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NOTE: Courses in this catalog PDF are current as of June 2009.
For the most up-to-date listing of courses, visit the catalog Web site
at http://onestop2.umn.edu/courses/designators.jsp?campus=UMNCR.
Accounting (ACCT)

ACCT 1803s.f. Directed Studies. (1-3 cr [max 6 cr]. Prereq–Instructor consent, every year) Current topics not covered in regularly offered courses.


ACCT 3302s. Cost Accounting II. (3 cr. Prereq–3301, every year) Refinements of cost accounting information systems, including management control systems, cost allocation refinements, capital budgeting, and performance measurement.


ACCT 3804s.f. Individual Studies. (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent, every year) Topic related to student’s major but not covered in regularly offered courses.

ACCT 4100f,s. Leadership Laboratory (NDSU). (1 cr [max 4 cr], every year) Study of leadership from military perspective. Situational leadership. Contemporary issues, including change management, professional ethics. Officer professional development topics. Case studies. Continuation of 3210.


Agricultural Business (AGBU)

AGBU 1005s. World Agricultural Food Systems. (3 cr, every year) Historical preferences, consumer trends in diverse geographic regions. How global/national policies affect food trade.


Agricultural Economics (AGEC)

AGEC 1004f. Introduction to Agriculture. (3 cr, every year)

AGEC 1803f,s. Directed Studies. (1-5 cr, max 6 cr, Prereq-#, every year)
Current topics not covered in regularly offered courses.

AGEC 2310f,s. Agribusiness Financial Records. (3 cr, every year)
Applied course in record keeping. Use of computerized system to record business transactions; manage agricultural inventories, receivables, payables, and payroll; and generate coordinated financial statements.

AGEC 2530f,s. Introduction to Agribusiness. (3 cr, every year)
Use of technical and agricultural knowledge in agricultural sales. Need-satisfaction approach to selling. Planning and conducting informational meetings, exhibiting at farm and trade shows, importance of service and timeliness in agribusiness, and planning in making agrisales presentations.

AGEC 3050s. Economics for Agriculture. (3 cr, Prereq-ECON 2101 or instructor consent, every year)

AGEC 3430s. Food Marketing Systems. (3 cr, Prereq=ECON 2101, every year)
Topics include frameworks for analyzing food marketing systems. Marketing institutions, food prices, marketing costs, functional/organizational issues, role of government. Grades/standards. Issues in transportation, storage, and international trade.

AGEC 3540f,s. Farm Business Management. (3 cr, Prereq-2210, every year)
Principles of farm accounting. Financial/income statements, cash flow statements, depreciation methods, farm income tax, enterprise analysis, farm management decision making, budgeting/planning, computer analysis of farm business.

AGEC 3640f,s. Agricultural Finance and Valuation. (3 cr, Prereq-2210, every year)
Analysis of investment strategies and financing policies for farm and agricultural businesses. Liquidity, solvency, profitability. Financial documents, legal aspects of credit, financial intermediaries serving agriculture, property valuation, estate planning.

AGEC 3804f,s. Individual Studies. (1-3 cr, max 6 cr, Prereq-Jr, #, every year)
Topic related to student's major not covered in regularly offered courses.

AGEC 4460s. International Marketing Problems and Practices. (3 cr, every year)
Problems/practices facing companies in international trade. Import/export regulations, exchange rates, business practices/policies.

AGEC 4740f. Grain and Livestock Marketing. (3 cr, every year)
Students develop commodity marketing plan for grain or livestock farming operations. Topics include cash markets, grid pricing, grade premiums/discounts, contracting, crop/livestock insurance, and futures/options.

AGEC 4750f. Agribusiness Marketing. (3 cr, Prereq-2530 or instructor consent, every year)
Role of marketing in agribusiness. Marketing systems/strategies for competitiveness in a rapidly changing marketplace. Identifying strengths/opportunities to create competitive advantage.

AGEC 4760s. Business Plan Development for Agribusiness. (3 cr, Prereq-2470 or 4750, every year)
Students work with agribusiness firm to assess current situation, future challenges/opportunities. Student teams conduct research, analyze results, formulate marketing plan. Findings/recommendations are presented to the business. Capstone course.

AGEC 4800. Rural Economic Development Practicum. (3 cr)
Students develop strategies/program to promote economic development for a rural community, including implementation/financing plans.

Agricultural Systems Management (ASM)

ASM 1021f. Introduction to Agricultural Systems Management. (2 cr, every year)
Overview of agricultural mechanization systems (engines, machinery, structures, processes).

ASM 1034s. Facility Maintenance and Safety. (4 cr, every year)
Safe operation, working environment for power equipment, structures, utilities, metal fabrication.

ASM 1044s. Computer-Aided Drafting. (3 cr, every year)
Sketching/dimensioning architectural/landscape projects. Use of CAD program to develop plan views, floor plans, elevations, pictorials, mechanical drawings.

ASM 1331. Agricultural Building Construction. (3 cr)

ASM 1803f,s. Directed Studies. (1-3 cr, max 6 cr, every year)
Current topics not covered in regularly offered courses.

ASM 2043s. Welding and Manufacturing Processes. (3 cr, every year)

ASM 2053s. Electricity, Controls, and Sensors in Agriculture. (3 cr, every year)
Theory and practical application of electricity and electrical controls in agriculture. Selection/maintenance of electrical motors, heating/light/controls devices, and sensors.

ASM 2200s. Introduction to Renewable Energy Systems. (3 cr, every year)

ASM 2250f. Agricultural Machinery Management. (3 cr, every year)
Mechanical principles. Application of field machinery/power units to varying crop, soil, climatic conditions. Farm management decisions. Introduction to precision agriculture.

ASM 3002s. Agricultural Mobile Power Systems. (3 cr, Prereq-Phys 1001, every year)
Selecting, testing, maintaining power units for portable, PTO, hydraulic applications. Spark/compression ignition systems, drive trains, DC electrical systems, air conditioning systems.

ASM 3005s. Facilities Planning and Selection. (3 cr, Prereq-BM 3005, Prereq-1034, Math 1031, Phys 1012, every year)
Planning facility design. Selecting/materials/equipment used in manufacturing and production operations.

ASM 3009f. Surveying. (4 cr, every year)
Course Descriptions

Course Numbers

0xxx......Courses that do not carry credit toward any University degree.

1xxx......Courses primarily for undergraduate students in their first year of study.

2xxx......Courses primarily for undergraduate students in their second year of study.

3xxx......Courses primarily for undergraduate students in their third year of study.

4xxx......Courses primarily for undergraduate students in their fourth year of study.

5xxx......Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Abbreviations

Letters following course numbers indicate what term(s) the course is taught:

f........fall semester
s..........spring semester
m........summer term
su.........summer term

A notation following course prerequisites indicates whether the course is offered every year, or in even or odd years.

Abbreviations in parentheses following a course name indicate the university that offers the course:

BUU........Bemidji State University
NDSU........North Dakota State University
UMTC........University of Minnesota, Twin Cities
UND........University of North Dakota

Other Abbreviations

Prereq......course prerequisites
cr...........credit
equiv. ......equivalent
fr, soph, jr, sr......freshman, sophomore, junior, senior

A prerequisite course listed by number only (e.g., prereq 3320) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.

ASM 3201s. Bio-Fuels Technology. (3 cr. Prereq-2200, every year)

ASM 3202f. Solar, Wind, and Geo-Thermal Systems. (3 cr. Prereq-2200, every year)
Historical development of solar, wind, and geo-thermal industries. Mechanical processes of design/utilization of these renewable energy sources. Economics, current legislation. Site tours, guest lectures.

ASM 3360f. Applications in Precision Agriculture. (3 cr. Prereq-ITM 1010, Soil 1293, every year)

ASM 3511s. Yield Monitoring and Data Interpretation. (1 cr. Prereq-ASM 3560, every year)

ASM 3512s. Remote Sensing Applications in Precision Agriculture. (1 cr. Prereq-ASM 3560, every year)
Fundamentals of remote sensing and satellite imaging in monitoring/managing cropping system variability. Applications of commercial mapping and GIS software in processing/interpreting production scale economic variables.

ASM 3513s. Precision Farming Data. (1 cr. Prereq-3560, every year)
Cropping systems data in precision agriculture. On-farm input/output record keeping, profit analysis using commercial software. On-farm trials/testing of agronomic variables using precision agriculture technologies.

ASM 3604f,s, su. Individual Studies. (1-3 cr [max 6 cr]. Prereq-Jr or instructor consent, every year)
Topics related to student’s major, not covered in regularly offered courses.

Agricultural, Food, and Environmental Education (AFEE)

The following courses are required for the undergraduate agricultural education major: This major is a collaborative agreement with the University of Minnesota, Twin Cities, which offers these courses via ITV.

AFEE 1001. Intro to Agricultural Education and Extension (UMTC). (1 cr, every year)
Historical development of agricultural education. Orientation to career opportunities. Areas/expectations of specialization. Issues.

AFEE 1002. Principles of Career Planning for Agricultural Professional (UMTC). (1 cr, every year)
Self-assessment/analysis of interests, skills, abilities. Analysis of occupations, employment potential, employee expectations. Information interviews to examine career options, employment portfolio.

AFEE 2096s. Professional Practicum in Agricultural Education: Early Experience (UMTC). (0 cr, every year)
Observe schools, extension offices, agricultural-oriented businesses to learn about work/workplace in agricultural education.

AFEE 511f. Agricultural Education: Methods of Teaching (UMTC). (4 cr, every year)

AFEE 5112s. Agricultural Education Program Organization and Curriculum for Youth (UMTC). (3 cr [max 4 cr], every year)
Development of community school program in agriculture, agribusiness, and environmental science that meets graduation outcomes and determines student needs.

AFEE 5114s. Agricultural Education Teaching Seminar (UMTC). (1 cr, every year)

AFEE 5116. Coordination of SAE Programs: Work-Based Learning (UMTC). (2 cr)
Principles/techniques for coordinating work-based learning and supervised agricultural experience (SAFE) in agricultural education. Roots of experiential learning integrated with classroom instruction and coordination.

AFEE 5118. Strategies for Managing and Advising the FFA Organization (UMTC). (2 cr)
Principles/techniques to advise an FFA chapter. Historical/philosophical basis of FFA, organization/structure. Integration with classroom instruction, public relations, recruitment, and administration of FFA chapters.

Agronomy (AGRO)

AGRO 1020s. Special Topics. (1-3 cr [max 6 cr], every year)
Identifying economically important crop/weed seeds throughout the United States.

AGRO 1030s. Crop and Weed Identification. (3 cr, every year)
Morphological characteristics used in mature plant, seedling, and seed identification. Identifying economically important crops and weeds throughout the United States in all stages of growth.

AGRO 1183s. Field Crops: Production Principles. (3 cr, every year)
Principles and cultural practices used in growing certain row crops, small grains, oil crops, and specialty crops.

AGRO 1540s. Seed Conditioning and Technology. (4 cr. Prereq-1030, every year)
Seed laws, certification standards, purity analysis, germination tests, vigor tests, principles of seed conditioning, handling equipment. Tours of facilities processing small grains, sunflowers, grasses, and legumes.

AGRO 1803s. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.

AGRO 2573f. Entomology. (3 cr = [NATR 2573]. Prereq-Agro 1183 or Hort 1010, every year)
Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

AGRO 2640f. Applied Agriculture Chemicals. (3 cr, every year)
Applied use of agriculture chemicals. Safety, toxicity, efficacy, phytotoxicity, recommendations, environmental interactions.

AGRO 2840s. Grain and Seed Evaluation. (4 cr. Prereq-1030, every year)
Analytical techniques, procedures, and practices in interpreting U.S. grain standards. Identifying seeds of crops, weeds, and diseases. Lab practice in grading grain according to U.S. standards and determining grain quality.

