN THE CLASSROOM—July 7-18.** (788064) (1-3 cr [max 4 cr]; §Elem 5227; 1300-1600 MTWThF; PeikH 165; A-N only) Mackey  
The institution of the newspaper; articulation of a series of useful instructional strategies, curriculum development techniques, and teaching materials. This offering for 3 credits. Meets with Elem 5227.

**5322. TEACHING COMPOSITION AND COMMUNICATION IN JUNIOR AND SENIOR HIGH SCHOOLS.** (791448) (3 cr; 0905-0955 MTWThF; PeikH 40; A-N only) Piche  
Contemporary directions in rhetorical theory and analysis of recent curriculum developments bearing on the teaching of oral and written composition.

**5351. DIRECTED STUDY.** (Cr ar [max 6 cr]; prereq education or graduate student; S-N optional)  
Sec 21, (487944) Mackey  
Sec 22, (388004) Jorstad  
Sec 23, (987950) Lange  
Sec 24, (591449) Gennaro

**r5394. WORKSHOP: SCIENCE EDUCATION.** (1-12 cr [max 12 cr]; each section limited to 10 students; A-N only) Gennaro  
Analysis of issues, materials, and instructional techniques related to current topics of relevance to secondary school and college science teachers.

**Sec 1, Development of Animal Behavior Curriculum Materials, June 17-27.** (789988) 3 cr, 0830-1200 MTWThF, Minnesota Zoological Gardens, 12101 Johnny Cake Ridge Road, Apple Valley, Mn.

Teachers will develop curricular materials for students taking a trip to the zoo; animal behavior; and the use of animals in the classroom; team curriculum writing. Speakers, behind-the-scenes tours, and hands-on experience with animals. Meet at the Education Center at the Zoo on the first day. Meets with Elem 5347, section 1.  
**Sec 2, Environmental Education, June 30-July 11.** (589989) 3 cr, 0830-1205 MTWThF, PeikH 385  
History and philosophy; the state Plan and SELOS (Some Essential Learning Outcomes) in environmental education (EE); integrating EE into the curriculum; ICE (National Diffusion Network) materials; water quality and acid rain curricular materials; energy education; Project Wild; Project Learning Tree; other Minnesota issues such as chemical and nuclear wastes, and use of peat as an energy source. Meets with Elem 5347, section 2.

**5395. SCHOOL BASED PROJECTS IN SCIENCE EDUCATION.** (989990) (1-12 cr [max 12 cr]; prereq MEd student in science education; A-N only) Gennaro  
Individual or group work on curricular, instructional, or evaluation problems and projects applicable to school situations.

**5404. LANGUAGE, CULTURE, AND EDUCATION.** (788792) (4 cr, §Spch 5404; 1115-1205 MTWThF; PeikH 46; A-N only) Piché  
Psychological and social-psychological perspectives for the study of language-communication; dimensions of language variation (dialects, codes, registers); implications for program development and instructional practices. Meets with Spch 5404.

**5659. SCHOOL-RELATED PROJECTS IN LANGUAGE ARTS.** (1-12 cr [max 12 cr]; A-N only; prereq MEd student in English education)  
Individual or group work on curricular, instructional, or evaluation problems and projects applicable to school situations.

Sec 21, (391453) Graves  
Sec 22, (991450) Piché

**8801. PROBLEMS: TEACHING SOCIAL STUDIES.** (3-9 cr; prereq 5150, 5152, 5156, 8104 or #; hrs ar)  
Individual research.

Sec 21, (786122) Glenn  
Sec 22, (486129) Mackey

**8871. PROBLEMS: CURRICULUM CONSTRUCTION.** (789991) (Cr and hrs ar; prereq #) Gennaro

**8894. PROBLEMS: SECOND LANGUAGES AND CULTURES EDUCATION.** (Cr ar [max 8 cr])  
Individual research.

Sec 21, (187946) Jorstad  
Sec 22, (587952) Lange

**8895. READINGS IN ENGLISH EDUCATION.** (1-3 cr)  
Readings in secondary school English curriculum and instruction.

Sec 21, (191454) Graves  
Sec 22, (791451) Piché

**8896. PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar)  
Sec 21, (091455) Graves  
Sec 22, (591452) Piché

**8898. READINGS IN SECOND LANGUAGES AND CULTURES EDUCATION.** (1-3 cr)

Readings in development, research, curriculum, instruction, evaluation, culture, teacher education, as needed by the student.

Sec 21, (987947) Jorstad  
Sec 22, (387953) Lange

## SECOND TERM

**5151. SCHOOL-BASED PROJECTS IN SOCIAL STUDIES EDUCATION.** (591435) (1-12 cr [max 12 cr]; A-N only) Glenn  
See First Term.

**5164. GLOBAL EDUCATION: CONTENT AND PROCESS—July 28-August 2; August 14-15.** (491685) (3 cr; §Elem 5164; 0800-1700 MTWThF; off campus) Cogan  
Designed to help classroom teachers and administrators assess current methods and materials and select appropriate evaluation instruments by examination of existing content and methods in global education. Meets with Elem 5164. This offering will be held in northern Minnesota. A limited number of partial tuition scholarships will be available to in-service teachers who meet specified criteria. Contact Professor John Cogan, 101 Pattee Hall, 150 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/376-4580). Advanced application required; deadline is May 1, 1986.

**5167. ECONOMIC EDUCATION PROGRAMS—July 28-August 8.** (891439) (1-3 cr; prereq Econ 1002 or equiv or #; 1300-1700 MTWThF; St. Olaf College, Northfield, MN; A-N only) Dalgaard  
Conceptual framework of economic education through analyzing research; objectives, philosophy, scope, and curricular sequence. This 3-credit course is offered in conjunction with Minnesota Business Venture. Students will prepare an action plan, work with high school students and staff from the Center for Economic Education and prepare an economics unit based on a computer simulation. A limited number of tuition scholarships will be available to inservice teachers who meet specified criteria with preference given to economics teachers. For information contact Bruce Dalgaard, Center for Economic Education, 1169 Management and Economics Building, University of Minnesota, 271 19th Avenue S., Minneapolis, MN 55455 (612/373-4469). Advance application is required by July 1, 1986.

**5185. SCHOOL AND PROFESSIONAL BASED EXPERIENCES IN SECOND LANGUAGES AND CULTURES.** (391436) (1-12 cr [max 12 cr]; prereq MEd students only; A-N only) Lange  
See First Term.

**r5191. WORKSHOP: TEACHING OF SECOND LANGUAGES AND CULTURES (Evaluation and Development of Courseware in Second Languages)—August 11-22.** (287962) (1-10 cr [max 10 cr]; limited to 30 students; 1200-1500 MTWThF; Jackson Junior High School, 6000 109 Ave. N, Champlin, MN; A-N only) Lange  
See First Term. This 3-credit workshop reviews the use of the computer within the context of second language learning in the United States; develops criteria for courseware evaluation; evaluation and development of courseware.

**5320. LITERATURE FOR ADOLESCENTS—July 21-August 15.** (191440) (3 cr; 0905-1015 MTWThF; PeikH 225; A-N only) Beach  
Reading and analysis of fiction and nonfiction; methods for critically assessing quality and appeal; appropriate for secondary English and social studies teachers and librarians.

**5321. TEACHING LITERATURE IN SECONDARY SCHOOLS—July 21-August 15.** (091441) (3 cr; 1045-1200 MTWThF; PeikH 225; A-N only) Beach  
Current theory and methods of instruction; research and response to literature and reading; adolescent literature; growth assessment; curriculum design and evaluation.

**5351. DIRECTED STUDY.** (Cr ar [max 6 cr]; S-N optional; prereq education or graduate student)  
Sec 21, (887956) Glenn  
Sec 22, (788016) Lange  
Sec 23, (588017) Beach  
Sec 24, (988080) Finley

**r5394. WORKSHOP: SCIENCE EDUCATION (Recent Developments in Earth Science Education—July 21-August 1.** (891442) (1-12 cr [max 12 cr]; limited to 25 students; 0830-1200 MTWThF; PeikH 385; A-N only) Finley  
See First Term. This 3-credit offering will cover recent instructional activities for teaching earth science to illustrate how theories of plate tectonics, sea floor spreading and the structure of the earth's interior explain volcanic activity; evolution of the ocean floor, earthquakes, mountain building, and selected aspects of evolution of living organisms; includes use of lab activities and equipment, computer simulations and audiovisual materials such as remote sensing images, aerial photographs, geologic maps and video discs to provide experience with geologic phenomena.

**5395. SCHOOL-BASED PROJECTS IN SCIENCE EDUCATION.** (691443) (1-12 cr [max 12 cr]; prereq MEd student in science education; A-N only) Finley  
See First Term.

**5659. SCHOOL-RELATED PROJECTS IN LANGUAGE ARTS.** (1-12 cr [max 12 cr]; prereq MEd student in English education; A-N only)  
See First Term.  
Sec 21, (687957) Beach  
Sec 22, (388018) Piché  
Sec 23, (291445) Graves

**8801. PROBLEMS: TEACHING SOCIAL STUDIES.** (3-9 cr; prereq 5150, 5152, 5156, 8104 or #) Glenn  
See First Term.  
Sec 21, (586140) Glenn  
Sec 22, (486146) Mackey

**8871. PROBLEMS: CURRICULUM CONSTRUCTION.** (491444) (Cr and hrs ar; prereq #) Finley

**8894. PROBLEMS: SECOND LANGUAGES AND CULTURES EDUCATION.** (191437) (Cr ar [max 8 cr]; prereq #) Lange  
See First Term.

**8895. READINGS IN ENGLISH EDUCATION.** (1-3 cr)  
Sec 21, (287959) Beach  
Sec 22, (787965) Piché  
Sec 23, (191446) Graves

**8896. PROBLEMS: TEACHING ENGLISH.** (Cr and hrs ar)  
Sec 21, (687960) Beach  
Sec 22, (587966) Piché  
Sec 23, (991447) Graves

**8898. READINGS IN SECOND LANGUAGES AND CULTURES EDUCATION.** (091438) (1-3 cr) Lange  
See First Term.

## Slavic (Slav)

253 Elliott Hall, 373-5079  
College of Liberal Arts  
(See also Russian)

### FIRST TERM

**R 5900. TOPICS IN RUSSIAN AND EAST EUROPEAN STUDIES—June 23-July 11.** (791188) (6 cr; limited to 10 students; prereq  $\Delta$ ; 0900-1200, 1330-1630 MTWThF; CivMinE 214)  
Workshop for high school teachers of Russian.

## Small Animal Clinical Sciences (SACS)

C-339 Veterinary Hospital, St. Paul. 373-1745  
College of Veterinary Medicine

### FIRST TERM

**5000. CLINICAL SMALL ANIMAL MEDICINE.** (791403) (6 cr; prereq #; arranged MTWThFS; VetTchHo) Hardy, S. Johnston, Klausner, Polzin, others

Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences to the diagnosis, prognosis, treatment, prevention, and eradication of disease in companion animals.

**5002. CLINICAL SMALL ANIMAL SURGERY.** (591404) (8 cr; prereq #; arranged MTWThFS; VetTchHo) Staff

The application of principles and techniques of the basic and surgical sciences used in the University Veterinary Teaching Hospital for the diagnosis, prognosis, and surgical management of certain diseases of the body systems in companion animals.

**5004. CLINICAL SMALL ANIMAL SPECIALTIES.** (091407) (6 cr; prereq #; arranged MTWThFS; VetTchHo) Bistner, McKeever, Ogburn, others

Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences with emphasis in cardiology, dermatology, and ophthalmology.

**5006. CLINICAL ANESTHESIOLOGY.** (391405) (4 cr; prereq #; arranged MTWThFS; VetTchHo) Staff  
Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences in anesthesiology.

**5008. CLINICAL RADIOLOGY.** (191406) (4 cr; prereq #; arranged MTWThFS; VetTchHo) Staff  
Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences in radiology.

**5257. A CLINICIAN'S ANALYSIS OF URINALYSIS—June 23-July 21.** (486650) (1 cr; completion of first 3 years of veterinary curriculum; 1300-1450 M; AnScVM 125) Osborne  
The primary purpose of this course is to provide an overview of proper interpretation of urinalysis findings in patients with a variety of disorders of various body systems.

**8197.\* ADVANCED DERMATOLOGIC CLINICS.** (190708) (4 cr; prereq grad student or #) McKeever  
In-depth clinical study of dermatologic disease states, diagnosis and therapy in animals.

**8198.\* PROBLEMS IN VETERINARY COMPARATIVE DERMATOLOGY.** (090709) (Cr ar; prereq grad student or #) McKeever  
Individual study involving a research study of a selected dermatologic problem.

**8390. SEMINAR: VETERINARY SURGERY.** (186268) (Cr ar; prereq 5360, 5365, or equiv, and #) Wallace

**8391. ADVANCED SMALL ANIMAL SURGERY.** (390710) (Cr ar; prereq CVM 5350 or equiv, #) Wallace, Lipowitz, Caywood  
Surgery of the various systems in small animals with preoperative and postoperative evaluation and treatment.

**8394. SURGERY OF THE GASTROINTESTINAL SYSTEM.** (187940) (Cr ar; prereq 5201 or equiv, #) Caywood, Lipowitz, Wallace

**8410. SURGICAL PHYSIOLOGY.** (087941) (2 cr; prereq 8391 or equiv, #) Wallace  
Macro and micro physiological changes that occur in the animal body as the result of surgical disease and intervention.

**8420. NEUROSURGERY.** (887942) (3 cr; prereq 8391 or equiv, #) Wallace  
Treatment of surgical diseases of animal nervous system, including pathophysiology of these animals.

**8430. THORACIC AND CARDIOVASCULAR SURGERY.** (789232) (prereq 8391, #; lect 0800-1300 MTWThF; lab 1400-1700 MTWThF, VetTchHos 350) Caywood, Lipowitz

**8490. ADVANCED VETERINARY RADIOLOGY.** (190711) (Cr ar; prereq 5450, 5451, 5452 or equiv, #) Feeney, others  
Advanced radiological procedures and modalities and their interpretation or application to veterinary medicine.

### SECOND TERM

**5000. CLINICAL SMALL ANIMAL MEDICINE.** (891408) (6 cr; prereq #; arranged MTWThFS; VetTchHo) Hardy, S. Johnston, Klausner, Polzin, others  
See First Term.

**5002. CLINICAL SMALL ANIMAL SURGERY.** (691409) (8 cr; prereq #; arranged MTWThFS; VetTchHo) Staff  
See First Term.

**5004. CLINICAL SMALL ANIMAL SPECIALTIES.** (091410) (6 cr; prereq #; arranged MTWThFS; VetTchHo) Bistner, McKeever, Ogburn, others  
See First Term.

**5006. CLINICAL ANESTHESIOLOGY.** (891411) (4 cr; prereq #; arranged MTWThFS; VetTchHo) Staff  
See First Term.

**5008. CLINICAL RADIOLOGY.** (691412) (4 cr; prereq #; arranged MTWThFS; VetTchHo) Staff  
See First Term.

**8197.\* ADVANCED DERMATOLOGIC CLINICS.** (586915) (4 cr; prereq grad student or #) McKeever  
See First Term.

**8198.\* PROBLEMS IN VETERINARY COMPARATIVE DERMATOLOGY.** (386916) (Cr ar; prereq grad student or #) McKeever  
See First Term.

**8390. SEMINAR: VETERINARY SURGERY.** (186263) (Cr ar; prereq 5360, 5365, or equiv, and #) Wallace

**8391. ADVANCED SMALL ANIMAL SURGERY.** (186917) (Cr ar; prereq CVM 5350 or equiv, #) Wallace, Lipowitz, Caywood  
See First Term.

**8394. SURGERY OF THE GASTROINTESTINAL SYSTEM.** (187937) (Cr ar; prereq 5201 or equiv, #) Caywood, Lipowitz, Wallace

**8410. SURGICAL PHYSIOLOGY.** (087938) (2 cr; prereq 8391 or equiv, #) Wallace  
See First Term.

**8420. NEUROSURGERY.** (887939) (3 cr; prereq 8391 or equiv, #) Wallace  
See First Term.

**8430. THORACIC AND CARDIOVASCULAR SURGERY.** (786265) (prereq 8391, #; lect 0800-1300 MTWThF; lab 1400-1700 MTWThF, VetTchHos 350) Caywood

**8490. ADVANCED VETERINARY RADIOLOGY.** (086918) (Cr ar; prereq 5450, 5451, 5452 or equiv, #) Feeney, others  
See First Term.

## Social and Administrative Pharmacy (SAPH)

7-159 Health Sciences Unit F. 376-5326  
College of Pharmacy

### FIRST TERM

**8100. SEMINAR.** (189695) (1 cr)

**8200. RESEARCH PROBLEMS.** (187932) (cr ar)

**8280. ADMINISTRATIVE CLERKSHIP.** (186934) (Cr ar; prereq  $\Delta$ )

**8400. SPECIAL CLINICAL PROBLEMS.** (989696) (Cr ar)

**8420. SOCIAL AND BEHAVIORAL ASPECTS OF PHARMACY PRACTICE.** (786704) (3 cr)

### SECOND TERM

**8100. SEMINAR.** (789697) (1 cr)

**8200. RESEARCH PROBLEMS.** (189767) (cr ar)

**8280. ADMINISTRATIVE CLERKSHIP.** (986135) (Cr ar; prereq  $\Delta$ )

**8400. SPECIAL CLINICAL PROBLEMS.** (589698) (Cr ar)

## Social and Philosophical Foundations of Education (SPFE)

275 Peik Hall. 373-5568  
College of Education

### FIRST TERM

**R 3090. THE SCHOOL AND SOCIETY.** (590737) (3 cr; limited to 45 students; prereq education sr; 0905-0955 MTWThF; BuH 123; A-N only) Lewis  
Readings in social science and philosophy give the student opportunity to integrate points of view concerning the role of the school in present-day society.

**3099. DIRECTED STUDY.** (1-6 cr; prereq #)  
Independent readings with guidance of the faculty  
Sec 21, (191351) Clark  
Sec 22, (591354) Lewis

**5099. DIRECTED STUDY.** (089155) (Cr ar [max 9 cr]; prereq #; S-N optional)  
Individual or group work on topics or problems in social and philosophical foundations of education.  
Sec 21, (991352) Clark  
Sec 22, (391355) Lewis

**5125. YOUTH IN MODERN SOCIETY.** (389329) (4 cr, §Soc 5952; 0800-0955 TTh; PeikH 37; A-N only) Clark  
Youth in advanced societies and as a social entity; functions and roles in industrial society, family, education, politics and government, economy and work, welfare and religion; organizations, social movements, and subcultures; empirical research and cross-cultural perspectives. Meets with Soc 5952.

**5180. INTRODUCTION TO THE ECONOMICS OF EDUCATION.** (191356) (4 cr, §EdAd 5280; 1010-1255 TTh; EdH Annex 64; A-N only)  
Economic impact of education on educational markets, prices and production relationships, distribution of income, and investment and cost-benefit analysis in education. Meets with EdAd 5280.

**5202. POLITICS OF EDUCATION.** (989097) (3 cr, §EdAd 5202; 1010-1205 MWF; PeikH 28; A-N only) Mazzoni  
Social science findings, concepts, and methods used to consider the political context of educational administration, emphasis on public school policymaking by local and state governments; role of administrators. Meets with EdAd 5202.

**8241. PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION.** (789330) (Cr and hrs ar; prereq #)  
For graduate students interested in research and original work in these areas.  
Sec 21, (791353) Clark  
Sec 22, (091357) Lewis

### SECOND TERM

**R 3090. THE SCHOOL AND SOCIETY.** (885124) (3 cr; limited to 45 students; prereq sr; 0800-0850 MTWThF; PeikH 28; A-N only) Harkins  
See First Term.

**3099. DIRECTED STUDY.** (188076) (1-6 cr; prereq #) Harkins  
See First Term.

**5099. DIRECTED STUDY.** (091360) (Cr ar [max 9 cr]; prereq #; S-N optional) Harkins  
See First Term.

**8241. PROBLEMS: HISTORY AND PHILOSOPHY OF EDUCATION.** (988077) (Cr and hrs ar; prereq #) Harkins  
See First Term.

# Social and Philosophical Foundations of Education

This graduate program emphasizes productive inquiry into education and society, a full understanding of education as a sociocultural phenomenon. In addition to independent study and research opportunities (SPFE 3099, SPFE 5099 and SPFE 8241), summer

course offerings cross-listed with other programs include Youth in Modern Society (SPFE 5125/Soc 5952), Politics of Education (SPFE 5202/EdAd 5202) and Introduction to the Economics of Education (SPFE 5180/EdAd 5280).

## Social, Hospital, and Continuing Pharmacy Education (SHCE)

Student Affairs Office,  
5-110 Health Sciences Unit F. 373-7997  
College of Pharmacy

### FIRST TERM

**5210. TERMINOLOGY OF THE HEALTH SCIENCES.** (686615) (2 cr, §HSU 5210; HSUnit F 7-125) McKennell  
A modern programmed learning course with the most current usage and traditional components; the language of health care delivery. Call 376-5315 for more information.

**5970. DIRECTED STUDIES.** (186618) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (186621) (Cr ar; prereq #)

### SECOND TERM

**5210. TERMINOLOGY OF THE HEALTH SCIENCES.** (686622) (2 cr, §HSU 5210; HSUnit F 7-125) McKennell  
A modern programmed learning course with the most current usage and traditional components; the language of health care delivery. Call 376-5315 for more information.

**5970. DIRECTED STUDIES.** (386625) (1-5 cr; prereq #)

**5999. SPECIAL PROBLEMS.** (886628) (Cr ar; prereq #)

## Social Work (SW)

400 Ford Hall. 373-2606  
College of Home Economics

### FIRST TERM

**n1001. INTRODUCTION TO SOCIAL WELFARE AND COMMUNITY SERVICES.** (591127) (5 cr; limited to 50 students; 0915-1100 MTWTh; FordH 349) Link, Sullivan  
A sampling of the fields of community-based social services, representative of societal responses to needs. Characteristics of such services reviewed historically, dynamically, and comparatively.

**3970. DIRECTED STUDIES.** (589684) (1-15 cr; prereq #, majors only)

**n5111. CONTEMPORARY POLICY AND PROGRAMS IN SOCIAL WELFARE.** (391128) (3-4 cr; prereq grad standing or 12 cr social sciences; limited to 30 students; 1615-1845 TTh; FordH 160) Pandey  
Framework for analysis of concepts and principles in social policy for social welfare programs and services.

**n5414. FUNDAMENTALS OF SOCIAL GROUP WORK.** (386138) (3-4 cr, §B414; prereq 3005; limited to 30 students; 1645-1915 MW; FordH 175) Edleson  
Analysis of basic principles of social group work practice applicable to both task and treatment groups. The small group as a social process to achieve task and treatment goals. Sociophilosophic orientation, theoretical frames of reference,

application of structure, task and process variables, use of member-to-member interactions, group goal settings, and professional relationships with groups, with individual members, and with systems external to small group.

**8020. FIELD INSTRUCTION II.** (290506) (4 cr or cr ar by # (max 12 cr required); prereq 8010; hrs ar) Johnston

**n8901. SCIENTIFIC INQUIRY.** (191129) (3 cr; limited to 20 students; 0915-1100 MW FordH 70) Jones  
Logic, methods, and techniques of scientific inquiry in social work. Nature and functions of theory, models, assumptions, problem formulation, causal analysis, conceptualization, operationalism, and hypothesis formulation.

**8970. DIRECTED STUDY.** (089673) (Cr ar; prereq #)  
Independent study under tutorial guidance.

**8990. RESEARCH PROJECTS.** (186139) (Cr ar (max 6 cr))

### SECOND TERM

**3970. DIRECTED STUDIES.** (389685) (1-15 cr; prereq #, majors only)

**n5010. TOPICS IN SOCIAL WORK.** (3 cr; 1 limited to 50 students, sec 2 limited to 30 students; prereq 1001, 3005, jr, sr or grad in social work)

Sec 1, (786136) **Child Sexual Abuse—Issues and Interventions—July 21-25;** 0830-1630 MTWThF; FordH 175, Gligun  
Methods and strategies for dealing with families in which child sexual abuse has occurred, including a noncoercive method of helping children discuss their own sexual abuse. Contemporary research and theory. Questions to be discussed: Does the mother always know? Is the child the seducer? Is adult-child sexual interaction a misuse of power?

Sec 2, (591130) **Working with the Elderly—A Social Work Perspective, July 21-25;** 0830-1630 MTWThF; KoltH S136, Quam

This workshop will focus on specific techniques of working with the elderly and their families and will be taught through the use of lecture, discussion, role plays and simulation exercises. Recent literature about casework, group work, and community organization with the elderly will be reviewed. This workshop is taught on a one-week concentrated format and it is expected that students have a general understanding of theories of aging and a multi-disciplinary approach to working with elderly clients.

**8020. FIELD INSTRUCTION II.** (285497) (4 cr or cr ar by #; prereq 8010; hrs ar) Johnston

**8970. DIRECTED STUDY.** (989763) (ar cr; prereq #)  
Independent study under tutorial guidance.

**8990. RESEARCH PROJECTS.** (188787) (Cr ar (max 6 cr))

## Sociology (Soc)

1114 Social Science. 373-2642  
College of Liberal Arts

### FIRST TERM

**1001. INTRODUCTION TO SOCIOLOGY.** (890565) (4 cr; 0905-0955 MTWThF; AndH 230) Thornton  
The scientific study of social behavior. Overview of major theories, methods, concepts and research findings. Characteristics of the basic social units (social relations, groups, organizations, institutions, society), and their patterns of interrelation and processes of change.

**3101. INTRODUCTION TO AMERICAN CRIMINAL JUSTICE.** (891358) (4 cr, §CJS 3101; 1010-1100 MTWThF, BlegH 425) Samaha

Components and dynamics as well as philosophical underpinning of the criminal justice system.

**3401. PRINCIPLES OF SOCIAL ORGANIZATION.** (891361) (5 cr; prereq 1001, 3801 or equiv; lect 0905-0955 MTWThF; BlegH 120; lab 0800-0855 TTh; BlegH 120) Friedmann  
How and why social organization is possible. Major concepts and theories of social structure, primary forms of social organization (groups, communities, networks, formal organizations), basic social processes (integration, differentiation, regulation, change), and how social organization evolves from individual decision making. Meets with 5401.

**3501. THE FAMILY SYSTEMS.** (491704) (4 cr; prereq 1001 or #; 1115-1205 MTWThF; BlegH 120) Reiss  
The family in contemporary American Society with attention to historical and cross-cultural comparisons; interrelationships with other social institutions, socialization, patterns of mate selection, life cycle processes and norms of human sexuality.

**3970. DIRECTED STUDIES.** (490567) (1-15 cr per term; prereq #, Δ, □) Staff  
Guided individual reading or study.

**5114. THE SOCIAL CONTROL OF WOMEN OFFENDERS.** (491363) (4 cr; prereq 3102 or #; 1115-1205 MTWThF; BlegH 115) Kruttschnitt

Historical and current explanations for female criminality; current trends in women's participation in crime and treatment of women by legal system.

**5135. WHITE COLLAR CRIME.** (191365) (4 cr; prereq 3101, 3102 or #... 5161, 5162 recommended; 1010-1100 MTWThF; BlegH 225) Clark

White collar crime, broadly construed; roots in American society, responses offered by theoreticians and amateur and professional politicians.

**5401. SOCIAL ORGANIZATION.** (791367) (4 cr (no cr for sociology majors); prereq 8 cr in sociology, anthropology, psychology, political science or economics; 0905-0955 MTWThF; BlegH 120) Friedmann  
Theories of social structure, social stratification, community structure, status groups, the nature of social power, social control processes, aspects of formal organizations, and rational actor models for decentralized social processes. Meets with 3401.

**5952. YOUTH IN MODERN SOCIETY.** (989522) (4 cr, §SPFE 5125; prereq 1001 or equiv or #; 0800-0955 TTh; PeikH 37) S Clark

Youth in advanced societies; youth as a social entity; functions of youth in industrial societies; roles in family, education, politics and government, economy and work, welfare and religion; youth organizations, social movements and subcultures; empirical research and cross-cultural perspectives. Meets with SPFE 5125.

**5960. TOPICS IN SOCIOLOGY: SOCIOLOGY UPDATE, RECENT ADVANCES FOR EDUCATORS.** (991366) (4 cr; prereq 1001; 1010-1205 TTh; BlegH 255) Cooperman, coordinator

Review of recent changes in sociology, including advances in empirical research, methods, and theory. Teaching sociology: approaches, techniques, aims.

**5970. DIRECTED STUDIES.** (290568) (1-15 cr per term; prereq #, Δ, CLA approval) Staff  
Guided individual reading or study.

**8090. TOPICS.** (989486) (Cr ar; prereq #) Staff



**FIRST AND SECOND TERMS: TEN-WEEK COURSE**

(Register once in Term I)

**3966. MAJOR PROJECT SEMINAR.** (291364) (4 cr; prereq 3801 and 3803 or 3802, preferably all three; 0905-0955 TTh, other hrs arr., BlegH 260) T. Anderson

Assists sociology majors in preparing research reports that satisfy the major project requirement. Provides guidance and direction in defining a research problem, collecting or selecting data, analyzing data, and writing a sociology research paper.

**SECOND TERM**

**1001. INTRODUCTION TO SOCIOLOGY.** (185498) (4 cr; 0905-0955 MTWThF; BlegH 10) Thornton  
See First Term.

**3102. INTRODUCTION TO CRIMINAL BEHAVIOR AND SOCIAL CONTROL.** (791370) (4 cr, §3103; prereq 3101; 1010-1100 MTWThF; BlegH 245) Kruttschnitt  
Basic issues in criminology and the sociology of law and social control organizations.

**R3201. PRINCIPLES OF SOCIAL PSYCHOLOGY.** (391372) (5 cr; prereq 1001; lect 0905-0955 MTWThF; BlegH 105; 0800-0855 lab TTh; BlegH 105) Friedmann  
Ideas and findings related to social psychology; experience in developing empirically based knowledge in social science. Meets with 5201.

**3214. UNDERSTANDING EVERYDAY LIFE.** (191373) (4 cr; prereq soph, jr., or sr.; 1115-1205 MTWThF; BlegH 135) ar.  
Behaviors (activities, personal associations), orientations (values, attitudes, beliefs), and personal interpretations of "typical" individuals; their relationship to social characteristics; the effects of transitions—anticipated (e.g., educational/occupational choice, marriage) and unexpected (e.g., unemployment, illness).

**3671. COMPARATIVE RURAL SOCIETIES: LATIN AMERICA.** (091374) (4 cr; prereq 8 or in sociology, anthropology, economics, or political science or #; 1220-1310 MTWThF; BlegH 105) ar.

Social and cultural change in Latin America. Demographic and ecological characteristics, institutional structure and its accompanying associations; linkages with outside and world views.

**3970. DIRECTED STUDIES.** (985499) (1-15 cr per term; prereq #, Δ, □) Staff  
See First Term.

**5161. CRIMINAL LAW IN AMERICAN SOCIETY.** (891375) (4 cr; 1010-1100 MTWThF, BlegH 425) Samaha  
Purposes and principles of criminal law; proper limits of criminal sanction and suggested reforms in existing criminal law.

**5201. INTRODUCTION TO SOCIAL PSYCHOLOGY.** (691376) (4 cr [no cr for sociology majors]; prereq 8 or in sociology, anthropology, psychology, political science, or economics; 0905-0955 MTWThF; BlegH 105) Friedmann  
Meets with 3201 lecture.

**5703. SOCIAL LIFE AND CULTURAL CHANGE.** (491377) (4 cr; prereq 8 cr in social science or #; 1010-1100 MTWThF; BlegH 420) ar  
Theories of social change; methodological problems. Comparative social thought and structure of antiquity as basic data for analysis.

**5970. DIRECTED STUDIES.** (985504) (1-15 cr per term; prereq #, Δ, CLA approval) Staff  
See First Term.

**8090. TOPICS.** (785505) (Cr ar; prereq #) Staff

**Soil Science (Soil)**

125 Soils, St. Paul. 373-1063  
College of Agriculture

**FIRST TERM**

**5114.\* SPECIAL PROBLEMS IN SOILS.** (989844) (1-5 cr per qtr [max 10 cr]; prereq 1122 or #) Adams, Baker, Bloom, Malzer, Gaudreau, Graham, Rust, Schmidt, Grava, Grigal, Swan, Cooper  
Research, readings, instruction.

**5570. FIELD TOUR OF MINNESOTA SOILS—June 16-20.** (291641) (3 cr; prereq 3520 or #)

Field tour of both northern and southern Minnesota's soils. Soil formation, soil profiles, land use and management practices discussed while visiting representative soils. Travel expenses are student's responsibility.

**8124.\* RESEARCH PROBLEMS IN SOILS.** (789845) (2-5 cr; hrs ar) Adams, Baker, Bloom, Dowdy, Graham, Malzer, Molina, Rust, Schmidt, Swan, Grava, Grigal  
Individual laboratory or fieldwork on special problems in a phase of soils other than the student's major thesis. Arrangements must be made in advance.