AGRO 3023f. Plant Breeding and Genetics. (4 cr. Prereq-BIOL 1009, even years)

AGRO 3038s. Research Techniques. (3 cr. Prereq-Jr or sr, every year)
Experimental design and methodology in plant science research. Basic philosophy, data interpretation and analysis, and application of research information to practical management situations.
AGRO 310f. Forages. (3 cr, even years)
Characterization, distribution, preservation, and uses of forage crops for pasture, silage, hay, and soil improvement. Cultural practices, disease and insect control, seed production, forage storage. Interrelationships between animals and plants as they relate to selection, production, and utilization of forage crops.
AGRO 323f. Introduction to Plant Pathology. (3 cr, Prereq-AGRO 1183 or Hort 1000, Biol 1009, every year)
Nature, diagnosis, and management of plant diseases. Identification, control, and life cycles of representative plant diseases significant in the Upper Midwest that illustrate plant pathology principles.
AGRO 344f.s. Topics in Specialty Crop Production. (1 cr [max 3 cr], Prereq-AGRO 1206, every year)
Lecture/discussion on one economically important or emerging specialty crop such as potato or sugar beet. Specific crop varies. Land selection, soil fertility, pest control, harvest, storage, quality, marketing.
AGRO 344f. Crop Production. (4 cr, Prereq-AGRO 1183, every year)
Principles, including best cultural practices for crops of particular economic importance to the region. Oilseed, small grain, and specialty crops.
AGRO 362f. Advanced Identification, Seed Analysis, and Grain Grading. (5 cr, Prereq-[AGRO 1030, 2850] or instructor consent, every year)
Advanced techniques in identification, seed analysis, and grain grading.
AGRO 363s. Integrated Crop Management (Capstone). (5 cr, Prereq-AGRO 1030, 1540, 2640, 3030, 3320, SOIL 3414, every year)
Capstone course. Students investigate, research, and study problems of agronomic crops and make recommendations. Students individually and in teams solve problems using scientific methods.
AGRO 364s. Weed Science. (3 cr, Prereq-[Biol 1009, CHEM 1401, SOIL 1093] or instructor consent, every year)
Mechanical, cultural, biological, and chemical weed control practices. Factors affecting control. Classification and modes of action of herbicides, insecticides, fungicides, and plant growth regulators.
AGRO 380f.s. Individual Studies. (1-3 cr [max 6 cr], Prereq-Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

Animal Science (ANSC)

ANSC 100f.s. Introduction to Animal Science. (4 cr, every year)
Survey of the meat animal, dairy, and equine industries. Emphasis on general management principles, health care, breeding, behavior, feeding, and care of dairy cattle, beef cattle, horses, sheep, and swine.
ANSC 103f. Introduction to Companion Animals. (3 cr, every year)
Companion animal industry. Emphasizes identification, general management principles, health care, breeding, behavior, feeding, and humane care of companion animals.
ANSC 110f. Animal Evaluation. (1 cr [max 3 cr], every year)
Conformation, breed characteristics, type, and their importance in evaluation. Techniques of evaluation and interpretation of evaluation data.
ANSC 120s. Advanced Animal Evaluation. (1 cr [max 3 cr], Prereq-110f, every year)
Advanced techniques in evaluating and selecting dairy or beef cattle, sheep, and swine. Preparing and delivering oral reasons.
ANSC 120sf. Beef and Dairy Production Techniques. (2 cr, every year)
Skills necessary for successful/economical beef and dairy production.
ANSC 120sf.s. Sheep and Swine Production Techniques. (2 cr, every year)
Skills necessary for successful/economical sheep/swine production.
ANSC 180f,s,su. Directed Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.
ANSC 2001. Artificial Insemination. (1 cr)
Anatomy, physiology, heat detection, hormone function/ synchronization, semen storage/handling, AI technique, record keeping, sire selection. Practical technical skills to run AI programs.
ANSC 210f.f. Feeds and Feeding. (4 cr, Prereq-[AGRO 1004, high school chem or Chem 1001, every year)
Identification and use of feed grains, forages, supplemental feeds, and additives. Bushel weights, price, and cost per unit calculations. Moisturecontent calculations. Factors influencing feed quality, feed value, price,and storage. Digestion, ration formulation, and feed processing methods.
ANSC 300f. Livestock Facilities and Environmental Systems. (Prereq-[ANSC 1205 or 1206, Math 1031, or instructor consent, every year]
ANSC 302f. Animal Breeding. (3 cr, every year)
Application of qualitative genetic principles to animal breeding. Introduction to quantitative genetics. Concepts of livestock improvements through breeding/selection systems.
ANSC 304f. Applied Animal Nutrition. (4 cr, Prereq-[AGRO 2104, Chem 1001 or 1401, every year)
Continuation of digestion/metabolism to include modifications/ control. Application of nutritional principles to economical feeding of different farm animal species. Nutrient requirements modifications due to weather, stress, feeding objectives, environment, and metabolic limitations. Computer formulation of rations.
ANSC 320f. Animal Anatomy and Physiology. (3 cr, Prereq-AGRO 1004, Biol 1009, every year)
Anatomy/physiology of several species. Organization of body from cells into tissues/organs. Identification, comparison, and contrast of different species. Growth development/function of selected bodily systems.
ANSC 320f. Dairy Production. (4 cr, Prereq-[AGRO 1205 or 1206, 2104, every year)
Growth/development of dairy cattle. Genetics/breeding, dairy nutrition, growth/development of heifer to first calving. Getting cows into production and their subsequent management, including milking management skills.
ANSC 320sf. Dairy Management Practicum. (3 cr, Prereq-[Sr or instructor consent, offered when feasible]
Management and clinical skills, including those unique to large dairy herds.
ANSC 330f. Beef Production. (3 cr, Prereq-[ANSC 1205 or 1206, 2104, every year)
Application of technology and information to systems of managing beef operations. Incorporation of economics, farm management, records, and production science in management plans. Computer applications in management.
ANSC 330f.s. Reproduction, AI, and Lactation. (4 cr, Prereq-330f, every year)
Functions of reproductive organs, fertilization, the estrous cycle and its endocrine control, reproductive efficiency and problems, principles of artificial insemination. Anatomy, physiology, and biochemistry of the mammary gland; mammary growth; initiation of and maintenance of lactation. Milk synthesis and factors influencing the lactation curve.
ANSC 344f.s. Current Topics in Animal Science. (1 cr, Prereq-[ANSC 1205, 2104, 330f or concurrent enrollment in 330f, every year)
Focus on one economically important or emerging topic in animal science (e.g., swine, sheep, companion animal). Lecture/discussion.
ANSC 350fs. Animal Health and Disease. (3 cr, Prereq-330f, every year)
Concepts of health and disease with emphasis on prevention through health plans and enhancing immunity. Influence of environment and other stressors on health and disease.
ANSC 380f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

Course Numbers
0xxxx Courses that do not carry credit toward any University degree.
1xxx Courses primarily for undergraduate students in their first year of study.
2xxx Courses primarily for undergraduate students in their second year of study.
3xxx Courses primarily for undergraduate students in their third year of study.
4xxx Courses primarily for undergraduate students in their fourth year of study.
5xxx Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Abbreviations
Letters following course numbers indicate what term(s) the course is taught:
f = fall semester
s = spring semester
m = May session
su = summer term

A notation following course prerequisites indicates whether the course is offered every year, or in even or odd years.

Abbreviations in parentheses following a course name indicate the university that offers the course:
BSU = Bemidji State University
NDSU = North Dakota State University
UMTC = University of Minnesota, Twin Cities
UND = University of North Dakota

Other Abbreviations
Prereq—course prerequisites
cr = credit
equiv. = equivalent
fr, soph, jr, sr = freshman, sophomore, junior, senior
= Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.
, ......In prerequisite listings, a comma means "and."

A prerequisite course listed by number only (e.g., prereq 3320) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.
ART 2000f. Elementary Art. (3 cr, every year)
How art can provide a means for children to develop their inherent creative abilities. Studio experience for putting methods into practice.

Aviation (AVIA)

AVIA 1103f. Introduction to Aviation. (4 cr, every year)
Preparation for FAA private pilot written exam. FAA regulations, weather, radio navigation, flight safety, emergency procedures.

AVIA 1104f,s. Introduction to Aviation Flight Lab. (1 cr Prereq–1105 or concurrent enrollment in 1103, every year)
Flight lab lessons leading to private pilot certificate. Flight lessons must be completed before private pilot certificate received before course credit is issued.

AVIA 1396f,s. Conv. Aircraft Operations. (1 cr Prereq–1103, 1104 or instructor consent, every year)
Ground school, dual flight instruction for endorsement for operation of tail wheel airplanes on ground, in flight.

AVIA 1803f,s. Directed Studies. (1-3 cr [max 6 cr], Prereq–Instructor consent, every year)
Current topics not covered in regularly offered courses.

AVIA 2220f. Basic Altitude Instrument Flying. (2 cr Prereq–1103, 1104, every year)
Operation, interpretation, and practical use of VOR, ADF, DME, RNAV, RMI, HIS, AND GPS systems. Instrument charts required for IFR flight.

AVIA 2221f. Basic Altitude Instrument Flying Lab. (1 cr Prereq–1103, 1104, every year)
Flight Lab associated with AVIA 2220. Flight by reference to instruments, including electronic navigation and instrument charts.

AVIA 2222s. IFR Regulations and Procedures. (2 cr Prereq–2220, 2221, every year)
Regulations, procedures, publications for operating IFR in national airspace system. Terminal/en route procedures.

AVIA 2223s. IFR Regulations and Procedures Flight Lab. (1 cr Prereq–2220, 2221, every year)
Flight lab associated with 2222. Instrument approach/departure procedures. Regulations/procedures associated with instrument flight operations. Upon completion of this course and 2221, the student is recommended to take FAA Instrument rating practical test.

AVIA 3320f. Airplane Aerodynamics. (2 cr Prereq–2222, 2223, every year)
Aerodynamics, performance, stability, control, weight/balance, special flight conditions as appropriate for commercial pilots. Commercial maneuvers, flight computers, commercial regulations.

AVIA 3321f. Airplane Aerodynamics Flight Lab. (1 cr Prereq–2222, 2223, every year)
Flight lab associated with 3320. Students train in a complex aircraft. Maneuvers/procedures required to complete FAA Commercial Pilot certificate. At completion of course, the student is endorsed for operation of a complex aircraft and recommended to take FAA Commercial practical test.

AVIA 3324s. Aircraft Systems and Instruments. (3 cr Prereq–1103, 1104 or instructor consent, every year)
Flight instruments, reciprocating engines. Propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems. Commercial regulations, including FAR parts 61, 91, 121, and 135.

AVIA 3355f,s. Multiengine Systems and Procedures. (2 cr Prereq–Instructor consent; offered on-demand, offered when feasible)

AVIA 3396f,s. Advanced Conv. Aircraft Operations (UND). (1 cr Prereq–1390, every year)
Ground school, dual flight instruction for advanced pilot maneuvering, flight applications of tail wheel airplanes. Students must complete flight lessons.
AVIA 3400f,s. Emergency Maneuver Training. (1 cr. Prereq—1103, 1104, 1396, every year)
Introduction: exploration of high-angle of attack flight. Emphasizes recognition/recovery from unusual attitudes, control failures, and in-flight emergencies.

AVIA 3415f,s. CFI Certification. (4 cr. Prereq.—[3320, 3321, 3324] or instructor consent, offered when feasible)
Preparation for FAA Certified Flight Instructor written tests. Flight instructor responsibilities, teaching concerns, effective teaching methods, learning process, flight training syllabi, effective evaluations. Offered on demand.

AVIA 3415f,s. CFI Certification Flight Lab. (1 cr. Prereq.—3412, offered when feasible)
Flight lab lessons leading to Certified Flight Instructor Certificate. Flight lessons must be completed or certificate received before course credit is issued.

AVIA 3415f,s. Instrument CFI Certification. (4 cr. Prereq.—3412, 3413; offered on demand, offered when feasible) Instrument flight instructor responsibilities and techniques. Additional study of instrument flight, ATC system, charts, publications, and rules of IFR environment they pertain to teaching. Practical teaching experience. Students must complete the instrument rating for a flight instructor certificate.

AVIA 3602s. Natural Resources and Enforcement Applications. (2 cr. odd years)
Mission specific knowledge/skills in natural resources and law enforcement aviation. History/purposes, authority, operations, safety, records, equipment and best practices for natural resources and law enforcement aviators.

AVIA 3804f,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq.—Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

Bachelor of Manufacturing (BM)

BM 3005f.s. Facilities Planning and Selection. (3 cr. Prereq.—[A35 3005], every year)
Planning facility design. Selecting materials/equipment used in manufacturing and production operations.

BM 3006. Maintenance and Safety Management. (3 cr. Prereq.—Math 1150)
Reliability, predictive techniques, non-destructive testing, equipment effectiveness, operator/employee education, maintenance project management, failure analysis, troubleshooting methods, workplace safety.

BM 3007s. Metrology. (3 cr. every year)
Instrument calibration, reading engineering standards, precision measurement, geometric dimensioning/tolerancing, graphical inspection analysis, measuring tools, surface plate inspection methods.

BM 3008f. Regulations and Compliance. (3 cr. every year)
Contributions by Demming, Juran, Ishikawa, Feigenbaum, maintenance project management, failure analysis, troubleshooting methods, workplace safety.

BM 3009. Quality Auditing Certification. (1 cr)
Key steps in audit process. Quality system audits, audit teams, conducting an audit, reporting, corrective action.

BM 3012f. Applied Engineering Principles. (3 cr. every year)
Overview of electrical systems, motors, lighting, floors, walls, drains, boilers, heat transfer systems, and hydraulic systems in manufacturing/food industry facilities.

BM 3020f,s. Industrial Safety. (3 cr. Prereq.—PMTC 2800 [Northwest Technical Colleges], offered when feasible)
Comprehensive approach to safety problems in the workplace, including OSHA standards, attitude development, safety auditing, and hazard analysis.

BM 3034f,s. Quality Management Systems. (3 cr. every year)

BM 3053f. Product Development Management. (3 cr. Prereq.—[AGBU 3053], every year)
Quality assurance aspects of development process. Methods to identify opportunities for improvement. Dynamic input from consumers via sales/marketing. Designing/manufacturing a product/service with quality parameters that consumers would purchase.

BM 3804f,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq.—Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

BM 3900f,su. Internship. (1-3 cr [max 3 cr]. Prereq.—Jr, every year)
Supervised professional work experience in manufacturing plant situations to help students gain an in-depth understanding of their field of study. Reports and consultations with faculty advisers and employers.

Biology (BIOL)

BIOL 1001f. Nature of Life. (1 cr. Prereq.—Biological major, every year)
Introduction to biology program, faculty, coursework, and expectations.

BIOL 1009f,su. General Biology. (4 cr. Prereq.—High school science courses, even year)

BIOL 1803f,su. Directed Studies for the Biological Sciences. (1-3 cr [max 12 cr]. Prereq.—Instructor permission, every year)
Participation in research for talented undergraduates with fewer than 30 credits.

BIOL 2012s. General Zoology. (4 cr. Prereq.—1009—1009, every year)
Major animal groups (phyla). Applications of morphological, physiological, and developmental characteristics to define evolutionary relationships. Parasitic forms affecting human welfare. Lab requires dissection, including mammals.

BIOL 2022f,s. General Botany. (3 cr. Prereq.—1009, every year)

BIOL 2032f. General Microbiology. (4 cr. Prereq.—Bio 1009 or 1464, Chem 1001 or 1021, every year)

BIOL 2103f. Human Anatomy and Physiology I. (4 cr. Prereq.—1009, every year)
Systems approach to anatomical structures and physiological functions of human body. Key concepts at chemical, cellular, tissue, and organ levels. Emphasizes special relationships of structures and their related functions within integumentary, skeletal, muscular, nervous and endocrine systems. Lab.

BIOL 2104s. Human Anatomy and Physiology II. (4 cr. Prereq.—1009, every year)

BIOL 3022s. Principles of Genetics. (3 cr. Prereq.—Bio 1009, Chem 1021 or 1401, Math 1031 or 1131 or 1150, even year)
Basic principles of Mendelian, molecular, and population genetics. Computer simulations/models used to study aberrations and their implications.

BIOL 3027f. Cell Biology. (3 cr. Prereq.—1009, [1401 or Chem 1021], every year)
Structure/function of prokaryotic/eukaryotic cells, including cell surface, membranes, organelles, cytoskeleton, cell growth, cell physiology, experimental methods used in cell studies. Lab includes contemporary cell biology research techniques, hypothesis testing, and communication of results.

Note: Courses listed in this catalog PDF are current as of June 2009.
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equiv............equivalent
fr, soph, jr, sr........freshman, sophomore, junior, senior

For students who do not need professional-level general chemistry. Atomic and molecular structure, inorganic nomenclature, balancing chemical equations.

CHEM 9921. Basic Chemistry. (0 cr. Prereq–[3 cr equiv]; High school algebra, every year)
Measurements, metric system. Atomic/molecular structure, nomenclature, balancing chemical equations.

CHEM 1001f.s. Introductory Chemistry. (4 cr. Prereq–High school algebra, high school chem, every year)
For students who do not need professional-level general chemistry. Atomic and molecular structure, inorganic nomenclature, balancing chemical equations, quantitative relationships, behavior of gases, phases of matter, solution chemistry, chemical dynamics, acid-base chemistry, oxidation-reduction process, nuclear processes, introduction to organic and biochemistry.

CHEM 1021f.s. Chemical Principles I. (4 cr. Prereq-Chem 1001, every year)

CHEM 1022s. Chemical Principles II. (4 cr. Prereq-Chem 1021 minimum C grade, every year)
Behavior of gases, thermodynamics, properties of solutions, solution equilibria, and oxidation/reduction reactions. Rigorous course: develops chemical foundations required in some agriculture, environmental, and preprofessional programs.

CHEM 1401f. Elementary Bioorganic Chemistry. (4 cr. Prereq–1001 or 1022, every year)
Organic chemistry as applied to important biochemical molecules.

CHEM 2301f. Organic Chemistry I. (3 cr. Prereq–1022, concurrent enrollment in 2310, every year)
Important classes of organic compounds, their structures/properties. Reaction between structure, reactivity, and properties. Spectroscopic characterization of organic molecules.

CHEM 2302s. Organic Chemistry II. (3 cr. Prereq–2301, concurrent enrollment in 2311, every year)
Reactions, synthesis, and characterization of organic compounds and biologically significant classes of organic compounds (lipids, carbohydrates, amino acids, proteins, nucleic acids).

CHEM 2310f. Organic Chemistry Laboratory I. (3 cr. Prereq–Concurrent enrollment in 2301, every year)
Lab techniques in synthesis, purification, and characterization of organic compounds.

CHEM 2311s. Organic Chemistry Laboratory II. (2 cr. Prereq–2310, concurrent enrollment in 2320, every year)
Lab techniques in synthesis, purification, and characterization of organic compounds.

CHEM 3021s. Biochemistry. (3 cr. Prereq–Bio1009, Chem 2301, every year)

CHEM 3022f. Analytical Chemistry and Spectroscopy. (4 cr. Prereq–2301, 2310, every year)
How to conduct research and analyze organic/inorganic chemicals for quality control or product/process development using techniques such as chromatography, spectroscopy, and spectrophotometry.

CHEM 3994f.s. Undergraduate Research in Chemistry. (1-3 cr [max 6 cr]. Prereq–2301, 2310, every year)
Laboratory techniques used in chemistry. Literature pertaining to field. Students write proposals for UROP/UROC grants.
Communication (COMM)

COMM 2225f,s,su. English Grammar and Usage. (3 cr. Prereq-Comp 1013, every year) Grammar, grammatical concepts. Analysis of processes and structural rules that describe how words combine with each other to form sentences. Practice in sentence diagramming.

COMM 2334f. Communication Topics. (3 cr. Prereq-Comm 1015, every year) Applying writing process to professional communication situations. Dissemination products containing text/visuals meeting professional community standards.


COMM 3000s. Communication Theory. (3 cr. Prereq-Comm 1013, Spch 1101, every year) Identifying, defining, synthesizing, applying, and critiquing communication theories. Focuses on relationship between theory/practice within interpersonal, group, organizational, and societal settings.

COMM 3001f. Communication in Human Relationships. (3 cr, every year) Anti-relational/relational communication, interpersonal/group processes, conflict management, collaboration, team building, and leadership.


COMM 3258s. Research Methods in Communication. (3 cr. Prereq-Comm 1013, Math 1150, Spch 1101, every year) Elements/methods of communication research. Use of quantitative/qualitative research methodologies, basic research design, and data collection methods to inform decision making within organizations.

COMM 3303f,s. Writing in Your Profession. (3 cr. Prereq-Comm 1011, 1013, every year) Writing about subjects related to students’ academic disciplines and future professions. Developing persuasive writing skills for academic, personal, and professional purposes. Effective communication principles, audiences, formats, and technologies.

COMM 3431f,s,su. Persuasion. (3 cr. Prereq-Spch 1101, every year) Persuasion in interpersonal, organizational, intra-/inter-cultural relationships. Contemporary persuasion with historical segments. Focuses on argumentative claims and how to analyze and respond coherently to them.

COMM 3537s. Visual Communication. (3 cr. Prereq-CA 1030, 1040, Comp 1013, Spch 1101, even years) Visual delivery of end-products in professional communication. Classical/contemporary theories of visual design. Designing visual delivery to reflect personal philosophy of communication. Integrating visual delivery system with text to meet professional/client standards.


COMM 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Jr or instructor consent, every year) Topic related to student’s major, not covered in regularly offered courses.

COMM 3855f,s. Topics in Communication. (3 cr. Prereq-Jr, every year) Current trends/practices in communication. Editing, training, event planning, political communication.

COMM 3900f,s,su. Internship. (3 cr [max 6 cr], every year) Internship sites may include a university, industry, or government agency. Internship proposal, progress report, and final report with letter from internship supervisor are required.

COMM 4703f. Communication Ethics. (3 cr. Prereq-Comm 1013, Spch 1101, every year) Literature pertaining to ethics in organizations. Relativism, subjectivism, objectivism, utilitarianism, Kantianism, virtue ethics, existentialism.

COMM 4704s. Organizational Communication. (3 cr. Prereq-Comm 3000, Comp 1013, Spch 1101, every year) Using communication processes to create/maintain organizations (e.g., meetings, employee assimilation, interpersonal relationships, decision making, leadership, etc.). Recognizing/identifying communication issues in organizations and applying organizational communication concepts, models, tools, and theories to resolve them.

COMM 4800f. Crisis Communication. (3 cr. Prereq-Comm 1013, Spch 1101, even years) Organizational crises, disasters, and emergency situations. Existing academic literature, everyday media literature. Focuses on appropriate communication strategies, written composition, and delivery of speeches.

COMM 4802s. Publication Design and Management. (3 cr. Prereq-CA 1030, 1040, Comp 1013, Spch 1101, even years) Applying project management principles to manage a publication from concept to final product. Design principles, desktop publishing software, audience analysis, usability testing, production. Using table presentations to communicate process and final product to clients/guests.

COMM 4900s. Public Relations. (3 cr. Prereq-Comm 1013, Spch 1101, every years) Overview of theory, practice, roles, and techniques used in public relations within organizations. Writing news releases, conducting news conferences, planning/implementing events, responding to challenging questions from audience members, and conducting public relations audit of an organization.

Composition (COMP)

COMP 1000f,s. College Writing Laboratory. (1 cr. Prereq-concurrent enrollment in 1011, every year) Supplemental instruction in writing. Small group activities, individual conferencing.

COMP 1011f,s. Composition I. (3 cr, every year) Process of clear, concrete, and convincing writing. Generation and discovery of subjects, revisions, editing.


COMP 1013f,s. Composition II. (3 cr. Prereq-1011, every year) Writing a research paper/s. Formulating/answering a research question. Developing an organizational/argument strategy for topic/audience. Supporting research question/argument with scholarly sources.

COMP 1013Hs. Honors: Composition II. (3 cr. Prereq-[1011 or 1011H], admittance to Honors Program, every year) Writing summaries, writing to synthesize material from several sources, evaluating readings and other materials, research writing.
Computer Applications (CA)

CA 1010f,s. Introduction to Computer Technology. (1 cr, every year)
Introduction to computer literacy, care of laptop, policies, e-mail and word processing essentials, PALs and portfolio development.

CA 1021f. Application Suite Software. (2 cr, every year)
Introduction to word processing, spreadsheet, and presentation graphics.

CA 105f,s,su. Word Processing and Publishing Applications. (3 cr, every year)
Creation, generation, and development of advanced/integrated word processing documents and publications such as legal briefs, medical records, marketing brochures, newsletters, and publishing-based Web sites.

CA 1020f,s. Spreadsheet Applications. (3 cr, every year)
Personal/presentation use of spreadsheets that include formulas, functions, what-if analysis, and charts. Focuses on applying spreadsheet applications to individual academic disciplines.

CA 104f,s,su. Web Site Development. (3 cr, every year)
Web site design. HTML/XML, scripting, graphics, Web services, user interface design.

CA 105f,s,su. Animation Software Applications. (3 cr, every year)
Fundamentals of animation applications. Students create animated page for Web sites and interactive learning components for gaming and E-learning.