**SECOND TERM**

**5114.\* SPECIAL PROBLEMS IN SOILS.** (790784) (1-5 cr per qtr [max 10 cr]; prereq 1122 or #) Adams, Baker, Bloom, Malzer, Gaudreau, Graham, Swan, Rust, Schmidt, Grigal, Cooper  
See First Term.

**8124.\* RESEARCH PROBLEMS IN SOILS.** (590785) (2-5 cr; hrs ar) Adams, Baker, Bloom, Dowdy, Graham, Malzer, Molina, Rust, Schmidt, Grava, Grigal, Swan  
See First Term.

**South Asian Studies (SoAS)****FIRST TERM**

**3413. BUDDHISM** (091701) (4 cr; 1010-1100 MTWThF; FolH 209) Junghare, Indira  
Historical account of the Buddhist religion in terms of its rise, development, various schools and common philosophical concepts. Focuses on Indian Buddhism, compares it with Hinduism, and discusses its demise and revival on the Indian subcontinent.

**Spanish (Span)**

34 Folwell Hall. 373-7998  
College of Liberal Arts

**FIRST TERM**

**R1101. BEGINNING SPANISH: ORAL APPROACH.** (5 cr, §Chic 1201; each section limited to 25 students)  
Emphasis on speaking and understanding Spanish; pronunciation; writing and reading skills; basic grammar; cultural aspects of language and civilizations of Spain and Spanish America.

Sec 1, (190569) 0800-0955 MTWThF, Pth 111  
Sec 2, (490570) 0800-0955 MTWThF, NichH 209

**R1102. BEGINNING SPANISH: ORAL APPROACH.** (5 cr, §Chic 1202; limited to 25 students; prereq 1101 or 1 yr high school Spanish)

Sec 1, (290571) 0800-0955 MTWThF, Pth 214  
Sec 2, (186702) 0800-0955 MTWThF, FolH 209

**R1103. BEGINNING SPANISH: ORAL APPROACH.** (190572) (5 cr, §Chic 1203; limited to 25 students; prereq 1102 or 2 yrs high school Spanish; 0905-1100 MTWThF; ChDev 105)  
See 1101.

**R1104. INTERMEDIATE SPANISH, ORAL APPROACH: INTERPRETATION OF MODERN PROBLEMS.** (990573) (4 cr; limited to 25 students; prereq 1103 or 3 yrs high school Spanish; 0940-1105 MTWThF; FolH 304)

Continued emphasis on speaking and comprehension; development of reading and writing skills based on materials from Spain and Spanish America dealing with current issues. Grammar review; frequent compositions and oral presentation to build vocabulary.

**R3002. READING FOR SPEED AND COMPREHENSION.** (790574) (3 cr; limited to 20 students; prereq 1105 or equiv 1010-1100 MTWTh; FolH 307)

Concentrated, individualized approach to sharpen reading skills,

expand vocabulary, improve comprehension. Sight-reading drills, speed tests, word study, reading aloud. Variety of practical and literary materials at graded levels of difficulty.

**R3614. DON QUIXOTE: A STUDY OF LOST ILLUSIONS.** (788789) (4 cr [cr does not count toward Spanish or Portuguese major but may be used toward Route II language requirement]; taught in English; limited to 30 students; 1115-1205 MTWThF; FolH 50) Zahareas  
Study of the novel in many facets: the "madness" of its characters, the relation of their actions and attitudes to the theme of reality/illusion and to the society of their times.

**3970. DIRECTED STUDIES.** (586221) (1-5 cr per term; prereq #, Δ, □)  
Guided individual reading or study.

**3973. MAJOR PROJECT.** (188179) (2 cr)  
Guided individual project for Spanish majors. Used to fulfill graduation requirements. Office of Undergraduate Studies has details.

**5015. METHODS OF TRANSLATION.** (191180) (4 cr; prereq 10 cr from 3001-3005 series or #; 1220-1520 M, 1220-1415 W; FolH 103) Sousa  
Meaning, use, and theories of translation. Techniques and problems of translation from Spanish and Portuguese to English and vice versa. Translation patterns, use of special vocabularies, and other adjuncts needed to understand both languages. Practical vocabulary and usage for various fields of work.

**5316. THE PICARESQUE NOVEL.** (091181) (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ; 1220-1520 T, 1220-1415 Th; FolH 103) Spadaccini  
Major picaresque narratives—Lazarillo, Guzman, Buscon, Cervantes' picares, Estebanillo Gonzalez—in relation to Spanish ambience, Western tradition, European novel, realism. Literary autobiography, episodic structure, themes of roguery, delinquency, sin, marginality, social criticism, moral preoccupations. Comparison to European counterparts.

**5711. THE STRUCTURE OF MODERN SPANISH: PHONOLOGY.** (386222) (4 cr; prereq 10 cr from 3001-3005 series or #; 1115-1205 MTWThF; FolH 107) Mantini  
Theoretical and practical aspects of Spanish sound system. Segmentals (vowels and consonants) and suprasegmentals (intonation, stress, and juncture). Dialectal differences.

**5920. TOPICS IN SPANISH-AMERICAN LITERATURE.** (891182) (4 cr per term [max 12 cr]; prereq 3104 or SpPt 3104 or Δ; 1430-1625 W, 1220-1520 F, FolH 103) Vidal  
Important groups, movements, trends, methods, genres. Specific approaches depend on topic and instructor.

**5970. DIRECTED READINGS.** (390576) (1-5 cr per term [max 15 cr]; for MA and PhD candidates; prereq #, Δ, CLA approval; hrs ar) Staff  
To fill gaps in students' preparation, especially when courses in certain indispensable topics, figures, periods, or issues have not been offered. Readings in Spanish and/or Spanish-American areas.

**8970. DIRECTED READINGS IN ROMANCE LANGUAGES.** (190577) (Cr and hrs ar; mainly for PhD candidates) Staff  
Authors and topics not otherwise offered. Weekly meetings based on student's research and analysis. Student and instructor agree on plan of reading or particular topics, figures, issues, etc. Readings in Spanish and/or Spanish-American areas.

**FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)**

A concentrated program of study permitting students to earn 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll in all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**R1101-1102-1103. BEGINNING SPANISH.** (15 cr for both terms; limited to 25 students; 0800-1100 MTWThF; section 5, FolH 107, sec 6, FolH 208)  
See 1101 First Term.

**R1101, Sec 5,** (090578) June 17-July 9, 5 cr  
**R1102, Sec 5,** (890579) July 10-31, 5 cr  
**R1103, Sec 5,** (190580) August 1-22, 5 cr

**R1101, Sec 6,** (090581) June 17-July 9, 5 cr  
**R1102, Sec 6,** (890582) July 10-31, 5 cr  
**R1103, Sec 6,** (890583) August 1-22, 5 cr

## SECOND TERM

**1101. BEGINNING SPANISH: ORAL APPROACH.** (585506) (5 cr, §Chic 1201; limited to 25 students; 0800-0955 MTWThF; KohH S138)  
See First Term.

**1102. BEGINNING SPANISH: ORAL APPROACH.** (185508) (5 cr, §Chic 1202; limited to 25 students; prereq 1101 or 1 yr high school Spanish; 0905-1100 MTWThF; LindH 217)  
See 1101 First Term.

**1103. BEGINNING SPANISH: ORAL APPROACH.** (385510) (5 cr, §Chic 1203; limited to 25 students; prereq 1102 or 2 yrs high school Spanish; 0905-1100 MTWThF; BuH 123)  
See 1101 First Term.

**1105. INTERMEDIATE SPANISH, ORAL APPROACH: DISCUSSIONS OF MODERN LITERATURE AND THE PRESS.** (185517) (4 cr; limited to 25 students; prereq 1104 or 4 yrs high school Spanish; 0940-1105 MTWThF; FolH 304)  
See 1104 First Term.

**3005. ORAL COMMUNICATION: SPEAKING AND LISTENING.** (391159) (4 cr; limited to 20 students; prereq 1105 or equiv; 1010-1100 MTWThF; FolH 203)  
Dialogues, group discussions, simulated situational conversations, interviews, skits, debates based on themes from sound and video tapes, records, speakers from Spain and Spanish America. Emphasis on fluency in speaking and understanding of oral expression.

**3104. THE ART OF READING LITERARY TEXTS.** (591161) (4 cr; §SpPt 3104; limited to 25 students; prereq 3002; 1115-1205 MTWThF; FolH 203) Jones  
Critical reading of Spanish and Spanish-American texts; works representing principal genres—novel, drama, poetry, essay; diverse approaches to literature. Terminology of criticism, literary problems and techniques.

**3970. DIRECTED STUDIES.** (188201) (1-5 cr per term; prereq #, Δ, □)  
Guided individual reading or study.

**3973. MAJOR PROJECT.** (588180) (2 cr)  
See First Term.

**5527. NATIONAL LITERARY CONSCIOUSNESS AND FREE TRADE.** (191163) (4 cr; prereq three 3xxx or 5xxx Spanish or Portuguese literature courses or Δ; 1325-1625 M, 1325-1520 W; FolH 108) Jara  
Analysis of literary movements between 1780 and 1900; reflection of process of formation of nation-states and incorporation of Latin America into international capitalist system as producer of foodstuffs and raw materials and importer of manufactured goods.

**5970. DIRECTED READINGS.** (085526) (1-5 cr per qtr [max 15 cr]; for MA and PhD candidates; prereq #, Δ, CLA approval; hrs ar) Staff  
See First Term.

**8970. DIRECTED READINGS IN ROMANCE LANGUAGES.** (685528) (Cr and hrs ar; mainly for Ph.D. candidates) Staff  
See First Term.

## Speech-Communication (Spch)

317 Folwell Hall, 376-2617  
College of Liberal Arts  
(See also Rhetoric 1222)

### FIRST TERM

**1101. FUNDAMENTALS OF SPEECH COMMUNICATION: ORAL COMMUNICATION.** (4 cr, §1441; each section limited to 24 students)

Oral communication processes and elements. Criticism and response to oral discourse. Individual speaking.

Sec 1, (490584) 0800-0850 MTWThF, FolH 306  
Sec 2, (290585) 0905-0955 MTWThF, FolH 306

**1102. FUNDAMENTALS OF SPEECH COMMUNICATION: COMMUNICATION PROCESS.** (190586) (4 cr; 1010-1100 MTWThF; FolH 406) Petronio  
Introduction to communication theory and research focusing on interpersonal, intercultural, group, and family settings.

**1313. ANALYSIS OF ORAL ARGUMENT.** (887987) (4 cr; limited to 25 students; 0800-0850 MTWThF; FolH 307)  
Strategies for analyzing and evaluating arguments received aurally. Problems in listening and responding to argument.

**3201. INTRODUCTION TO BROADCASTING PRODUCTION.** (191186) (4 cr; limited to 22 students; 1010-1310 TTh; RarigC 610)  
Practice and theory. Projects in performance, scripting, studio equipment and procedures.

## Small group communication workshops

Direct experience as a working-learning device in leadership situations will be provided in Spch 5441, a workshop offered June 17-29. Experiences will deal with the nature of authority, power, and organizational and intergroup processes. Spch 5441 examines the role of communication in building the culture of organizations. It covers the theory of communicating in organizing, the analysis of organizational cultures, and changing organizational cultures. Spch 5441 meets June 17-July 3.

**3203. RADIO PRODUCTION.** (186196) (4 cr; limited to 14 students; prereq 3201; 1220-1310 MTWThF; EddyH 28) Reist  
Equipment and staff organization; program design and presentation. Organization, writing, production, direction, and performance of radio news, music, dramatic, and documentary programs.

**3211. DETERMINANTS OF BROADCAST PROGRAMMING.** (986197) (4 cr; 0800-0955 MTW; FolH 50) Browne  
Historical development and contemporary aspects of broadcast programming. Roles of governmental, industrial, and public organizations in influencing programming decisions. Problem areas in programming.

**3431. THE ROLE OF PERSUASION IN THE MODERN WORLD.** (991187) (4 cr; soph standing rec; 1115-1205 MTWThF; FolH 406) Bormann  
Persuasion in interpersonal, organizational, intracultural, and intercultural relationships. Contemporary persuasion, with occasional historical segments.

**3451. INTERCULTURAL COMMUNICATION: THEORY AND PRACTICE.** (687988) (4 cr; prereq planning an intercultural experience; 0800-0850 MTWThF; FolH 406)  
Theories of intercultural communication; factors influencing intercultural communication for students wishing to become both knowledgeable and proficient in interaction across cultures.

**3641. DISCUSSION AND CONFERENCE METHODS.** (989357) (4 cr; limited to 30 students; prereq 1101 or 1101H or #; 0905-0955 MTWThF; FolH 406) McArthur  
Cooperative thinking in task-oriented groups. Planning, preparing for, participating in, and leading private and public meetings.

**3970. DIRECTED STUDIES.** (990587) (Cr ar [cr does not count toward speech-communication major]; prereq at least one course in speech-communication, #, Δ, □)  
Individual study projects in speech-communication. Consultation with an instructor who agrees to supervise the project is required.

**3980. DIRECTED INSTRUCTION.** (790588) (1-4 cr per term [max 8 cr; cr does not count toward speech-communication major]; S-N only; prereq #, Δ, □)  
Students work with an instructor in planning and teaching an undergraduate course.

**5402. PROBLEMS IN INTERPERSONAL COMMUNICATION.** (786198) (4 cr; prereq 3401 or #; 1115-1205 MTWThF; FolH 307) McArthur  
Factors contributing to misunderstanding, disagreement, and cessation of contact in dyads.

**5404. LANGUAGE, CULTURE, AND EDUCATION.** (988791) (4 cr; limited to 15 students, §SeEd 5404; prereq 1102, 3401 or #; 1115-1205 MTWThF; PaikH 46) Piché  
Psychological and social-psychological perspectives for study of language-communication; dimensions of language variation (dialects, codes, registers); implications for program development and instructional practices. Meets with SeEd 5404.

**5406. FAMILY COMMUNICATION.** (591189) (4 cr; prereq 1102, 3401 for undergrads . . . 5421 or equiv for grads; 1115-1205 MTWThF; FolH 306) Petronio

Using a life cycle perspective, examines evolution of communicative patterns among members of a nuclear family at various stages of development.

**5414. AUTHORITY AND POWER IN TASK-ORIENTED COMMUNICATION—June 17-29.** (790591) (4 cr; limited to 60 students; S-N only; prereq 3641 or #; 1615-1815 MTWThF; 0900-1730 Sat Sun; FolH 308) Shapiro  
Authority and power in task-oriented groups. Tavistock type, small group, intergroup, and large group laboratory experiences. Verbal and nonverbal processes that operate in and among groups to facilitate or inhibit effective leadership and followership. See Special Programs section.

**5441. COMMUNICATION IN HUMAN ORGANIZATIONS—June 17-July 3.** (189356) (4 cr; prereq 3401 or 8 cr social sciences; 1535-1800 MTWThF; FolH 209) Bantz  
Communication in organizational settings. Organizational structure and dynamics and their effect on the communication process. See Special Programs section.

**5617. HISTORY AND CRITICISM OF AMERICAN PUBLIC ADDRESS.** (991190) (4 cr; prereq 1101, Psy1001; 1220-1310 MTWThF; FolH 406) Bormann  
History and criticism of religious and reform speech in the United States, 1620 to 1920.

**5970. DIRECTED READINGS.** (590589) (Cr ar; prereq 9 cr in 3xxx-5xxx-level speech courses, #, Δ, CLA approval)  
Directed reading and preparation of reports on selected subjects.

**8203. HISTORICAL AND DESCRIPTIVE RESEARCH IN SPEECH-COMMUNICATION.** (791191) (3 cr; 1325-1520 MW; FolH 307) Browne  
Elements involved in conducting and analyzing historical and descriptive research in speech-communication; approaches to historical research, assessment of primary and secondary sources; execution of major research project.

**8441. SEMINAR: ORGANIZATIONAL COMMUNICATION.** (591192) (3 cr; prereq 5441 or #; 1325-1520 TTh; FolH 307) Bantz  
Directed projects. Emphasis on studies conducted in real or simulated organizations.

**8990. RESEARCH.** (990590) (Cr ar; prereq #, Δ)  
Open to graduate students engaged in research on special problems.

### SECOND TERM

**1101. FUNDAMENTALS OF SPEECH COMMUNICATION: ORAL COMMUNICATION.** (485532) (4 cr, §1441; limited to 24 students; 0800-0850 MTWThF; FolH 306)  
See First Term.

**1313. ANALYSIS OF ORAL ARGUMENT.** (687991) (4 cr; limited to 25 students; 0905-0955 MTWThF; FolH 307)  
See First Term

**3204. STUDIO TELEVISION PRODUCTION.** (585537) (4 cr; prereq 3201; limited to 18 students; 1010-1310 TTh; RarigC 610)  
Analysis of the in-studio production process. Writing, producing, and directing in-studio video.

**3401. THEORIES OF PERSON-TO-PERSON COMMUNICATION.** (286343) (4 cr; prereq 1102 or #, Psy 1001; 0905-0955 MTWThF; FolH 50) Sykes  
Social scientific perspectives on talk. Review of variable analytic, covering-law, pragmatic and rule-based theories of conversation.

**3601. APPROACHES TO PUBLIC DISCOURSE.** (789358) (4 cr; prereq 1101; 0800-0850 MTWThF; FolH 308) Scott  
Theoretical systems intended to explain or direct the creation of public discourse. Traditional rhetoric to contemporary perspectives. Using theory to explain the practice of public discourse.

**3605. PUBLIC SPEAKING.** (487992) (4 cr; prereq 1101; 1010-1100 MTWThF; FolH 307) Scott  
Principles of preparing and presenting public speeches; directed practice in public speaking; consideration of function of public speaking in contemporary life.

**r 3641. DISCUSSION AND CONFERENCE METHODS.** (186344) (4 cr; limited to 30 students; prereq 1101 or 1101H or #: 1115-1205 MTWThF; FolH 307)  
See First Term.

**3970. DIRECTED STUDIES.** (185548) (Cr ar [cr does not count toward speech-communication major]; prereq at least one course in speech-communication, #, Δ, □)  
See First Term.

**3980. DIRECTED INSTRUCTION.** (285550) (1-4 cr per term [max 8 cr...cr does not count toward speech-communication major]; S-N only; prereq #, Δ, □)  
See First Term.

**r 5261. THE COMMUNICATIVE PROCESSES OF TELEVISION.** (891196) (4 cr; limited to 25 students; prereq 3211 or #: 0800-0850 MTWThF; FolH 406) Cohen  
Television as a system of communicative processes: the organizational processes of televised communicators, television content as a link between communicators and communicatees, and how viewers use television.

**r 5405. NONVERBAL COMMUNICATION: THEORY AND RESEARCH.** (986345) (4 cr; limited to 25 students; 1220- 1310 MTWThF; FolH 50) Sykes  
Nonverbal (extra-linguistic) elements and dimensions of interpersonal communication. Nonverbal categories examined to include gesture, facial expression, posture, clothing, and environment.

**5421. QUANTITATIVE RESEARCH IN COMMUNICATION.** (691197) (4 cr; prereq 3401 or 5403 or #: 1010-1100 MTWThF; FolH 406) Cohen  
Experimental and descriptive research; design and procedures; individual projects.

**5431. THE PROCESS OF PERSUASION.** (691734) (4 cr; prereq 1102, Psy 1001; 1115-1205 MTWThF; FolH 406) Howell  
Theories of modern motivational communication. Analysis of the process of social control through persuasive speech.

**5970. DIRECTED READINGS.** (985552) (Cr ar; prereq 9 or in 3xxx-5xxx-level speech courses, #, Δ, CLA approval)  
See First Term.

**8451. SEMINAR: FACE-TO-FACE INTERCULTURAL COMMUNICATION.** (891733) (3 cr; prereq, if US citizen, Anth 5101 or similar course in cultural anthropology or #: 5451 recommended; 1325-1520 TTh; FolH 307) Howell  
Factors influencing face-to-face communication in varied cultures, concentrating upon task-oriented communication between North American and nationals in the host country. Verbal (linguistic) and nonverbal (nonlinguistic) dimensions of communication.

**8990. RESEARCH.** (185556) (Cr ar; prereq #, Δ)  
See First Term.

## Statistics (Stat)

270A Vincent Hall, 373-3036  
College of Liberal Arts

### FIRST TERM

**1051. INTRODUCTION TO IDEAS OF STATISTICS.** (590592) (4 cr; prereq high school higher algebra; 0905-0955 MTTh, 0905-1100 WF; VinH 311)  
Presentation and analysis of data. Probabilistic models for inference. Inference and decision procedures. Emphasis on concepts rather than computation.

**r 3091. INTRODUCTION TO PROBABILITY AND STATISTICS.** (489368) (4 cr, \$5121, \$5131; limited to 40 students; prereq differential and integral calculus; 1010-1100 MTTh, 1010-1205 WF; VinH 1)  
Elementary probability and probability distributions, sampling and elements of statistical inference. Treatment is more mathematical than 1051.

**r 5021. STATISTICAL ANALYSIS I.** (188790) (5 cr; prereq college algebra or #: 0905-1005 MTWThF, 1325-1455 TTh; ClaOff B25)  
Frequency distributions, descriptive statistics, elementary probability; binomial, Poisson, and normal distributions, estimation and testing, analysis of variance, multiple comparisons, linear regression.

**5121. THEORY OF STATISTICS.** (390593) (4 cr, \$5131-5132-5133; prereq Math 1231 or 1331 or 1621; 1115-1205 MWF, 1010-1205 TTh; VinH 311)  
Univariate and multivariate distributions, law of large numbers, sampling, likelihood methods, estimation and hypothesis testing.

**5890. SENIOR PAPER.** (788131) (2 cr; prereq sr statistics major)  
Satisfies senior project requirement for majors. Directed study. Paper on specified area, a consulting project, or original computer program.

### SECOND TERM

**r 3091. INTRODUCTION TO PROBABILITY AND STATISTICS.** (4 cr, \$5121, \$5131; each section limited to 40 students; prereq differential and integral calculus)  
See First Term.

Sec 1, (085560) 0905-0955 MTTh, 0905-1100 WF, VinH 311  
Sec 2, (089169) 1010-1105 MTTh, 1010-1205 WF, MurH 311

**5122. THEORY OF STATISTICS.** (185565) (4 cr, \$5131-5132-5133; prereq 5121; 1115-1205 MWF, 1010-1205 TTh; VinH 311)  
Confidence intervals, testing hypotheses, regression, analysis of variance and covariance, distribution-free methods.

## Surgery (Surg)

11-100 Phillips-Wangensteen Building, 373-8803  
Medical School

### FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in term I)

#### Elective Courses for Undergraduate Students

**5500. EXTERNSHIP IN GENERAL SURGERY (University and Affiliated Hospitals, Hennepin Cty Med Center).** (587112) (Cr ar; prereq regis med) Cerra, staff

**5501. EMERGENCY ROOM EXTERNSHIP.** (189669) (9 cr; prereq regis med) Cerra

**5502. EXTERNSHIP IN THE SURGICAL INTENSIVE CARE UNIT.** (589670) (9 cr; prereq regis med) Cerra

**5503. RESEARCH PROBLEMS IN SURGERY.** (389671) (9 cr; prereq regis med; S-N only) Sutherland

**5504. EXTERNSHIP IN SURGICAL NUTRITION.** (286682) Cerra

**5511. EMERGENCY ROOM EXTERNSHIP.** (791692) (St. Paul Ramsey Med. Center) (9 cr; prereq regis med) Cerra

**5523. EXTERNSHIP IN COLON AND RECTAL SURGERY (Veterans Administration Hospital).** (387113) (4.5 cr; offered all periods except 5; prereq regis med; 3 weeks) Goldberg

#### Required Courses for Graduate Students

**8200. CLINICAL SURGICAL PROBLEMS AND MANAGEMENT.** (187114) (5 cr; ar MTWThF) Najarian, staff

**8201. SURGERY-ROENTGENOLOGY-PATHOLOGY CONFERENCE.** (087115) (1 cr; 1600-1730 F; Mayo C321-Todd Amph) Najarian

**8202. SURGICAL RESEARCH.** (887116) (5 cr; ar MTWThF; Sur Res Lab) Staff

**8203. SURGERY COMPLICATIONS AND RESEARCH CONFERENCE.** (687117) (1 cr; 1640-1730 T; PWB 11-157) Najarian, staff

**8207. TRANSPLANTATION AND BONE MARROW CONFERENCE.** (487118) (1 cr; 1640-1730 Th; PWB 11-157) Najarian

## Swedish (Swed)

210 Colwell Hall, 373-2560  
College of Liberal Arts

### FIRST AND SECOND TERMS: TEN-WEEK COURSE (Register once in Term I)

A concentrated program of study permitting student to earn a total of 15 hours of credit, the equivalent of a full year's sequence in language. **Students must enroll in all three courses and may not enroll in other summer courses.** Prospective students should talk to an adviser before registering for intensive language courses.

**1101-1102-1103. BEGINNING SWEDISH.** (15 cr for both terms; 0905-1230 MTWThF; Kolth S139) Stockenström  
For students with little or no knowledge of Swedish, stresses fundamentals of grammar, correct pronunciation, reading, practice, conversation and simple composition.

**R1101,** Sec 5, (891148) June 17-July 9, 5 cr

**R1102,** Sec 5, (891149) July 10-31, 5 cr

**R1103,** Sec 5, (091150) August 1-22, 5 cr



## Textiles and Clothing (TexC)

240 McNeal Hall, St. Paul, 376-1535  
College of Home Economics

### FIRST TERM

**r 1643. APPAREL INDUSTRIES.** (685979) (4 cr; prereq Econ 1002 or AgEc 1030; 0800-1000 MWF; McNH 146)  
Structure, operation, and problems of domestic and foreign apparel industries including ready-to-wear, couture, and auxiliary fashion sector; interrelationships with the textile industry and distributors.

**r3643. RETAIL MERCHANDISING.** (091228) (5 cr; prereq 1641, Mktg 3065; 0800-1000 MTWThF; McNH 470) Badenoch  
Merchandise selection and controls, sales analysis, model stocks and buying plans.

**5003. COOPERATIVE EDUCATION PROGRAM.** (989973) (4-8 cr, 5003-5004; not for grad cr; prereq sr, 15004, #: minimum GPA 2.50; hrs ar; S-N only)  
A planned work experience relating activity in business, industry, or government to the student's area of study. Written consent of faculty supervisor prior to registration is required.

**5004. COOPERATIVE EDUCATION INTEGRATIVE PAPER.** (789974) (2-4 cr, 5003-5004; not for grad cr; prereq sr, 15003, #: hrs ar; A-N only)  
Paper analyzing a problem encountered in the planned work experience in terms of the student's area of study.

**r5680. SPECIAL TOPICS IN TEXTILES AND CLOTHING: Conservation Problems.** (891229) (3 cr; prereq 3621 or #: limited to 10 students; 0830-1200 MWF; McNH 363) R Johnson  
Methods of conserving historic textile products with particular emphasis on wet cleaning. Each student must bring several items for laboratory examination and conservation.

**8621. READINGS IN TEXTILES.** (589975) (1-3 cr; prereq #: hrs ar) R Johnson  
Independent reading useful for individual programs but not available in other course offerings.

**8625. PROBLEMS: TEXTILES AND CLOTHING.** (389976) (3-9 cr [max 9 cr]; prereq #: hrs ar) R Johnson  
Independent study in the physical behavioral aspects of textiles and/or clothing.

**8661. READINGS IN CLOTHING.** (189977) (1-3 cr; prereq minimum 12 cr in TexC courses, #: hrs ar) Grindereing

Independent study; survey of literature in selected areas related to human behavioral aspects of clothing and textiles. Written reports.

**8663. PROBLEMS: CLOTHING AND TEXTILES.** (089978) (3-9 cr [max 9 cr]; prereq #; hrs ar) Grindereing  
Independent study in human behavioral aspects of clothing or textiles.

**SECOND TERM**

**5003. COOPERATIVE EDUCATION PROGRAM.** (986734) (4-8 cr, 5003-5004†; not for grad cr; prereq sr, 15004, #; minimum GPA 2.50; hrs ar; S-N only)  
See First Term.

**5004. COOPERATIVE EDUCATION INTEGRATIVE PAPER.** (786735) (2-4 cr, 5003-5004†; not for grad cr; prereq sr, 15003, #; hrs ar; A-N only)  
See First Term.

**8621. READINGS IN TEXTILES.** (285984) (1-3 cr; prereq #; hrs ar) R Johnson  
See First Term.

**8625. PROBLEMS: TEXTILES AND CLOTHING.** (988208) (3-9 cr [max 9 cr]; prereq #; hrs ar) R Johnson  
See First Term.

**8661. READINGS IN CLOTHING.** (185248) (1-3 cr; prereq minimum 12 cr in TextC courses, #; hrs ar) Grindereing  
See First Term.

**8663. PROBLEMS: CLOTHING AND TEXTILES.** (385250) (3-9 cr [max 9 cr]; prereq #; hrs ar) Grindereing  
See First Term.

**Theatre Arts (Th)**

208 Middlebrook Hall. 373-3118  
College of Liberal Arts

**FIRST TERM**

**1101. INTRODUCTION TO THE THEATRE.** (391338) (4 cr; limited to 35 students; 1010-1205 MTWThF; RarigC 190)  
Norwood  
History and theory of plays and playwrights.

**1326. BEGINNING ACTING: TECHNIQUE.** (191339) (4 cr; limited to 18 students; prereq 1321; 1010-1205 MTWThF; RarigC 10) Moulton  
Fundamentals of body movement, rhythm, and acting technique. Individual and group performances.

**3311. BEGINNING VOICE PRODUCTION FOR THE THEATRE.** (591340) (4 cr; limited to 18 students; prereq 1321 or 11321; 0800-0955 MTWTh; RarigC 20) Nash  
Exercise for actors to develop correct breathing, vocal placement and clear diction. Performance and vocal analysis of prose, poetry and drama.

**3321. ADVANCED ACTING: CHARACTERIZATION.** (591693) (4 cr; limited to 18 students, prereq 1326, 1220-1415 MTWTh, RarigC 90) Reid  
Presentation of scences from plays with emphasis on characterization.

**3412H. HONORS COURSE: TUTORIAL SEMINAR IN THEATRE ARTS.** (689630) (0-3 cr [limited to 3 cr for cum laude and magna cum laude...up to 3 addtl cr through X regis for summa cum laude]; prereq theatre arts honors candidate and Δ)

**3515. TECHNICAL THEATRE PRODUCTION II.** (191342) (4 cr; limited to 40 students; prereq 1504; 1010-1205 MTWThF; RarigC 275; lab ar) Crellin, Montgomery  
Theory and practice of design and execution of stage costuming and stage lighting.

**5100. THEATRE PRACTICUM.** (090595) (1-6 cr; prereq written permission, #, Δ) Josal, Staff  
Arranged individual creative projects in production of approved plays. Playwriting, directing, acting, and design.

**5110. THEATRE PERFORMANCE.** (890596) (1 cr [9 cr max]; prereq written permission after casting and/or assignment to a production; credit awarded quarter performance takes pace; S-N only) Staff  
Participation in the rehearsals and performances of a major University Theatre production.

**5510. DRAWING AND RENDERING FOR THEATRE DESIGNERS.** June 17-July 11. (391341) (2 cr; limited to 15 students; prereq 3513 or 3515 or grad student; #; 0800-0955 MTWThF; RarigC 275) Brockman  
Development of drawing and rendering skills necessary for the presentation of scene and costume designs.

**5718. THEATRE MANAGEMENT AND PROMOTION.** (187994) (4 cr; limited to 15 students; prereq 1504, sr or grad or #; 1220-1415 MTWTh; RarigC 75) Neely  
Theory and practice in ticket office procedures, house management, publicity, and promotion; special problems in college, community, children's, and professional theatre.

**5720. PLAYS IN PRODUCTION AND PERFORMANCE.** (289369) (2-4 cr [max 6 cr for undergrads]; prereq 5712 and written permission) Staff  
Work on campus or in the field with a community, high school, touring, or professional theatre group for experience in stage direction.

**5760. ADVANCED STAGE MANAGEMENT.** (689370) (1-3 cr [max 6 cr for undergrads]; prereq 5716 or 15716 and written permission) Staff  
Practical experience in stage management for specific productions of the University Theatre with emphasis on rehearsal and performance.

**5970. DIRECTED READINGS.** (290599) (1-6 cr; prereq 9 cr in theatre, #, Δ, CLA approval) Staff  
Directed reading and preparation of reports on selected subjects.

**8990. RESEARCH.** (490598) (Cr ar; prereq # and Δ) Staff  
Open to graduate students engaged in research on special problems.

**SECOND TERM**

**1321. BEGINNING ACTING: CREATIVE APPROACH.** (691345) (4 cr; limited to 20 students; prereq 1101, 1504, and 3rd qtr freshman or above; 0800-0955 MTWTh; RarigC 90) Berry  
Beginning Stanislavskian technique and improvisational exercises leading to elementary scene study.