CA 106f,s,su. Database Applications. (3 cr, every year)
Techniques for designing, developing, prototyping, creating, querying, reporting, and maintaining databases with MS Access.

CA 2190f,s,su. Topics in Computer Applications. (1-3 cr [max 3 cr], every year)
Topics related to advanced computer application certification, such as MOS, IC3, CompTIA, Linux, and Oracle.

Computer Software (CS)

CS 1500s. Discrete Structures I. (3 cr, every year)
Foundations of discrete mathematics as they apply to software engineering. Functions, relations, sets, simple proof techniques, boolean algebra, propositional logic, digital logic, elementary number theory, fundamentals of counting.

CS 1600f. Discrete Structures II. (3 cr, Prereq–3500, every year)
Predicate logic, recurrence relations, graphs, trees, matrices, computational complexity, elementary computability, discrete probability.

CS 2050f,s. Introduction to Programming I. (3 cr, Prereq–MATH 1031 or equiv of 2 yrs high school algebra or ACT score of 20, every year)
Structured/object oriented programming with current industry accepted languages. Data, selection, and iteration structures. Input/output operations, class definitions, interfaces, exception handling, inheritance, composition, polymorphism.

CS 2060f,s,su. Database Management Systems. (3 cr, every year)
Introduction to database design management/implementation. Data modeling, normalization, DML, DDL. Use of common DBMSs and modeling tools.

CS 2070s. Introduction to Programming II. (3 cr, Prereq–2050, every year)
Java programming language and development process. Objects, classes, packages, applets.

CS 2090f. Data Structures and Algorithms. (3 cr, every year)

CS 2100f. Microcomputer Systems Architecture. (3 cr, every year)
Computer organization/machine architecture. Overview of computer system organization. Digital logic level, register level, operating system program interface. May use assembly language of an available machine for programming assignments.

CS 2200f. Introduction to Software Engineering. (3 cr, Prereq–ITM 2050, 2060, every year)
Software development methodologies. Emphasizes object-oriented methodologies. Risk analysis, testing techniques/strategies, project management, architectural/user interface design, technical metrics for software.

CS 2300s. Software Construction. (3 cr, Prereq–2200, every year)
Low-level software design issues, including formal approaches.

CS 2400s. Software Engineering Approach to Human Computer Interaction. (3 cr, every year)
Topics relating to designing/evaluating user interfaces. Psychological background needed to understand people.

CS 2345f,s. XML. (3 cr. Prereq–2060, 2070, every year)
Students create well-formed XML documents, enforce rules through document type definitions/schemas, and manipulate XML documents through document object model and simple API for XML. Complementary technologies, including XSL, CSS, XPointer, XML, HTML, and CSS.

CS 3200f. Software Design and Architecture. (3 cr, Prereq–2200, every year)
Formal methods of software analysis/design. Requirement analysis, definition. Specification, including formal methods, prototyping. Design, including object/function oriented design.

CS 3300f. Software Quality Assurance and Testing. (3 cr, Prereq–2200, every year)
Software quality assurance. Reviews/inspections, testing, formal verification methods, process management/improvement, defect prevention.

CS 3400s. Software Requirements Analysis. (3 cr, Prereq–2200, every year)
Discovering/elicitng requirements, languages and models for representing requirements, analysis/validation techniques, specifying/measuring external qualities, requirements in agile processes, requirements change management.

CS 3700f,s. Software Project Management. (3 cr s[MGMT 4200], Prereq–2200, Mgmt 3200, offered when feasible)
Procedures, team leadership skills, and resource management using computer software. Application/evaluation involving identifying a project and carrying out all steps necessary to achieve satisfactory completion in a team environment.

CS 3820s. Gaming: Real-Time Systems. (3 cr. Prereq–3050, Math 1272, Phys 1102, every year)
Mathematical foundations/modeling techniques, mapping, anti-aliasing, real-time rendering, binary space partition trees, object control issues.

CS 3900f,s,su. Internship. (1 cr [max 6 cr], every year)
Students identify employment opportunities in the field.

CS 4500f. Senior Project I. (3 cr, Prereq–3500, every year)
First of a full year, individual project/research course. Students pursue projects or research (applied in nature), with a faculty adviser, within their area of specialization.

CS 4510f. Senior Project II. (3 cr, Prereq–4500, every year)
Second of a full year, individual project/research course. Students pursue projects or research (applied in nature), with a faculty adviser, within their area of specialization.

Criminal Justice (CRJS)

CRJS 1120s. Criminal Justice and Society (BSU). (4 cr, offered when feasible)
Philosophies, principles, social aspects that underlie formulation of law and administration of justice in the United States. Agencies that constitute the criminal justice system.

CRJS 1500f. Introduction to Criminal Justice. (4 cr, every year)
Analysis of criminal justice system. Focuses on police, courts, corrections, and notion of justice in American society.
CRJS 1803f,s,su. Directed Studies. (1-3 cr. [max 6 cr.]. Prereq: Instructor consent, every year) Current topics not covered in regularly offered courses.


CRJS 2400s. Introduction to Corrections. (3 cr. Prereq-1500, every year) Penology. History, philosophy, programs, policies, and problems associated with correctional practice. Topics include probation, prisons, jails, parole, community corrections, and alternative sanctions.


CRJS 2550s. Traffic Law. (2 cr. every year) Motor vehicle and traffic code. Private/commercial vehicle regulations. Licensing regulations.

CRJS 2560s. First Responder. (3 cr. every year) Care for traumatic accidents, injuries, and medical emergencies. Successful completion of course results in certification as first responder with Minnesota Emergency Medical Services Regulatory Board (EMSRB).

CRJS 3200f. Criminal Justice Statistics (BSU). (3 cr. offered when feasible) Application of analytical techniques to address criminal justice issues. Technical requirements for various statistical techniques, their interpretation.

CRJS 3202s. Criminal Justice Research Methods and Practicum (BSU). (3 cr. offered when feasible) Process of social scientific inquiry into criminal justice issues. Studies apply knowledge of statistical analysis while designing/implementing a research project.


CRJS 3306f. Correctional Process (BSU). (3 cr. Prereq-1120, offered when feasible) Corrections as major part of criminal justice system. Focuses on principles, assumptions, and processes pertaining to achieving correctional goals/objectives.


CRJS 3320f. Juvenile Delinquency and Justice (BSU). (3 cr. every year) Historical responses to delinquents, definition of delinquency, theories of correction, juvenile justice system.


CRJS 3345s. Criminal Justice Administration (BSU). (3 cr. Prereq-[3304, 3305] or 3306, offered when feasible) Principles of organization and management of criminal justice agencies. Line/nonline functions, personnel administration, planning, budgeting, goals, control.

CRJS 3350s. Criminal Justice Administration. (3 cr. every year) Application of leading administrative theories to problems of criminal justice system. Bureaucratic nature of American criminal justice system as complex organization.

CRJS 3358s. Criminal Law (BSU). (4 cr. every year) Concepts of criminal law and elements of criminal offenses, in Minnesota in particular. Crimes against persons, against property, against administration of justice. Case method is used to define contours of judicial interpretation of criminal law.


CRJS 3360s. Criminal Procedure (BSU). (3 cr. every year) Rights of criminally accused, primarily those in pre-trial stages of criminal process. Bill of Rights as it pertains to criminally accused.


CRJS 3435f. Institutional Corrections. (3 cr. every year) Function, structure, and operation of American adult/juvenile correctional institutions.


CRJS 3475s. Community Corrections. (3 cr. every year) Intervention strategies as alternatives to institutional corrections in sentencing adjudicated persons. Community corrections, parole, house arrest, restitution, community service. Development of intervention services in support of dispositions.


CRJS 3515s. Criminal Justice Ethics. (3 cr. every year) Ethical issues/dilemmas facing practitioners in criminal justice. Students' own ethical questions pertaining to their area of interest. Development of solutions to dilemmas they may encounter.

CRJS 3525f. Juvenile Justice and Delinquency. (3 cr. every year) Processing/treatment of juvenile offenders. Organization, operations, and goals of individuals, agencies, and institutions that work with offenders.

CRJS 3530f. Criminal Justice Diversity. (3 cr. every year) Dynamics of class, race, and gender as they intersect with crime/justice in the United States. How class, race, and gender separate/together influence criminal justice system. Reforms to reduce bias in crime control.


CRJS 3804f,s,su. Individual Studies. (1-3 cr. [max 6 cr.]. Prereq-Instructor's consent, every year) Topic related to student's major not covered in regularly offered courses.

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cr......credit
equiv......equivalent
freshman, sophomore, junior, senior =........Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.
......In prerequisite listings, a comma means "and."
A prerequisite course listed by number only (e.g., prereq 3322) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.
CRJS 3900F. Criminal Justice Field Placement (Internship). (3 cr. Prereq–Instructor consent, every year)
Observation, participation, and study in selected criminal justice agencies.

CRJS 4000F. Applied Ethics (BSU). (3 cr. Prereq–1120, every year)
Ethical issues in criminal justice. Ethical dilemmas facing practitioners in the field. Emphasizes students' own ethical questions pertaining to their area of interest in criminal justice and the development of solutions to dilemmas they may encounter.

CRJS 4103F. Criminal Justice Diversity (BSU). (3 cr, every year)
Dynamics of class, race, and gender as they intersect with social realities of crime/juice in the U.S. How class, race, and gender operate separately and in combination to influence the criminal justice system. Reforms to reduce bias in crime control.

CRJS 4110S. Criminal Justice Research Methods and Statistics. (4 cr. Prereq–1500, MATH 1150, every year)

CRJS 4315F. Women and Crime. (3 cr, every year)
Historical/theoretical perspectives and contemporary trends concerning women and crime. Processing of women by criminal justice system. Women as criminal justice professionals.

CRJS 4390S. Special Topics in Criminal Justice. (1-3 cr. [max 6 cr, every year])
Independent investigation of topics of special interest related to criminal justice. Topics vary to reflect contemporary criminal justice issues.

CRJS 4435S. Theories of Punishment. (3 cr, every year)
Philosophical issues associated with criminal punishment.

CRJS 4481S. Police and Community Relations (BSU). (4 cr. Prereq–1120, 3504, every year)
Addresses several Minnesota Board of Police Officer Standards and Training learning objectives: victimization, dealing with the mentally disturbed, police/minority relations, police/community relations.

CRJS 4510F. Victimization. (3 cr, every year)
Criminological examination of victims. Victims' reactions. Responses by criminal justice system and other societal agencies.

CRJS 4540F. Criminal Law. (4 cr, every year)

CRJS 4550S. Criminal Procedure. (4 cr, every year)

CRJS 4920S. Senior Seminar (BSU). (3 cr. Prereq–Sr or instructor consent, every year)

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Early Childhood Education (ECE)

All 3xxx and 4xxx courses are restricted to students who have been admitted to and retained in the teacher education licensure program in the early childhood education degree program.

ECE 2100F. Child Development and Learning. (5 cr, every year)
Child development/learning from prenatal through eight years of age. Emphasizes major developmental domains/learning: physical (including health practice), cognitive, language, emotional, social (including cultural), and creative. Assessment of development/learning. Field experiences in child observation/assessment.

ECE 2300F. Introduction to Early Childhood Education. (3 cr. Prereq–Completion of Pre-Professional Skills Test [PPST]; Minimum GPA of 2.5, every year)
Philosophical, historical, pedagogical, societal, institutional foundations of infant/toddler, preprimary, primary grade education. Efforts of modern programs to adapt instruction to developmental levels and experience backgrounds of young children and to work in partnership with parents. Field experience.

ECE 3410S. Learning Environments for Infants and Toddlers. (4 cr. Prereq–2100, Ed 3110, minimum GPA of 2.5, every year)
Designing, organizing, and maintaining learning environment. Arrangement of physical setting, provision of materials, construction of curriculum, implementation of learning experiences. Assessment of child’s learning and of teaching/learning environment. Field Experiences.

ECE 3420S. Nurturing and Collaborative Relationships for Infants and Toddlers. (3 cr. Prereq–2100, every year)
Principles of caregiving. Relationship to teaching/learning environment. Developmentally appropriate guidance, collaborative parent/staff relationships, respecting family/cultural values/experiences.

ECE 3672S. Promoting Children’s Physical Health. (2 cr. Prereq–ED 3100, every year)
Establishing healthy and safe learning environments. Procedures/practices for optimum health, safety and nutrition. Introduction to curriculum resources.

ECE 3804F, S. Individual Studies. (1-3 cr. [max 6 cr. Prereq–Jr, instructor consent, every year)
Topic related to student’s major and not covered in regularly offered courses.

ECE 3901F. The Professional Teacher I. (5 cr. Prereq–GPA of at least 2.50, every year)
Role of student teacher in planning for full-time teaching. Orientation to student teaching handbook with related assignments. Development of standards based student teaching notebook.

ECE 3902F. The Professional Teacher II. (5 cr. Prereq–3901, every year)
Completion/evaluation of professional standards-based portfolio, teacher licensure application. Taken concurrently with last student teaching experience.

ECE 4404F, S. Infant and Toddler Student Teaching. (6 cr. Prereq–3410, 3420, 4750, 3901, minimum GPA of 2.5, every year)
Students integrate theory/practice as member of teaching team with placement in infant or toddler classroom. Portfolio-based student-teaching experience. Focuses on selected INTASC/BOT indicators. University approved placement.

ECE 4500F. Young Children With Special Needs. (3 cr. Prereq–3410, 4700, Ed 3201, minimum GPA of 2.5, every year)
Introduction to teaching young children with special needs. Important aspects of teaching in special-education/inclusive settings. Students interrelate experiences working with children with developing an educational philosophy.
Education (ED)

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Course Descriptions

Educational and Human Development (EDHD)

The following courses are required for the undergraduate agricultural education major: This major is a collaborative agreement with the University of Minnesota, Twin Cities, which offers these courses via ITV.

EDHD 5001s. Learning, Cognition, and Assessment in the Schools (UMTC). (3 cr, offered when feasible)

Learning, cognitive development, classroom management, motivation, instruction, assessment. Behaviorism, cognitive/social constructivism, human information processing theory. Intelligence, knowledge acquisition, reasoning, scholastic achievement, standardized testing, reliability, validity, evaluation, performance assessment, portfolios, demonstrations. Applications to instruction/organization of curricular materials.

EDHD 5005s. Developmental and Individual Differences in Educational Contexts (UMTC). (3 cr, every year)


EDHD 5005s. School and Society (UMTC). (2 cr, every year)

Readings in history, philosophy, social sciences, law that reveal current educational values in pluralistic society. Multiple expectations of schools. Civil liberties, rights, community. Varying cultural background of students, family circumstances, exceptional needs.

EDHD 5009. Technology for Teaching and Learning (UMTC). (1.5 cr, every year)

Diverse educational technology in K-12 classrooms. Effective use of technology. Computer technologies to stimulate personal productivity/communication, enhance teaching/learning processes.

EDHD 5009s. Human Relations: Applied Skills for School and Society (UMTC). (3 cr, every year)

Issues of prejudice/discrimination in terms of history, power, social perception. Knowledge/skills acquisition in cooperative learning, multicultural education, group dynamics, social influence, leadership, judgment, decision making, prejudice reduction, conflict resolution, teaching in diverse educational settings.

Educational Policy and Administration (EDPA)

The following course is required for the undergraduate agricultural education major: This major is a collaborative agreement with the University of Minnesota, Twin Cities, which offers this course via ITV.

EDPA 5341f. American Middle School (UMTC). (3 cr, every year)

Uniqueness of the early adolescent. Appropriate learning situations for educators working with middle-level students.

English as a Second Language (ESL)

ESL 101f,s,su. High-Beginning ESL Writing. (0 cr, Prereq: IBT score of at least 32 or permission of ESL coordinator, every year)

Sentence composition, paragrap development. Sentence/paragraph structures, topic sentence, supporting/concluding sentences. Types of paragraphs (definition, descriptive, opinion, narrative, etc.).

ESL 131f,s. High-Beginning ESL Reading and Vocabulary. (0 cr, Prereq: IBT score of at least 32 or permission of ESL coordinator, every year)

Sentence/paragraph reading comprehension, active vocabulary building through contexts. Analysis of sentence structures. Identification of topic, main idea, and supporting details. Unity/coherence through transitions, words, and ideas.

ESL 201f,s. Intermediate English Grammar. (0 cr, Prereq: 101 or permission of ESL coordinator, every year)


ESL 211f,s. Intermediate ESL Speaking and Listening. (0 cr, Prereq: 111 or permission of ESL coordinator, every year)


ESL 231f,s. Intermediate ESL Writing. (0 cr, Prereq: 121 or permission of ESL coordinator, every year)


ESL 231f,s. Intermediate ESL Reading and Vocabulary. (0 cr, Prereq: 131 or permission of ESL coordinator, every year)

Strategic reading comprehension skills (e.g., finding main ideas, supporting materials, making inferences, summarizing, using context) of short essays. Active vocabulary building through context/etymology.

ESL 301f,s. High-Intermediate English Grammar. (0 cr, Prereq: 201 or permission of ESL coordinator, every year)


ESL 311f,s. High-Intermediate ESL Speaking and Listening. (0 cr, Prereq: 231 or permission of ESL coordinator, every year)

Note-taking skills. Comprehension of long lectures. Practice of communicative skills necessary for debates, group discussions, and public presentations.

ESL 311f,s. High-Intermediate ESL Writing. (0 cr, Prereq: 221 or permission of ESL coordinator, every year)


ESL 331f,s. High-Intermediate ESL Reading and Vocabulary. (0 cr, Prereq: 231 or permission of ESL coordinator, every year)

Critical reading skills. Speed reading. Vocabulary building for academic disciplines. Practice in strategic reading comprehension skills.

Entrepreneurship (ENTR)

ENTR 2200f,s. Introduction to Entrepreneurship and Small Business. (3 cr, every year)

Entrepreneurship and the economy. Traits/skills of entrepreneurs, opportunities in entrepreneurship, legal forms of business establishment, self-analysis/fitness for entrepreneurship.

ENTR 3200f, Business Plan Development. (1 cr. [AGEC 4760]. Prereq: Mgmt 3100, 3200, Mkgt 3300, every year)

Business start-up/development phase. Planning related to opportunity recognition, product development, marketing, and financing. Students research/write a basic business plan.

ENTR 3400s. Entrepreneurial and Small Business Finance. (3 cr, Prereq: 3200, every year)

Start-up/expansion financing, requirements for economic development groups. SBA loan guarantees, venture capitalists, small business valuation techniques. Cessation, related tax planning strategies.

ENTR 4200f. Field Studies in Entrepreneurship and Small Business. (3 cr. Prereq—3200, 3400, every year) Students, in tandem with faculty adviser, consult with local small business or entrepreneurs to solve problems or capitalize on new opportunities. Guest speakers provide insight on philosophies/practices.

ENTR 4800s. Entrepreneurship and Small Business Strategies. (3 cr. Prereq—3200, 3400, every year) Capstone course. Students prepare/present comprehensive business plan for entrepreneurial venture, including comprehensive financials, marketing plan, business formation and management plan, and growth strategy.

Equine Science (EQSC)

EQSC 1000s. Light Horse Driving. (2 cr, every year) Types of driving vehicles and harness, including fine harness, heavy harness, and competitive driving. Hitching/driving the fine harness horse. Techniques for training the fine harness horse to drive. Negotiating obstacles while driving.

EQSC 1002f. Equine Careers and Husbandry Practices. (1 cr, every year) Technical knowledge and practical experience needed for where students want to be in that industry.

EQSC 1100f,s. Western Equitation. (3 cr, every year) Grooming, handling, safety, identification of equipment, saddling, mounting, correct body position (equitation), cues and their proper use, various riding techniques. Focus on developing proper equitation skills and techniques for riding and showing.

EQSC 1200f,s. Hunt Seat & Dressage Equitation. (3 cr, every year) Developing hunt seat skills and techniques, including how to ride a course of jumps. “Centered riding” techniques. Basic dressage maneuvers and riding lower-level dressage tests.

EQSC 1202s. Equine Evaluation. (2 cr, every year) Conformation, breed characteristics, and type and their importance in evaluation. Performance evaluation, criteria, and scoring methods. Preparation and delivery of oral reasons.

EQSC 1300f. Saddle Seat Equitation. (3 cr. Prereq—1100 or 1200 or instructor consent, every year) Saddling, mounting, seat/hands, other saddle seat techniques. Developing equitation skills for saddle seat riding/showing.

EQSC 1803f,s,su. Directed Studies. (1-3 cr max 6 cr, Prereq—Instructor consent, every year) Current topics not covered in regularly offered courses.

EQSC 2001s. Concepts in Dressage Equitation. (3 cr. Prereq—1200 or instructor consent, every year) Developing a balanced, classical seat for riding. Dressage techniques, riding a test, collection, advanced maneuvers. Refining skills to develop a supple, obedient horse.


EQSC 2153f,s. Riding Instructor Training. (2 cr. Prereq—Any two of the following: EqSc 1100, EqSc 1200, EqSc 1300, every year) Formulating lesson plans. Teaching methods for individuals or group. Safety, insurance, liability, management. Student’s teaching methods are evaluated.


EQSC 3300s. Equine Reproductive Techniques. (3 cr. Prereq—2101, AnSc 3203, 3304 or instructor consent, every year) Breeding management practices/techniques. Gestation, fetal development, endocrinology, estrus manipulation, artificial insemination, embryo transfer, cooled and cryopreservation of semen. Lab emphasizes skills required in equine industry. Lecture emphasizes reproductive theory.

EQSC 3400s. Equine Exercise Physiology. (3 cr. Prereq—AnSc 3203, EqSc 3102, every year) Skeletal, muscular, cardiovascular, and regulatory systems of the horse. Effect of work-related stress (mental and physical) using physiological measures and how the systems relate to one another; how various types of conditioning can affect the systems separately and as a whole.

EQSC 3413f,s. Horse Training and Showing. (3 cr max 6 cr, Prereq—6 crs of equitation courses from 1100, 1200, 1300, 3441, 3442, 3443, 3472 or concurrent enrollment in 3412), every year) Work with untrained young horse or older show horse to correct problems or maintain the horse.

EQSC 3441s. Topics in Advanced Western Equitation. (3 cr. Prereq—1100 or instructor consent, every year) Experience in reining maneuvers. Students refine skills.

EQSC 3443f. Topics in Advanced Equitation Over Fences. (3 cr. Prereq—1200 or instructor consent, every year) Experience in riding more challenging course of jumps.

EQSC 3500f,s,su. Individual Studies. (1-3 cr max 6 cr) Prereq—Jr, instructor consent, every year) Topic related to student’s major not covered in regularly offered courses.

EQSC 4102s. Equine Management. (3 cr. Prereq—Econ 1101, every year) Fundamentals of horse management. Record keeping (traditional, computer based). Marketing, sales techniques. Legal aspects (e.g., contracts, zoning, liability, insurance). Management project that involves establishing, maintaining, improving an equine business.

Food Science and Nutrition (FSCN)

FSCN 1123f,s,su. Fundamentals of Nutrition. (3 cr, every year) Fundamentals of nutrition and metabolism, including the nutrients: carbohydrates, proteins, fats, minerals, vitamins, and water. Assessment of health risks, health promotion, and disease prevention.

FSCN 1273f. Medical Nutrition Therapy. (4 cr, every year) Modifying diet in disease. Calculating diets for common conditions (e.g., hypertension, obesity, diabetes, diverticular disease). Measuring/calculating body composition.

FSCN 1313f,s,su. Life Cycle Nutrition. (3 cr. Prereq—FSCN 1123, every year) Influence of age, growth, and normal development on nutritional requirements.

FSCN 1654s. Nutritional Care: Practices and Procedures. (3 cr, every year) Application of nutritional practices and procedures in health care facilities, including medical terminology, medical charting, and diet histories. State and federal guidelines and regulations.

FSCN 1803f,s,su. Directed Studies. (1-3 cr max 6 cr, Prereq—Instructor consent, every year) Current topics not covered in regularly offered courses.

FSCN 1999f,s. Dietetic Practicum. (1-3 cr max 6 cr) Supervised experience in various health care and nutrition settings. Application of classroom theories to actual operations.

Note: Courses listed in this catalog PDF are current as of June 2009.

Course Numbers

0xxxx Courses that do not carry credit toward any University degree.

1xxxx Courses primarily for undergraduate students in their first year of study.

2xxxx Courses primarily for undergraduate students in their second year of study.

3xxxx Courses primarily for undergraduate students in their third year of study.

4xxxx Courses primarily for undergraduate students in their fourth year of study.