**3171. HISTORY OF THE THEATRE.** (091343) (4 cr; prereq 1101, 1504; 1010-1205 MTWTh; RarigC 275) Gadberry  
The practices and conventions of plays in performance. Western theatre through Renaissance and oriental theatre.

**3412H. HONORS COURSE: TUTORIAL SEMINAR IN THEATRE ARTS.** (688798) (0-3 [limited to 3 cr cum laude and magna cum laude...up to 3 addtl cr through X regis for summa cum laude]; prereq theatre arts honors candidate and Δ)

**5100. THEATRE PRACTICUM.** (189003) (1-6 cr; prereq written permission #, Δ) Staff  
Arranged individual creative projects in production of approved plays. Playwriting, directing, acting, and design.

**5110. THEATRE PERFORMANCE.** (488799) (1 cr [9 cr max]; prereq written permission after casting and/or assignment to a production; credit awarded quarter performance takes place; S-N only) Staff  
Participation in the rehearsals and performances of a major University Theatre production.

**5720. PLAYS IN PRODUCTION AND PERFORMANCE.** (188800) (2-4 cr [max 6 cr for undergrads]; prereq 5712 and written permission) Staff  
Work on campus or in the field with a community, high school, touring, or professional theatre group for experience in stage direction.

**5760. ADVANCED STAGE MANAGEMENT.** (088801) (1-3 cr [max 6 cr for undergrads]; prereq 5716 or 5716 and written permission) Staff  
Practical experience in stage management for specific productions of the University Theatre with emphasis on rehearsal and performance.

**5970. DIRECTED READINGS.** (189686) (1-6 cr; prereq 9 cr in theatre, #, Δ, CLA approval) Staff  
Directed reading and preparation of reports on selected subjects.

**8990. RESEARCH.** (688803) (Cr ar; prereq # and Δ) Staff  
Open to graduate students engaged in research on special problems.

**Therapeutic Radiology (TRad)**

M-10 Masonic Cancer Center. 373-8680  
Medical School

**FIRST TERM**

**3122. RADIATION PHYSICS.** (589250) (3 cr; prereq 3121)  
**3151. RADIATION ONCOLOGY TREATMENT PLANNING.** (389251) (4 cr; prereq #)

**FIRST AND SECOND TERMS: TEN-WEEK COURSES (Register once in Term I)**

**5340. SPECIAL PROBLEMS IN RADIATION THERAPY.** (287119) (Cr ar; prereq regis med)  
**5505. EXTERNSHIP IN RADIATION THERAPY.** (889500) (Cr ar; prereq regis med) Levitt, Kim, Lee, Potish  
**5506. CANCER DIAGNOSIS AND TREATMENT.** (689501) (Cr ar; prereq regis med) Levitt, Kim, Lee, Potish  
**5507. ADVANCED EXTERNSHIP IN RADIATION THERAPY.** (687120) (Cr ar; prereq regis med) Levitt, Kim, Lee, Potish  
**5508. SPECIAL PROBLEMS IN RADIATION BIOLOGY.** (487121) (Cr ar)

**5512. DOSIMETRY OF INTERNAL AND EXTERNAL RADIATION.** (287122) (1 cr; 0830-0930 W; 1243 HSUnitJ) Khan, Werner, Deibel, Gerbi

**5540. SPECIAL PROBLEMS IN RADIOLOGICAL PHYSICS.** (187123) (Cr ar; prereq regis med) Khan  
**8300. RADIATION THERAPY.** (987124) (Cr ar)

**8310. FUNDAMENTALS OF RADIATION THERAPY.** (787125) (1 cr; 1600-1700 M; 1243 HSUnitJ)

**8315. RADIATION THERAPY PATHOLOGY.** (587126) (1 cr)

**8320. RADIATION THERAPY TREATMENT PLANNING PROBLEMS.** (387127) (1 cr)

**8325. RADIATION THERAPY PEDIATRICS ONCOLOGY.** (187128) (1 cr)

**8350. RESEARCH IN RADIATION THERAPY.** (087129) (Cr ar)

**8410. SEMINAR: RADIATION BIOLOGY.** (387130) (1 cr; prereq #) Song, Buchsbaum, Vallera

**8450. RESEARCH IN RADIATION BIOLOGY.** (187131) (Cr ar) Song, Buchsbaum, Vallera

**8550. RESEARCH IN RADIOLOGICAL PHYSICS.** (087132) (Cr ar) Khan

**SECOND TERM**

**3122. RADIATION PHYSICS.** (189252) (3 cr; prereq 3121)

**3151. RADIATION ONCOLOGY TREATMENT PLANNING.** (089253) (4 cr; prereq #)

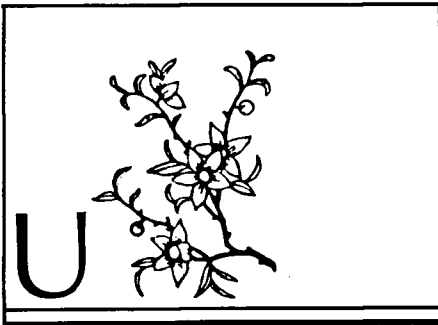
**3152. RADIATION ONCOLOGY TREATMENT PLANNING.** (389279) (4 cr; prereq 3151)

**3170. RADIATION THERAPY.** (789280) (4 cr; prereq #)

**Transportation (Tran)**

(See Logistics Management)





## University College (UC)

317 Walter Library. 373-4638

### FIRST TERM

- R 3075. INDEPENDENT STUDY.** (190703) (Cr ar; prereq  $\Delta$ )
- 3201. DIRECTED STUDIES.** (990704) (8 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3211. DEGREE PLANNING.** (789635) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3212. DEGREE PLANNING.** (589636) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3213. DEGREE PLANNING.** (389637) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3291. GRADUATION DOSSIER PREPARATION.** (089639) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3292. GRADUATION DOSSIER PREPARATION.** (389640) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3293. GRADUATION DOSSIER PREPARATION.** (189641) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3299. GRADUATION DOSSIER EXAMINATION.** (189638) (7 cr; prereq UWW student, prior submission of dossier for examination,  $\Delta$ ; S-N only)

### SECOND TERM

- R 3075. INDEPENDENT STUDY.** (187338) (Cr ar; prereq  $\Delta$ )
- 3201. DIRECTED STUDIES.** (087342) (8 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3211. DEGREE PLANNING.** (089642) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3212. DEGREE PLANNING.** (889643) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3213. DEGREE PLANNING.** (689644) (7 cr; prereq UWW student,  $\Delta$ ; S-N only)
- 3291. GRADUATION DOSSIER PREPARATION.** (489645) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3292. GRADUATION DOSSIER PREPARATION.** (289646) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3293. GRADUATION DOSSIER PREPARATION.** (189647) (7 cr [max 21 cr]; prereq UWW student,  $\Delta$ ; S-N only)
- 3299. GRADUATION DOSSIER EXAMINATION.** (989648) (7 cr; prereq UWW student, prior submission of dossier for examination,  $\Delta$ ; S-N only)

## Urban Studies (Urbs)

348 Social Sciences. 376-4913  
College of Liberal Arts

### FIRST TERM

- 3900. INTERNSHIP.** (090600) (1-6 cr per term [max 12 cr], prereq jr or sr and  $\Delta$ ; 1730-1930 M; BlegH 350) Edwards  
A weekly seminar integrating the internship experience with the academic program. Should be taken during or immediately after the internship.
- 3970. DIRECTED STUDIES.** (489189) (2-6 cr; prereq #,  $\Delta$ ,  $\square$ ) Staff

## Urologic Surgery (Urol)

A-597 Mayo. 373-8780  
Medical School

### FIRST TERM

- 5180. EXTERNSHIP IN UROLOGY.** (887133) (Cr and hrs ar) Staff

### Required Courses for Graduate Students

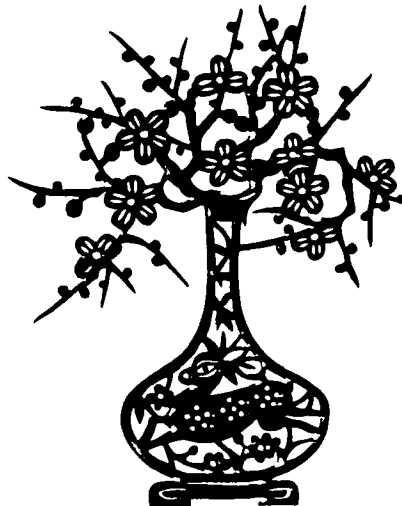
- 8250. UROLOGICAL SURGERY.** (687134) (4 cr; 0900-1200 MTThF; Main OR-H) Fraley, others  
Urological fellow first assists at operations in the University Hospitals and later is permitted to operate under supervision of the staff.
- 8251. CYSTOSCOPY AND UROLOGICAL DIAGNOSIS.** (487135) (4 cr; 0800-1200 MTWThF; Cysto Suite) Fraley, others  
Urological fellow performs cystoscopies and other diagnostic procedures.
- 8252. UROLOGICAL CONFERENCE.** (287136) (4 cr; 1600-1700 F, Ward Rds, Sta 57; 0900-1100 S, Sta 57 Conf Rm) Fraley, others  
Problems in diagnosis and treatment.
- 8253. RESEARCH: UROLOGY.** (187137) (4 cr) Fraley, others  
Problems in experimental and clinical surgery.
- 8254. UROLOGICAL SEMINAR.** (987138) (3 cr) Fraley, others
- 8255. UROLOGICAL-RADIOLOGICAL CONFERENCE.** (787139) (3 cr; 1300-1400 MTWThF; Mayo A503) Fraley, others
- 8256. UROLOGICAL-PATHOLOGICAL CONFERENCE.** (187140) (3 cr; 1640-1700 W; Mayo A503) Fraley, others
- 8257. SELECTED TOPICS: GENITOURINARY SYSTEM.** (788727) (2 cr) Fraley, others

### SECOND TERM

- 5180. EXTERNSHIP IN UROLOGY.** (987687) (Cr and hrs ar) Staff

### Required Courses for Graduate Students

- 8250. UROLOGICAL SURGERY.** (787691) (4 cr; 0900-1200 MTThF; Main OR-H) Fraley, others  
See First Term.
- 8251. CYSTOSCOPY AND UROLOGICAL DIAGNOSIS.** (687697) (4 cr; 0800-1200 MTWThF; Cysto Suite) Fraley, others  
See First Term.
- 8252. UROLOGICAL CONFERENCE.** (887682) (4 cr; 1600-1700 F, Ward Rds, Sta 57; 0900-1100 S, Sta 57 Conf Rm) Fraley, others  
See First Term.
- 8253. RESEARCH: UROLOGY.** (787688) (4 cr) Fraley, others  
See First Term.
- 8254. UROLOGICAL SEMINAR.** (587692) (3 cr) Fraley, others
- 8255. UROLOGICAL-RADIOLOGICAL CONFERENCE.** (887696) (3 cr; 1300-1400 MTWThF; Mayo A503) Fraley, others
- 8256. UROLOGICAL-PATHOLOGICAL CONFERENCE.** (588227) (3 cr; 1630-1700 W; Mayo A503) Fraley, others



## Veterinary Biology (VB)

295K Animal Science, St. Paul. 376-4760  
College of Veterinary Medicine

### FIRST TERM

- 5149.\* TOPICS OF ORGANOLGY.** (090712) (1-5 cr [may be repeated for cr]; prereq 5104 or equiv, #) Staff  
Lecture and laboratory presentation of selected organ systems of domestic and laboratory animals.
- 8111. HISTOLOGIC AND ULTRAHISTOLOGIC TECHNIQUES.** (188182) (3 cr; prereq 5105, #) Weber  
Principles and methods in preparing animal tissues for histological and ultra-histological observation.
- 8112-8113-8114. RESEARCH PROPOSITIONS IN MORPHOLOGY.** (890713) (690714) (490715) (2 cr per qtr; prereq #) Staff  
Each student defines an unsolved morphologic problem, hypothesizes a solution, and proposes an experimental approach to test the hypothesis. Written and oral presentation of proposition are evaluated by departmental graduate faculty.
- 8134-8135. COMPARATIVE VETERINARY NEUROLOGY.** (290716) (190717) (4 cr per qtr; prereq 5100, #) Fletcher, Beitz  
Correlated studies of the central nervous system of domestic animals. Emphasis on relating neuroanatomy to neurophysiology.
- 8136. EXPERIMENTAL COMPARATIVE VETERINARY NEUROLOGY.** (990718) (3 cr; prereq 8135, #) Fletcher, Beitz  
Principles, methods, and laboratory exercises in investigating the central nervous system of domestic animals.
- 8150. RESEARCH PROBLEMS IN VETERINARY ANATOMY.** (790719) (1-5 cr; prereq #) Staff  
Individual research projects under staff direction in selected areas of veterinary anatomy. Topics and species determined by consultation. Project may be a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser.
- 8349. RESEARCH IN PHYSIOLOGY.** (190720) (Cr ar, \$AnSc 8830; prereq #) Staff  
Individual research under faculty direction. Topics to be determined by consultation; may be a specialized aspect of a thesis problem or an independent problem of mutual interest to graduate student and adviser.
- 8448. PROBLEMS IN VETERINARY PHARMACOLOGY.** (990721) (Cr ar; prereq 5401 or equiv, #) Larson, Brown
- 8550. SEMINAR: VETERINARY BIOLOGY.** (191379) (1 cr; prereq #) Beitz

### SECOND TERM

- 5149.\* TOPICS OF ORGANOLGY.** (886919) (1-5 cr [may be repeated for cr]; prereq 5104 or equiv, #) Staff  
See First Term.
- 8111. HISTOLOGIC AND ULTRAHISTOLOGIC TECHNIQUES.** (085977) (3 cr; prereq 5105, #) Weber  
See First Term.
- 8112-8113-8114. RESEARCH PROPOSITIONS IN MORPHOLOGY.** (186920) (086921) (886922) (2 cr per qtr; prereq #) Staff  
See First Term.
- 8134-8135. COMPARATIVE VETERINARY NEUROLOGY.** (886923) (486924) (4 cr per qtr; prereq 5100, #) Fletcher, Beitz  
See First Term.



**8136. EXPERIMENTAL COMPARATIVE VETERINARY NEUROLOGY.** (286925) (3 cr; prereq 8135, #) Fletcher, Beitz See First Term.

**8150. RESEARCH PROBLEMS IN VETERINARY ANATOMY.** (186926) (1-5 cr; prereq #) Staff See First Term.

**8349. RESEARCH IN PHYSIOLOGY.** (986927) (Cr ar, §AnSc 8830; prereq #) Staff See First Term.

**8448. PROBLEMS IN VETERINARY PHARMACOLOGY.** (786928) (Cr ar; prereq 5401 or equiv, #) Larson, Brown

**8550. SEMINAR: VETERINARY BIOLOGY.** (491380) (1 cr; prereq #) Beitz

## Veterinary Diagnostic Investigation (VDI)

E-220 Veterinary Diagnostic Laboratories, St. Paul. 373-0774

College of Veterinary Medicine

### FIRST TERM

**5000. DIAGNOSTIC MEDICINE.** (991416) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences to veterinary diagnostic medicine.

**5001. CLINICAL TOXICOLOGY.** (591418) (.6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences to clinical toxicology and clinical pharmacology.

**5521. SURGICAL PATHOLOGY.** (687912) (3 cr; prereq #) Barnes, staff Preparation and interpretation of surgical and necropsy specimens.

**5522. DIAGNOSTIC PATHOLOGY.** (487913) (5 cr; prereq #) Barnes, staff History, necropsy lesions, laboratory results, and histopathology in the diagnosis of animal diseases.

**5622. PROBLEMS IN DIAGNOSTIC VIROLOGY.** (185931) (1-4 cr; prereq #) Laboratory techniques in diagnostic virology and viral research.

### SECOND TERM

**5000. DIAGNOSTIC MEDICINE.** (791420) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5001. CLINICAL TOXICOLOGY.** (591421) (.6 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5521. SURGICAL PATHOLOGY.** (087910) (3 cr; prereq #) Barnes, staff See First Term.

**5522. DIAGNOSTIC PATHOLOGY.** (887911) (5 cr; prereq #) Barnes, staff See First Term.

**5622. PROBLEMS IN DIAGNOSTIC VIROLOGY.** (085932) (1-4 cr; prereq #) See First Term.

## Veterinary Medicine (CVM)

205g Veterinary Science, St. Paul. 376-3872  
College of Veterinary Medicine

### FIRST AND SECOND TERM: TWELVE-WEEK COURSE

**1809. INTERNSHIP IN ANIMAL HOSPITAL PRACTICE.** (289159) (4 cr; prereq #; 0800-1630 MTWThF; VetTchHos) Staff

Laboratories devoted to the principles and techniques of medical and surgical nursing care, examination, diagnostic and therapeutic procedures, and applied procedures in anesthesiology and radiology. Rotations in Small Animal Medicine and Surgery, Large Animal Medicine and Surgery, Anesthesiology, Radiology, and Intensive Care.

## Veterinary Pathobiology (VPB)

205g Veterinary Science, St. Paul. 376-3872  
College of Veterinary Medicine

### FIRST TERM

**5000. VETERINARY HOSPITAL NECROPSY.** (891425) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Necropsy techniques, examination of tissue for diagnosis, submission of tissue for laboratory analysis, and preparation of reports and records.

**5001. CLINICAL HEMATOLOGY AND CYTOLOGY.** (691426) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of the basic and clinical medical sciences in hematology and cytology.

**5002. CLINICAL MICROBIOLOGY.** (491427) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of veterinary clinical and diagnostic microbiology.

**5003. CLINICAL CHEMISTRY.** (291428) (1 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of veterinary clinical chemistry.

**5004. CLINICAL PARASITOLOGY.** (191429) (1.4 cr; prereq #; arranged MTWThFS; VetTchHos) Staff Laboratories devoted to the application of principles and techniques of veterinary clinical and diagnostic parasitology.

**5523. PATHOLOGY OF SPONTANEOUS DISEASES OF LABORATORY ANIMALS.** (489502) (2-3 cr; prereq #) Leininger Gross and microscopic pathology of laboratory animals.

**5524. PATHOLOGY OF SPONTANEOUS DISEASES OF POULTRY.** (790722) (3 cr; prereq #) Walser Gross and microscopic pathology of spontaneous diseases of chickens, turkeys, and game birds.

**5709. PREVENTIVE AVIAN MEDICINE—June 23-July 21.** (188635) (1 cr; prereq regis vet med, 4th year or grad student or #; 1500-1650 M; VetS 145) Newman, Halvorson Preventive avian disease programs and management practices. Visits to poultry and aviary establishments.

**5748. PROBLEMS IN VETERINARY MICROBIOLOGY AND PUBLIC HEALTH.** (189258) (Cr ar)

**8531. HOSPITAL PATHOLOGY.** (590723) (1-2 cr; prereq 5501, 5502, 5503, #) O'Leary, Leininger, staff Necropsy and surgical pathology techniques, examination of tissues for diagnosis, preparation of reports and records.

**8533. PROBLEMS: PATHOLOGY.** (390724) (Cr ar; prereq #) Johnson, staff

**8534. PROBLEMS: CLINICAL PATHOLOGY.** (190725) (Cr ar; prereq #) Perman, Weiss

**8648. PROBLEMS IN VETERINARY PARASITOLOGY.** (090726) (Cr ar; prereq 5602 or equiv, #) Bemrick, Schlotthauer, Stromberg

**8720. ADVANCED VETERINARY MICROBIOLOGY.** (890727) (Cr ar; prereq #) Staff Special topics, techniques, collateral reading, and conferences.

**8721. ADVANCED POULTRY DISEASES.** (690728) (2 cr; prereq 5704, #) Halvorson, Newman Investigation of infectious disease problems of poultry.

**8724. ADVANCED VETERINARY DIAGNOSTIC MICROBIOLOGY.** (490729) (Cr ar; prereq #) Ward Lectures and laboratory in techniques of diagnostic mycology, bacteriology, virology, and serology.

### SECOND TERM

**5000. VETERINARY HOSPITAL NECROPSY.** (491430) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5001. CLINICAL HEMATOLOGY AND CYTOLOGY.** (291431) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5002. CLINICAL MICROBIOLOGY.** (191432) (2 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5003. CLINICAL CHEMISTRY.** (991433) (1 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5004. CLINICAL PARASITOLOGY.** (791434) (1.4 cr; prereq #; arranged MTWThFS; VetTchHos) Staff See First Term.

**5523. PATHOLOGY OF SPONTANEOUS DISEASES OF LABORATORY ANIMALS.** (189776) (2 cr; prereq #) Leininger See First Term.

**5524. PATHOLOGY OF SPONTANEOUS DISEASES OF POULTRY.** (586929) (3 cr; prereq #) Walser See First Term.

**8531. HOSPITAL PATHOLOGY.** (986930) (1-2 cr; prereq 5501, 5502, 5503, #) O'Leary, Leininger, staff See First Term.

**8533. PROBLEMS: PATHOLOGY.** (786931) (Cr ar; prereq #) Johnson, staff

**8534. PROBLEMS: CLINICAL PATHOLOGY.** (586932) (Cr ar; prereq #) Perman, Weiss

**8648. PROBLEMS IN VETERINARY PARASITOLOGY.** (386933) (Cr ar; prereq 5602 or equiv, #) Bemrick, Schlotthauer, Stromberg

**8720. ADVANCED VETERINARY MICROBIOLOGY.** (186934) (Cr ar; prereq #) Staff See First Term.

**8721. ADVANCED POULTRY DISEASES.** (086935) (2 cr; prereq 5704, #) Newman, Halvorson See First Term.

**8724. ADVANCED VETERINARY DIAGNOSTIC MICROBIOLOGY.** (886936) (Cr ar; prereq #) Ward See First Term.

**8725. CELL CULTURE TECHNIQUES.** (985986) (2 cr; prereq 5703 or equiv, #) Shope Laboratory exercises and discussions on culture of vertebrate cells; proper preparation of all materials necessary for handling cell cultures; establishment of primary cell cultures by various techniques and maintenance of cells as monolayers or in suspension. Animal viruses used for plaque assays, neutralization tests, limited fluorescent antibody techniques and microtitration. Laboratory work in student's specific area of interest.

## Vocational Education (VoEd)

210 Vocational/Technical Building, St. Paul. 373-7787  
College of Education

### FIRST TERM

**5101. SPECIAL TOPICS IN CURRICULUM: Vocational Education Program Renewal and New Program Development—June 16-20.** (591368) (1-6 cr [max 9 cr]; prereq #; 0905-1205, 1325-1625 MTWThF and hrs ar; VoTech R380; A-N only) Pucel Topics vary with each offering but cover development and evaluation of curricula and/or curriculum materials. This offering for 3 credits is presented in a hands-on workshop format designed to upgrade the skills of vocational educators who wish to review vocational courses and programs, or to propose new programs.

**5200. EVALUATION OF LOCAL VOCATIONAL EDUCATION PROGRAMS—July 7-18.** (391369) (3 cr; 0905-1220 MTWThF and hrs ar; VoTech R280; A-N only) Moss Procedures and experience in the use of instruments for conducting program evaluations for teachers, administrators, and state department personnel.

**5300. PHILOSOPHY AND PRACTICE OF VOCATIONAL EDUCATION—June 17-27.** (990816) (3 cr; 1325-1625 MTWThF and hrs ar; VoTech R285; A-N only) G Swanson Interpretation of the purposes of vocational education in varying socioeconomic contexts; analysis of vocational fields in regard to recipients, practices, legislation, and funding.

**R5780. INTERNSHIP: TRAINING AND DEVELOPMENT.** (489340) (Cr ar [max 15 cr]; limited to 15 students; prereq 5750; hrs ar; S-N optional) McLean Students apply and contract for training positions in industry and business; individual contracts describe the specific training and development responsibilities to be fulfilled during the period of internship; may be used to meet a portion of student teaching requirement providing student will still be qualified to teach in public school.

## SECOND TERM

**R 5300. PHILOSOPHY AND PRACTICE OF VOCATIONAL EDUCATION—July 21-25.** (185170) (3 cr; limited to 50 students; 0905-1205 and 1325-1625 MTWThF and hrs ar; VoTech R285; A-N only) Ashmun  
See First Term.

**R 5750. TRAINING IN INDUSTRY AND BUSINESS—July 21-25.** (391694) (3 or 4 cr; limited to 25 students; 0905-1205 and 1325-1625 MTWThF and hrs ar; VoTech R280; A-N only) Bjorkquist  
Appraisal of the training function in industry and business; advancement of competencies in areas of analysis, design, development, delivery, and evaluation of training. This offering for 3 credits.

**R 5760. ORGANIZATION DEVELOPMENT IN INDUSTRY AND BUSINESS—July 28-August 1.** (291378) (3 or 4 cr; limited to 25 students; 0905-1625 MTWThF and hrs ar; VoTech R285; A-N only) McLean  
Introduction to major concepts, skills, and techniques. This offering for 3 credits.

**R 5780. INTERNSHIP: TRAINING AND DEVELOPMENT.** (287928) (Cr and hrs ar [max 15 cr]; limited to 15 students; prereq 5750; S-N optional) McLean  
See First Term.

# Vocational Education

**Evaluation of Local Vocational Education Programs—VoEd 5200, July 7-18,** examines current evaluation methods, both quantitative and qualitative as they apply to vocational education and training settings. Students will examine major evaluation theories and their application to such programs using methods which include involvement of those concerned to manage the evaluation process; define evaluation questions, and analyze and report evaluation results.

**Training in Industry and Business—VoEd 5750, July 21-25,** presents the analysis, design, development, implementation, and control functions of training, with students actively participating in the solution of realistic training problems. Content is relevant to those with training responsibilities in the private or public sector and for those with responsibilities for customizing training.



## Women's Studies (WoSt)

492 Ford Hall, 373-3508  
College of Liberal Arts

### FIRST TERM

**R 3001. THE BIOLOGY OF WOMEN.** (186148) (4 cr; prereq Biol 1011 or Phsl 1001 or #; limited to 40; 0800-0930 TWTh; FordH 160) Zita  
Physiology, anatomy, and endocrine chemistry relevant to women's lifecycles and reproductive functioning.

**R 3501. WOMEN AND LITERATURE.** (491718) (4 cr; prereq introductory work in literature; limited to 40 students; 0930-1100 TWTh; FordH 170) Albrecht  
Women writers and critics of literature about women. Usually limited to Western literature.

**3970. DIRECTED STUDIES.** (688784) (1-15 cr; prereq #, Δ, □)

**3980. DIRECTED INSTRUCTION.** (488785) (1-5 cr; prereq #, Δ, □)

**3990. DIRECTED RESEARCH.** (288786) (1-5 cr; prereq #, Δ, □)

**5970. DIRECTED STUDIES.** (089706) (1-5 cr [max 12 cr]; prereq #, Δ, CLA approval)

**8970. DIRECTED STUDIES.** (986149) (1-8 cr; prereq #, Δ)

### SECOND TERM

**R 1006. INTRODUCTION TO WOMEN'S STUDIES.** (791384) (4 cr; 1115-1205 MTWThF; FordH 285) Scheman  
Women's studies as a discipline; brief history of feminism; overview of issues related to the current and rapidly changing role and status of women.

**3502. WOMEN AND THE ARTS.** (987978) (4 cr; prereq introductory work in music, art, drama, dance, film, or other arts; 1010-1100 MTWThF; FordH 285) McClary  
Art by or about women. Focus may be on one or more forms of artistic expression.

**3970. DIRECTED STUDIES.** (889786) (1-15 cr; prereq #, Δ, □)

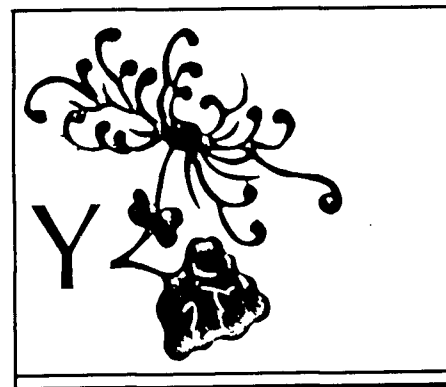
**3980. DIRECTED INSTRUCTION.** (689773) (1-5 cr; prereq #, Δ, □)

**3990. DIRECTED RESEARCH.** (787979) (1-5 cr; prereq #, Δ, □)

**R 5910. TOPICS IN WOMEN'S STUDIES: Feminist Theories and The Family.** (986152) (3 cr; §FSoS 5240; limited to 15 students; 0930-1100 MWF; FordH 150) Rosenblatt, Staff  
This course will develop some basic feminist theories and critique family field textbooks and often cited and/or recent family field research in terms of these theories.  
Meets with FSoS 5240.

**5970. DIRECTED STUDIES.** (889707) (1-5 cr; max 12 cr; prereq #, Δ, CLA approval)

**8970. DIRECTED STUDIES.** (786153) (1-8 cr; prereq #, Δ)



## Youth Development and Research (YoSt)

386 McNeal Hall, St. Paul, 376-7624  
College of Home Economics

### FIRST TERM

**5120. INDEPENDENT STUDY IN YOUTH STUDIES.** (889979) (Cr ar [max 12 cr per qtr]; prereq #; hrs ar) Staff  
Independent reading and/or research under faculty supervision.

### SECOND TERM

**5120. INDEPENDENT STUDY IN YOUTH STUDIES.** (885253) (Cr ar [max 12 cr per qtr]; prereq #; hrs ar) Staff  
See First Term.

# ITASCA BIOLOGY PROGRAM



The Lake Itasca Biology Program, sponsored by the University of Minnesota Summer Session, is a joint enterprise of the College of Biological Sciences and the College of Agriculture. Courses are also offered by General College, the University of Minnesota, Duluth, and the University of North Dakota.

**First Term • June 15-July 5**  
**Second Term • July 6-July 26**  
**Third Term • July 27-August 16**

*Many courses run for two terms. Check dates in course list.*

## **Administrative Staff**

Office (June 15 to August 15 only  
218/266-3302)

David F. Parmelee, Program Director  
Dorothy K. Bromenshenkel, Secretary

## **Building and Grounds**

Daniel Traun, Resident Manager

## **Research**

Jon Ross, Resident Biologist

## **Infirmary**

to be announced, Registered Nurse

## **Library**

Thomas J. English, Librarian

## **The Itasca Habitats**

The Lake Itasca Forestry and Biological Station is located on the east shore of Lake Itasca in Itasca State Park—just a mile from the headwaters of the Mississippi River in northwestern Minnesota. This important and nationally recognized ecological area is where the three great plant regions of the eastern United States meet, and it provides

opportunities for study of varied ecosystems and of a singular range of fauna and flora with southern, northern, and western origins.

The forests of the park are unique. Here, the northern coniferous and deciduous types of the central hardwood region meet. In addition, the many bog areas provide a wide variety of plant communities for study. Itasca's forests have been protected for over a half century, and many have never been cut. Here, truly, is an excellent array of virgin timber stands and communities developing into climax types.

Forty miles to the west a dramatic break from the forests to the prairie 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.

Within the fifty square miles of Itasca Park are many lakes and streams of different types providing unusual field opportunities for work in limnology, algae, fungi, invertebrates, and fishes.

Opportunities to observe nesting loons, eagles, and other birds closely are especially outstanding in June and July. An abundance of interesting mammals afford many striking behavioral and ecological problems for study.



## Courses of Instruction

R Means "controlled enrollment."  
 ¶ Means "concurrent registration."  
 # Means "consent of instructor is required."  
 Δ Means "consent of department is required."  
 □ Means "consent of college is required."  
 Classes begin at 8:00 a. m. and continue all day.  
 The University of Minnesota is on the quarter system.

### Biology (Biol)



**R5041. Ecology—July 6-August 16.**

(391730) (4 cr; students should register for 1 cr of 5890 for field research credit; limited to 20 students; prereq course in calculus, course in plant biology and/or animal biology; Monday/Thursday) Siniff and staff  
 Interactions of plant and animal populations and their environments. Organization, functioning, and development of ecological systems; population growth and regulation. Human impact on the biosphere in modern times.

**R5816. Field Biology Photography—June 15-July 5.** (991724) (3 cr; limited to 20 students; prereq course in beginning biology; Tuesday/Friday) Rubbelke

Applied photographic techniques for field documentation of biological subjects and events. Emphasis on practical solutions to problems encountered in the photography of living plants and animals in natural habitats.

**R5850. Special Topics in Biology—Five sections from June 15-July 26.** (max 6 cr with combined sections; hrs ar)

Sections 1, 2, and 3 are designed for high school and college teachers, field biologists, naturalists, and beginning graduate students who intend to do field work. Modern methods for observing, recording and analyzing behavior of wild animals in their natural habitat. The one-week modules may be taken either singly or consecutively. Each unit is self-contained and taught by a specialist, but all are coordinated by a single faculty member.

**Sec 1, June 15-21, Ethology.** (791725) 2 cr, limited to 20 students, Phillips  
 Techniques for observation and objective recording of the behavior of free-living animals. Reconnaissance observations, description and categorization of behavior for objective, quantitative analysis; techniques and equipment for note-taking; video- and audio-recording; use of microcomputers.

**Sec 2, June 22-28, Ethology.** (591726) 2 cr; limited to 20 students, Kuechle, Phillips  
 Use of radio-telemetry to study animal behav-

ior especially movements and the use of space. Basic features of radio transmission, transmitters, and receivers relevant to bio-telemetry; safe and humane methods for capture and immobilization of animals for radio-tagging; techniques for attachment of transmitters; locating radio-tagged animals; processing data from radio-fixes; telemetry of further behavioral and physiological information.

**Sec 3, June 29-July 5, Ethology.** (391727) 2 cr; limited to 20 students, Oring, Phillips

Field techniques, equipment and theory for study of sound communication; field techniques for study of endocrine correlates of behavior including capturing animals, drawing blood samples, field preparation of blood samples, and recordkeeping; visit to a long-term study of the breeding behavior and its evolution and endocrinology of a single species; techniques for field experimentation in animal behavior.

**Sec 4, June 15-July 5, Advanced Field Ornithology.** (191728) 3 cr; limited to 10 students; Warner

This course is designed for individuals who have had some training in ornithology, but little or no field experience. Emphasis on bird vocalizations, habitat selection, and breeding ecology.

**Sec 5, July 6-July 26, Statistics.** (091729) 2 cr; limited to 20 students; prereq general course in ecology, held in the evening, Siniff  
 Section 5 is designed for students who intend to use statistical methods in their field projects. An introduction to statistical methods commonly used in field studies, including sampling procedures, descriptive statistics, design of field studies and statistical tests of data contrasting experimental and control units.

**R5890. Research Problems at Itasca—June 15-August 16.** (cr ar; prereq #;) Staff  
 Undergraduate and graduate students develop a short-term research project in most of the departments offering courses at Itasca during one, two, or all three of the 1986 terms.

**Sec 1, June 15-July 5.** (289856)

**Sec 2, July 6-July 26.** (191731)

**Sec 3, July 27-August 16.** (491735)

### Botany (Bot)

**R5801. Plains and Boreal Flora—June 15-July 26.** (189857) (5 cr; limited to 20 students; prereq course in taxonomy; Δ; Monday/Thursday) Lee

Survey of the summer flowering plants and ferns of the state with particular reference to local flora. Identification by technical keys; important plant families; field recognition of common species; habitat preferences; collecting methods; literature; taxonomic methods.

**R5811. Freshwater Algae—June 15-July 26.** (989858) (5 cr; limited to 20 students; prereq 10 cr botany, biology, or zoology; Δ; Tuesday/Friday) Czarniecki

The developmental morphology and taxonomy of freshwater algae as related to ecology. Identification of field collections by technical keys, collecting and analytical methods, and use of information for recognizing distribution patterns.

## Ecology and Behavioral Biology (EBB)

**R3800. Introduction to Field Research—July 6-August 16.** (189860) (10 cr; limited to 20 students; prereq two courses in biology; Δ; hrs ar) Regal

Intended for undergraduates with little or no previous experience in field biology. An intensive course on how to do research. A series of ecological and behavioral projects provides an introduction to the biology of forests, prairies, lakes, and marshes of the Itasca region while serving to develop individual abilities in the planning and design of experiments, acquisition and analysis of data, and preparation of scientific reports.

**R5814. Community Structure and Functioning—July 6-August 16.** (591007) (5 cr; limited to 20 students; prereq course in ecology; Δ; Wednesday/Saturday) Auerbach  
Communities represented in Itasca Park and vicinity, with emphasis on vegetation. Patterns of distribution of the communities, their interaction with the environment, and their dynamic relationships. Methods of community description and analysis.

**R5817. Vertebrate Ecology—July 6-August 16.** (391078) (5 cr; limited to 15 students; prereq course in ecology; Δ; Tuesday/Friday) Tester

Field studies on populations and their relationships to local environments; habitat analysis and ecological research methods. Individual and team research projects, field trips, and lectures.

**R5820. Wetland Ecology—July 6-August 16.** (391081) (10 cr; limited to 15 students; prereq 15 cr biology; introductory chemistry, and a course in plant identification recommended; Δ; hrs ar) Gorham  
Nature, origin, and development of the lake, marsh, swamp, and bog ecosystems; environmental control and productivity.

**R5831. Natural History of Invertebrates—June 15-July 5.** (186349) (5 cr; limited to 20 students; prereq general biology course or equiv; Δ; hrs ar) Gilbertson  
Advanced taxonomic and ecological survey of local fauna and independent ecological studies of several taxonomic groups.

**R5834. Field Ornithology—June 15-July 19.** (989861) (5 cr; limited to 15 students; prereq course in biology; Δ; Wednesday/Saturday) Warner

The breeding season, biology, and behavioral ecology of birds in the Itasca Park region. Field trips to a variety of habitats to learn bird identification and observe and practice techniques for conducting field studies. Laboratory sessions investigate family distinctions and species identification. Individual field projects.

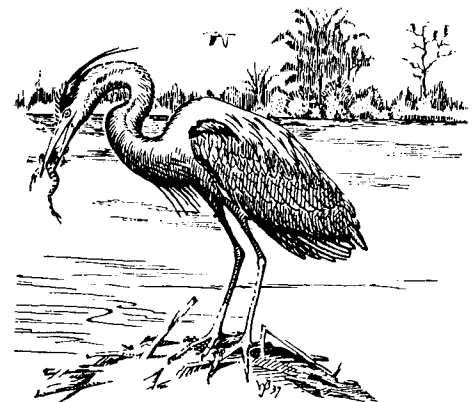
**R8800. Advanced Field Ecology—July 6-August 16.** (891084) (10 cr; limited to 20 students; prereq admission to a grad program; Δ; hrs ar) Strong

The formulation and testing of ecological theory under field conditions. Group and individual research projects, lectures, seminars, and student presentations on topics such as coevolution, life history strategies, behavioral strategies, resource allocation, and community structure.

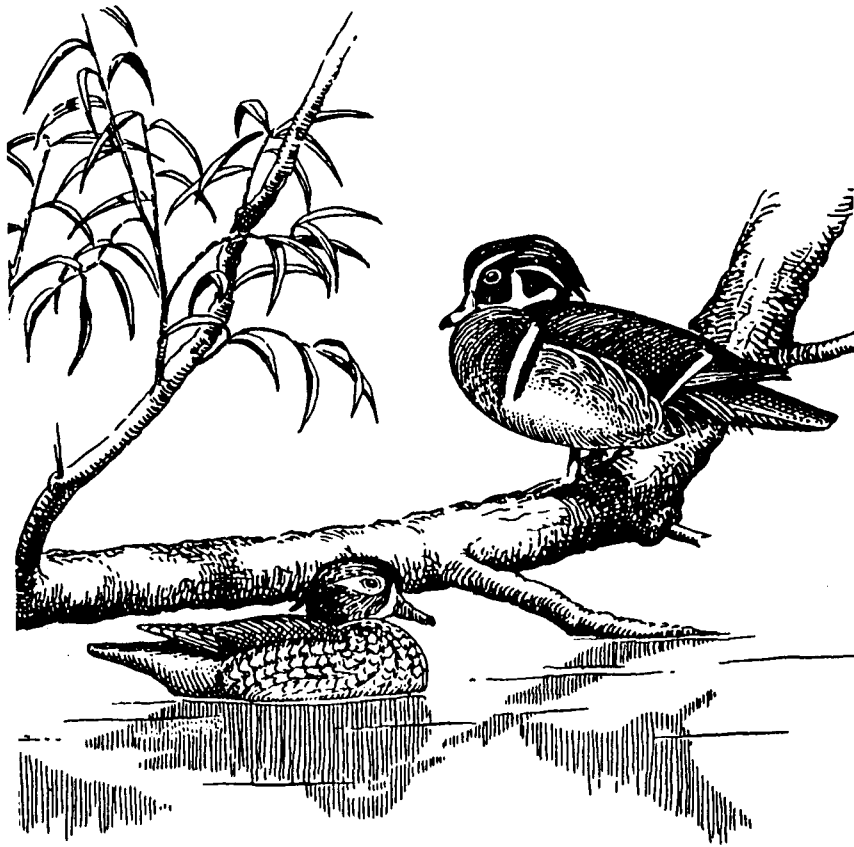
## General College (GC)

**R1133. Nature Study—June 15-July 5.** (787870) (5 cr; limited to 20 students; Monday/Wednesday/Thursday, additional hrs ar) Hatch

For students with little or no prior training in biology. Natural histories of common Minnesota plants and animals discussed and examined in the field from the standpoint of the informed amateur naturalist. Techniques of field observation and identification of living organisms.







## University of Minnesota, Duluth (UMD)

**Biol 5873. Aquatic Ecology—July 27-August 16.** (xxxxxx) (3 cr; limited to 20 students; prereq either a basic course in limnology, or ecology, or some aspect of fisheries biology; tuition will be assessed at the UMD rate; Tuesday/Friday) Klemer  
Experimental approaches to the study of factors affecting the growth and distribution of aquatic organisms. Students will participate in field and laboratory experiments designed to test hypotheses of current interest in limnology.

**Biol 8900. Special Topics in Biology.** (xxxxxx)

## University of North Dakota (UND)

**UND 373. Natural History of Vertebrates—June 22-July 26.** (xxxxxx) (5 cr; limited to 20 students; prereq introductory biology; tuition will be assessed at the UND rate; Monday/Thursday) Seabloom  
Classification, distribution, and habits of vertebrates.

### Condensed Course Schedule

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			<b>Term I June 15 to July 5</b>		
Bot 5801 <sup>1</sup> GC 1133 UND 373 <sup>3</sup> Courses to be arranged: Biol 5850, EBB 5831, Biol 5890	Bot 5811 <sup>1</sup> Biol 5816	EBB 5834 <sup>1</sup> GC 1133	Bot 5801 <sup>1</sup> GC 1133 UND 373 <sup>3</sup>	Bot 5811 <sup>1</sup> Biol 5816	EBB 5834 <sup>3</sup>
			<b>Term II July 6 to July 26</b>		
Bot 5801 <sup>2</sup> Biol 5041 <sup>1</sup> UND 373 <sup>4</sup> Courses to be arranged: Biol 5850, Biol 5890, EBB 3800 <sup>1</sup> , EBB 5820 <sup>1</sup> , EBB 8800 <sup>1</sup>	Bot 5811 <sup>2</sup> EBB 5817 <sup>1</sup>	EBB 5834 <sup>4</sup> EBB 5814 <sup>1</sup>	Bot 5801 <sup>2</sup> Biol 5041 <sup>1</sup> UND 373 <sup>4</sup>	Bot 5811 <sup>2</sup> EBB 5817 <sup>1</sup>	EBB 5834 <sup>4</sup> EBB 5814 <sup>1</sup>
			<b>Term III July 27 to August 16</b>		
Biol 5041 <sup>2</sup> Courses to be arranged: Biol 5890, EBB 3800 <sup>2</sup> , EBB 5820 <sup>2</sup> , EBB 8800 <sup>2</sup>	UMD Biol 5873 EBB 5817	EBB 5814 <sup>2</sup>	Biol 5041 <sup>2</sup>	UMD Biol 5873 EBB 5817 <sup>2</sup>	EBB 5814 <sup>2</sup>

<sup>1</sup>First half of 6-week course.

<sup>3</sup>First part of 5-week course.

<sup>2</sup>Second half of 6-week course.

<sup>4</sup>Second part of 5-week course.

Students must register for complete course.

## Itasca Biology Program Faculty

**Michael J. Auerbach**, Assistant Professor, University of North Dakota, is interested in both empirical and theoretical biology, involving quantitative field experiments and computer-oriented theoretical investigations. His research entails the use of diverse insect-plant systems to test various current hypotheses in population and community ecology. (EBB 5814)

**David B. Czarnecki**, Associate Professor of Biology, Loras College, is interested in the morphology and ecology of freshwater algae, particularly diatoms; environmentally induced morphological and life-history expressions; functional and developmental aspects of frustular substructure; algal components of inland alkaline-saline systems, acid bogs, and other seemingly inhospitable environments. (Bot 5811)

**Donald E. Gilbertson**, Professor and Director, Bell Museum of Natural History, University of Minnesota, is interested in parasitology and in invertebrate zoology; his special interests lie in the relationships between trematodes and freshwater snails. (EBB 5831)

**Eville Gorham**, Regents Professor, University of Minnesota, works in limnology, ecology, and biogeochemistry. His current research concerns the ecology of sphagnum bogs, environmental factors controlling floristic boundaries in Minnesota, and the influence of morphometry on lake stratifications. (EBB 5820)

**Jay T. Hatch**, Assistant Professor, University of Minnesota, is interested in the life history of Minnesota fishes, especially during the larval period, and in methods of instruction for students with anxiety about science. (GC 1133)

**Andrew R. Klemer**, Associate Professor, University of Minnesota-Duluth, is interested in aquatic ecology, experimental limnology, physiological ecology of phytoplankton, phytoplankton succession, distribution, and buoyancy regulation. (UM-Duluth Biol 5873 Aquatic Ecology)

**Larry W. Kuechle**, Director, Cedar Creek Bioelectronics Laboratory, University of Minnesota, designs and builds instrumentation for radio-telemetry and wildlife monitoring. Current activities include monitoring location, temperature and heart rate of a wide range of vertebrates in locations ranging from the subarctic through the southwestern deserts to the Antarctic. (Biol 5850)

**Gregory J. Lee**, Lecturer, Botany, University of California, Davis, is interested in the systematics and evolution of flowering plants. His research interests are in experimental systematics, particularly regarding the chromosomal, morphological and ecological differentiation of recently evolved species. (Bot 5801)

**Lewis W. Oring**, Professor, University of North Dakota, is conducting research on avian social systems, both ecological correlates of evolutionary differences between avian social systems and endocrinological mechanisms regulating polyandry in birds. (Biol 5850)

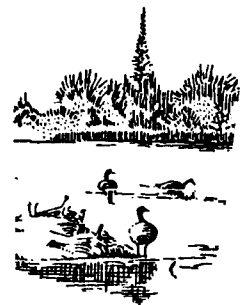
**David F. Parmelee**, Professor and Program Director of the Itasca Biology Program, University of Minnesota, specializes in the distribution, ecology and behavior of arctic and antarctic birds.

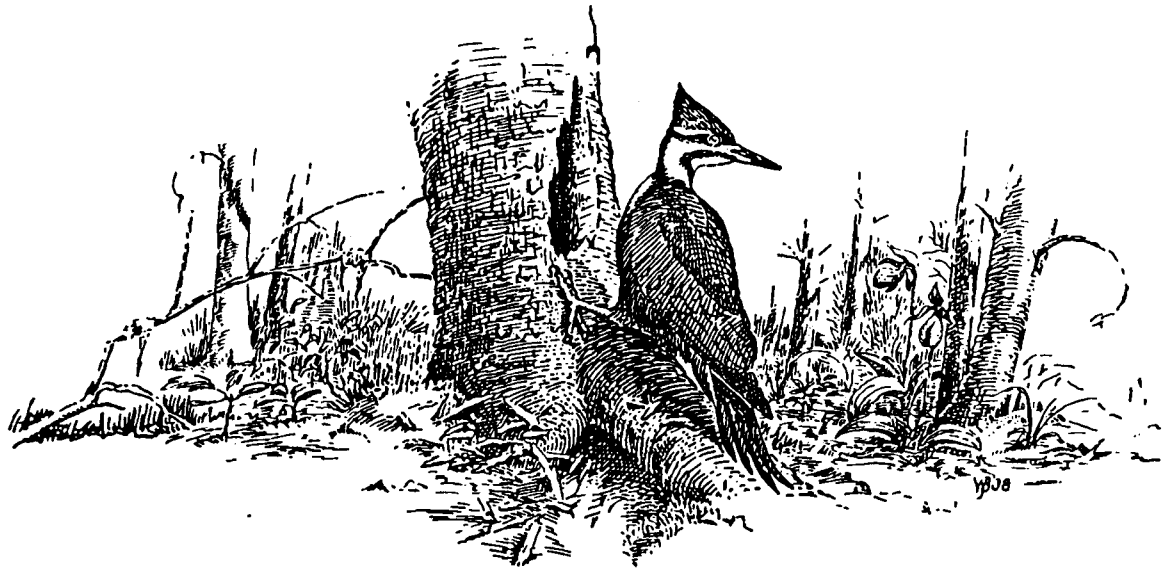
**Richard E. Phillips**, Professor, University of Minnesota, is studying the neural and endocrine mechanisms of behavior, especially of birds, and vocal communication in birds. (Biol 5850)

**Philip J. Regal**, Professor, University of Minnesota, is an evolutionary biologist who has published on vertebrate biology, temperature regulation, plant-animal interactions, and tropical ecology. (EBB 3800)

**Donald L. Rubbelke**, Assistant Professor, College of Saint Benedict-St. John's University, is currently interested in developing and applying new methods in biological photography. (Biol 5816)

**Robert W. Seabloom**, Professor, University of North Dakota, has research inter-





ests concerning vertebrate ecology and zoogeography in the northern Great Plains, and endocrine function in mammalian populations. (UND 373)

**Donald B. Siniff**, Professor, University of Minnesota, is interested in vertebrate ecology, with special interest in population ecology of large mammals. (EBB 5041, Biol 5850)

**Donald R. Strong, Jr.**, Professor, Florida State University, is widely interested in community and population biology, and conducts field work on insect-plant association with the marsh grass *Spartina* and with tropical monocots. (EBB 8800)

**John R. Tester**, Professor, University of Minnesota, is interested in behavioral and population ecology of terrestrial vertebrates. Recent research has emphasized habitat selection and activity rhythms. (EBB 5817)

**Dwain W. Warner**, Professor and Curator of Ornithology, University of Minnesota, is studying the effects of habitat loss, especially tropical forest destruction, on long-distance migrant birds and the effects of continuing forest fragmentation on breeding habitats in Minnesota. (EBB 5834, Biol 5850)

## Independent Investigators

Qualified investigators may pursue research in various fields of terrestrial and freshwater biology during any season. An application to conduct research on the station and a research permit must be completed and research fees paid before initiating research projects. Interested persons should contact Jon Ross, Resident Biologist, University of Minnesota Forestry and Biological Station, Lake Itasca, MN 56460. (218/266-3345).



## Course Work and Research

The variety of courses available in the three terms allows students an opportunity to choose an entire summer of either intensive work in a particular field of interest or a sampling of several types of field experiences.

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

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

For teachers of biology in high schools and colleges, the program offers opportunity for advanced study through course work or independent research.

A freshwater algal culture collection consisting of about 60 species found within Itasca State Park is available for students and researchers.

Advanced students and research workers needing laboratory space and special equipment should make prior arrangements with Jon Ross, Resident Biologist, University of Minnesota Forestry and Biological Station, Lake Itasca, MN 56460. An application to conduct research on the station and a research permit must be completed and research fees paid before initiating research projects.

## Instructional Facilities

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

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

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

The library is stocked with important journals and books basic to field work and offers ample room for study. Other journals and books are available from the University Libraries.

## Admission

Courses are open to all qualified graduate and undergraduate students and others with continuing education objectives. The general rules for admission of graduate and undergraduate students to the summer session apply to the Itasca Biology Program. Please read the admission and registration instructions on page 103.

## How to Register for Courses at Itasca

Registration for a course taught at the Itasca Station is a two step process. First you reserve a place in a course and make a deposit; second, if space is available, you complete your registration by paying your tuition and fees. Since both housing facilities and class sizes are limited, early application for reservation is recommended.

**Step 1:** Complete the reservation form and the Itasca Summer Information Sheet found on page 87. So that we can verify prerequisites for the courses, attach to these two forms a recent transcript of your academic record and a listing of courses in which you are currently enrolled. (Note: Transcripts are not mandatory for teachers and others holding baccalaureate degrees, and for those not seeking credits.)

Enclose a deposit of \$25 for each course for which you intend to register. The deposit is applied toward the tuition charged at the time of registration, or it will be returned to you if space is not available. Make checks payable to the University of Minnesota.

Students will be notified of acceptance into classes. Early applicants will be notified



## On the Station...

**Getting there**—By car, highways 200 and 71 provide easy access into the park, by plane, Republic Airlines offers daily service between the Twin Cities and Bemidji, or by bus either to Park Rapids or to Bemidji. If you come by plane or bus, you will be met upon arrival *if you make prior arrangements with the program director*. Before June 15 you may telephone Professor David Parmelee, at (612) 373-1292, or write him at 349 Bell Museum of Natural History, University of Minnesota, 10 Church Street S.E., Minneapolis, MN 55455. After June 15 you may telephone him at the Itasca office (218/266-3302) or write to him at University of Minnesota Forestry and Biological Station, Lake Itasca, MN 56460.

**Living arrangements**—there are nine cabins for men, each accommodating eight students, and seven cabins for women, accommodating six to eight students each. The heated cabins are rustic, but comfortable, with bunk beds and with desks for study in each cabin. Women's cabins contain toilets and wash basins. A central bathhouse with laundry facilities is located near each of these groups of cabins.

You will have to bring your own pillows, bed linen, and towels, and since the nights are often cool, you may want to bring two or three wool blankets.

**Family accommodations**—A list of accommodations off-campus in one of many resorts in the vicinity will be furnished upon request.

The station maintains a tent and trailer camp area with a modern bathhouse and outlets for water and electricity, but no cooking facilities. Students staying in the campground must provide their own camp stoves or grills, or make arrangements for meals at the Itasca food service. Registered students and their spouses and children have top priority for use of the campground. The weekly charge is \$7 for each adult and child over 12. If you are interested, please apply well in advance of the session, and if your spouse or children are accompanying you, please notify the program director.

**Personal needs**—essential equipment includes serviceable clothing (sweaters, sweatshirts, shorts for warmer days, shoes or boots for fieldwork), a warm jacket, rain gear, a swimsuit, a flashlight, notebooks, pocket field manuals, a portable typewriter, typing paper, and a calculator.

**Meals**—The dining hall is managed by University Food Services. A professionally trained chef serves meals in an attractive dining hall located on the lakeshore. Important: All persons housed in student cabins must use the dining hall facility.

**Accommodations for visitors**—If you are expecting a guest, please notify the office at least 24 hours in advance. There are very limited facilities for guests on the station; it is possible you may have to make arrangements for guests at a local resort. All overnight guests must register at the office upon arrival. Meals for your guests can be arranged in advance at the Itasca food service. Please inform your guests of park regulations—students must take responsibility for the conduct of their visitors.

**Mail**—Have your mail addressed to University of Minnesota Forestry and Biological Station, Lake Itasca, MN 56460.

**Recreation**—Within the park, the opportunities for swimming, fishing, canoeing, and hiking are excellent. At the station, equipment for softball, volleyball, soccer, and horseshoes is available. Evening social events may be

by April 10. If a course you want is filled, you will be placed on the waiting list. When an opening occurs you will be notified. Late course reservations are accepted up to the day of registration since openings occur from time to time even in classes that close early.

Students may register for 2-6 credits per term. A maximum load usually is 6 credits per term. However students taking courses which overlap terms may request permission to enroll for more than six credits.

**Step 2: Complete the Registration.** All students will be mailed a fee statement prior to the start of the Itasca program on which the courses in which they are enrolled will be indicated. Tuition and fees can be mailed to or paid in person at the Bursar's office in 145 Williamson or paid in person at the Cashier's office in 107 Coffey Hall.

Students registering late may pay tuition and fees at the Itasca Station on registration day. Students registering for the Duluth or North Dakota courses will be mailed special tuition instructions.

Term	Itasca Registration Day
First	June 15
Second	July 6
Third	July 27

## Changes in Registration and Cancellations

Changes in registration must be approved by the program director and are strongly discouraged after registration day. Cancellations also must be approved by the program director. Because late cancellations often create vacancies in classes that someone else wants, students who know they are going to cancel should do so as soon as possible. Cancellation for any reason before June 15 should be reported immediately to the program director by telephone (612-373-1292), followed by a statement in writing to 349 Bell Museum, 10 Church Street S.E., Minneapolis, MN 55455; after June 15 to Itasca Forestry and Biological Station, Lake Itasca, MN 56460 (telephone 218/266-3302). Students who want to cancel after the session has begun should consult with their instructor.

The deposit fee will be returned if written notice of cancellation is postmarked be-



fore May 15 for Term I; before June 6 for Term II; and before June 27 for Term III. Partial refunds of tuition are possible with cancellation within the first six days of the term.

## Tuition, Fees, and Other Costs<sup>1</sup>

**Tuition.** Tuition and all fees are payable at the beginning of each term by every registrant. An additional charge is assessed for both late registration and late payment. Tuition is assessed on a per-credit basis according to the University of Minnesota college in which the academic year student registered during a previous term. Summer-only undergraduate students will be charged tuition at the College of Biological Sciences rate: \$49.74. Academic year students, please consult the tuition and late registration/late payment schedule on page 112.

**Graduate School Tuition.** Students registering through the Graduate School pay Itasca Biology Program tuition at the rate of \$89.68 per credit, per term for 1-5 credits; for six or more credits the tuition is \$538.07 per term.

**Student Services and Laboratory Fee.** All students pay a laboratory fee of \$10 per term, and those who take 3 or more credits pay a student services fee of \$26.08 per term. New students pay a records service fee of \$6.

**Room and Board.** There is a service charge of \$7 per week for dormitory facilities. A charge of \$57.00 per week for board is payable to the University of Minnesota. Itasca food service is run on an actual cost basis. These fees are also payable at the beginning of each term.

**Transportation Costs.** University vehicles are available for class field trips. Students using them are charged a fee to cover actual costs. Costs usually range from less than \$1 to \$30. Courses that commonly use University vehicles for long or frequent field trips are GC 1133, Bot 5801, 5811, EBB 3800, 5814, 5817, 5834.

planned by the students, and there are weekly lectures by staff members or visiting scientists.

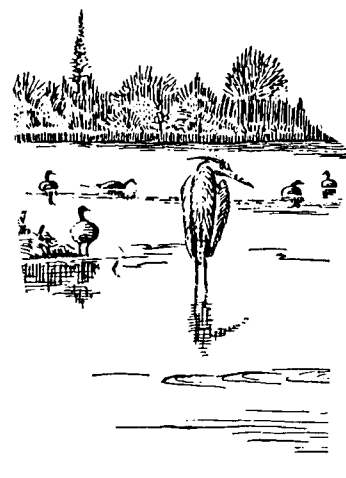
**Guidelines**—campus regulations are kept at a minimum. Students are expected to keep their own quarters clean and orderly. You may bring your car, but garages and repair services are not provided. Weekend absences and extended field trips should be reported in advance. Domestic pets are not allowed at the station.

Off campus and within park boundaries, Minnesota State Park regulations govern. The state park entry sticker (\$15 for both Minnesota residents and for nonresidents) must be purchased for private cars at the park entrance.

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

## Health Service

A registered nurse is on duty at the station infirmary for consultation, first aid and assistance with any ongoing medical treatments. Further medical assistance is available by referral to a physician at the Park Rapids Clinic. This service is available to all students who have paid the student services fee. Benefits do not include such items as routine physical examinations, treatment of chronic conditions, or payment for drugs. If you are taking fewer than three credits and elected not to pay the student services fee, all medical services are your responsibility and you are advised to make prior arrangements for treatment at Park Rapids or Bemidji. Everyone living at the station is required to have hospitalization coverage whether obtained through or outside the University. (See information about charges for University-sponsored hospital coverage on page 115.)



<sup>1</sup>Tuition, fees, and other costs are subject to change without notice.

## Scholarships and Research Stipends

Both scholarship awards and graduate student research stipends are available for qualified students in the summer, as follows:

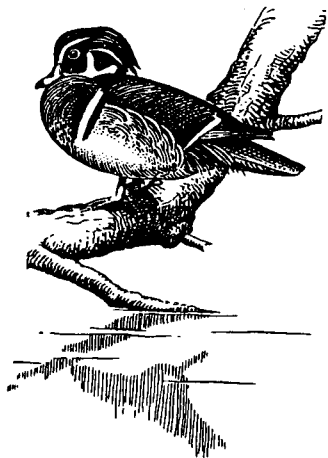
*Alexander P. Anderson and Lydia Anderson Fellowships*, at \$350 each, are available only to persons holding a degree from the University of Minnesota. For information and applications write to the Graduate School Fellowship Office, 422 Johnston Hall, University of Minnesota, 101 Pleasant Street S.E., Minneapolis, MN 55455.

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

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

*Fisheries and Wildlife Management Spring and Summer Scholarships* are provided by the Minnehaha Chapter, Izaak Walton League, Kenneth M. Frenzel Memorial Scholarship, and the James R. Beer Memorial Scholarship of the Minnesota Student Chapter of the Wildlife Society. For information and applications write to the Program Director, Itasca Biology Program, 349 Bell Museum of Natural History, University of Minnesota, 10 Church Street S.E., Minneapolis, MN 55455.

Inquiries should be directed to Professor David F. Parmelee, Program Director, Itasca Biology Program, 349 Bell Museum of Natural History, University of Minnesota, 10 Church Street S.E., Minneapolis, MN 55455. Inquiries should be made as early as possible; the deadline for research stipend application is April 10.



## Student Loans

Students who are enrolled in a University of Minnesota degree or certificate program during the academic year may be eligible for a Guaranteed Student Loan to help pay for the cost of their Itasca sessions. The necessary forms may be obtained from the Office of Student Financial Aid in 210 Fraser Hall on the Minneapolis campus or 197 Coffey Hall on the St. Paul campus.

*Visiting students who are regularly enrolled in other institutions should arrange for student loans through their home institutions.* These students should expect a delay in receipt of their loans, because a lending institution generally will release a check only after the student has completed registration and his or her enrollment is certified by the Office of Admissions and Records.

## Employment Opportunities

A limited number of jobs (library, office, shops, etc.) are available to students on a competitive basis. Interested persons should request an application form from the program director of the Itasca Biology Program. Only University of Minnesota students may apply for graduate teaching assistant positions and College Work-Study Program jobs. Deadline for job applications is April 10.

**REGISTRATION**  
**Itasca Biology Program**

Please print.

See Registration section of this bulletin before completing this form. Schedule only one course per day, using the Condensed Course Schedule. Mail this form with the Itasca Summer Information Sheet and all required materials to Program Director, Itasca Biology Program, 349 Bell Museum of Natural History, University of Minnesota, 10 Church Street S.E., Minneapolis, MN 55455.

Student Name (last, first, middle, former)			U of M ID Number	
Current Street Address			Home Phone Number ( )	
City	State	Zip Code	Work Phone Number ( )	
Permanent Street Address			Reserve for me a (check one): <input type="checkbox"/> Student cabin <input type="checkbox"/> Campground site <input type="checkbox"/> Resort	
City	State	Zip Code		
Current Student Status (check one): <input type="checkbox"/> Grad <input type="checkbox"/> Adult Special <input type="checkbox"/> Freshman <input type="checkbox"/> Sophomore <input type="checkbox"/> Junior <input type="checkbox"/> Senior <input type="checkbox"/> Independent Investigator				
Student Status by Summer 1986		University or College You Now Attend		
If you are a University of Minnesota student, write college and year in which you were last enrolled:				
College _____			Year 19_____	
	Call Number	Credits	Department	Course Number
Term I June 15-July 5				
Term II July 6-26				
Term III July 27-August 16				

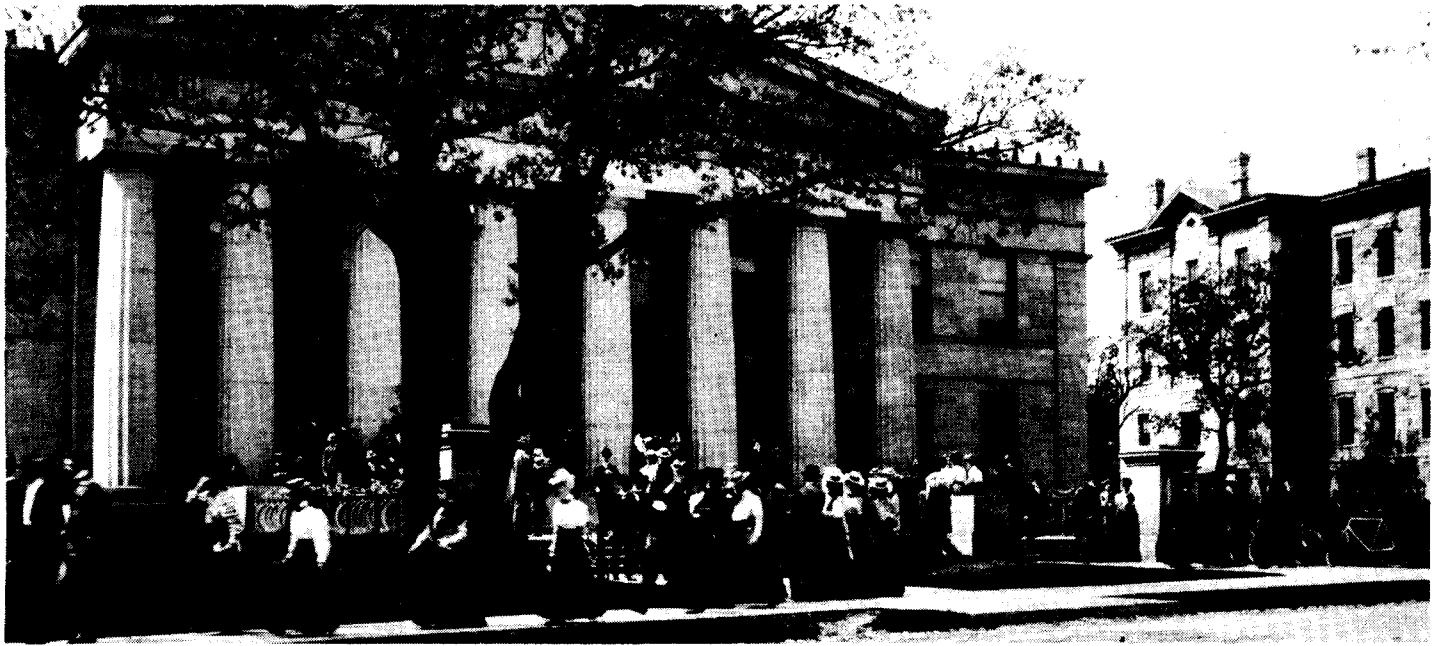
If a course runs for more than 3 weeks, list it only in the term in which it begins.