5xxxx Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Abbreviations

Letters following course numbers indicate what term(s) the course is taught:

f = fall semester
s = spring semester
m = May session
su = summer term

A notation following course prerequisites indicates whether the course is offered every year, or in even or odd years.

Abbreviations in parentheses following a course name indicate the university that offers the course:

BSU = Bemidji State University
NDSU = North Dakota State University
UMTC = University of Minnesota, Twin Cities
UND = University of North Dakota

Other Abbreviations

Prereq course prerequisites cr credit
equiv. = equivalent
fr, soph, jr, sr = freshman, sophomore, junior, senior
 cheated = Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.

A prerequisite course listed by number only (e.g., prereq 3322) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.
Course Descriptions

Course Numbers
0xxx...... Courses that do not carry credit toward any University degree.
1xxx...... Courses primarily for undergraduate students in their first year of study.
2xxx...... Courses primarily for undergraduate students in their second year of study.
3xxx...... Courses primarily for undergraduate students in their third year of study.
4xxx...... Courses primarily for undergraduate students in their fourth year of study.
5xxx...... Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

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Other Abbreviations
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cr......credit
equiv......equivalent
fr, soph, jr, sr......freshman, sophomore, junior, senior
=......Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.

In prerequisite listings, a comma means “and.”
A prerequisite course listed by number only (e.g., prereq 3322) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.

FSCN 3211f. Professional Issues in Dietetics. (1 cr, every year)
Food nutrition laws and policies and current issues in health care legislation. Students review research in dietetics and make presentations to groups.

FSCN 3310s. Elements of Food Science. (3 cr, every year)
Food properties and changes caused by heat, cold, and mechanical and chemical processes used in food preparation. Composition of food and effects of cooking on food. Functions of specific ingredients in recipes.

FSCN 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

FSCN 3900f,s,su. Internship. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Undergraduate students in their third or fourth year may enroll in such courses.

General Agriculture (GNAG)

GNAG 1012f. Introduction to Applied Agricultural Chemistry. (2 cr, Prereq-CHEM 1001 or [concurrent enrollment in CHEM 1001, instructor consent], every year)
Common chemical processes, their application to production agriculture. Application of pH in soil/seed systems. Dilution principles, units of weights/measure. Basic applied theories used in agriculture.

GNAG 1805f,s,su. Directed Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.

GNAG 2899f. Pre-Internship Seminar. (.5 cr, every year)
Expectations/responsibilities of internships. Preparing for a job search. Presentations about internship experiences from those who have recently completed 3900. Discussions between students, staff, and invited guests.

GNAG 3203s,su. Ag Products and Processing. (3 cr, Prereq-Jr, every year)
Survey of raw agricultural products produced in the Upper Midwest, transport, processing, packaging, wholesale and retail distribution and sales. Quality factors, food laws and regulations, sanitation, food safety, and environmental concerns.

GNAG 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

GNAG 3899f. Pre-Internship Seminar. (.5 cr, every year)
Expectations/responsibilities of internships. Preparing for a job search. Presentations about internship experiences from those who have recently completed 3900. Discussions between students, staff, and invited guests.

GNAG 3900f,s,su. Internship. (1-4 cr [max 4 cr], Prereq-GNAG 2899 or 3899, soph or sr, every year)
Supervised professional work experience in agricultural business, governmental agency. Report/consultation with faculty adviser/employer.

GNAG 3901f. Post Internship Seminar. (.5 cr, Prereq-GNAG 3900, every year)
Student who have recently completed internships prepare/deliver a PowerPoint presentation of experience/knowledge gained. Discussions between post/pre-internship students, staff, and invited guests.

GNED 1001f,s. Effective Reading for a Changing World. (2 cr, every year)
Recommended for first semester on campus, every year)
Current topics not covered in regularly offered courses.

GBUS 1981s. Internship Seminar. (1 cr, every year)
Current topics not covered in regularly offered courses.

GBUS 1981s. Internship Seminar. (1 cr, every year)
Assists students in transition from high school to college-level academics. Interactive environment. Knowledge and strategy skills for academic success.

GBUS 1000f,s. Seminar for New Students. (2 cr, Prereq-Recommended for first semester on campus, every year)
Assists students in transition from high school to college-level academics. Interactive environment. Knowledge and strategy skills for academic success.

GBUS 3107f,s. Legal Environment in Business. (3 cr, every year)
Fundamental concepts of business law, with emphasis on the legal system, contracts, bailments, agency, business organizations, and the fundamentals of commercial law.

GBUS 3900f,s,su. Topics in Business. (1-3 cr [max 6 cr], every year)
May include varied emerging topics in business.

GBUS 3500f,s,su. Business Ethics. (3 cr, every year)

GBUS 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

General Education (GNED)

GNED 1000f,s. Seminar for New Students. (2 cr, Prereq-Recommended for first semester on campus, every year)
Current topics not covered in regularly offered courses.

GNED 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.

GNED 1001f,s. Effective Reading for a Changing World. (2 cr, every year)
Developing comprehension/study strategies for reading college texts and related materials.

GNED 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.

GNED 1900f,s. Chancellor’s Academic Success Seminar. (1-3 cr, every year)
Comprehensive study program to help strengthen learning skills. Includes some monitoring of contract requirements.

GNED 3000osu. Global Seminar. (1-3 cr [max 6 cr], every year)
Experiential learning approach to a specific culture and its current local/global issues. In-depth experiences in a discipline area of student’s choice. Required international travel for one to three weeks, led by a faculty member.

GNED 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

GNED 3804f,s. Teaching and Learning Assistance. (1 cr [max 4 cr], Prereq-Instructor consent, minimum GPA 3.00 in subject matter, offered when feasible)
Skills/techniques in disciplinary content associated with college teaching. Supervised by faculty monitor and site supervisor.
Geography (GEOG)

GEOG 1104.f,s. World Regional Geography. (3 cr, every year)
Theme of socioeconomic development, broadly defined, used to organize and present a variety of geographic concepts in relationship to selected major regions of the world. By using a geographic perspective in the study of cultures, development, and human-environment interaction, the course concerns itself with who has what, where, and how.

Geology (GEOL)

GEOL 1001.f,s. Introductory Geology. (3 cr, every year)
Survey of Earth, including its composition, structure, and dynamics; internal and surface processes related to theories of sea floor and continental movement; summary of geological history and development of life.

Health (HLTH)

HLTH 1026.f,a. First Aid and CPR. (2 cr, every year)
American Red Cross course that follows guidelines set by the ARC and UMC for certification and grading. Prepares students to carry out the Emergency Action Principles and grants certification in Responding to Emergencies (an inclusive first aid and CPR course) if the ARC standards are successfully met.

HLTH 1076.f. Wellness. (3 cr, every year)
Students develop a personal wellness plan.

Health Science (HSCI)

HSCI 3804.f,s,su. Individual Studies. (1-3 cr [max 3 cr], every year)
Individualized study, related to student’s interest, in health care topic not covered in regular courses.

HSCI 3899.f,s,su. Pre-Internship Seminar. (.5 cr, every year)
Expectations/responsibilities of internship. Preparing for a job search. Presentations about internship experiences by those who have recently completed 3900 (internship). Discussions between students, staff, and invited guests.

HSCI 3900.f,s,su. Internship. (1-2 cr [max 2 cr], every year)
Supervised professional work experience in health care facility. Report consultation with faculty adviser/employer.

HSCI 3901.f,s,su. Post-Internship Seminar. (.5 cr, every year)
Prereq-3900, every year)
Students who have recently completed internships prepare/deliver a PowerPoint presentation of experience/knowledge gained. Discussions between post/pre-internship students, staff, and invited guests.

Health Systems Management (HSM)

HSM 1010s. Medical Terminology. (2 cr, every year)
Prefixes, suffixes, and roots used to compose medical terms. Pronouncing and defining terminology related to body structure, disease, diagnosis, and treatment.

HSM 1803.f,s,su. Directed Studies. (1-3 cr [max 6 cr], Prereq-Instructor consent, every year)
Current topics not covered in regularly offered courses.

HSM 2001. Introduction to Health Services Organizations. (2 cr, every year)

HSM 3020s. Quality Improvement and Risk Management. (4 cr, Prereq-3100, 3200, offered when feasible)
Quality assessment activities in health care facilities. Emphasizes case management, utilization review, patient care evaluation, risk management activities. Methodologies/strategies, including quantitative/qualitative analysis of data. Students generate or update a quality assurance plan.

HSM 3030s. Health Care and Medical Needs. (2 cr, Prereq-HSM 1010; Biol 1642, offered when feasible)
Common health conditions, diseases, disabilities. Intervention/treatment issues. Health care and medical needs across age continuum. Medical/Pharmacologic terminology.

HSM 3100s.f,s. Essentials of Managed Care. (5 cr, Prereq-HSM 2010, offered when feasible)
Major economic forces affecting U.S. health care delivery system. Methods for addressing access, cost, and quality. Types of managed care organizations, management control and governance structures, closed and open panels, contracting and reimbursement, carve outs, special market segments; Medicaid, Medicare, rural, urban populations.

HSM 3130s,su. Health Management Information Systems. (3 cr, Prereq-ITM 1010, every year)
Data accumulation, storage, integration, manipulation, and presentation. Strategic uses of data. Information access/security, their relation to patient confidentiality.

HSM 3200.f. Health Care Leadership and Planning. (4 cr, Prereq-2010, every year)
Organizational management characteristics for modern health care settings. Management process/roles addressing resource allocation, delivery of clinical services, governance, patient satisfaction, and outcome evaluation.

HSM 3250s.f,s. Administration of Continuum Care Facilities. (3 cr, every year)
Programs/services to meet the needs of an aging population. Physical, social, and psychological aspects of aging. Role, organization, function, and management characteristics of long-term health care facilities. Administrative structures, staffing, and changing work force. Governance, operations oversight.

HSM 3340s.f. Health Care Policy and Comparative Systems. (3 cr, offered when feasible)
Analysis/comparison of world health problems and delivery systems. Geographic, political, and economic relationships affecting health care systems.

HSM 3804.f,s,su. Individual Studies. (1-3 cr [max 6 cr], Prereq-Jr instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

HSM 3900.f,s,su. Internship. (1-3 cr [max 3 cr], Prereq-3200, 3230, 4210, 4212, instructor consent, internship plan approved by HSM program director; may be repeated in different health care setting, every year)
Ten-week field experience under direction of a faculty member and invited guests.

HSM 4010s. Health Care Finance. (3 cr, Prereq-Acct 2100, Acct 2102, every year)
Finance structure of U.S. health care system. Reimbursement, carve outs, special market segments; Medicaid, Medicare, rural, urban populations.

HSM 4210.s. Health Policy and Biomedical Ethics. (4 cr, Prereq-3200, offered when feasible)

HSM 4212.f,s,su. Regulatory Management. (3 cr, Prereq-3200, offered when feasible)
Health care funding/reimbursement processes. Compliance/regulatory mechanisms. Federal/state surveys.

History (HIST)

HIST 1011s. World Civilization I. (3 cr, every year)
Ancient Near East, Greece, Egypt, Rome, and Medieval Europe.

HIST 1022s. World Civilization II. (3 cr, every year)
Renaissance and Modern Europe from Reformation to present.

HIST 1301f. American History I. (3 cr, every year)
Colonial era and early national period from the Revolution through the Civil War and Reconstruction.

HIST 1302f. American History II. (3 cr, every year)
Gilded Age to present with emphasis on foreign involvements and wars, New Deal, civil rights, and economic developments.
Course Descriptions

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3xxx ....... Courses primarily for undergraduate students in their third year of study.
4xxx ....... Courses primarily for undergraduate students in their fourth year of study.
5xxx ....... Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Abbreviations
Letters following course numbers indicate what term(s) the course is taught:
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s............spring semester
su...........summer term

A notation following course prerequisites indicates whether the course is offered every year, or in even or odd years.
Abbreviations in parentheses following a course name indicate the university that offers the course:
BU..............Bemidji State University
DSU..............North Dakota State University
UMTC...........University of Minnesota, Twin Cities
UND..............University of North Dakota

Other Abbreviations
Prereq........course prerequisites
cr............credit
equiv.........equivalent
fr, soph, jr, sr....freshman, sophomore, junior, senior
=..............Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.

A prerequisite course listed by number only (e.g., prerequisite 3322) is in the same department as the course being described.
Courses beginning with 0 cannot be used for credit toward graduation or transfer.