**ITASCA SUMMER INFORMATION SHEET**  
**Office of Admissions and Records**

Please print.

See Registration section of this bulletin before completing this form. Mail it with the Registration form, a \$25 per course deposit (check or money order payable to the University of Minnesota) to be credited to your tuition, and a recent transcript of your academic record (including all current courses), to: Program Director, Itasca Biology Program, 349 Bell Museum of Natural History, University of Minnesota, 10 Church Street S.E., Minneapolis, MN 55455. NOTE: Applications will not be reviewed until all items are received.

Student Name (last, first, middle, former)			U of M ID Number	
Current Street Address			Social Security Number	
City	State	Zip Code	Birthdate (month/day/year)	
Permanent Street Address			Sex (check one): <input type="checkbox"/> Male <input type="checkbox"/> Female	
City	State	Zip Code	Home Phone Number ( )	
Have you ever registered in University of Minnesota day classes, including summer? <input type="checkbox"/> Yes <input type="checkbox"/> No    If yes, write quarter, year, and college: Quarter _____ Year _____ College _____ Degree held _____			Summer Term (check one, two, or three) <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III	
If you have never registered in University of Minnesota day classes, have you applied for or been granted admission? <input type="checkbox"/> Yes <input type="checkbox"/> No    If yes, write quarter, year, and college: Quarter _____ Year _____ College _____				



Burton Hall, originally the University Library, as it was in the early 1900s.

## A Short History Of The Summer Session

By Lynn Waldsmith

The first Summer Session of record at the University of Minnesota took place in 1881 with 42 students who studied botany, chemistry, and geology. Today, the University's Summer Session has become one of the largest in the nation, with almost 17,000 students enrolled in over 1000 scheduled courses in 1985.

For many years, Summer Session courses were designed primarily for teachers, and with good reason. The land grant universities of the nation were established before there were high schools and at a time when those teaching at the elementary level had minimal training and experience. When Lincoln was inaugurated there was only one high school in Minnesota, and there were few more when the University was founded.

Thus, a major objective of the Summer Session in those early years was to help establish and improve the state's educational systems. For this reason, the state department of public instruction actually ran the Summer Session at first, with the Board of Regents granting permission for the use of University buildings, libraries, and equipment, and University instructors donating their time.

According to the Summer Session bulletin of 1909, the summer school was located in Minneapolis, "a delightful place of summer residence," and was organized in two units, the elementary and the college sections. The elementary section offered Minnesota teachers free courses leading to certification. The college section, also planned primarily for teachers, led to a college degree and charged tuition fees; teachers paid \$4 for the college courses, while others could enroll for \$9.

Most of the summer courses during these early years were held in Folwell and Pillsbury halls, and the period from

10:05 to 10:50 was set aside each day for students to attend a chapel service. There is no indication of whether attendance at chapel was mandatory.

With the arrival in 1911 of George Edgar Vincent as third president of the University, a greater commitment was initiated to extend the services of the University to as many Minnesotans as possible.

Shortly after President Vincent came to the University, the Regents assumed full responsibility for the Summer Session, approving a budget for summer instruction. They recommended that "\$6,500 be set aside for the establishment of summer courses . . . for the benefit not only of our own students but also for men and women whose occupations prevent their attendance at the University during the academic year."

Among the changes that were introduced was uniformity in teaching hours, credits, payment for instruction, and a broader range of course offerings.

Today's Summer Session is significantly different from that of the past. While teachers still make up an important part of summer enrollments, the largest number of students is represented by the College of Liberal Arts. The Summer Session provides a "fourth quarter" of sorts for students who currently attend the University; in fact, roughly two-thirds of those who attend Summer Session have been enrolled in the preceding academic year. But many others also take advantage of the educational opportunities offered by Summer Session, including those who attend other colleges and universities, those who wish to return to school, those who wish to improve their job skills or simply take courses for enjoyment and personal fulfillment, and qualified high school students. The University of Minnesota extends its summer invitation of learning to you.

# Special Programs

## Conference-Courses new for 1986

A combined conference-course format will be used for three programs offered during the summer of 1986. Participants may choose to register in the course for credit or to attend only the conference for non-credit. The fees will vary depending upon the level of participation desired by the participant. The Department of Professional Development and Conference Services, the Department of Extension Classes and the respective academic departments are working with Summer Session to organize these unique multiple format learning opportunities. Contact Summer Session, 135 Johnston Hall, 101 Pleasant Street S.E., Minneapolis, MN 55455 (612-373-2925) for more information on these conference-courses.

**Advanced Non-Fiction Writing: Computers and Composition** (Engl 5100, 4 cr, July 20-August 2) is for current and potential high school and college teachers of composition who want to learn more about working with computers to make a difference in students writing ability. Students will explore software applications and practice Computer Aided Instruction (CAI) lesson and screen design. Students registered for the course will be expected to attend the conference attached to the course. No separate conference registration will be necessary. Professor Donald Ross will be the principal instructor and also lead the

planning committee for the conference described below.

A two-day conference on Friday, August 1 and Saturday, August 2 will explore public policy, administrative, pedagogical and research topics for current teachers or directors of writing laboratories that use computer aided instruction. The conference will have a keynote address and paper presentations. Consultant time for topics that people have found frustrating or significant when teaching with computers will be available to participants. On Saturday, July 26, the conference will consider public policy issues affecting support computers in schools to aid student writing development.

**Assessment of the Undergraduate Experience** (HiEd 8228, July 3.) The course will explore issues under current national debate regarding policies, procedures, instruments, and appropriateness of assessing undergraduate education outcomes. Students are required to attend a three-day conference on the same topic June 30-July 2. Advance application is required to negotiate the number of credits, determine correct section for registration and receive reading assignments to be discussed at the first meeting. Students will meet on June 27 with Professor Corcoran to identify issues and to be paired with a faculty mentor who will provide guidance on paper/projects. The students will reconvene on July 3

after the conference to discuss assigned readings and to plan research papers. For further information write or call Professor Mary Corcoran, 221A Burton Hall, University of Minnesota, 178 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-5841).

The three-day conference (June 30-July 2) on the same topic will consist of a keynote address and orientation to the issues, presentations by invited guests, discussion groups following the presentations and final summary session. The topics of the conference are aimed to help faculty and college administrators who are considering or are implementing assessment programs, and to assist public policy leaders who are considering mandated assessment.

**A Silver Burdett Music Summer Workshop** (Extension Classes: MuEd 5750, 3 cr, July 28-August 1) provides new ways to teach general music, K-8; exchanges of ideas with other teachers; and beginning experiences with music software and computers. Those who want to register for credit will do so with Professor Robert Borg, School of Music. For more information contact Extension Classes, 101 Westbrook Hall, 77 Pleasant Street S.E., Minneapolis, MN 55455 (612/373-3195).



# Summer Scholars experiences for high school students

The University of Minnesota offers special, college credit, summer programs for high ability students who enjoy exploring a broad range of new subjects and want to get started early with college life. Gifted and talented high school students are invited to consider these courses that are taught by some of the University's best faculty. Students will live in campus dormitories. Application materials will be available after March 1, 1986. Call Summer Session (612/373-2925) or write for information (135 Johnston Hall, 101 Pleasant St. S.E., Minneapolis, MN 55455).

## Twin Cities Campus

**Summer Honors College** is an intensive two-week college learning and residential experience during which students who will be juniors and seniors take courses from a list that includes mathematics, English, studio arts, psychology, political science, history, humanities, architecture, and physics. The first term will run June 17-June 27; and a second term will run July 7-July 18. The second term will have an international studies focus. Students may enroll for one or both terms. Tuition, fees, and room and board, after merit scholarship, will be \$225. Day only students pay \$135. Need-based scholarships are available to help with the remainder of the cost.

**Summer Music Honors Program** is a unique opportunity for outstanding high school musicians in grades 10-12 to join together for artistic performance of the finest orchestra, band and chorus reper-

toire. The two exciting weeks of musical instruction and ensemble opportunities will take place in the new music building, Ferguson Hall, on the West Bank of the Twin Cities Campus. For the first time, seniors may register for college credit in these foundation of music and ensemble courses. The dates are June 17-June 28. The cost is the same as for the Summer Honors College.

**Honors Institute in Theatre** provides talented high school students who will be juniors and seniors a formal exploration of the elements of stage work combined with production and performance. At the heart of the program is a concern that students learn to work out practical theatre problems together under the guidance of University faculty. Courses in theatre arts will be provided for college credit. A performance will culminate the four-week (June 17-July 12) term. The cost for the four-week program will be \$390, after merit scholarships are available to help with the remainder of the cost.

## University of Minnesota, Morris

*The UMM Summer Scholars Program* explores questions related not only to the scientific and technological revolutions of our times but also our own and society's values. Students who will be seniors spend two weeks (July 14-July 25) exploring interdisciplinary questions through college credit courses on "Genetic Alteration: Tinkering with Nature" and "Growing up American." Tuition, fees, room and board will be \$225 after merit scholarships. Need-based scholarships are available to help with the remainder of the cost.

## University of Minnesota, Duluth

*The UMD Math/Computers/Science Summer Institute* provides talented student in grades 11-12 with college credit courses on advanced topics to challenge and increase their math and science capabilities. Tentative dates for the five week institute are June 22-July 25. Need-based scholarships are available to help with the cost. Contact Terri Williams, Summer Session, 19 School of Business and Economics Building, University of Minnesota, Duluth, Duluth, MN 55812-2496 (Call 218/726-6142).

## Summer Language Institute

This summer, within the framework of the Summer Language Institute, the University of Minnesota is offering several options for students, for high school teachers, and for others who would like to pursue language study. The study options available on campus include the regular-pace language courses, intensive courses in 14 separate languages, and courses particularly designed for high school teachers.

The ability to speak a language other than our own is fast becoming a necessary skill, one of the many tools for meeting the demands of a world in which a sensitive and greater understanding of international cultures is vital. The urgency of this need is a cardinal and challenging reason to study language this summer.

Another compelling reason for language study in the summer is the new second language entrance standard and the revised graduation requirement to be initiated by the College of Liberal Arts starting fall quarter 1986. The new entrance standard is being phased in over the next three years, and while it is not a requirement for admission to CLA, graduating students must have demonstrated proficiency in a second language equivalent to that usually gained in two years of college study.

**Intensive language study** in the summer is one of the options available. These classes are taught over the two terms of summer; each course is offered for 15 credits, or the equivalent of three quarters of study; the commitment requires three morning hours of class per day, with additional hours of language laboratory—and, the student cannot register for any other

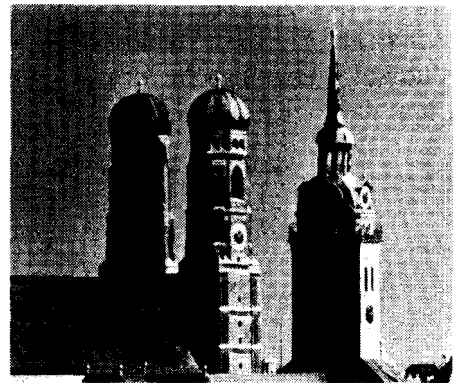
course during the summer. In 1986 the languages offered in the intensive format are: beginning Chinese, Dutch, French, German, Modern Greek, Hebrew, Italian, Japanese, Latin (5-week intensive), Ojibwe, Portuguese, Russian, Spanish and Swedish.

**Regular-pace language courses** will be available each term in French, German, and Spanish.

**High school teachers** have two special foreign language study options. Current teachers of foreign language may find a workshop course in foreign language pedagogy (French, German, and Spanish) useful to them. "*Teaching of Second Languages and Cultures*" (SeEd 5191) will be offered in the first term of the summer session.

Teachers who may be teaching a foreign language after being away from the language for a time may be interested in three-week special courses to improve speaking and reading proficiency in "German Proficiency Teaching in Action—July 28-August 15" (Ger 5010) or "Proficiency Teaching of French—July 21-August 8" (Fren 5990). Either course would be helpful to teachers assigned to teach German or French after teaching another subject for many years.

Russian language teachers may be interested in a short-term intensive Russian language experience in order to maintain and improve their language proficiency. Participants will also be introduced to new methods and materials available for teaching Russian (June 23 to July 11).



## Travel and Study

Combining travel and study is an available option for summer language study.

For teachers, the College of Education is offering a study tour to *The People's Republic of China, June 15-July 4*, that features visits to historical and cultural sites and to the schools throughout China. A three-week tour of the *Soviet Union, July 2-24* is one that will provide teachers the opportunity to discuss and observe educational reform throughout Russia, Central Asia, and Eastern Siberia. A tour to *Eastern Europe July 27-August 8* will take participants to West Germany, Czechoslovakia, Poland, Austria, Hungary, and Yugoslavia. Additional information and persons to contact about these tours sponsored by the College of Education can be found on page 5.

In addition, the study abroad programs offered by Extension Classes Office of Study Abroad (ECOSA) are available to summer students. *Polish in Lublin* is one such program, held July 21-August 31 at the Marie Curie Skłodowska University in Lublin, Poland. This

class integrates an introductory Polish language course and the study of Polish culture with the experience of living in a Polish environment. *The International Program in Toledo, Spain* gives students the opportunity to choose course work in Spanish language and the liberal arts that best suits his or her individual needs. The summer program in Toledo meets from June 15 to July 27 and includes a one-week excursion to northern Spain.

Additional information about these two classes may be had from Extension Classes Office of Study Abroad, 202 Wesbrook Hall, University of Minnesota, 77 Pleasant Street S.E., Minneapolis, MN 55455.

The College of Liberal Art is offering the *7th annual Nankai Institute*, an intensive language program in Chinese held at Nankai University, Tianjin, China, June 23 to August 16, 1986. Nankai Institute offers courses in standard Chinese at second year, third year, and advanced levels. It also provides students with a rare opportunity to experience Chinese language and culture firsthand through contact with Chinese students. Application must be made by February 28, 1986.

There is an optional post-institute tour August 17-28 arranged so that students may visit Huang Shan, Nanjing, Wuxi, Suzhou, and Shanghai.

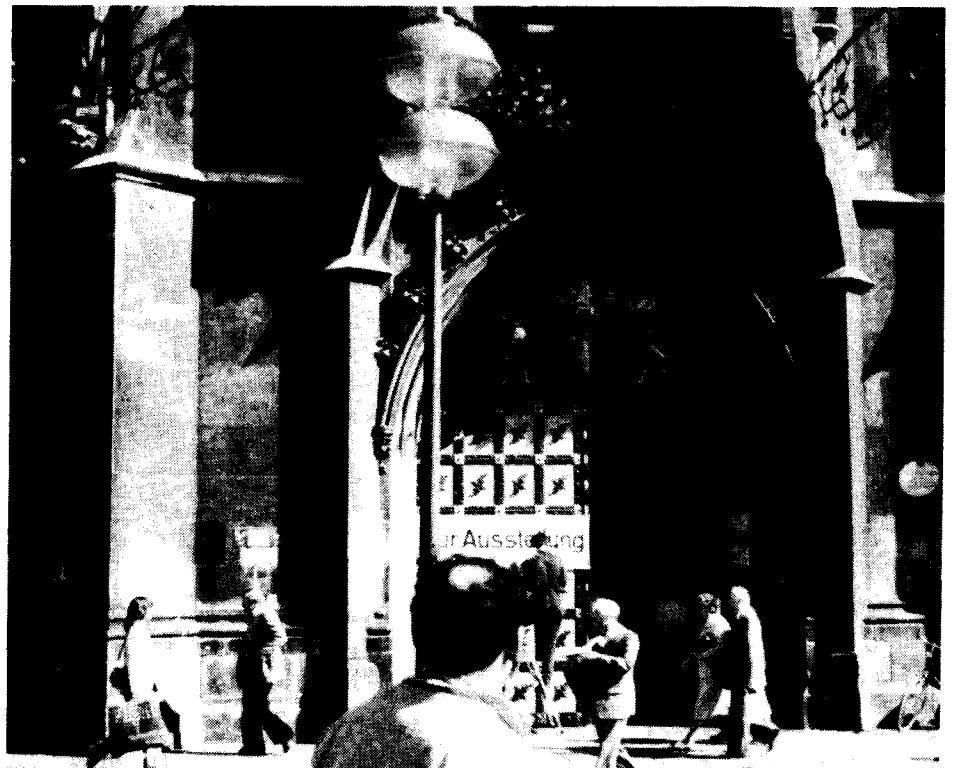
For further information and application forms please telephone, or write: Minnesota-Nankai Institute/East Asian Studies Department/University of Minnesota/113 Folwell Hall/9 Pleasant Street S.E., Minneapolis, MN 55455. (612/373-5822, or 373-2564).

## Intensive English language and orientation to U.S.A. for international students

The Intensive English Language and Orientation Program for non-native speakers of English will be offered July 16 through September 10. The program focuses on English language instruction and orientation to U.S. life and education. The core program includes 25 hours per week of classroom instruction in listening, grammar, reading, and writing. Language laboratory facilities are available. Participants take part in field trips,

out-state visits, and lectures, seminars, and workshops designed to introduce them to the United States. An optional homestay program is available.

Applications and additional information can be obtained from the Director of Special Programs, Intensive English Language and Orientation Program, International Student Adviser's Office, 717 East River Road, Minneapolis, MN 55455.



# Student Services

## Housing

### Minneapolis Residence Halls

Pioneer Hall, and a small number of spaces in Middlebrook Hall, have been reserved for summer session students for 1986. Pioneer Hall, with a mix of double and single rooms, is a coeducational, non-air-conditioned, residence hall on the East Bank near the Health Sciences. A seven day per week (19 meal) food service program under the direction of a professional food manager is part of the contract and will be provided in a newly remodeled food service adjacent to Pioneer Hall.

Middlebrook Hall is a coeducational, air-conditioned residence on the West Bank. All rooms are doubles. A food service program similar to that offered in Pioneer will be provided in Middlebrook.

For both summer terms in Pioneer and Middlebrook, meal service begins on the first day of class.

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



### St. Paul Residence Hall

Bailey Hall will be open as a conference facility during the summer of 1986. Depending on demand by summer session students for space in Bailey Hall, a few spaces for students may be available. Special arrangements may be required for food service. If Bailey is open for students during either summer term, accommodations will be in non-air-conditioned double rooms. For information, contact the Housing Office, Comstock Hall, University of Minnesota, 210 Delaware Street S.E., Minneapolis, MN 55455 (612/373-7542).

### Off-Campus Housing in Private Residences

Apartments, houses, duplexes, sublets, roommate requests, and

rooms in private homes, rooming houses, cooperatives, fraternities, and sororities are listed by the Division of Off-Campus Housing. A summer sublet list is available upon request. Most units are offered about a month before they are available for occupancy. In the past several years, over 8,000 rental units were listed.

For more information about specific services, contact the Division of Off-Campus Housing, Comstock Hall-East, University of Minnesota, 210 Delaware Street, S.E., Minneapolis, MN 55455 (612) 373-7542. During the summer months the Division provides listings and counseling in 190 Coffey Hall on the St. Paul campus. The service is available from June 1 through September 30.

# The University Libraries—

The University of Minnesota-Twin Cities Libraries, with a collection of more than 4 million cataloged volumes, ranks among the largest American university libraries. In addition to books and periodicals, the libraries have substantial holdings of government documents, manuscripts, archives, phonograph records, audiovisual tapes, and other materials.

The core collections, which comprise the backbone of the University Libraries holdings, are located in 18 separate locations. The collections directly support the curriculum of the University and serve as the foundation for research.

## Humanities and Social Sciences Collections

The main humanities and social sciences collections including American studies, anthropology, art, business, film, geography, history, language, literature, philosophy, political science, religion, sociology, and women's studies, are found in Wilson Library on the West Bank.

The collections for education, library science, and psychology are found in Walter Library on the East Bank, along with a broad and diverse undergraduate collection.

The collections in design, vocational education, family social sciences, rural sociology, and textiles, are housed in the St. Paul Central Library on the St. Paul campus.

## Related Subject Collections

- Ames Library of South Asia (S-10 Wilson)
- East Asian Library (S-30 Wilson)
- Government Publications Library (409 Wilson)
- Journalism Library (Eric Sevareid Library, 121 Murphy Hall)
- Map Library (S-76 Wilson)
- Middle East Library (S-50 Wilson)
- Music Library (Ferguson Hall)
- Public Affairs Library (50 Humphrey Institute)

**The Law Library** (Law Center) contains a comprehensive legal literature collection including state and federal statutes; reports and regulations; legal periodicals and treatises; and a broad range of foreign and comparative international legal sources.

## Science Collections

The main science and technology collection including chemistry, engineering, geology, and physics, is housed in the Science and Technology Library in Walter Library.

The health science collections, including allied health, dentistry, medicine, mortuary science, nursing, pharmacy, and public health, are in the Bio-Medical Library in Diehl Hall.

The agricultural and biological sciences collections are found in the St. Paul Central Library on the St. Paul campus.

## Related Subject Collections

- Anderson Horticultural Library (University of Minnesota Landscape Arboretum)
- Architecture Library (160 Architecture)

- Biochemistry Library (406 Biological Sciences Center, St. Paul)
- Entomology, Fisheries & Wildlife Library (375 Hodson Hall, St. Paul)
- Forestry Library (203 Green Hall, St. Paul)
- Mathematics Library (310 Vincent Hall)
- Natural History Library (305 Bell Museum of Natural History)
- Plant Pathology Library (395 Borlaug Hall)
- Veterinary Medical Library (450 Veterinary Science, St. Paul)

## Archives and Special Collections

- Charles Babbage Institute Collection (101 Walter)
- James Ford Bell Library (462 Wilson)
- Children's Literature Research Collection (109 Walter)
- Manuscripts Division (862 Berry St., St. Paul)
- Social Welfare History Archives (101 Walter)
- Special Collections and Rare Books Division (466 Wilson)
- University Archives (10 Walter)
- Wangensteen Historical Collection (568 Diehl Hall)

## Central Reference and Research Service Points

### HUMANITIES AND SOCIAL SCIENCES

East Bank Reference	Walter Library, 1st floor
West Bank Reference	Wilson Library, 1st floor
Business Reference	Wilson Library, 2nd floor
Government Publications Reference	Wilson Library, 4th floor

### SCIENCES

Bio-Medical Reference	Diehl Hall, 3rd floor (street level)
Science & Technology Reference	Walter Library, 2nd floor
St. Paul Central Reference	Central Library, ground floor



## Specialized Services

The University Libraries provide a number of services, including in-depth reference service, library instruction, computer-literature searching, inter-library borrowing, and photocopying.

## Circulation of Materials

Information regarding student, faculty and staff borrowing privileges can be obtained from any library unit.

## Library Hours

A recording of current library hours is available by calling 373-0066.

# Advising and counseling services for summer-only students

Summer-only students with questions about what to study and which courses to take can make use of either the Counseling Department in Continuing Education and Extension, or the college offices. Minority students will find several special offices to help them.

**The Counseling Department of Continuing Education and Extension (CEE)** offers both counseling and program advising services, without fee, to summer-only students. The offices are located in 314 Nolte Center, 315 Pillsbury Drive S.E.; telephone 373-3905 (after April 26 use 625-2500). Students may telephone to arrange for day or evening appointments, although advisers are available on a walk-in basis from 9:00-12:00 and 1:00-4:00 Monday through Friday during regular daytime hours. Students with mobility impairments should call ahead for an appointment, a curb cut is provided on the south entrance to Nolte Center (Pillsbury Drive S.E.).

**Counseling**—Professional counseling and assessment services are available to Summer Session students who want to learn more about their own values, interests, and personalities; who wish help in educational and vocational planning or choosing a major field of study; and who seek help with problems affecting their academic performance. A fee of \$80 is charged for students and prospective students (\$125 for nonstudents) who want to take advantage of the full range of assessment services. All fees may change July 1.

Appointments must be made in advance.

**Advising**—Program advising is available to help students select programs of study; determine prerequisites and academic standing; evaluate transcripts of previous college work; choose the kinds and number of courses to take and the order in which they should be taken; arrange for examinations for credit or advanced standing; and handle other academic matters. Extension certification programs are available to Summer Session students.

**Information by telephone**—Information about Continuing Education and Extension is available by telephone through the Digital Information Access Line (DIAL). For a brochure listing the various tapes available, telephone 373-1857.

**College advising**—Both academic-year students and summer-only students are encouraged to use collegiate advising services. The advisers offer individual help in planning your study program and meeting your other academic life concerns. Wise use of the advising system can make your college experience satisfying and more productive. You should take pertinent records and materials to adviser appointments, and you can profit by preparing for program planning sessions by giving some prior thought to possible course selections or program schedules. See list of college offices on the inside front or back covers.

**College of Liberal Arts summer-only students** may use the advising services available in B18

Johnston Hall between 8 a.m. and 4 p.m. Advisers can assist you with your concerns regarding registration, course work, choosing a major, and using a computer-assisted career planning program. You may call ahead for an appointment, telephone 373-2880 (after May 24 use 624-9585), although advisers are available on a walk-in basis.

**College of Education summer-only students** may use the advising services available from the College of Education Student Affairs Office (ESAO), 1425 University Avenue S.E., Minneapolis 55414, telephone 373-1422. The staff will be available during Summer Session registration as well as during both terms for consultation concerning admission, information about teacher licensure requirements, and placement services.

**The Office of Minority and Special Student Affairs (OMSSA)** provides services to students through four Learning Resource Centers (LRC) and through the Summer Institute. The LRCs provide guidance, counseling, and academic support about careers, jobs, financial aid, tutoring, and admissions.

American Indian LRC, 125 Fraser Hall, 376-2982

Asian/Pacific American LRC, 306 Walter Library, 373-7917

Black LRC, 323 Walter Library, 373-7947

Chicano/Latino LRC, 332 Walter Library, 376-8020

The *OMSSA Summer Institute* offers a precollege program for new OMSSA students to help ease the transition from high school to the University. The eight-week summer institute gives students a chance to get a head start in college—to sharpen academic skills, such as writing and math; become

familiar with University life; learn how the University system works; meet other students; and earn college credits. Participants receive stipends to cover tuition and fees, books and supplies, room and board, transportation, and health insurance. Generally about 125 students are admitted to the institute.

**Other college services for minority students** are available. These programs provide supportive services for their students to supplement and personalize the general services provided by the University as a whole.

**MLK Program**—The College of Liberal Arts (CLA) has designated one of its many advising offices—the Martin Luther King (MLK) Program Office—to specifically serve the needs of minority students enrolled in CLA. The MLK office provides registration assistance, academic program planning, and tutorial services as well as special sections of classes for students it serves.

**Project Technology Power**—The Institute of Technology (IT) has a program called Project Technology Power. This office provides advising and counseling services to IT minority students, and its director acts as the official adviser to the Minorities in IT (MINIT) student club.

**PEP Program**—The PEP Program in the General College is designed to assist freshmen in developing college-level communication skills. The curriculum consists of intensive English, writing skills, study skills and oral communication. The PEP Program will prepare students for academic mainstreaming in their areas of specialization.

**HELP Center**—The HELP Center, another General College pro-

gram, is an advocacy and counseling center for minority, low income, and nontraditional students.

In addition to these special services for minority students, the College of Liberal Arts and other undergraduate colleges have honors and other special interest programs for their enrolled students.

**Office for Students with Disabilities**—Counseling, information, problem solving, academic assistance, and referral services are provided for students and prospective students with physical or learning disabilities at 12 Johnston Hall (373-3714, Voice or TTY). Assistance includes sign language interpreters for students with hearing impairments.



# The Minnesota Union

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

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

## Coffman Memorial Union

Coffman Memorial Union (CMU) is a center of campus life for the East Bank. The union offers a wide variety of social, recreational, and cultural facilities, services, and programs designed to serve the many educational and leisure-time needs of students, faculty, and staff.

CMU has lounges, study areas, dining facilities, a recreation/games complex, an art/craft studio, and a music listening center, providing members of the University community with places to meet, study, eat, learn, and relax. Meeting and dining rooms, lecture halls and theatre facilities are available by reservation for group rental. In addition, Coffman Union also houses art galleries, MSA Store, University YWCA, newsstands, the campus Lost and Found Office, the Locker Rental Service, WMMR radio station, the International Study and Travel Center, ISTA Agency, the Golden Razor Barber and Beauty Salon, and a service center offering postal, MTC transit, and University of Minnesota parking services.

Summer hours for CMU are 7 a.m. to 10 p.m. Monday through Friday. Consult the *Minnesota Daily* for specific program events, times, and dates. For further information about programs, services, and facilities at Coffman Union, call 373-2403 during building hours.

## St. Paul Student Center

The air-conditioned St. Paul Student Center is open during the summer session from 7:00 a.m. to 10:00 p.m. Monday through Friday. The center offers a variety of services and programs to ensure that your summer on campus is an enjoyable one.

The Terrace Cafe provides breakfast, lunch, and snacks from 7:00 a.m. to 4:00 p.m. with both indoor and outdoor seating available. Books Underground, the campus bookstore, is open weekdays 8:00 a.m. to 4:30 p.m. and carries course texts, books for leisure reading, school supplies, and U of M souvenirs. For questions concerning campus and Student Center facilities and activities, stop by Information Services on the lower level or call 373-1046. Information Services also sells magazines, candy, tobacco, MTC bus passes, and movie discount tickets.

## West Bank Union

West Bank Union facilities include common rooms in Anderson Hall for lounging, reading, and playing table games; a common room in Blegen Hall for study, conversation, and playing chess; and the service centers in the Social Sciences Building and the WBU Skyway, offering program information, locker rentals, and general assistance.

The West Bank has expanded facilities in the WBU Skyway, which

connects Blegen Hall and Willey Hall, and houses a service center and several offices. The WBU Program Hall, adjacent to Willey Hall houses a general purpose lounge and program area as well as a large theater/lecture hall.

Summer hours for WBU are 7:30 a.m. to 4:30 p.m. Monday through Friday. For information about programs, consult the *Minnesota Daily* or call 373-5058 during business hours.

# Museums

## Bell Museum of Natural History

The James Ford Bell Museum of Natural History is permanent home to some of the nation's finest exhibits of Minnesota wildlife. The Jaques Gallery and Ground Floor Gallery feature changing temporary exhibits on a variety of natural science topics. The Museum also features the Blue Heron Bookshop, education programs for the public, the University's natural history library. In the Touch and See Room, visitors of all ages are invited to examine the animal skins, horns and antlers, and other natural items throughout the room. Trained staff are available to aid in the discovery process.

The Blue Heron Bookshop offers an outstanding selection of books on evolution, ecology and natural history. Records of animal sounds, cards, stationery and children's books are also available.

The Museum is accessible to the handicapped. It is located at 17th and University Avenues S.E.

on the Minneapolis campus. The Museum is open from 9 a.m. to 5 p.m. Tuesday through Saturday, and from 1 to 5 on Sundays. Call 373-2423 for group reservations, information on exhibits and programs, and for fees. The mailing address is: 10 Church St. S.E., Minneapolis, MN 55455.

## University Art Museum

The Art Museum, located on the third and fourth floors of Northrop Auditorium, presents frequently changing exhibitions of photographs, paintings, sculpture, prints, and decorative arts and related interdisciplinary events.

Art Museum facilities supplement classroom studio and library experience in the arts. Individual works of art and specialized materials from the museum's collection are available for study by appointment.

Museum hours are 11 a.m. to 5 p.m. Monday, Tuesday, Wednesday, Friday; 11 a.m. to 8 p.m. Thursday, and 2 to 5 p.m. Sunday. The Museum is closed on Saturday and University holidays. Admission is free. The main office is located in 110 Northrop Auditorium, 373-3424.

## Summer Entertainment

**Concerts**—Watch for announcement of the concert and entertainment schedule to be held on the Northrop Plaza and outside the St. Paul Student Center.

One or more performances will be sponsored most weeks. Most performances are held during the noon hour and are free. Last year, food stands were available for those who wanted to buy their lunch. The concerts include popular, jazz, folk, and classical music.

Summer Session and the department of Concerts and Lectures sponsor five or six concerts performed by nationally recognized artists. Watch for concert information in the Registration Centers, Northrop Auditorium, and the *Minnesota Daily*. Ticket information is available at the Northrop Ticket Office, 105 Northrop Auditorium, 84 Church Street S.E., Minneapolis, MN 55455-0202. Call 373-2345 between 8:30 and 4:30 weekdays. Students can purchase tickets at reduced prices by presenting a record of their Summer Session registration.

**Theatre**—During the summer months of June through August, University Theatre offers theatre productions aboard the Minnesota Centennial Showboat. The Showboat is a real sternwheel riverboat moored on the Mississippi River. Audiences enjoy lighthearted musical entertainment or melodramas aboard the air-conditioned Showboat.

Call 373-2337 for ticket information and reservations.

## Student Employment

The Student Employment Center, of the Office of Student Financial Aid, (Room 120, Fraser Hall) assists students seeking part-time work either with the University or with private or public employers.

To be eligible for summer employment on student status, people **MUST** be registered for a minimum number of credits for either spring quarter or the summer session. More information on minimum credits is available from Student Employment.

Student Employment is a referral service, not a placement service. Students apply in person for vacancies posted on the Student Employment bulletin board. If an individual is eligible for student status and fulfills the minimum qualifications for a job, a referral is issued to the student, who contacts the hiring department or employer for an interview. Chances of finding a summer job depend on the number of jobs available and the student's qualifications and hours available. Most vacancies are 29 hours per week or less and are maintenance or clerical jobs. Student Employment does not handle graduate academic positions.

This office also has a temporary placement service for students who want to work a flexible schedule in temporary jobs at the University. For more information, contact the Student Emergency Service (SES), 373-4403.

The Job Location and Development Program (JLD) refers students to off-campus employment openings. In addition, this provides workshops on job searching and interviewing techniques (376-4790).

## Campus Bus Service (Route 13)

Detailed information about University bus service between the Minneapolis and St. Paul campuses, between the East and West Banks, and to and from the Como Avenue parking complex is available at the main information centers at Coffman Union, the West Bank Union, Williamson Hall, the St. Paul Student Center, the Housing Office in Comstock Hall, and the University's Transit Services Office at 2818 Como Avenue S.E., Minneapolis, MN 55414 (373-0374). (For information before or after normal business hours, call Medicine Lake Lines at 647-9290.)

Wheelchair-accessible campus bus service is available at 20- and 30-minute intervals throughout the day.

During the summer months, there is no campus bus service on Saturdays, Sundays, or official University holidays.

## Fares

There is no charge to ride the inter or intra campus buses, provided you board and exit at on-campus stops. The fare is 60¢ at off-campus stops (15¢ surcharge during rush hours), or one punch on a special inter campus bus reduced-fare discount card. These discount cards allow 20 rides for \$11 (55¢ per ride) and can be purchased at any University bursar or cashier's office. By purchasing a discount card, you avoid having to pay the 15¢ surcharge during the rush hours of 6 to 9 a.m. and 3:30 to 6:30 p.m.

## Como Avenue Park and Ride Complex

Free parking is available at the Como Avenue Park and Ride complex located near the intersection of Como and 29th Avenues S.E., just a few blocks west of Highway 280. Route 13 inter campus buses make regular stops at the complex and the trip to either campus only takes about 6 minutes. The one-way cash bus fare at the "Como Lot" is 30¢, however bus fare discount cards offering 20 "Como Lot" rides for \$5 (25¢ per ride) are available at any University bursar or cashier's office, as well as at the University's Transit Services Office.

## Route Key

Route 13-G (Grove)	Travels <i>between</i> Blegen Hall on the West Bank and the St. Paul Student Center via Como and Larpenteur Avenues. Stops at Jones Hall on the East Bank and in the University "Grove".
Route 13-J (Jones)	Travels <i>between</i> Jones Hall on the East Bank and St. Paul Student Center via Como and Larpenteur Avenues.
Route 13-N (Northern)	Travels <i>from</i> Blegen Hall on the West Bank to the St. Paul Student Center (and northern portions of the St. Paul campus) via Como and Larpenteur Avenues. Stops at Jones Hall.
Route 13-S (Southern)	Travels <i>between</i> Blegen Hall on the West Bank and the St. Paul Student Center (and southern portions of the St. Paul Campus) via Como and Larpenteur Avenues. Stops at Jones Hall.
Route 13-U (University Ave.)	Travels <i>between</i> Blegen Hall on the West Bank and the St. Paul Student Center via Washington and University Avenues. Stops on Washington Avenue just east of Church Street.

NOTE: All routes except Route 13-U stop at the Como Lot.

## Schedule

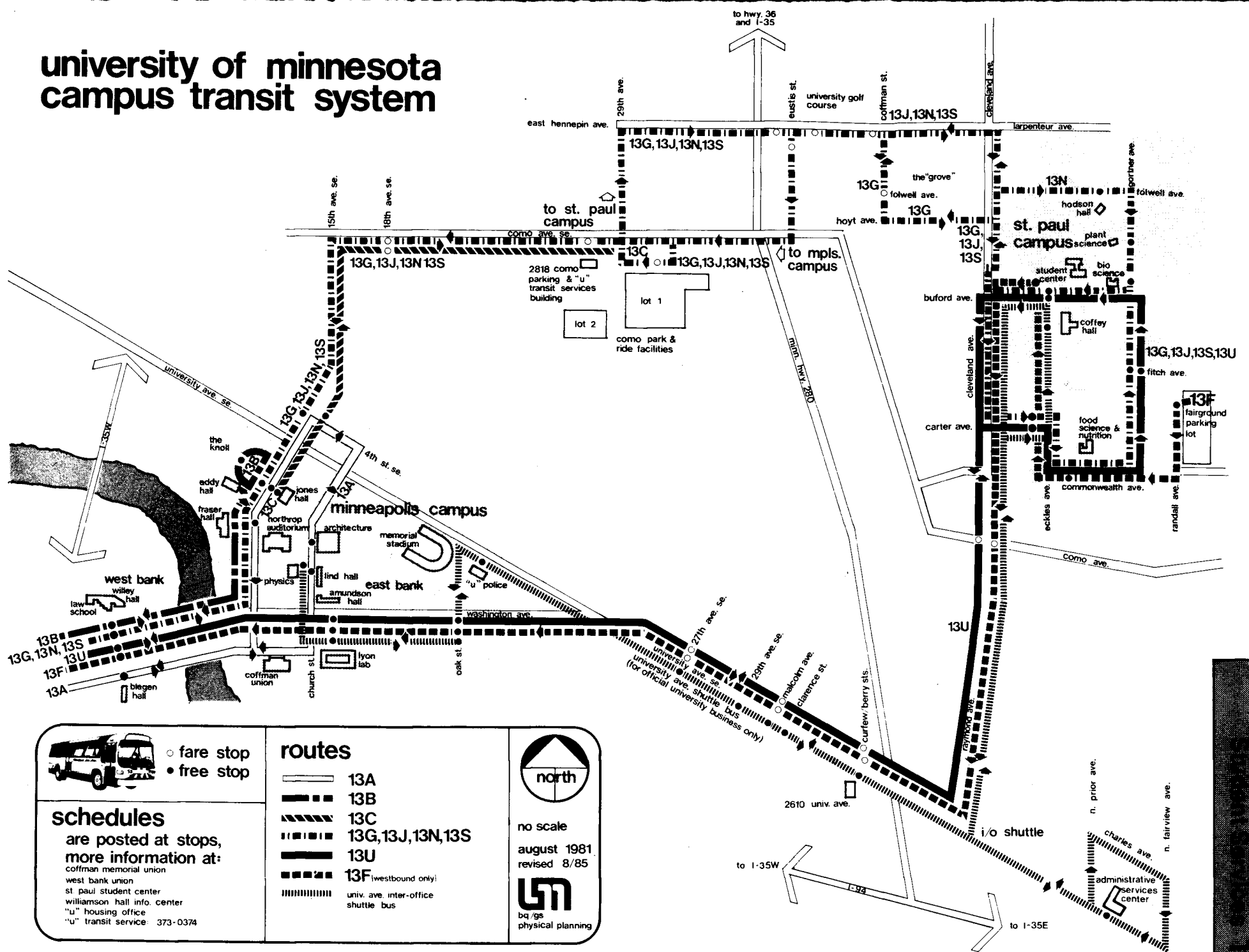
Between 7:05 a.m. and 5:25 p.m., inter and intra campus buses operate every 10 minutes (at 5, 25 and 45 minutes after each hour via Jones Hall and Como Avenue and at 15, 35 and 55 minutes after each hour via Washington and University Avenues). Between 5:45 p.m. and 7:25 p.m. there is only intercampus bus service and that operates every 20 minutes.

Wheelchair-accessible inter and intra campus bus service is available at 20 and 30 minute intervals throughout the day.

During the summer months, there is no campus bus service on Saturdays, Sundays or official University holidays.

More detailed schedules are posted at each campus bus stop and are printed in the *Minnesota Daily* on the first class day of each Summer Session. Schedules are also available via Route 13 campus bus drivers and at the locations referred to in the introductory paragraph to the Campus Bus Service section above.

# university of minnesota campus transit system



- fare stop
- free stop

## routes

- 13A
- - - 13B
- ▨ 13C
- ▧ 13G, 13J, 13N, 13S
- ▩ 13U
- 13F (westbound only)
- univ. ave. inter-office shuttle bus



no scale  
august 1981  
revised 8/85



## schedules

are posted at stops,  
more information at:  
coffman memorial union  
west bank union  
st. paul student center  
williamson hall info. center  
"u" housing office  
"u" transit service: 373-0374



## University Child Care Center

The University Child Care Center provides care for infants and toddlers as well as preschool children. The center is open Monday through Friday throughout the year from 7:30 a.m. to 5:30 p.m. Fees for care are charged on a sliding scale based on family income, family size, and age of child. For further information, visit the University Child Care Center, 1818 4th Street South, Minneapolis, MN 55454; or call 376-5265. A limited number of summer-only placements are available.

## University Bookstores Summer Hours

### Minnesota Book Center

290 Williamson Hall, 373-3688  
Monday through Friday, 8 a.m. to 4:30 p.m.  
First week of each term: Monday through Thursday, 8 a.m. to 6 p.m.; Friday, 8 a.m. to 4:30 p.m.

### H. D. Smith Bookstore

Anderson Hall (street level), 373-4450  
Summer hours are the same as the Minnesota Book Center in Williamson Hall.

### Books Underground

7 Student Center, St. Paul, 373-0800  
Monday through Friday, 8 a.m. to 4:30 p.m.

### Health Sciences Bookstore

2-554 Moos Tower, 373-4007  
Monday through Friday, 8 a.m. to 4:30 p.m.

## Campus Sports Facilities

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

**Recreational sports** are available during the two five-week summer terms. Students may sign up individually or in teams for softball, tennis, and soccer. For people seeking individual exercise experiences, the Department of Recreational Sports also offers the popular aerobics sessions for a small fee.

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

Building gymnasium is also available for student use.

**Baseball and softball diamonds** are available at Bierman Field, West Bank Field, golf course fields, and soccer fields on the St. Paul campus.

Complete information on sports programs is available from The Department of Recreational Sports, 107 Cooke Hall, 373-4200. The Pool Update Line is 373-4234.

**An 18-hole golf course, a 9-hole (par 3) golf course, and tennis courts** may be used by regularly enrolled summer session students upon presentation of a fee statement and a nominal fee. The golf courses can be reached by intercampus bus. The Golf Course telephone number is 373-1645. The telephone number for the Fourth Street Tennis Courts is 373-4212.



# Registration

## INTRODUCTION

Summer session courses at the University of Minnesota, Twin Cities, are open to anyone who is a high school graduate (with or without college experience) and high school students who have completed the 10th or 11th grade and who are in the top 20% of their class.

For registration purposes, you are either an "academic year" student or a "summer-only" student. Procedures and policies vary slightly depending on the type of student you are.

**Are you an academic year student or a summer-only student?** Use the two tables below to determine which type of student you are, then turn to the appropriate section for registration instructions.

**Academic Year Students**—You are an academic year student if *all* of the following apply to you:

*You have been officially admitted to any Twin Cities unit of the University.*

*You have registered in that unit during any fall, winter, or spring quarter.*

*You are now registering through that same unit.*

Follow the registration instructions on page 105 for academic year students.

**Summer-only Students**—You are a summer-only student if *any* of the following apply to you:

*You have never registered for any day school course at the University of Minnesota, Twin Cities.*

*You have registered at the University during previous summers but never during a fall, winter, or spring quarter.*

*You are a student at another campus of the University of Minnesota (Crookston, Duluth, Morris, or Waseca) or at another college or university.*

*You have been admitted to a Twin Cities college for fall 1986. (If your admission is effective summer 1986, you are considered an academic year student and will receive registration instructions from your college office.)*

*You are a high school student.*

Follow the registration instructions on page 105 for summer-only students.

## University Gallery

AFRICAN ART FROM  
THE PERMANENT  
COLLECTION



## REGISTRATION SERVICES

### Summer Session Office

135 Johnston Hall, Minneapolis  
Monday 8 a.m.-4:30 p.m. (to  
6:30 p.m. beginning April 14)  
Tuesday-Friday 8 a.m.-4:30 p.m.  
612/373-2925

For general information and help on all summer session concerns. Summer *bulletins* available.

### Registration Center

202 Fraser Hall, Minneapolis  
Monday 8 a.m.-6:30 p.m.  
Tuesday-Friday 8-4

For turning in scholarships, registration materials, cancel/add materials, and obtaining fee statements.

### Registration, Student Records, and Scheduling

150/155 Williamson Hall

Student Relations (150) 376-1680  
Monday 8 a.m.-6:30 p.m.  
Tuesday-Friday 8-4

For assistance with individual student record problems, questions; registration services for students with mobility impairments; name and address changes; student loan deferments; turning in Application for Degree forms.

Certifications (155) 376-1680  
Monday 8 a.m.-6:30 p.m.  
Tuesday-Friday 8-4

For certification letters and Veterans certification.

Transcript Quick-Service (155)  
Monday 8 a.m.-6:30 p.m.  
Tuesday-Friday 8-4

For regular service for official transcripts (\$2 charge), rush service for official transcripts (\$6 charge), and for unofficial copies of student records (limit one copy per day).

### St. Paul Admissions and Records

130 Coffey Hall (373-0703)  
Monday 8 a.m.-6:30 p.m.  
Tuesday-Friday 8-4

Registration Service

For turning in registration materials and cancel/add materials and obtaining fee statements.

Student Contact Area

For registration services for students with disabilities. For assistance with individual student record problems and questions; for certifications; for turning in Application for Degree forms and name and address changes. For regular service for official transcripts (\$2 charge), rush service for official transcripts (\$6 charge), and for unofficial copies of students records (limit one copy per day).

### Student Accounts Receivable

Fraser Hall (376-8057)  
Monday-Friday 8-3:30  
130 Coffey Hall  
Monday-Friday 10-2

For obtaining refund vouchers, obtaining fee payment verifications, receiving assistance with student billing problems, questions (concerning only quarters from spring 1982 on). Picture ID required for service.

### Bursar's Office

145 Williamson Hall, East Bank  
Blegen Hall ground level, West Bank  
107 Coffey Hall, St. Paul  
Monday-Friday 8-3:30

For paying tuition and fees, cashing refund vouchers and checks (student ID card and bottom half of fee statement necessary for check cashing; \$50 limit per day; \$.25 charge per check; \$10 charge for returned check), purchasing deposit cards and student ID card authorizations.

### ID Card Office

248 Williamson Hall  
Monday-Friday 8-4

For obtaining new student ID cards (Summer-only students are not issued student ID cards.).

### Information Center

first floor concourse,  
Williamson Hall  
Monday-Friday 7:45-4:30

For obtaining college bulletins, maps, campus bus information (route 13 and and MTC routes 52 only), and miscellaneous publications and information; lost student ID cards turned in.

## REGISTRATION FOR ACADEMIC YEAR STUDENTS

**Overview**—Registering for courses in the summer is just like registering for courses in fall, winter, or spring quarters. It is true that there is no queue for summer, and registration, therefore, is on a first come, first served basis. But it usually isn't necessary to register on the first or second day. Don't wait in long lines unless you are trying for those few courses that close immediately. (Last year only ArtS 1701, EPsy 3131, ME 3303, and Spch 3641 had closed at the end of the second day of registration.) You must, however, complete registration before the start of either term so you receive full benefit from the short terms.

This year you may register for both terms during May. (Registration for academic year students begins on May 12.) Because you will also be able to register for fall quarter in late May, you will be able to plan your program more carefully. If those special or necessary courses need to be adjusted, you can even register for or cancel/add summer courses during early fall registration.

Remember: The policies in this bulletin apply to your registration. Read all information carefully to avoid potential problems. You will receive credit only for those courses in which you are properly registered. Likewise, you must pay for every course for which you register unless you officially cancel.

### Steps in Registration—

**Step 1**—Complete the registration check list on the next page.

**Step 2**—Bring your Course Request forms and this bulletin to your registration center.

**Step 3**—Pay your tuition and fees.

**Late Registration Fee**—You must register by June 17 for first term or July 21 for second term to avoid a late registration fee. Students who register from June 18-23 for first term or July 22-25 for second term will be charged a \$10 late registration fee. Students who register on or after June 24 for first term or on or after July 28 for second term will be charged a \$20 late registration fee.

## REGISTRATION FOR SUMMER-ONLY STUDENTS

**Overview**—In-person registration for both terms begins May 15. Registration by mail is possible for students registering through the colleges of Liberal Arts and Education. (See page 107 for more information.)

For most students, registration consists of two main parts: a visit to a college office where your program will be approved and a trip to a registration center where you will request a place in the courses you have chosen.

When you register for courses at the University as a summer-only student, you register *through* a particular college. Typically, the college through which you register is the one offering the course. (A number of general subject areas are also available through the College of Liberal Arts. See page 107.) Courses are listed in this book alphabetically by department. Above each department's listing are printed the address and telephone number of the department and the name of the college with which the department is affiliated.

When you go to a college office for approval of your program, your previous course work will be matched against the level of the courses you wish to take—to help insure that the courses are right for you.

You do *not* need college approval if you are registering through the College of Liberal Arts *unless you are a high school student*. (If you are a high school student you *must* get college approval.) You will need to be quite careful in choosing your courses if you do not require college approval of your program. Check the prerequisites for your courses thoroughly before you register. If you are a high school graduate who has been admitted to the College of Liberal Arts for fall quarter, you are especially encouraged to check with a college adviser before registering to see how well your summer courses fit in with your intended course of study.

A trip to the registration center is the second part of the registration process. The steps below outline the complete process for you. At the registration center you will be given a fee statement which will contain the following charges: tuition (tuition varies by college—you pay the rate of the college through which you are registering); the student services fee if you register for 3 or more credits; a one-time record service fee if you are registering for the first time at the University; and hospitalization insurance if you have no private coverage. Full information on tuition and fees is found on pages 112-115.

Remember: The policies in this bulletin apply to your registration. Read all information carefully to avoid potential problems. You will receive credit only for those courses in which you are properly registered. Likewise, you must pay for every course for which you register unless you officially cancel.

### Steps in Registration—

**Step 1**—Complete the registration check list on the next page.

**Step 2**—Fill out a Summer-only form. (Summer-only forms are available in 202 Fraser Hall, 130 Coffey Hall, and 135 Johnston Hall.) Complete a Course Request form using the guide on page 116. (Forms are found in the back of this bulletin.) Bring your completed forms to the college through which you will be registering for approval of your program. College offices are listed on the inside front and back covers. If you are registering through the College of Liberal Arts and do not need approval, you will still need to complete a Summer-only form.

**Step 3**—Bring your Summer-only forms and Course Request Forms for each term to a registration center—202 Fraser Hall for the colleges on the Minneapolis campus (150 Williamson Hall for students with mobility impairments) and 130 Coffey Hall for colleges on the St. Paul campus. For summer-only students, your social security number will be your file number. Please bring your number with you to the registration center.

**Step 4**—Pay your tuition and fees. See fee payment on page 114.

**Late Registration Fee**—You must register by June 17 for first term or July 21 for second term to avoid a late registration fee. Students who register from June 18-23 for first term or July 22-25 for second term will be charged a \$10 late registration fee. Students who register on or after June 24 for first term or on or after July 28 for second term will be charged a \$20 late registration fee.

**A Registration Check List**—Run through the check list below before you go to your registration center. You will be able to avoid frustrating delays by following these hints:

**Are your Course Request forms filled out completely?** Fill out a separate form for each term. (Forms are found in the back of this bulletin.) Use the guide on page 116. List alternate courses in case your first choices are not available. Obtain college office (department office in I.T.) approval if required.

**Do you need to complete a summer-only form?** If you are a summer-only student be sure to complete this form (Summer-only forms are available in 202 Fraser Hall, 130 Coffey Hall, and 135 Johnston Hall) and have it approved before you go to the registration center.

**Can you register by mail?** Summer-only students in the College of Liberal Arts and summer-only, M.Ed., and adult special students in the College of Education, see page 107.

**Have you checked the Section Status Report?** Check the report (posted outside of 101 Fraser Hall, B18 and 16 Johnston Hall, 4 Mechanical Engineering, 170 Anderson Hall, and 130 Coffey Hall) to see if space is available in limited enrollment (**R**) courses. Remember: The Section Status Report lists only *limited* enrollment courses. If you use it exclusively to plan your program, you may overlook courses that have no limit on enrollment.

**Do you need any Registration Override Permits?** Is there a # or  $\Delta$  or  $\square$  in the prerequisite statement of your course? Are you trying to register in a closed course?

**Do you have any holds you need to clear?** You will not be able to register if you have any holds on your record. Clear your holds as soon as possible. See page 110 for more information.

**Are you considering an intensive language course?** Intensive language courses, a special program offered through summer session, are ideal for students who want a full-time commitment to language learning. These courses (usually a three-course concurrent registration sequence) typically require 15 hours a week in class and 30-40 hours of study outside of class. Working, even part time, or taking other courses during the 10 weeks of the language program is *not recommended*. At the end of the course, the student has not only gained the equivalent of 3 quarters of study but has also participated in an unique, rewarding educational experience. See special programs on page 92.

**Are you interested in special programs for high school students?** Information on special programs is on page 91 and information on procedures for taking regular courses as a high school student is on page 109.

**Are you a new international student?** You *must* go to the International Student Adviser's Office before you register. See page 109.

**Are you taking School of Management courses?** Read the instructions on pages 107-108.

**Are you a CLA academic year student?** Read pages 106-107.

**Are you a student in the Graduate School?** The instructions on page 108 apply to you. **If you are a graduate student at another institution**, you may be interested in transient graduate student status. See pages 108-109.

**Can you register through the Senior Citizen Education Program?** Complete details are on page 110.

**Do you qualify for a partial exemption from the Health Service fee?** If so, apply now. For more information, see page 115.

**Are you registering for more than 10 credits per term?** Ten credits is considered a full program for either term. To register for more than 10 credits you must have college approval.

## REGISTRATION INSTRUCTIONS FOR COLLEGE OF LIBERAL ARTS ACADEMIC YEAR STUDENTS

**Before Proceeding with Registration**—CLA holds are waived for summer session. Other holds are enforced. Read the CLA instructions on these pages. Check the Section Status Reports in Johnston Hall, ground floor, or in your college office. Honors course listings are available in 115 Johnston Hall.

**Program Approval**—The signature of your adviser is not required. Scholastic committee approval is needed for:

- registration for more than 10 credits;*
- freshman registration in 3000- and 5000-level courses;*
- sophomore registration in 5000-level courses;*
- registration for courses not listed in the CLA Bulletin;*
- late registration or late additions to your registration (scholastic committee approval required after the fifth day of class). For further information about changes in registration see the CLA Bulletin and page 110;*
- cancellation of a course after the second to the last day of class.*

All additions and cancellations are subject to the rules that apply to the original registration. Apply for scholastic committee approval in your college office.

College approval is needed for registration for independent study, extra credit, directed study, directed research, and directed instruction. Written approval is also required from the department; forms are available in the department. Before you register, bring the signed approval form and your completed Course Request form to 214 Johnston Hall for college approval.

Graduate School approval is required for registration in 8000-level courses. Approval must be from the instructor, the director of graduate studies, and the Graduate School. Approval forms are available in college offices.

**S-N Registration**—Changes to or from S-N registration may be made through the fifth day of the term. Follow the cancel/add procedures outlined on page 110.

The number of S-N credits that can be applied to a CLA degree is limited. See the *CLA Bulletin* for details. Courses in departmental majors may be taken S-N only if the department has approved such a policy. Otherwise, S-N registration is allowed in all courses listed in the *CLA Bulletin*.

Ask in your college office about restrictions on the use of S-N credits in premedicine, predentistry, prepharmacy, and all interdepartmental programs (such as American Studies, International Relations, Social Welfare, and Urban Studies). If you are in a preprofessional program, you should follow the requirements of the college that you plan to enter.

### MAIL REGISTRATION FOR COLLEGE OF LIBERAL ARTS SUMMER-ONLY STUDENTS

As a summer-only student you can register by mail for College of Liberal Arts (CLA) courses—for both term I and term II. Registration is also possible through CLA for courses in the following departments: Architecture, Astronomy, Biology, Chemistry, Child Psychology, Computer Science, Geology, Mathematics, Physics, and Physical Education. If you have fewer than 90 quarter credits (60 semester credits), you can register for Decision Sciences 1050 and/or Accounting 1024 or 1025 through CLA.

There are restrictions on mail registration. You *cannot* register by mail for:

*courses that require a Registration Override Permit (e.g., courses where a # or  $\Delta$  or  $\square$  appears in the prerequisite statement)*

*courses or workshops that have special registration instructions*

*8000-level courses*

In-person registration is *required* if you are a high school student who has not yet graduated.

In-person registration is *recommended* if you are a high school graduate who has been admitted for fall quarter. You will find it helpful to check with a CLA adviser to see how well your summer courses fit in with your intended course of study.

In-person registration is also recommended for courses that fill up quickly. (Any course that has an **R** before the course number has limited enrollment.) Last summer the following courses had closed by the end of the first day of summer-only registration: Studio Arts 1701; Composition 3031; Computer Science 3105; German 1101; Mathematics 1131; Physical Education 1007; Spanish 1101-1102-1103 (10-week intensive), 1102 (nonintensive), and 3614; and Speech-Communication 3641.

To receive instructions and materials for CLA mail registration, send in the card in the back of this bulletin or call 612/373-2925. Completed materials must be returned between May 1 and May 31. Processing of mail registrations will begin May 15. Remember: If you register by mail and decide later not to at-

tend, you must *officially* cancel to avoid being charged for full tuition and fees.

### MAIL REGISTRATION FOR COLLEGE OF EDUCATION STUDENTS

Students registering in the College of Education as M.Ed., adult special, and summer-only students may register by mail for both term I and term II. Teachers registering for courses in any department and students taking professional education courses are especially encouraged to register by mail through the College of Education.

There are restrictions on mail registration. You *cannot* register by mail for:

*courses that require a Registration Override Permit (e.g., courses where a # or  $\Delta$  or  $\square$  appears in the prerequisite statement)*

*courses or workshops that have special registration instructions*

*8000-level courses*

In-person registration is recommended for courses that fill up quickly. (Any course that has an **R** before the course number has limited enrollment.) Last summer the following Education courses had closed by the end of the first day of summer-only registration: Educational Psychology 3131; Physical Education 1007; and Vocational Education 5750 and 5760.

To receive instructions and materials for mail registration, send in the card in the back of this bulletin or call 612/373-2925. Completed materials must be returned between May 1 and May 31. Processing of mail registrations will begin May 15.

Remember: If you register and decide later not to attend, you must *officially* cancel to avoid being charged for full tuition and fees. To cancel before classes begin, call the Education Students Affairs Office registration clerk at 612/373-2268.

### REGISTRATION INSTRUCTIONS FOR UNDERGRADUATE SCHOOL OF MANAGEMENT COURSES

**Academic Year Students**—You must have completed or have in progress 90 credits to register in 3000- and 5000-level School of Management courses. School of Management undergraduates and adult special students, and degree-seeking students in all Twin Cities units (except General College) need no prior approval from the School of Management. General College degree-seeking students need college referral from their GC advising office. Non-School of Management adult special students must obtain a Registration Override Permit in 290 Humphrey Center for each course.

**Summer-only Students**—You can register for 3000- and 5000-level School of Management courses if you have completed or have in progress 90 or more quarter credits (60 or more semester credits). You can register as a summer-only student through the School of Management if you plan to take the *majority* of your summer credits in the School of Manage-



ment. You will need to complete a School of Management Summer-only form (available in 290 Humphrey Center) in addition to the Summer-only form in this bulletin. If you are registering as a summer-only student through another college, you must obtain a Registration Override Permit in 290 Humphrey Center for every 3000- and 5000-level School of Management course you wish to take.

If you have fewer than 90 quarter credits (60 semester credits), you can register for Decision Sciences 1050 and/or Accounting 1024 or 1025 by enrolling as a summer-only student through the College of Liberal Arts.

## GRADUATE SCHOOL REGISTRATION INSTRUCTIONS

**New Students**—If you are registering for the first time in the Graduate School, obtain your registration materials in 307 Johnston Hall.

**Previously Registered Students**—You must follow these steps to clear any Graduate School holds:

MAST PGM	Take signed master's program to 316 Johnston Hall.
DOCT PGM	Take signed doctoral program to 316 Johnston Hall.
SPEC PGM	Take signed specialist program to 316 Johnston Hall.
THES TITLE	Take signed thesis title to 316 Johnston Hall.
TRANSCRIPT	Take bachelor's transcript showing degree awarded to 306 Johnston Hall.
PROJ TITLE	Take project title to 316 Johnston Hall.
GPA	Take letter releasing hold from major field director of graduate studies to 316 Johnston Hall.
INCOMPLETE	Take letter releasing hold from major field director of graduate studies to 316 Johnston Hall.
DEAN'S HOLD	Go to 306 Johnston Hall for instructions.
DOCT CAND	Go to 316 Johnston Hall for instructions.

**Adviser Signature**—Your adviser must sign your Course Request form. You must also obtain your adviser's signature for any change in registration. Changes after the third week of the term require your instructor's signature as well. Changes after the last day of class will not be permitted except with the approval of the Graduate School, 306 Johnston Hall. Any change to your designated grading option must be made with your instructor before the last day of class.

**Thesis Credits**—If you were admitted on or after fall 1983 to the Graduate School, you will be required to register, before receiving your degree, for a standard number of thesis credits—16 thesis credits for Plan A Master's and M.Eng. students and 36 thesis credits for Ph.D., Ed.D., and D.M.A. students. Tuition for thesis credits is assessed at the same rate as course credits. For thesis credits register for Grad 8777 or 8888.

**Residency Credit**—In the summer, you earn 1/10 of a quarter's residency for each credit, up to a maximum 5/10 per term. For complete residency requirements, see the *Graduate School Bulletin*.

**Official Doctoral Candidates**—Registration materials are available in 316 Johnston Hall if you wish to register in the summer.

**Maximum Credits**—The maximum load for each summer term is 10. Refer questions to an assistant to the dean, 306 Johnston Hall.

**Graduation**—Graduate School degrees are awarded monthly. To graduate at the end of any given month you must:

*submit your Application for Degree* to Student Relations, 150 Williamson Hall or 130 Coffey Hall on or before the first working day of the month. You must pay your graduation fee (and final quarter fee if doctorate) when you submit your application.

*complete all other requirements* by the last working day of the month.

Graduating before the end of the quarter may affect your eligibility for student loans, housing, etc. Check with the appropriate office if you have questions of eligibility.

Plan A master's and doctoral students receive an Application for Degree plus detailed graduation instructions when they register their thesis title in the Graduate School, 316 Johnston Hall. Plan B students receive an Application for Degree and graduation instructions when they pick up their Final Examination Report form from the Graduate School, 316 Johnston Hall.

**Doctoral Oral Examinations**—You must schedule your preliminary and final oral exams *at least one week in advance*. You may schedule your exams by coming to 316 Johnston Hall or by calling 373-7912 for a preliminary exam or 373-2953 for a final oral exam. These exams will not be scheduled from the beginning of second term to the beginning of fall quarter unless members of the assigned committee can be assembled without substitution.

**Transient Graduate Student Status**—If you are currently enrolled in an accredited U.S. graduate school, you may want to consider transient graduate student status at the University of Minnesota during the summer. Your decision will depend, in large part, on the requirements of your home school and the level of the course you want to take. Transient status is necessary if your home school requires your work appear on a transcript *as a graduate school course*. You will also need transient status if you plan to register for any 8000-level course. In both cases you should register through the Graduate School and would pay Graduate School tuition rates.

Check first with your home institution to see if your proposed registration (both the level of the course and the course content) will be acceptable in your graduate program. Then apply for transient status by filling out Graduate School form 57. (Write for the form to the Graduate School, 307 Johnston Hall, University of Minnesota, 101 Pleasant Street S.E., Minneapolis, MN 55455.) Be sure to allow at least 3 weeks for the approval process. No application fee or supporting materials

are required. Permission to register as a transient student, if granted, will be for one summer (both terms) or one academic quarter and will not extend beyond that single summer or quarter.