HIST 3054f.s. Topics in History. (3 cr [max 6 cr], offered when feasible)
Topics of regional, national, or international importance, such as Minnesota history, U.S. Civil War, Japanese history.

Honors (HON)
HON 1010f. Honors Symposium. (2 cr. Prereq–Admitted to honors, every year)
Independent thinking, writing, discussion, leadership, research skills. Foundation for honors program. Topics vary by faculty/student interests. Global perspective.

HON 3030f,s,au. Honors Contract. (1 cr [max 6 cr]. Prereq–1010, every year)
Students work with faculty sponsor to organize other students into a group that discusses a common reading. Students are encouraged to take advantage of colloquia offered on campus.

HON 4010f. Proposal for Honors Essay, Research, or Creative Project. (1 cr. Prereq–1010, consent of [project adviser, director of honors], every year)
Frequent meetings with academic advisor and director of honors to develop honors project proposal to fulfill final honors program requirements.

HON 4030f,s,au. Honors Essay, Research, or Creative Project. (3 cr [max 6 cr]. Prereq–4010, approval of [departmental advisor, director of honors], every year)
Guides student through process of research/preparation of documentation for dissemination at public defense. Discipline-specific work supervised by advisor to develop an original essay, research, or creative project.

Horticulture (HORT)
HORT 1010f.s. Introduction to Horticulture. (3 cr, every year)
Environmental considerations, planting, propagation, pruning, and protection of horticultural crops. Greenhouse/field experience.

HORT 1021f. Woody Plant Materials. (4 cr. Prereq–1010 or instructor consent, every year)
Identification, ecology, and use of deciduous and evergreen trees, shrubs, and vines.

HORT 1025f. Introduction to Arboriculture. (2 cr, even years)
Applications in arboriculture. Tree biology, tree/soil/water relations, planting, pruning, worker safety, trees/urban interfaces, electrical hazards, plant health care, golf course tree maintenance. Climbing/felling techniques.

HORT 1091f. Indoor Flowering and Foliage Plants. (2 cr, odd years)
Identification, culture, and propagation of foliage plants used in interior decoration.

HORT 1092s. Floral Design. (2 cr, every year)
Principles for design related to floral arrangement, identification, use, and care of cut flowers common to florist industry.

HORT 1803f,s. Directed Studies. (1-3 cr [max 6 cr], every year)
Topics not covered in regularly offered courses.

HORT 2025f. Applications in Arboriculture. (3 cr. Prereq–1025, every year)

HORT 3030s. Landscape Design. (4 cr. Prereq–1021, every year)
Application of aesthetic, environmental, and functional design principles to creative planning/development of residential/commercial landscapes. Emphasizes low impact and sustainability.

HORT 3031f. Herbaceous Perennial Plant Materials. (2 cr [max 6 cr], every year)
Identification, classification, ecology, and landscape uses of perennial flowers, bulbs, ground covers, and wildflowers.

HORT 3033f. Commercial Floriculture Crops-Fall. (4 cr.
Prereq–1010, every year)
Identification and culture of holiday pot plants and major cut flower crops. Soil preparation, artificial mixes, soil testing, applying soil test results; greenhouse pests, life cycle, control and management.

HORT 3034s. Commercial Floriculture Crops-Spring. (4 cr.
Prereq–1010, every year)
Fundamentals of greenhouse structure and management. Heating and cooling requirements, lighting photoperiod control, soil sterilization, production of winter grown greenhouse crops such as mums, azaleas, cineraria. Identification and culture of annual bedding plants. Wholesale production, use of annual flowers in residential and commercial landscape design.

HORT 3036s. Plant Propagation. (4 cr. Prereq–1010, Biol 2022, every year)
Plant propagation techniques for the commercial and home propagator. Mist system construction and operation. Propagation of plants by tissue culture, seed, cutting, layering, grafting, and division.

HORT 3040f. Landscape Installation and Maintenance. (3 cr, every year)
Applied horticulture practices in planting landscape materials, installing hardscapes, and maintaining residential/commercial landscapes. Proper use/maintenance of equipment. Emphasizes environmental/sustainability considerations.

HORT 3045s. Urban Forestry Planning and Management. (3 cr.
Prereq–3025, every year)
Tree management for municipal forester. Tree planning/planting for city streets. Right of way pruning, management techniques, electrical hazard awareness, risk assessment/removals. Research papers, group exercises.

HORT 3093f. Advanced Floral Design and Florist Operations. (2 cr.
Prereq–1092, even years)
Advanced floral design. Management/business issues unique to floral industry.

HORT 3080f,s. Individual Studies. (1-3 cr [max 6 cr], every year)
Topics related to student’s major not covered in regularly offered courses.

Hotel, Restaurant, and Institutional Management (HRI)
HRI 1001f. Introduction to Hospitality and Tourism. (1 cr, every year)
Managerial careers/opportunities in food service, lodging, and tourism. Historical developments, industry leaders. Students develop strategies for academic/career-related success and participate in Hospitality Association.

HRI 1111f,s,au. Introduction to Food Preparation. (3 cr, every year)

HRI 1112s,au. Sanitation and Safety. (2 cr, every year)
Introduction to sanitation and safety concerns in a food service establishment and to Hazard Analysis Critical Control Points (HACCP). Can lead to Serve Safe certification from the National Restaurant Association.

HRI 1803f,s. Directed Studies. (1-3 cr [max 6 cr], Prereq–Instructor consent, every year)
Current topics not covered in regularly offered courses.

HRI 2121f,s. Quantity Foods Systems Management. (4 cr.
Prereq–1111, 1112, every year)
Comprehensive overview of food management within an institutional setting. Hands-on management of quantity food production. Applies principles of menu planning, food preparation, personnel management, sanitation/safety, food distribution, human resources, and equipment management.

HRI 2211f. Rooms Division Operational Management. (3 cr, every year)
Operational procedures/principles pertaining to Rooms Division. Emphasizes issues related to management of front office and housekeeping operations.
Information Technology Management (ITM)

ITM 1803.f,s,su. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instructor consent, every year) Current topics not covered in regularly offered courses.

ITM 2020.s. Introduction to Management Information Systems. (3 cr. every year) Theoretical background for and hands-on experience with “software as a service” applications and traditional individual/company hosted software.


ITM 310f.s. Messaging Systems. (3 cr. Prereq-ITM 3110, 3120, every year) Unified messaging types such as electronic mail, fax, and voice. Server software such as Microsoft Exchange, Lotus Notes, and Novell Groupwise. Internet standards for messaging.

ITM 3190.f,s. Topics in Information Technology Management. (3 cr, every year) Topics may include cloud fusion, asp, net, and other emerging platforms.

ITM 3804.f,s,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq-Jr, instructor consent, every year) Topic related to student’s major not covered in regularly offered courses.

Literature (LIT)

LIT 1005.f,s. Introduction to Literature. (3 cr, every year) Major forms of literature from various cultures and historical periods. Developing an informed, personal response to literature and interpretive skills required for an appreciation of literature.

LIT 1015.f,s. Readings in American Life. (3 cr, every year) American literature from Puritans to present. Developing an informed, personal response to that literature. Major concerns of American writers in different eras. Introduction to interpretive skills required for an appreciation of literature.

LIT 3001.s. World Literature. (3 cr, every year) Representative works from various cultures from around the globe. Relevant historical contexts and social movements. Intensified interpretive skills for the appreciation of diverse genres.

Management (MGMT)

MGMT 1030.f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instuctor consent, every year) Current topics not covered in regularly offered courses.

Note: Courses listed in this catalog PDF are current as of June 2009.
MGMT 3200f,s. Principles of Management. (3 cr. Prereq–Psy 1001 or instructor consent, every year)
Theories, concepts, skills relevant to professional manager role. Basic functions of a manager: planning, organizing, leading, controlling. Decision making, motivation, staffing, international management, basic ethics, social responsibility, change. Integrates theory and applications.

MGMT 3210f,s,su. Supervision and Leadership. (5 cr, every year)
Emphasis on organizational environment and human behavior. Human resource systems, motivating employees, leadership, managing change, job satisfaction, communication, group processes, interpersonal and group dynamics within an organization. Participative learning approach complements traditional teaching methods with role playing and case studies.

MGMT 3220f. Human Resource Management. (3 cr. Prereq–Mgmt 3200, every year)
Focuses on management of people at work with emphasis on recruitment, selection, training, compensation, and evaluation. Changing nature of the world of work, labor market, labor relations, emerging legal issues, discrimination in pay and employment, and effects of technological change on jobs and employment performance.

MGMT 3250f,s. Operations Management. (3 cr. Prereq–Mgmt 3200, Math 1150 or instructor consent, every year)
Concepts, procedures, and technologies used by managers, administrators, and employees in operation of an organization. Levels of planning, material/inventory management, improving products/systems, project management.

MGMT 3255f. Logistics and Supply Chain Management. (3 cr. Prereq–3250, every year)
Management systems for distribution, materials handling, inventory control, transportation planning, and facilities location/analysis. Emphasizes logistics information systems and development of logistics strategy.

MGMT 3260f,s. Current Topics. (3 cr. Prereq–3200; Mktg 3200 or instructor consent, every year)
Emerging trends in business theory/applications. Introduction to major trends, their implications.

MGMT 3270f,s. Fundamentals of E-Business. (3 cr. Prereq–3200, MGMT 3300, every year)

MGMT 3300f. Management Case Studies. (3 cr. Prereq–Mgmt 3100, Mgmt 3200, Mktg 3300 or instructor consent, every year)
Specialized studies/cases covering management situations faced by businesses. Facilitates student research, analysis, and decisions in different business situations. Students work individually and as a management team member in making decisions.

MGMT 3360f,s. International Marketing. (3 cr. Prereq–Mktg 3300, every year)
Factors affecting marketing of goods/services. Managing the organization in international environment. Students complete a team marketing plan for a product being marketed internationally.

MGMT 3370f. Brand Management. (3 cr. Prereq–3250, 3300, MGMT 3200, every year)

MGMT 3710f. Sales Management. (3 cr. Prereq–3220, every year)

MGMT 380f,s. Individual Studies. (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

MKTG 1803f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq–Instrucor consent, every year)
Current topics not covered in regularly offered courses.

MKTG 2200f,s. Personal Selling. (3 cr, every year)

MKTG 3125f,s. Retail Management. (3 cr. Prereq–2200, every year)
Marketing, inventory planning/control, merchandising, retail supply chain, promotions. Challenges/opportunities in competitive environment. Characteristics of successful retail managers.

MKTG 3320f. Internet Marketing. (3 cr. Prereq–CA 1010, 1020, every year)
Value of incorporating electronic marketing of goods/services. Strategies for using Internet to leverage marketing mix (product, price, place, promotion) for greatest possible return on investment.

MKTG 3520f,s. Integrated Marketing Communication. (3 cr. Prereq–3200, 3300, every year)

MKTG 3330f,s. Principles of Marketing. (3 cr. Prereq–Econ 2101 or 2102, Psy 1001 or instructor consent, every year)
Introduction to marketing as a strategic marketing process. Team development of marketing plan that implements product, pricing, distribution, and promotional strategies.

MKTG 3340f,s. Buyer Behavior. (3 cr. Prereq–Mktg 3300, every year)
Fundamentals of buyer behavior. Behavior of individuals and groups; social and environmental factors that influence a buyer’s purchase decision. Group projects outside the classroom.

MKTG 3360f,s. International Marketing. (3 cr. Prereq–3300, MGMT 3200, every year)
Managing the organization in international environment. Students complete a team marketing plan for a product being marketed internationally.

MKTG 3700f. Brand Management. (3 cr. Prereq–3250, 3300, MGMT 3200, every year)

MKTG 3710. Sales Management. (3 cr. Prereq–3220, every year)

MKTG 380f,s. Individual Studies. (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

MKTG 4200f. Marketing Research. (3 cr. Prereq–Math 1150, Mktg 3300, every year)
Research process from marketing perspective. Problem formulation, scientific research methods, analysis/interpretation of marketing data, research report writing, decision-making process derived from market research.