If you decide you do not need transient status, register as a summer-only student through the college offering the course. But be advised that a subsequent change to transient status is difficult. The Graduate School can help you with your final decision (612/373-5542).

## NEW INTERNATIONAL STUDENTS

**Preregistration Interview**—If you hold a non-immigrant visa of any type and if you are registering for the first time at the University, go to the International Student Adviser's Office, 717 East River Road, Minneapolis. (You will not be allowed to register until you have done so.) There you will meet with a staff member who will provide you with information on how to begin the registration process. You will be asked to provide evidence of your financial support and information about your immigration status. It is very important that you bring your passport and immigration service documents (I-94, I-20ID, page 3 and 8 of your I-20AB, and/or IAP-66) to the interview with you. If you are a permanent resident, you must present documented evidence of your status.

**English Proficiency**—You may be required to take a local English test before you register. If English is not your first language and you achieved less than 550 on the TOEFL exam or if the TOEFL exam was temporarily waived at the time of your admission, you will be required to take the Minnesota English Language Proficiency test. A \$15 fee for this test must be paid at your preregistration interview. Register for this test as soon as possible; scores are not available for 7-10 days. You will be given more information about testing and requirements for English classes during your preregistration interview.

**Health Clearance**—If you are not a citizen of the United States and if you are registering for the first time at the University, you will not be allowed to register without a health clearance. Boynton Health Service, 410 Church Street, Minneapolis, will provide you with a health clearance form once you have taken a Mantoux tuberculin skin test or have shown proof that you have been tested within the last year and are free of tuberculosis. Report to the main desk, N300 Boynton, several days before you plan to register. You will need to return 48 hours after you have taken the Mantoux to have the test read and to obtain your health clearance form.

Mantoux tests for international students are very often positive. If your test is positive, you will still be allowed to register; you will, however, be required to meet with a nurse-practitioner and to have a chest x-ray.

## HIGH SCHOOL STUDENTS

High school students have several opportunities open to them during the summer to take advantage of courses and programs offered by the University of Minnesota. Special programs are available exclusively for high school students. (See page 91 for special programs.)

Many regular summer session courses are also open to high school students. In either case, you can earn college credits that can be used later at the University or at most other colleges and universities.

**Regular Summer Session Courses**—To qualify for summer-only admission to regular summer session courses, you must have completed the 10th or 11th grade and be in the top 20% of your class. You will be required to present an official copy of your high school transcript, demonstrating a strong academic background and appropriate preparation for the course(s) selected. You are also encouraged to present, whenever possible, a letter of recommendation from a high school teacher or counselor. This letter of recommendation is *required* if your transcript does not indicate your high school rank.

To apply for approval of your program, take your transcript and letter(s) to one of the college offices listed on the inside front and back covers. If you want to take *introductory* (1000-level) courses in the Institute of Technology, the College of Biological Sciences, or the College of Liberal Arts, go to 49 Johnston Hall. For *advanced* courses in the College of Biological Sciences or the Institute of Technology, or *any* course in the colleges of Agriculture, Forestry, Home Economics, or the General College, go to the office of the college offering the course. When you have received college approval, you may register by following the instructions for summer-only students on page 105.

**Post-Secondary Enrollment Options Act (EOA)**—The state options act which allows high school juniors and seniors to attend college tuition-free is not in effect during the summer. You may want, however, to take a regular summer course or enroll in one of the special programs for high school students in order to discover whether you want to take advantage of the options act next fall. You *are* responsible for tuition during the summer, although financial aid is available for the special programs.

If you are interested in taking University courses fall 1986, you should talk to someone in the Advanced High School Student Services office. Contact this office long before high school begins in the fall so that you can work out the many details involved in using college work for high school. Call 612/373-3905 (612/625-2500 after April 26) and ask for the post-secondary options adviser, or write to the office at 337 Nolte Center, 315 Pillsbury Drive S.E., Minneapolis, MN 55455.

## SENIOR CITIZEN EDUCATION PROGRAM

If you are 62 or older and a Minnesota resident, you may audit courses free of charge or take courses for credit at \$6 per credit whenever space is available after the first day of class. (The Section Status Reports—located outside of 101 Fraser Hall, B18 and 16 Johnston, 4 Mechanical Engineering, 170 Anderson Hall, and 130 Coffey Hall—can tell you if a course with limited enrollment—**R** before the course number—is open or closed. If a course is not on the report, it has no limit on enrollment.) Under this plan, you need not pay the student services fee, but must pay any required laboratory or materials fees.

Registration for the Senior Citizen Education Program is on the second day of class (June 18 for first term and July 22 for second term). Attend the first day of class, however, to see if space is available and to receive information about class procedures. To register, go to 202 Fraser Hall (150 Williamson Hall for those with mobility impairments) or 130 Coffey Hall with your registration forms and identification to verify age and Minnesota residency. Call 376-1680 for more information.

## AUDITING COURSES

Most colleges permit auditing in their courses. As an auditor, you enroll in, pay tuition and fees for, and attend classes but do not complete assignments or take examinations. You receive no credit for the course, but it will be placed on your transcript with the symbol V (Visitor) to indicate your special registration status. Although you do not receive credit, the credit value for the course counts in determining the credit total for the student services fee.

Colleges may have additional requirements for you to meet before you register as an auditor. It may be necessary to have approval from your instructor and/or special scholastic committees. Colleges generally do not allow you to repeat an audited course for credit. For further information, check with the college offering the course.

To register as an auditor once you have received any necessary approval, list the course on your Course Request form and place a V in the grading option column for that course.

## HOLDS

If you have a hold on your record, you may not register until that hold is cleared with the office imposing the hold. A hold may be imposed for financial indebtedness to the University (e.g., for unpaid library fines, unpaid tuition or fees, or delinquent health service payments) or for disciplinary or scholastic reasons. For more information, see the current *General Information Bulletin*, check with your college office, or call or visit a Student Relations staff member in the Office of Registration, Student Records, and Scheduling, 150 Williamson Hall (376-1680).

## CHANGE OF REGISTRATION

**General Guidelines**—Use a Course Request form to make changes in your registration. Subject to certain limitations, you may add or cancel courses or may change grading systems. Course cancellations are generally allowed without written permission—and without the course showing on your transcript—during the first five days of the term. (For first term, the first week of classes ends on Monday, June 23.) Cancellation of a course after the fifth day of the term, for 5-week courses, will result in a W on your record. (10-week courses may be cancelled without transcript record through the tenth day of the term.) Many colleges require special approval for cancellations after the end of the first week. Check with your college office for complete cancel/add policies.

**When to Cancel Courses**—If you decide before the term begins not to attend, cancel before the first day of class. If you stop attending class for any reason, cancel immediately. Cancellations are effective the day you *officially* cancel (by taking a completed Course Request form to your registration center), not on the date you stopped attending class. If you fail to cancel any course for which you have registered but not paid, you will receive billing statements for your tuition and fees, including a \$10 late payment fee. Unless you make full payment, a hold will be placed on your record.

**Tuition Charges and Refunds for Course Additions and Cancellations**—Full tuition is charged on a per-credit basis for all changes in registration that increase your credit load. No additional tuition is charged when any course addition is balanced at the same time by a course cancellation equal to the number of credits being added. Refunds are issued on a per-credit basis according to the refund rate that applies to the date of cancellation. (For more information on refunds, see page 115.)

**How to Change Your Registration**—To change your course load or grading system, you should:

1. Fill out a Course Request form. Use the extra form in this book or obtain a form from your college office or registration center. Check the box indicating cancel/add and note the number of credits you will have after this change. If you are cancelling *all* courses, check the appropriate box.
2. Obtain instructor, adviser, and/or college office approval if required.
3. Turn in your Course Request form at your registration center, where you will receive a revised fee statement. Remember, each fee statement you receive has its own due date. Later fee statements do not extend the due dates on earlier fee statements.

## GRADING POLICIES AND OPTIONS

There are two grading systems at the University of Minnesota—Twin Cities; A-B-C-D-N and S-N. The S represents satisfactory work based on standards announced by the instructor and may vary from course to course. The N stands for no credit and is assigned when minimum course standards are not met (i.e., when the student does not earn an S or D or higher). There is no F grade.

If either A-N only (for A-B-C-D-N) or S-N only is printed after the prerequisite statement for a course, you *must* register for that grading system. (Leave the grade option column blank on your Course Request form.) If no grading system is listed, you may usually register for either A-N or S-N grading by marking your choice on your Course Request form. Colleges may restrict the use of S-N grading because of degree requirements. There may also be a limit on the number of credits per term which may be taken S-N. Check with your college office for complete information.

You may change your designated grading option through the first week of classes for 5-week courses (Monday, June 23 for first term; Friday, July 25 for second term) and through the second week of classes for 10-week courses (Monday, June 30). To change your grading option, bring a completed Course Request form to your registration center (202 Fraser or 130 Coffey Hall).

## FINAL EXAMS

Final exams are scheduled during the regular meeting time of the course, usually on the last day of the course. If you miss the

final exam in a course, you will receive a grade of I (Incomplete) when, in the instructor's opinion, there is a reasonable expectation that you can successfully complete the work of the course. Instructors should announce both course requirements and make-up policies on the first day of class.

## RECEIVING YOUR GRADES

Your grades will be mailed to you—at your current address—approximately 2-3 weeks after the end of each term. If you will be moving or will not be on campus through the summer, you should submit an address change to 150 Williamson Hall or 130 Coffey Hall. In addition, many instructors will accept a self-addressed, stamped postcard which they will return to you once grades have been assigned.

## GRADUATION

For graduation first term, undergraduates and students in professional programs (e.g., MEd) must submit an Application for Degree form to the Student Relations Unit, 150 Williamson Hall (130 Coffey Hall for St. Paul-based students) by June 10. For graduation second term, the Application for Degree form is due July 18. Your application *must* include a \$16 graduation fee (check or money order only). If you miss the deadline for a term, you will not be able to graduate until the next term or quarter.

Graduate school degrees are awarded monthly. For application deadlines, see the Graduate School registration instructions on page 108.

# Tuition And Fees

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

**Tuition for Undergraduate Colleges, Graduate School, Public Health, Law**—For the units listed below, rates in the summer are the same for both residents and nonresidents of Minnesota. All rates are per-credit and are tied to the college through which you are registering. If there are both lower division and upper division rates listed for a college, *academic year students* pay lower division rates through the term in which they register for their 90th credit. *Summer-only* and *adult special* students pay upper division rates.

<i>Students registering in:</i>	ACADEMIC YEAR STUDENTS	SUMMER- ONLY STUDENTS
Agriculture, College of		
Lower Division.....	\$ 38.90	\$ 50.98
Upper Division.....	50.98	50.98
Biological Sciences, College of..	49.74	49.74
Dental Hygiene		
Certificate Program .....	38.90	48.29
Baccalaureate Program.....	48.29	48.29
Education, College of		
Lower Division.....	38.90	49.73
Upper Division.....	49.73	49.73
Forestry, College of		
Lower Division.....	38.90	54.53
Upper Division.....	54.53	54.53
General College of		
Lower Division.....	38.90	39.44
Upper Division.....	39.44	39.44
Graduate School.....	89.68	89.68
Home Economics, College of		
Lower Division.....	38.90	51.64
Upper Division.....	51.64	51.64
Law School .....	116.40	116.40
Liberal Arts, College of		
Lower Division.....	38.90	40.54
Upper Division.....	40.54	40.54
Management, School of.....	47.10	47.10
Medical Technology, Program in	58.10	58.10
Mortuary Science, Department of.....	53.36	53.36
Nurse Anesthetist (Medical School).....	58.10	58.10
Public Health, School of.....	52.44	52.44
Technology, Institute of		
Lower Division.....	38.90	48.99
Upper Division.....	48.99	48.99
University College		
Lower Division.....	38.90	40.54
Upper Division.....	40.54	40.54

<sup>1</sup>Tuition and fees are subject to change without notice.

**Tuition for Professional Programs and Schools**—The schools and programs listed below have both resident and nonresident rates. Summer-only students pay the same rate as academic year students.

<i>Students registering in:</i>	RESIDENT	NONRESIDENT
Dentistry, School of		
per-credit .....	\$ 128.16	\$ 256.32
12 or more credits.....	1537.86	3075.72
M.B.A. program (Graduate School).....	110.78	179.36
Medical School		
1-5 credits .....	457.11	914.22
6-10 credits .....	914.22	1828.44
11-15 credits .....	1371.32	2742.64
16 or more credits.....	1828.43	3656.86
Nursing, School of .....	58.10	116.20
Occupational Therapy, Physical Therapy, Programs in.....	58.10	159.78
Pharmacy, College of.....	55.61	111.22
Veterinary Medicine		
per-credit .....	114.22	228.44
6 or more credits (per Summer Session term) .	685.34	1370.68

**Late Fees, Due Dates**—Late fees are assessed for both late registration and late payment.

**Late Registration**—No registration will be accepted after June 17 (first term) or July 21 (second term) without payment of the late registration fee, as follows:

June 18-23 or July 22-25	\$10
Thereafter	\$20

**Late Payment**—A fee of \$10 is charged if tuition and fees are paid after the due date, as indicated on the fee statement at the time of registration and on the following chart:

<i>Registration Period</i>	<i>Tuition and Fees Due Date</i>
Through June 16 or July 18	5 workdays after registration
June 17-19 or July 21-23	June 23 or July 25
Thereafter	1 workday after registration

See Fee Payment, below, for more information.

**Student Services Fee**—If you register for 3 or more credits in a term, you must pay a \$45.41 student services fee for that term in addition to tuition. Students who register for 3 or more credits in a course of 7- to 10-week length will be assessed the student services fee for two terms.

The student services fee is generally waived for courses held outside the 9-county metro area (Hennepin, Ramsey, Dakota, Washington, Anoka, Carver, Wright, and Chisago). If your course is held on another campus of the University, however, you pay the student services fee of that campus. A special rate is assessed for the Itasca Biology Program and the Itasca Forestry Session.

The student services fee supports a number of organizations and services available to summer students including: 3 student unions; the student newspaper *Minnesota Daily*; Boynton Health Service prepaid outpatient health care; sports facilities; and music and dance events. (See the section on services and cultural opportunities for more information on these summer activities.)

**Minnesota Public Interest Research Group—MPIRG** is a nonprofit, nonpartisan, student-run organization funded by an

optional fee of \$1.12 per term. A statewide advocacy group, MPIRG gives students the opportunity to speak out on public issues and work for social change. The fee supports a professional staff for lobbying, litigation, organizing, and research. You may decline to pay the fee prior to registration by initialing the MPIRG section on the Course Request form or may obtain a refund at a location and date that will be announced in the student newspaper *Minnesota Daily*.

## COURSE FEES<sup>1</sup>

All fees are per term unless otherwise indicated.

Students taking the following courses will pay course fees as follows:

### COMPOSITION AND COMMUNICATION

\$140<sup>2</sup>—0011 Preparatory Composition

### ECOLOGY AND BEHAVIORAL BIOLOGY

\$15—5014, 5016, 5132, 5134 Transportation Fee

### FORESTRY

\$50—ForP 3300 Wood Industries Tour

### HEALTH SERVICE (Field Trips)

\$24 per summer term—Required of students on University field trips such as anthropology, geology, mines, etc. (covers outpatient medical care for emergency illness at nearest facility on approval of the person in charge of the group. Eligible charges which are not collectible from a student's insurance carrier will be paid by Boynton Health Service

up to a maximum of \$50 per visit). Students in University-sponsored foreign travel groups must rely on private insurance coverage while traveling.

### ITASCA BIOLOGICAL STATION

\$10—Laboratory Fee  
\$5 per week minimum—Research fee (Researchers must also pay the laboratory fee)

### LANDSCAPE ARCHITECTURE

\$35—5073, 5107

### MATHEMATICS

\$140<sup>2</sup>—0005, 0006, 0007, 0009 Preparatory Mathematics  
\$155.60<sup>2</sup>—1008  
\$194.50<sup>2</sup>—1111, 1201

### MUSIC, APPLIED

Courses in applied music carry 2 credits (minimum of 5 hours of private lessons) per summer term. Music majors who have passed the entrance exam: \$0 per 2 credits

M.M. and D.M.A. students at the 83xx level: \$0 per 2 credits.

Majors taking extra credits (beyond requirement) or taking lessons on a second instrument: \$40 per 2 credits

Non-majors, elective credit: \$100 (0-2 credits)

### PUBLIC HEALTH

\$200—5755 Administrative Residency

### SOIL SCIENCE

\$6—3220 Field Course  
\$19—3520, 5510 Transportation Fee

### STUDIO ARTS<sup>3</sup>

Materials fees:  
\$ 3—1101, 5190  
\$20—1702, 3430, 5430  
\$25—1301, 1302, 1701, 1811, 1812, 3301, 3302, 3304, 3305, 3710, 5310, 5320, 5340, 5350, 5390, 5710, 5790, 5899

\$30—1510, 1520, 1530, 3303, 3720, 3810, 5330, 5590

\$35—3510, 3520, 3530, 5510, 5520, 5530, 8510

\$40—3820

\$45—5810, 5820

\$50—8810

Arranged (amount adjusted to individual needs of students or particular class project)—3970, 3980, 5970, 8000-level courses

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

<sup>2</sup>In lieu of tuition

<sup>3</sup>Materials fees—assessed at the time of registration. Arranged fees are collected by department.

## SPECIAL FEES<sup>1</sup>

### DEPOSIT CARDS

\$20—Chemistry cards.  
\$ 5—Art cards.

Deposit cards may be purchased from the bursar. Materials and breakage will be charged against the card; any balance will be refunded at the end of the course.

### CREDIT BY SPECIAL EXAMINATION

\$30—Check with your college office for further information.

### DIPLOMA, OVERSEAS MAILING

\$5—for sending a diploma *air mail* to address outside the United States, Canada, or Mexico (Fee optional)

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

### DIPLOMA REPLACEMENT FEE

\$15

### GRADUATION FEE (each degree)

\$16—including diploma

### INTERNATIONAL STUDENT AID FEE

\$2 per term required of all non-immigrant students who have temporary visa status.

### MINNESOTA PUBLIC INTEREST RESEARCH GROUP (MPIRG)

\$1.12 (refusable/refundable)—assessed with student services fee.

### MUSIC PRACTICE ROOMS

Rooms with upright or grand piano, harp, harpsichord, organ, or percussion as well as rooms with no instrument will be available per term. Check in 100 Ferguson Hall for rental information and rates.

### PHYSICAL EDUCATION RENTAL CARDS

\$.75 per day; \$10 per one or both summer terms for towel and locker at Cooke Hall, Norris Hall, St. Paul Gym.

\$10 per one or both summer terms for gym clothing rental at Cooke Hall.

### RECORD SERVICE FEE

\$6 required of all new academic year and summer-only students. This fee provides students with unofficial copies of student records.

### SPEECH AND HEARING CLINIC

U of M students, staff, and faculty are not charged for clinical services provided in the Speech and Hearing Clinic.

### Outpatients:

Speech Pathology, Clinical Management—\$2 per session  
Audiologic Evaluation—\$25  
Audiologic Evaluation for Senior Citizens—\$15  
Audiology Screening—\$2  
Audiology Screening Followup—\$5

### TRANSCRIPT FEE

\$2 per official certified copy—regular service (5-7 workdays).  
\$6 per copy rush service (same day service).



## FINANCIAL AID

**Summer Financial Aid**—Employment, Guaranteed Student Loans (GSL), Auxiliary Loans to Assist Students (ALAS), and Parent Loans for Undergraduate Students (PLUS) are available to eligible summer applicants. Summer Pell Grants are also available to eligible undergraduates who will be graduating before to spring 1987.

To be considered for summer aid, undergraduates must take at least 6 credits over the two summer terms; graduate students 4 credits. For Pell Grant purposes, 6 summer credits qualifies you as a half-time student. Awarding of summer aid will be based on financial need and the amount of aid available.

Detailed summer application information is contained in the *Financial Aid Application Instructions and Forms* brochure published by the Office of Student Financial Aid. This brochure and other application materials for employment, GSLs, and Pell Grants are available now. ALAS and PLUS applications will be available May 1.

If you are interested in summer aid, obtain an application packet from the Office of Student Financial Aid, 210 Fraser Hall, 106 Pleasant Street S.E., Minneapolis, MN 55455 or 197 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108. You may also call (612) 376-2424 in Minneapolis or (612) 376-2572 in St. Paul. See Student Employment, below, for employment information.

**Part-Time Student Aid**—Minnesota Part-Time Student Grants are available in the summer for both day and evening students. You must be a Minnesota resident, not have a prior bachelor's degree, be enrolled part-time, and meet income guidelines for financial need. No minimum credit load is required; a maximum of 11 credits can be taken over the summer. Contact Extension Counseling, 314 Nolte Center, 315 Pillsbury Drive S.E., Minneapolis, MN 55455 (612/373-3905) for information.

**Summer Employment**—To be eligible for summer employment, academic year students must be registered for a minimum number of credits in either spring quarter or summer session courses. More information on minimum credits for academic year students is available at the Student Employment Center, 120 Fraser Hall. Summer-only students must be registered for at least 6 summer credits (either 6 credits for term I or 3 credits each term) to be eligible.

If you are eligible for employment, Student Employment can refer you to positions for which you are qualified. Then you must contact the employer(s) for interview(s). Your chances of finding a summer job depend on the number of jobs available, your qualifications, and the hours you are available for work. Most jobs are 29 hours a week or less and are maintenance or clerical jobs.

Student Employment has a placement service for students who want to work a flexible schedule in temporary jobs. Referrals to off-campus jobs are also available along with workshops on job searches and interview techniques.

**Regents' Scholarships**—University staff members employed during the summer session are entitled to the same tuition privileges in the summer as during the academic year. Check with the Human Resources Development Division for limitations.

## FEE PAYMENT

**Paying Your Fees**—You must pay all tuition and fees in full by the due date(s) on your fee statement(s). There is no installment payment plan for the summer session. Remember: Each fee statement you receive has its own due date. Later fee statements do not extend the due dates on earlier fee statements. A \$10 late payment fee can be charged for any fee statement that is paid after the due date printed on it.

**When to Pay**—For students who register through June 16 for first term or July 18 for second term, tuition and fees are due 5 workdays following the date of registration. (Fees for second session are never due before July 7.) For students who register from June 17-19, fees are due June 23; from July 21-23, fees are due July 25. Fees are due one workday following the date of registration for students who register on or after June 20 for first term or July 24 for second term.

**Where to Pay**—Pay your tuition and fees at the Bursar's Office (145 Williamson Hall on the east bank, ground floor of Blegen Hall on the west bank in Minneapolis, or the Cashier's Office in 107 Coffey Hall in St. Paul). Your fee statement and a check or money order may also be dropped in any of the fee deposit boxes on campus: in the Fraser and Coffey Hall registration centers; both concourses of Williamson Hall; Blegen Hall; Coffman Union Service Center; and all dorms. Payments are picked up at 8 a.m. and are credited to the previous day. The receipted fee statement may be picked up after five workdays at the east bank Bursar's Office, 145 Williamson Hall, in Minneapolis or at the Cashier's Office in 107 Coffey Hall in St. Paul. Your receipted fee statement will be mailed to you if you enclose a self-addressed, stamped envelope.

**Mailing Your Payment**—The fee statement and a check or money order may be mailed to the Bursar's Office, PO Box 88, Minneapolis, MN 55440-0088. Write your student ID number on your check or money order and enclose all copies of your fee statement. *Do not remove the student copy before sending in payment but do remove the lower portion—your course confirmation form.* The postmark date on your mailed payment must be the same as or earlier than the fee statement due date, or you will be billed for a \$10 late payment fee. If you want your receipted fee statement returned to you by mail, you must enclose a self-addressed, stamped envelope. If you do not include this return envelope, you can pick up your receipted copy after five workdays at the Bursar's Office in Minneapolis (145 Williamson Hall).

**Refund of Fees**—To receive a refund, you must cancel immediately if you stop attending class for any reason. Your refund will be based on the date you *officially* cancel (by taking a completed Course Request form to your registration center) *not* on the date you stopped attending class. Only if you officially cancel before classes begin will you receive a 100% refund. Refunds for cancellations after classes begin are on the following basis:

Length of Term	80% Refund	60% Refund	No Refund After
10 weeks	during 1st & 2nd weeks	during 3rd & 4th weeks	4 weeks
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 days	2 days	2 days

Note: For first term, the first week of classes ends on Monday, June 23.

## HEALTH SERVICE AND HOSPITALIZATION CHARGES

**General Information**—If you pay the student services fee, which includes the Health Service fee, you become eligible for prepaid general outpatient health care at Boynton Health Service, 410 Church Street, on the Minneapolis campus. If you attend and pay the student services fee for both terms, you are eligible for benefits until the first day of Welcome Week in the fall. If you do not pay the student services fee, you may purchase outpatient health coverage through the Extended Outpatient Benefits Plan available at the Boynton Cashier's Office, room W220. If you do not pay the student services fee nor purchase outpatient health coverage, but *are* a registered student, you (and your spouse) may still use the Health Service on a fee-for-service basis.

Boynton Health Service is open and available throughout the summer. Hours are 8 a.m.-4:30 p.m. Monday through Friday. General care includes coverage for general outpatient services (such as care for upper respiratory infections and minor injuries and illness), chest clinic, internal medicine, women's clinic (offering routine exams as well as contraceptive services, pregnancy testing, and counseling), eye (except refractions), orthopaedics, and laboratory procedures. Mental health clinic visits, x-ray, and proctology procedures are charged directly to your insurance.

During the hours the health service is closed, medical care for emergencies is available in the emergency department of University Hospitals. The cost for after hours care in the emergency department is only partially covered by your prepaid health care at Boynton, however; the balance of charges will be your responsibility.

Full fees are charged for routine physical exams, prescription drugs, eye glasses, dental care, and surgical procedures. Partial fees are charged for some specialty care.

**Hospitalization Insurance**—All students are required to carry hospitalization insurance coverage. International students must carry hospitalization insurance for themselves and their dependents for each term they are affiliated with the University. If you need coverage, you may purchase a University-sponsored hospitalization insurance policy when you register or at the Health Service, room W227A. The fees for coverage are: first term (5-week coverage)—\$26.50; second term, including, interim, (9-week coverage)—\$53.00; both terms (14-week coverage)—\$79.50. Only students who pay the Health Service fee or enroll in the Extended Outpatient Benefits Plan are eligible for this coverage. For information regarding dependent insurance coverage, contact the Student Insurance Office at Boynton Health Service, room W227A.

**Partial Exemption From Health Service Fee**—If you are a member of a health maintenance organization such as Coordinated Health Care, Group Health Inc., MedCenter, Physician's Health Plan, SHARE, or HMO Minnesota, or if you have health insurance which duplicates Boynton Health Service prepaid benefits, you may apply partial exemption (\$10.65 per term) of the Health Service fee *no later than the end of the first week of classes*. To apply, show proof of coverage to the Boynton Health Service Cashier, room W220, who will certify a Health Service Fee Adjustment Request form. (You may also obtain the Health Service Fee Adjustment Request form at 109 Coffey Hall.) You must present this form to the registration clerk in order to receive the partial deduction from your Health Service fee assessment. (This form should never be mailed to the Bursar's office.)

**Further Information**—For detailed information about health coverage and fee exemptions, contact the Cashier's Office W220 Boynton Health Service (373-3780).

## COMPLETING YOUR COURSE REQUEST FORM

① Chris R. Student  
123-45-6789



ID CARD IMPRINT (if no ID card, print name, ID or Social Security Number)

② College of Enrollment <b>Liberal Arts</b>				④ Street Address <b>1234 S Elm Street</b>				Telephone Number <b>373-4343</b>		
③ Major <b>Liberal Arts</b>				City <b>Minneapolis</b>		State <b>MN</b>		Zip Code <b>55455</b>		
⑤ Term and Year: <input type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Summer Session I <input type="checkbox"/> Summer Session II <b>1986</b>										
⑥ <input checked="" type="checkbox"/> Original Registration: Number of credits <b>8</b>				<input type="checkbox"/> Cancel Add: Number of Credits Remaining _____				<input type="checkbox"/> Complete Cancel		
<p><b>NOTE:</b> Fill in VARIABLE CREDITS only if credits are listed as "ar cr" in the Class Schedule. Fill in GRADE OPTION only if mandatory grading is not listed in the Class Schedule.</p>										
COURSE(S)—First Choice (original registration)				COURSE(S)—Second Choice (or cancel add additions)				CANCELLATIONS		
CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR COURSE NUMBER AND SECTION	CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR COURSE NUMBER AND SECTION	CALL NUMBER	DESIGNATOR COURSE NUMBER AND SECTION	
⑦ (A) <b>789179</b>	(B) <b>S-N</b>	(C)	(D) <b>Comp 1027-1</b>	⑧ <b>887410</b>			<b>ArtH 3014</b>	⑨		
<b>691605</b>			<b>Hist 1301</b>							
MPIRG (OPTIONAL) ⑩ Minnesota Public Interest Research Group is described in the Class Schedule. The MPIRG fee is \$2.25 per quarter (or \$1.12 per summer term) for those who pay the student services fee. If you choose NOT to pay the MPIRG fee, initial here → <input type="checkbox"/> Payment is refundable through MPIRG				⑪ ADVISER APPROVAL (if needed) 				⑫ ADDITIONAL APPROVAL (if needed)		

- ① Print your name and student ID number (or Social Security Number).
- ② Print the college through which you are enrolling.
- ③ Print your major, if any.
- ④ Print your complete address and phone number. (This is the address to which your summer grades will be sent.)
- ⑤ Indicate the term (summer I or summer II) and year for which you are registering.
- ⑥ Check the box for original registration if this is your first registration for the term and fill in the number of credits for which you are registering. If you are making changes in your original registration (cancel/adding), check the cancel/add box and fill in the number of credits you will have after completing those changes. Check the "Complete Cancel" box if you are cancelling all courses.
- ⑦ This section is for your first choice course requests:
  - (A) Print the six digit call number. (The call number is to the right of each course title or section number.)
  - (B) Mark the grading system you are requesting, only if the course is offered for both A-N and S-N. See example above and read the paragraphs on Grading Policies and Options in this Bulletin for further information.
  - (C) Print the number of credits only if you are registering for a variable credit course (i.e., 1-4 cr.) or an arranged credit course (ar cr).
  - (D) Print the designator (department abbreviation—e.g., Acct, Elem, Hist) and the course number, plus the section number (if a section) for each course.

- ⑧ This section is for your second choice course requests. **Plan alternatives for all parts of the course (e.g., lecture, lab, recitation) in case your first choice requests are closed or otherwise unavailable.** If you are cancel/adding, list any course additions here.
- ⑨ Provide the call number, designator, course, and section numbers for any courses you are cancelling. Remember to indicate your credit total in section 6.
- ⑩ MPIRG—see instructions on form. The Minnesota Public Interest Research Group (MPIRG) is a nonprofit, nonpartisan, student-run organization funded at the Twin Cities campus by an optional fee of \$1.12 per term. A statewide advocacy group, MPIRG gives students the opportunity to speak out on public issues and work for social change. The fee supports a professional staff for lobbying, litigation, organizing, and research.
- ⑪ College, department, and/or adviser approval, as required.
- ⑫ Additional approval, as required.

# Colleges of the University



## Agriculture

The College of Agriculture enjoys a near-unique setting among colleges of agriculture in the United States. As part of a major land-grant university, it is located in the heart of a major metropolitan area which itself is in the midst of one of the most important agricultural centers in the country. This rich and diverse setting is a tremendous asset to the college as it helps students to prepare for challenging and rewarding careers in agriculture.

Choosing from a wide range of undergraduate majors, all leading to a bachelor's degree, students in the college explore significant issues in the physical, biological, and social sciences as these sciences relate to agriculture.

## Biological Sciences

Many of the urgent problems confronting our world—including health, environmental quality, and social wel-

fare issues—are biological in nature. Programs in the College of Biological Sciences (CBS) have been developed in response to the growing demand for research and education in the life sciences.

The college offers the bachelor of science (B.S.) degree in biology, botany, biochemistry, genetics and cell biology, and microbiology. Students normally enter the college in their junior year.

## Dentistry

The School of Dentistry, the only dental school in Minnesota, provides training in one of the major fields of health care. The professional curriculum is a four-year program.

## Education

The College of Education is ranked among the top 10 educational research and development centers in the United States. The college offers upper division and graduate programs designed to prepare professionals for careers in education. All undergraduate programs lead to the bachelor of science degree (B.S.) and require four years to complete. Students may choose among teaching preparation majors in elementary or secondary education, or may select one of several nonteaching options.

## Forestry

The College of Forestry, rated one of the top three colleges of forestry in the country, offers baccalaureate degrees in six areas: Fisheries and Wildlife, Forest Products, Forest Resources, Renewable Resource Science, Recreation Resource Management, and Urban Forestry.

Graduates of the college may find positions in business and industry, consulting firms, and public forestry and conservation agencies.

## General College

The General College (GC) is the University's open-admission, general education college. GC students may wish to combine general education courses with career-related studies, seek one of the college's career development certificates, or fulfill general education requirements in preparation for transfer to a four-year professional or liberal arts program.

## Graduate School

The Graduate School offers more than 180 master's and doctoral degree programs, covering virtually every area of academic inquiry. The University is the only Ph.D.-granting institution in the state.

Any student with a bachelor's degree or its foreign equivalent from a recognized college or university may apply for admission. Applicants with the necessary background for their chosen major field, an excellent scholastic record, and appropriate professional qualifications may be considered for admission.

## Home Economics

The College of Home Economics on the St. Paul campus offers the bachelor of science (B.S.) degree in twelve four-year programs.

Undergraduate programs are problem oriented and focus on people and their near environment: food and nutrition, clothing, shelter, and human relationships. They combine a thorough grounding in the liberal arts with additional course work from one or more subject areas. Programs attract a broad spectrum of students: students with interest and ability in the natural sciences, in art and design, in the social sciences, and in business and education. All provide opportunities for students to gain on-the-job experience (for credit) through internships, field experience or directed study.



## Law

The University's Law School is generally considered one of the top twenty law schools in the country. Students in the Law School follow a three-year program to earn a juris doctor (J.D.) degree.



## Liberal Arts

The College of Liberal Arts (CLA) is the largest academic unit of the University and one of the largest liberal arts colleges in the United States—and its impressive size is matched by its reputation. Several CLA programs—including economics, geography, and political science—rank among the top in their fields.

CLA offers a rich variety of four-year degree programs for its 16,000 students and also offers preparation for students who plan to transfer to professional programs of other colleges inside or outside the University. Nearly two-thirds of the freshmen who come to the Twin Cities campus each year enroll in CLA.

The college offers five bachelor's degrees: the bachelor of arts (B.A.), the bachelor of science (B.S.), the bachelor of fine arts (B.F.A.), the bachelor of

music (B.M.), and the bachelor of individualized studies (B.I.S.). It also offers several preprofessional programs involving one to four years of work in CLA.

## Management

Located in the midst of the thriving Twin Cities business community, the University of Minnesota's School of Management has a long history of contacts with area business firms and local, state, and federal government offices in the metropolitan area.

The School of Management offers basic professional training for positions of responsibility in business and in non-profit agencies and institutions. Emphasis in the curriculum is on management, fundamental principles of business operations, effective communications, and international awareness, with a sound foundation in the liberal arts.

## Medical School

The Medical School, considered one of the top schools of medicine in the country, offers a four-year curriculum leading to the doctor of medicine (M.D.) degree.

## Nursing

The School of Nursing offers professional preparation leading to the degree of bachelor of science in nursing (B.S.N.). Students spend the first year of the four-year program in prenursing liberal arts study and are admitted to the three-year professional program as sophomores.

## Pharmacy

The College of Pharmacy is one of 72 accredited schools of pharmacy in the country. The University of Minnesota has offered a bachelor of science in pharmacy program since 1927 and a doctor of pharmacy (Pharm.D.) program since 1971.

## Public Affairs

The Hubert H. Humphrey Institute of Public Affairs was established in 1977 to serve as a memorial to Hubert H. Humphrey and to devote educational resources at the University to upholding the ideas and continuing the commitment to public service for which Senator Humphrey was known and honored during his lifetime.

The institute offers degree programs leading to the master of arts in public affairs (M.A.) and the master of planning in public affairs (M.P.).

## Public Health

The School of Public Health primarily offers advanced courses for professionals in the various disciplines of public health and preventive medicine. A number of these courses are open to undergraduates, although the School of Public Health awards no undergraduate degrees. An undergraduate major in biometry is available through the College of Liberal Arts. Undergraduates may also incorporate public health courses into programs administered by other colleges of the University. Through the Inter-College Program of University College, students can complete an individually designed bachelor's degree program with a concentration in public health.

## Institute of Technology

The Institute of Technology (IT) prepares students for careers in architecture, mathematics, physical science, and engineering. An IT student may obtain one of 20 different bachelor's degrees. Each IT curriculum provides the student first with fundamental training in physical science and mathematics, then with more specialized professional courses.

The basic curriculum of the first year in IT is similar for all students except those enrolled in architecture, chemical engineering, chemistry, and material science. In the second year, programs differ but are still flexible enough to allow students to transfer from one department to another with minimal difficulty.

## University College

University College (UC) programs enable students to design their own degree plans to meet individual academic needs. UC students may earn either bachelor of science or bachelor of arts degrees through the Inter-College Program or the University Without Walls.

## Veterinary Medicine

The College of Veterinary Medicine, one of 27 such schools in the country, offers a complete classroom and clinical program leading to the doctor of veterinary medicine (D.V.M.) degree.



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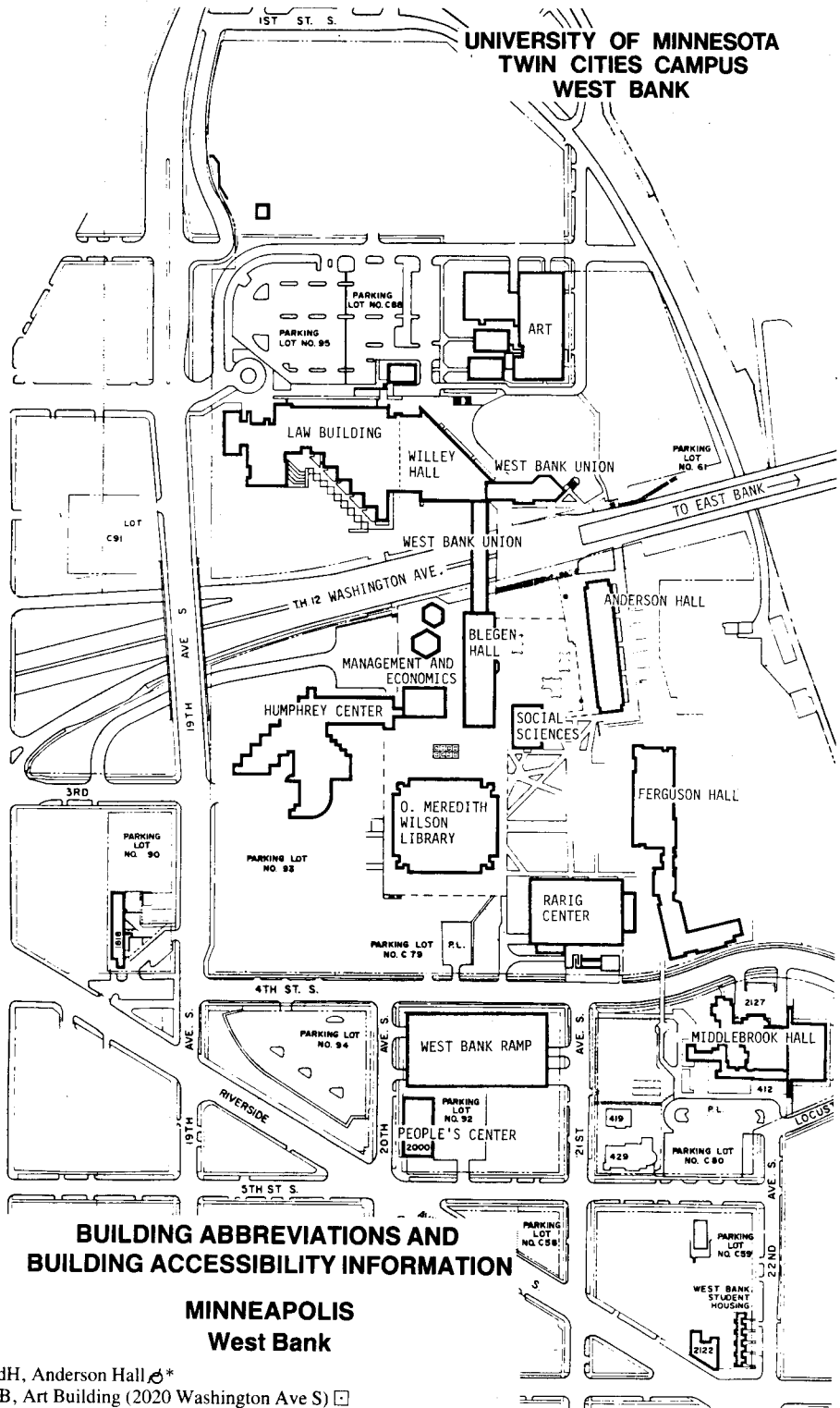
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**BUILDING ABBREVIATIONS AND BUILDING ACCESSIBILITY INFORMATION**

**MINNEAPOLIS West Bank**

- AndH, Anderson Hall ☺\*
- ArtB, Art Building (2020 Washington Ave S) ☐
- BlegH, Blegen Hall ☺\*L
- FergH, Ferguson Hall ☺\*L
- HHH Ctr, Humphrey Center ☺\*L
- Law, Law Building ☺\*L
- MdbH, Middlebrook Hall ☺\*L
- Mgmt/Econ, Management/Economics Building ☺\*
- OMWL, O Meredith Wilson Library ☺\*L
- PeoCtr, People's Center (2000 5th Street)
- RarigC, Rarig Center ☺\*L
- SocSci, Social Sciences Building ☺\*
- WBU, West Bank Union ☺L
- WilleyH, Willey Hall ☺\*L

**CODES:**

- ☺ = accessible building
- ☐ = partially accessible
- = inaccessible building
- \* = elevator
- L = adapted restroom

# BUILDING ABBREVIATIONS AND BUILDING ACCESSIBILITY INFORMATION

## MINNEAPOLIS

### East Bank

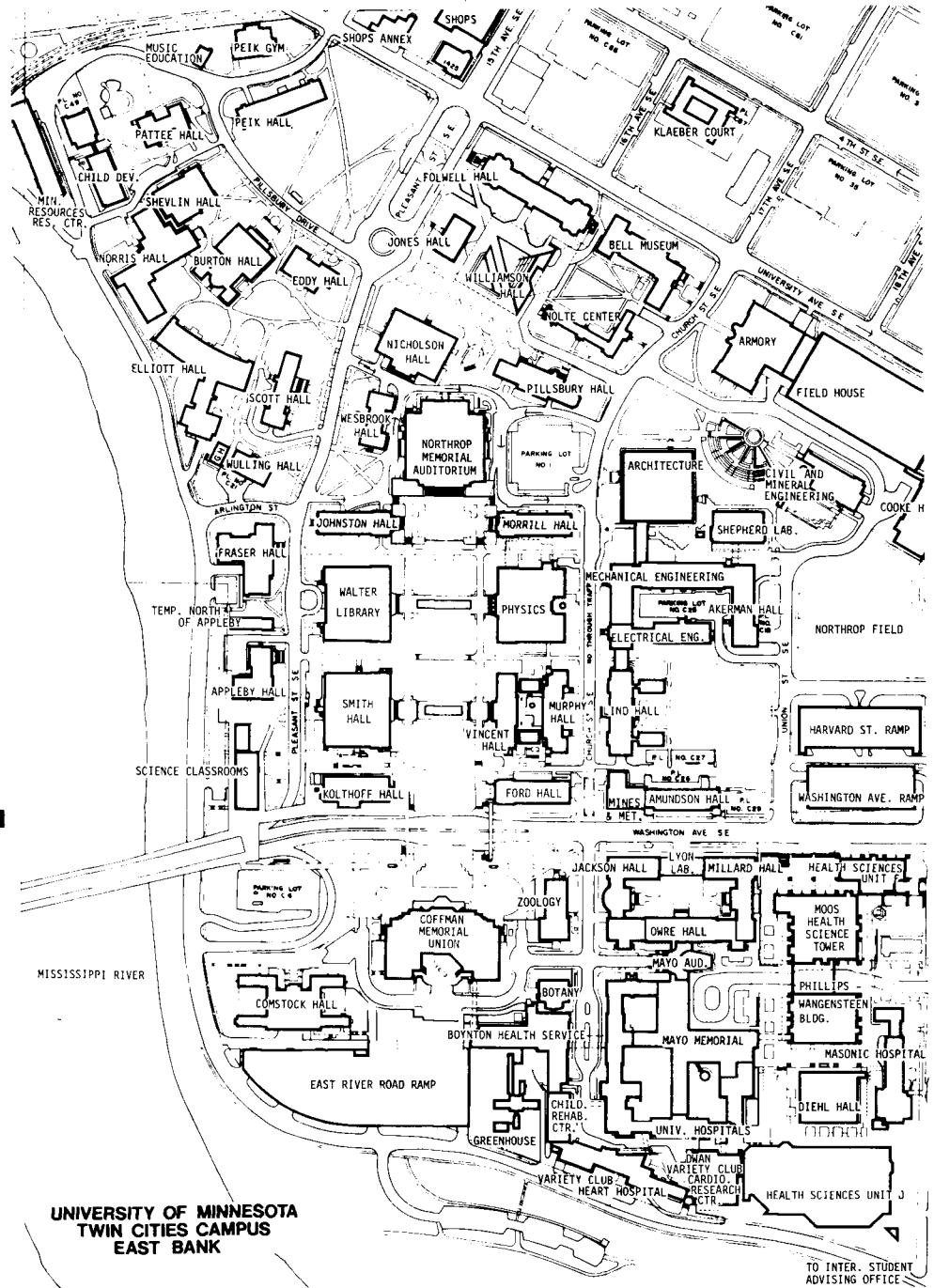
AkerH, Akerman Hall   
 AmundH, Amundson Hall  \* L  
 ApH, Appleby Hall  \*  
 Arch, Architecture  \* L  
 Armory   
 BellMus, Museum of Natural History  \* L  
 BFAB, Bierman Field Athletic Building  \* L  
 Botany   
 BoynHS, Boynton Health Service  \* L  
 BuH, Burton Hall  \* L  
 CenH, Centennial Hall  
 ChDev, Child Development  \*  
 ChRC, Children's Rehabilitation Center  \* L  
 CivMinE, Civil and Mineral Engineering  \* L  
 CMU, Coffman Memorial Union  \* L  
 CookeH, Cooke Hall   
 DiehlH, Diehl Hall  \*  
 DVCCRC, Dwan Variety Club Cardiovascular Research Center  \* L  
 EddyH, Eddy Hall   
 EdHAN, Eddy Hall Annex  
 ElectE, Electrical Engineering   
 EltH, Elliott Hall  \* L  
 ExpE, Experimental Engineering   
 FieldHse, University Field House  
 FolH, Folwell Hall  \* L  
 FordH, Ford Hall  \* L  
 FraserH, Fraser Hall   
 FronH, Frontier Hall  \*  
 HL, St. Anthony Falls Hydraulic Laboratory (Hennepin Island)  
 HSUnitF, Health Sciences Unit F  \* L  
 JacH, Jackson Hall  \*  
 JOAd, Jackson-Owre Addition  \*  
 JohH, Johnston Hall  \* L  
 JonesH, Jones Hall   
 KlaCt, Klaeber Court   
 KoltH, Kolthoff Hall  \* L  
 LindH, Lind Hall  \* L  
 LyonL, Lyon Laboratories

Mayo, Mayo Memorial  \* L  
 MechE, Mechanical Engineering  \* L  
 MinMet, Mines and Metallurgy  \*  
 MldrH, Millard Hall  \*  
 MMA, Mayo Memorial Auditorium   
 MoosT, Moos Health Sciences Tower  \* L  
 MorH, Morrill Hall  \* L  
 MRRRC, Mineral Resources Research Center   
 MurH, Murphy Hall   
 MusEd, Music Education   
 NichH, Nicholson Hall  \* L  
 NMA, Northrop Memorial Auditorium  \* L  
 NorrisH, Norris Hall  L  
 OwreH, Owre Hall  \* L  
 PeikG, Peik Gym   
 PeikH, Peik Hall  \*  
 Phys, Tate Laboratory of Physics  \*  
 PiH, Pioneer Hall   
 PillsH, Pillsbury Hall   
 PiH, Pattee  \*  
 PWB, Phillips Wangensteen Building  \* L  
 SaH, Sanford Hall   
 SciCB, Science Classroom Building  \*  
 ScottH, Scott Hall   
 ShepLab, Shepherd Laboratories  \*  
 ShevH, Shevlin Hall   
 SmithH, Smith Hall  \*  
 Stad, Stadium  L  
 TerH, Territorial Hall   
 TNA, Temporary, North of Appleby   
 TNCE, Temporary, North Court of Engineering   
 VFWCR, VFW Cancer Research Center  
 VinH, Vincent Hall  \*  
 WaLib, Walter Library  \* L  
 WesH, Westbrook Hall   
 WmsA, Williams Arena  L  
 WmsonH, Williamson Hall  \* L  
 WullH, Wulling Hall  \*  
 Zoology  \* L

#### CODES:

- = accessible building
- = partially accessible
- = inaccessible building
- \* = elevator
- L = adapted restroom

For a map, *Guide for the Handicapped*, and further information, contact Physical Planning at 373-5765 or Office for Students with Disabilities at 376-2716.



# BUILDING ABBREVIATIONS AND BUILDING ACCESSIBILITY INFORMATION

## ST. PAUL

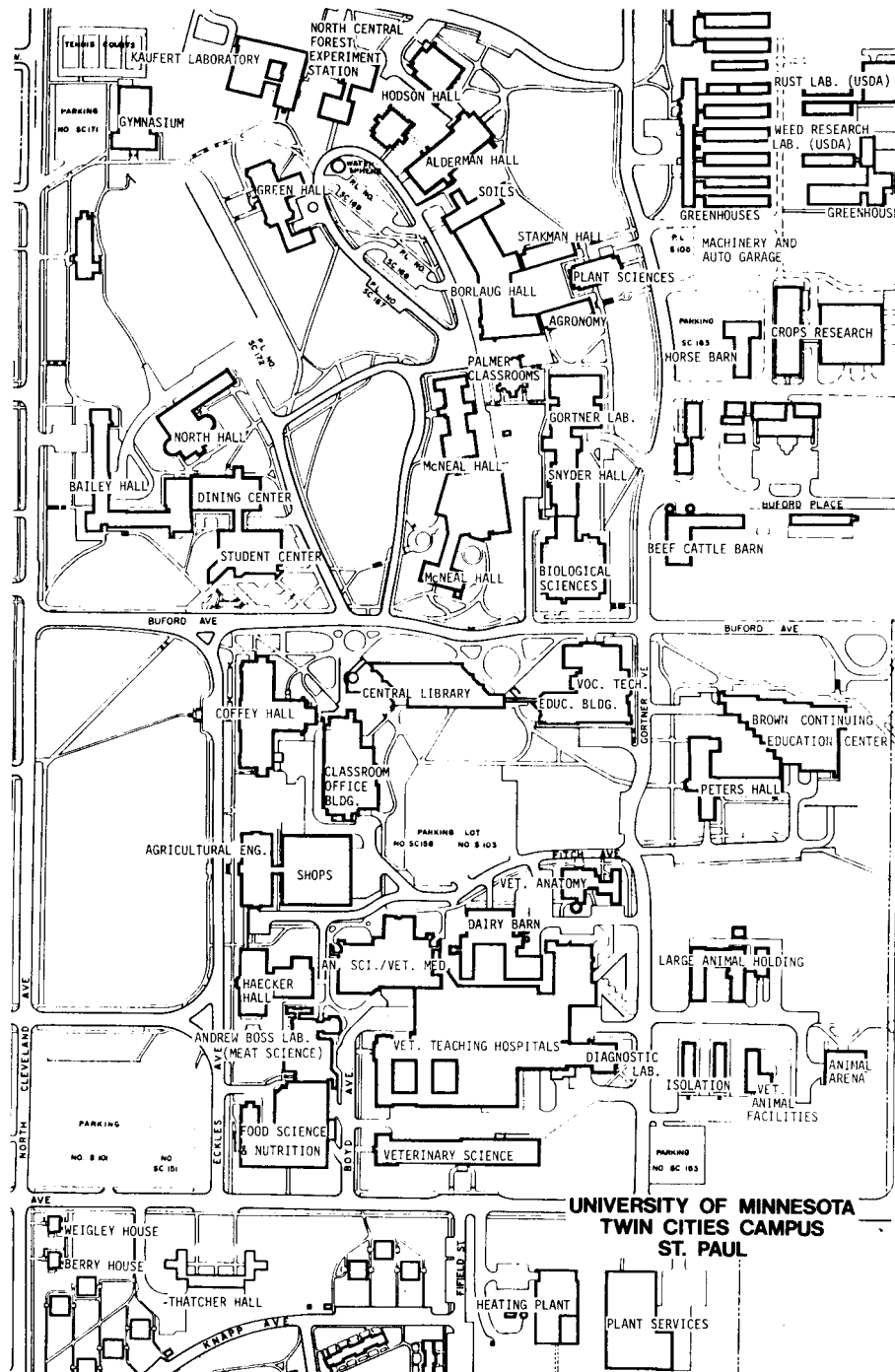
ABLMS, Andrew Boss Laboratory-Meat Science ♻ \*  
 AgEng, Agricultural Engineering ☐ \*  
 Agr, Agronomy ■  
 AgrPGGH, Agronomy/Plant Genetics Greenhouse  
 AlderH, Alderman Hall ♻ \*  
 AnAren, Animal Arena  
 AnScVM, Animal Science, Veterinary Medicine ☐ \*  
 Berry, Berry House (1304 Cleveland Ave N) ☐  
 BioSci, Biological Sciences Center ☐ \*  
 CentLib, St. Paul Campus Central Library ♻ \*  
 ClaOff, Classroom Office Bldg ♻ \*  
 CofH, Coffey Hall ♻ \*  
 DinC, Dining Center ♻ \*  
 EBCEC, Earle Brown Continuing Education Center ♻ \* L  
 FScN, Food Science and Nutrition ♻ \*  
 GorL, Gortner Laboratory of Biochemistry ♻ \*

GrMH, Green Hall ♻ \* L  
 Gym, Gymnasium ■  
 HckrH, Haecker Hall ☐  
 HodsonH, Hodson Hall ♻ \*  
 KaufL, Kaufert Laboratory ♻ \*  
 McNH, McNeal Hall ♻ \* L  
 NorH, North Hall ■  
 PalmC, Palmer Classroom Building ☐  
 PetH, Peters Hall ☐  
 PISci, Plant Sciences ■  
 SnH, Snyder Hall  
 Soils ♻ \*  
 StakH, Stakman Hall of Plant Pathology ■  
 StCen, Student Center ♻ \* L  
 VetA, Veterinary Anatomy ☐  
 VetDL, Veterinary Diagnostic Laboratories ■  
 VetS, Veterinary Science ■  
 VetTchHos, Veterinary Teaching Hospitals ☐  
 VoTech, Vocational-Technical Education ♻ \* L  
 Weigley, Weigley House (1316 Cleveland Ave N)

### CODES:

- ♻ = accessible building
- ☐ = partially accessible
- = inaccessible building
- \* = elevator
- L = adapted restroom

For a map, *Guide for the Handicapped*, and further information, contact Physical Planning at 373-5765 or Office for Students with Disabilities at 376-2716.







# REQUEST FOR SUMMER-ONLY STATUS

## University of Minnesota

Please see the instructions in the Summer Session Bulletin. Please print.

Student ID Number (if any)		Social Security Number		Birthdate (month/day/year)	
Student Name (last, first, middle)					
Street Address (for mailing grades)				Summer Term/Year <input type="checkbox"/> I <input type="checkbox"/> II 19__	
City		State	Zip Code	Sex (check one): <input type="checkbox"/> Male <input type="checkbox"/> Female	
To which University of Minnesota college are you submitting your request?					
Have you registered before at any University of Minnesota campus? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If yes: <input type="checkbox"/> Day (including past summers)		<input type="checkbox"/> Extension			
If day: Campus: <input type="checkbox"/> Crookston <input type="checkbox"/> Duluth <input type="checkbox"/> Morris <input type="checkbox"/> Twin Cities <input type="checkbox"/> Waseca					
Date of Last Enrollment _____			College _____		
Student Name (at time of last enrollment) _____					
Have you applied or been admitted to the University of Minnesota in the past 2 years? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If day: Campus: <input type="checkbox"/> Crookston <input type="checkbox"/> Duluth <input type="checkbox"/> Morris <input type="checkbox"/> Twin Cities <input type="checkbox"/> Waseca					
College _____			Term/Year _____ 19__		
Expected Graduation Date _____					
Student Name (at time of application) _____					
Have you received an admission letter? <input type="checkbox"/> Yes <input type="checkbox"/> No					

### FOR STUDENTS CURRENTLY OR PREVIOUSLY ENROLLED IN ANOTHER UNIVERSITY OR COLLEGE

Previous College or University (most recent)		Major Field of Study	
Number of Credits Earned (indicate quarter or semester)		Approximate GPA (4.00 scale)	
Did you graduate? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes: Degree Earned _____		Date Granted _____	

### FOR HIGH SCHOOL STUDENTS

Name of High School	Last Grade Completed Before Summer Session Starts
---------------------	---

### OPTIONAL

How did you learn about Summer Session? (check all that apply):

Letter       Newspaper       Teacher       Friend       Summer Bulletin

Minnesota Daily       Other \_\_\_\_\_

<p align="center"><b>for college use only</b></p> <p><input type="checkbox"/> approved for summer-only registration</p> <p>college code _____</p> <p>_____ date _____</p> <p>college approval or stamp</p>	<p align="center"><b>for records office use only</b></p> <p>initials _____</p> <p>date _____</p>
--	--

Course Request Forms are on page 128. Additional forms are available at 202 Fraser Hall, 130 Coffey Hall, and 135 Johnston Hall.

Additional maps of the Twin Cities campus are available from the Summer Session, 135 Johnston Hall.


**COURSE REQUEST**  
 University of Minnesota

Print name and ID number (or Social Security number)

College of Enrollment				Street Address				Telephone Number	
Major				City			State	Zip Code	
Term and Year:    ___ Fall       ___ Winter       ___ Spring       ___ Summer Session I       ___ Summer Session II       19___									
<input type="checkbox"/> Original Registration: Number of credits ___			<input type="checkbox"/> Cancel/Add: Number of Credits Remaining ___				<input type="checkbox"/> Complete Cancel		
<b>NOTE:</b> Fill in VARIABLE CREDITS <b>only</b> if credits are listed as "ar cr" in the Class Schedule. Fill in GRADE OPTION <b>only</b> if mandatory grading is not listed in the Class Schedule.									
COURSE(S)—First Choice (original registration)				COURSE(S)—Second Choice (or cancel/add additions)				CANCELLATIONS	
CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR, COURSE NUMBER, AND SECTION	CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR, COURSE NUMBER, AND SECTION	CALL NUMBER	DESIGNATOR, COURSE NUMBER, AND SECTION
<b>MPIRG (OPTIONAL)</b> Minnesota Public Interest Research Group is described in the Class Schedule. The MPIRG fee is \$2.25 per quarter (or \$1.12 per summer term) for those who pay the student services fee. If you choose NOT to pay the MPIRG fee, initial here _____ Payment is refundable through MPIRG.				<b>ADVISER APPROVAL (if needed)</b>				<b>ADDITIONAL APPROVAL (if needed)</b>	

A 22 10/84 (P-724B)


**COURSE REQUEST**  
 University of Minnesota

Print name and ID number (or Social Security number)

College of Enrollment				Street Address				Telephone Number	
Major				City			State	Zip Code	
Term and Year:    ___ Fall       ___ Winter       ___ Spring       ___ Summer Session I       ___ Summer Session II       19___									
<input type="checkbox"/> Original Registration: Number of credits ___			<input type="checkbox"/> Cancel/Add: Number of Credits Remaining ___				<input type="checkbox"/> Complete Cancel		
<b>NOTE:</b> Fill in VARIABLE CREDITS <b>only</b> if credits are listed as "ar cr" in the Class Schedule. Fill in GRADE OPTION <b>only</b> if mandatory grading is not listed in the Class Schedule.									
COURSE(S)—First Choice (original registration)				COURSE(S)—Second Choice (or cancel/add additions)				CANCELLATIONS	
CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR, COURSE NUMBER, AND SECTION	CALL NUMBER	GRADE OPTION	VARIABLE CREDITS	DESIGNATOR, COURSE NUMBER, AND SECTION	CALL NUMBER	DESIGNATOR, COURSE NUMBER, AND SECTION
<b>MPIRG (OPTIONAL)</b> Minnesota Public Interest Research Group is described in the Class Schedule. The MPIRG fee is \$2.25 per quarter (or \$1.12 per summer term) for those who pay the student services fee. If you choose NOT to pay the MPIRG fee, initial here _____ Payment is refundable through MPIRG.				<b>ADVISER APPROVAL (if needed)</b>				<b>ADDITIONAL APPROVAL (if needed)</b>	

A 22 10/84 (P-724B)

**College of Education Students Only  
Mail Registration Request**

I will be registering for courses in the College of Education (see page 107). Please send me mail registration materials for the 1986 Summer Session.

**Please Print**

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Check appropriate status:

College of Education Student \_\_\_\_\_ ID # \_\_\_\_\_ Inservice Teacher \_\_\_\_\_

Not a teacher but registering for education courses \_\_\_\_\_

**College of Liberal Arts  
Summer-Only Students  
Mail Registration Request**

I plan to be a summer-only student registering through the College of Liberal Arts (see page 107). Please send me registration materials for the 1986 Summer Session.

**Please Print**

Name \_\_\_\_\_

Address \_\_\_\_\_

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

**Programs for High School Students**

High ability students may want to investigate one of the special programs (see page 91) available to them this summer.

Please send me further information on:

- Summer Honors College
- Summer Music Honors Program
- Math/Computers/Science Summer Institute, Duluth Campus
- The Summer Scholars Program, Morris Campus
- Honors Institute in Theatre

**Please Print**

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Telephone \_\_\_\_\_

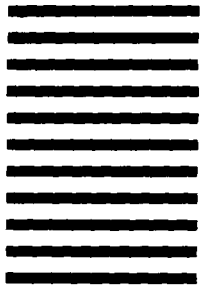


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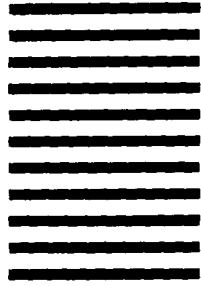


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Summer Session  
135 Johnston Hall  
101 Pleasant Street S.E.  
Minneapolis, MN 55455



## COLLEGE OFFICES

Agriculture, 277 Coffey Hall (St. Paul)	373-0921
Biological Sciences, 223 Snyder Hall (St. Paul)	373-3648
Dental Hygiene, 5-164 Moos Health Sciences Tower	373-3271
Dentistry, 15-106 Moos Health Sciences Tower	373-3454
Education, 1425 University Avenue S.E.	373-2257
Forestry, 10 Green Hall (St. Paul)	373-0842
General College, 10 Nicholson Hall	376-2950
Graduate School, 307 Johnston Hall	373-5542
(Students registered in the Graduate School spring quarter may obtain registration materials in the office of their major department.)	
Home Economics, 32 McNeal Hall (St. Paul)	373-0933
Liberal Arts	
Regular (currently enrolled or previously registered) students: college office	
High school students: 49 Johnston Hall	376-3950
School of Management, 225 Management/Economics (West Bank)	373-3701
School of Management Graduate Studies, 334 Management/Economics (West Bank)	373-5505
Medical Technology, 15-170 Phillips-Wangensteen Building	373-9670
Medicine, 3-105 Owre Hall	373-7690
Military Science, 108 Armory Building	373-2212
Mortuary Science, 400 Botany	373-3870
Nursing, 5-140 Health Sciences Unit F	373-8208, 373-3462
Pharmacy, 5-110 Health Sciences Unit F	373-7997
Physical and Occupational Therapy, 271 Children's Rehabilitation Center	373-9024
Humphrey Institute of Public Affairs, Hubert H. Humphrey Center	373-2653
Public Health, 1250 Mayo Memorial Building	373-8060
Institute of Technology, 105 Lind Hall	373-3227, 373-3228
University College, Inter-College Program, 213 Temporary North of Appleby	376-1253
University Without Walls, 201 Wesbrook	373-3919
Veterinary Medicine, 460 Veterinary Teaching Hospitals (St. Paul)	376-3886

## COLLEGE OF EDUCATION STUDENTS ONLY

Students may register by mail for both terms. See page 107 for limitations. To request registration materials, complete and return the card at the right. If you intend to register by mail, please act promptly; all registration materials must be received by the College of Education between May 1 and May 31.

## COLLEGE OF LIBERAL ARTS SUMMER-ONLY STUDENTS

CLA summer-only students who qualify (see page 107 of this bulletin) may register by mail. To request registration materials, complete and return the card at the right. Please act promptly; all registration materials must be received between May 1 and May 31.

## Summer Scholars Programs

High ability high school students may want to participate in one of the special programs available to them this summer. Short descriptions of these programs can be found on page 91 of this bulletin. For further information about the Summer Honors College, the Honors Institute in Theatre, Summer Music Honors Program, Summer Scholars Program in Morris, or the Math/Computers/Science Scholars Summer Program in Duluth, please complete the postage-paid return card at the right and mail it to the Summer Session Office.



UNIVERSITY OF MINNESOTA  
Summer Session  
135 Johnston Hall  
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First Term June 17-July 18  
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Continuing Education and Extension

UNIVERSITY OF MINNESOTA BULLETIN  
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