MKTG 4800s. Marketing Strategies. (3 cr. Prereq–3250, final sem sr or instructor consent, every year)
Analysis of marketing decisions, creative problem-solving exercises, presentation of case analyses and marketing plans. Individual/group projects. Students critique current marketing articles. Case studies, readings.
Natural Resources (NATR)

Course Numbers
0xxx......Courses that do not carry credit toward any University degree.
1xxx......Courses primarily for undergraduate students in their first year of study.
2xxx......Courses primarily for undergraduate students in their second year of study.
3xxx......Courses primarily for undergraduate students in their third year of study.
4xxx......Courses primarily for undergraduate students in their fourth year of study.
5xxx......Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

Course Abbreviations
Letters following course numbers indicate what term(s) the course is taught: f=fall semester, s=spring semester, m=May session, su=summer term.
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Abbreviations in parentheses following a course name indicate the university that offers the course:
BSU......Bemidji State University
NDSU......North Dakota State University
UMTC......University of Minnesota, Twin Cities
UND......University of North Dakota

Other Abbreviations
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Mathematics (MATH)

MATH 981f,s. Basic Math. (0 cr. Prereq-[3 cr equiv], every year)
Operations on whole numbers, fractions, mixed numbers, decimals, order of operations, problem solving, calculator use, formulas, real numbers, exponents, scientific notation, linear equations, applications, introduction to geometry.

MATH 991f,s. Elementary and Intermediate Algebra. (0 cr. Prereq-[4 cr equiv], 0991 or equiv, every year)
Signed numbers, first-degree equations/inequalities, fractional equations, exponents, polynomials, factoring, rational expressions, radical expressions, graphing, systems of equations, functions.

MATH 1001f,s. Technical Math. (3 cr. Prereq-Math 0981 or equiv; Will not satisfy math/sci distribution requirements for baccalaureate degrees; no credit granted if taken after 1031 or 1150; every year)
Signed numbers, calculator use, percentage problems, graphing, exponents, formulas, area/volume, solving linear equations, unit conversions, agriculture/business examples.

MATH 1011f,s. Mathematics for Elementary School Teachers (BSU). (3 cr. Prereq-Education major or instructor consent, every year)
Background for education majors before enrollment in Ed 3770. Emphasizes use of mathematics manipulatives for modeling basic operations. Set theory, numeration. Systems of whole numbers, integers, rational numbers, real numbers.

MATH 1031f,s. College Algebra. (3 cr. Prereq-991 or 0992, every year)

MATH 1122f,s. Survey of Calculus. (3 cr. Prereq-Math 1031, every year)
Derivatives, integrals, differential equations, maxima and minima, partial differentiation, applications.

MATH 1150f,s. Elementary Statistics. (3 cr. Prereq-Math 0991, 0992 or 2 years high school algebra, every year)
Descriptive statistics, elementary probability, normal distribution, binomial distribution, confidence intervals, tests of hypotheses, correlation, regression, chi-square, ANOVA.

MATH 1233f,s. Precalculus. (4 cr. Prereq-Math 1031 or placement exam, every year)
Review of algebra, functions, polynomial, rational, exponential, logarithmic, and trigonometric functions, trigonometric identities/equations, systems of equations, determinants, matrices, sequences/series, topics from analytic geometry.

MATH 1271f. Calculus I. (4 cr. Prereq-Math 1250 or placement exam, every year)
Limits, differential calculus of functions of a single variable, applications. Introduction to integral calculus of a single variable.

MATH 1272f. Calculus II. (4 cr. Prereq-Math 1271, every year)
Techniques of integration, calculus involving transcendental functions, polar coordinates, Taylor/polynomial, vectors/curves in space, cylindrical/spherical coordinates.

Music (MUS)

MUS 1011f,s. University Singers. (1 cr [max 6 cr], every year)
Performing group provides experience in many areas of choral music.

MUS 1012f. Introduction to Music. (3 cr. every year)
Music from Renaissance to present. Styles, forms, expressions. Some examples of music from various cultures compared with western art music.

MUS 1041f,s. Private Music Instruction. (1 cr [max 6 cr], every year)
Individual music lessons in voice or instruments. One half-hour lesson per week.

MUS 1042f,s. Private Instruction: Class Piano. (1 cr [max 6 cr], every year)
Study of piano technique/musicianship in classroom setting using multiple electronic keyboards. Musical concepts, including melody, harmony, rhythm, repertoire.

MUS 1051f,s. Pep-Jazz Band. (1 cr [max 6 cr], every year)
Ensemble of musicians play brass, woodwind, percussion instruments in concerts on/off campus and at selected UMC athletic events.

MUS 1071s. Musical Theater. (1 cr [max 6 cr], every year)
Involvement in a musical theatre presentation. May include musical accompaniment, acting, singing, technical support.

MUS 111f. Music Theory I: Foundations of Tonal Music. (3 cr. offered when feasible)
Theory and notation, two-part counterpoint; consonance and dissonance; melodic contours; music fundamentals (key signatures, scales, rhythms, chordal construction). Writing and analyzing basic diatonic tonal structures.

MUS 112s. Music Theory II: Diatonic Tonality, Harmony and Voice Leading. (3 cr. Prereq-Mus 111f, offered when feasible)
Basic harmonic and contrapuntal relationships. Sonata, rondo, variation, minuet, and other standard categories of tonal composition. Chromatic tonal practices; expanded chordal vocabulary, voice leading analysis. Basic theories of 20th-century music.

MUS 201lf,s. University Singers (Choir). (1 cr [max 6 cr]. Prereq-1011, audition demonstrating skill in [sight-reading, accuracy of pitch, basic musicianship], every year)
Performing group that provides experience in many areas of choral music. Students serve as section leaders, are required to review music to be rehearsed by ensemble before the music is “handed out.”

MUS 202f,s. Music of the Twentieth Century. (3 cr. Prereq-Mus 1021 or instructor consent, odd years)
Composes various styles of 20th-century music to develop an understanding of human expression; compares musical forms and trends:

MUS 204f,s. Private Instruction. (1 cr [max 6 cr], Prereq-Instructor consent, every year)
Advanced music instruction.

MUS 205f,s. Pep-Jazz Band. (1 cr [max 6 cr], Prereq-audition, every year)
Students serve as section leaders, are required to review music to be rehearsed by ensemble before the music is “handed out.”

MUS 209s. Instrumental and Choral Conducting. (2 cr. Prereq-At least 2 cr of Mus 101f and/or 105f, instructor consent, every year)
Conduct UMC ensembles to develop score reading skills, conducting techniques.

Natural Resources (NATR)

NATR 122f. Environmental Science and Sustainability. (3 cr, every year)
Interdisciplinary survey course. Applying ecological principles to social systems, food/fiber production. Economic considerations of land use and rural communities, pollution, global warming, energy production/use, and biodiversity.

NATR 123f. Introduction to Natural Resources. (3 cr, every year)
Survey of our natural resource heritage with emphasis on North America. Various fields within natural resources examined in terms of conservation practices, employment opportunities, and importance to sustainable societies.

NATR 124f,s. Elements of Forestry. (4 cr. Prereq-1233, every year)
Forest management: ecology, silviculture, protection, and multiple-use decision-making processes. Woody forest plants, identification, growth requirements, and management techniques. Compass use and map reading. Survey of the lake states forest products industry.

NATR 166f,s. Principles of Fisheries Management. (3 cr. Prereq-1233, every year)
Fisheries management and fish species of Minnesota. Identification, ecology, population assessment, application of appropriate management techniques.
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NATR 1803s.f. Directed Studies. (1-5 cr [max 6 cr]. Prereq: Instructor consent, every year)
Current topics not covered in regularly offered courses.

NATR 2573f. Entomology. (3 cr [AGRO 2573]. Prereq-Hort 1010 or Agro 1183, every year)
Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

NATR 2630s. Introduction to Geographic Information Systems. (3 cr [Prereq-1244, MATH 1031, every year])
Application/use of computer-based information systems, data delivery, and geographic information systems in natural resource management and regional planning. Labs focus on developing basic competence using current suite of ArcGIS software and finding, retrieving and utilizing data currently available from public resource management agencies.

NATR 2899f. Pre-Internship Seminar. (5 cr, every year)
Expectations/responsibilities of internship. Preparing for a job search. Presentations about internship experiences by those who have recently completed internship. Discussion between students, staff and invited guests.

NATR 3203s. Park and Recreation Management. (3 cr. Prereq-NatR 1123, every year)
Survey of park and recreational area management. The recreationist; federal and state legislation; the roles of federal, state, local, and private sector recreation managers; and management techniques as they affect the public and private recreational area manager.

NATR 3296f.s.su. Special Topics in Wildlife Management. (1-3 cr [max 6 cr]. Prereq-Sr or instructor consent, offered when feasible)
Offered on demand. Focused studies on wildlife-related topics. Seminars by students and guest speakers, field trips, global studies trips abroad.

NATR 3297f.s. Spec Topics in Water Resources. (1-3 cr [max 6 cr]. Prereq-Sr or instructor consent, offered on demand)
Focused studies on water-related topics offered on demand. Seminars by students and guest speakers, field trips, global studies trips abroad.

NATR 3344s. Land Use Planning. (3 cr. Prereq-Jr or Sr status, every year)
Ecological, economic, and legal principles applied to land use planning in relation to agricultural, industrial, residential, wild land, forestry, recreational, and transportation needs. Legislative, agency, and citizen involvement in environmental law formulation and enforcement. Case studies.

NATR 3345s. Plant Taxonomy. (3 cr. Prereq-Biol 2022 or instructor consent, every year)
Principles of plant taxonomy with emphasis on higher vascular plants of the Upper Midwest; family characteristics, floral structure, ecology, evolutionary relationships, values to human life, and importance as wildlife food and cover. Methods of field study and collection.

NATR 3368su. Land Management Field School. (1-4 cr [max 4 cr]. Prereq-Junior or Senior status, every year)
Intensive field-oriented program of study. Application of land management techniques in field situations. Guest lectures, field trips to natural resource agency projects.

NATR 3374f. Ecology. (4 cr. Prereq-Biol 1009, Soil 1203, every year)
Interactions among plants, animals, and the physical environment; structure and function of ecosystems; population dynamics, biotic communities; principles of biotic succession and ecosystem management.

NATR 3376f. Wetland and Riparian Ecology and Management. (3 cr. Prereq-3374, every year)

Classification, reproduction, physiology, behavior, ecological adaptations, zoogeography of mammals. Emphasizes techniques used in field/laboratory studies.

NATR 3466s. Ornithology. (3 cr [Biol 3466], every year)
Classification, reproduction, physiology, behavior, ecological adaptations, zoogeography of birds. Emphasizes techniques used in field/laboratory studies.

NATR 3468f. Wildlife Habitat Management Techniques. (3 cr, odd years)
Planning, ecological effects, application, monitoring of habitat management as used by conservation organizations: site preparation, planting, mowing, burning, grazing, herbicide use. Certification in prescribed burning, pesticide use. Wetland restoration, surface-mined land reclamation.

NATR 3499s. Special Topics in Wilderness Management. (1-3 cr [max 12 cr]. Prereq-NatR 3203, every year)
Directed study offered once a year, with the following topics covered on a rotating basis: wilderness philosophy and ethic development, management of the wilderness resource, management of recreation resources, and wilderness Management plan preparation. Includes significant use of new communications technologies.

NATR 3496f.s. Special Topics in Ecology and Conservation Biology. (1-3 cr [max 9 cr]. Prereq-3374, every year)
Topics ecology and conservation biology. Recent/significant primary literature. Critical thinking/evaluation. Application to issues in ecological research.

NATR 3520s. Natural Resource Law Enforcement Techniques. (3 cr. Prereq-1233, CRJS 1120, even years)
Survey of methods, procedures, and techniques in natural resource field law enforcement work. Natural resource case law. Applicable statutes pertaining to tenets of search/seizure, arrest, surveillance, and court system.

NATR 3635f. Geographic Information Systems Applications. (3 cr. Prereq-2630, every year)
Advanced principles/applications of geographic information systems. Nature/accuracy of geo-referenced data and methods of data capture, storage, retrieval, modeling, and digital map display. Includes semester-long lab project.

NATR 3645f. Wildlife Ecology and Management. (4 cr. Prereq-NatR 3374, every year)
Application of ecological principles to studying and managing wildlife populations, with emphasis on habitat management. Field and lab techniques used by natural resource agencies.

NATR 3660s. Prairie Ecosystem Management. (2 cr. Prereq-NatR 3374, every year)
Description of prairie biome of North America, ecological relationships. Uses by native American, European peoples as setting for art/literature and as habitat for wildlife/livestock, management, restoration. Identification of prairie plants.

NATR 3699s. Integrated Resource Management. (3 cr. Prereq-Sr or instructor consent, every year)
Team study exploring synthesis of environmental, technical, economic, political, and administrative principles as applied to case studies and current management situations. Emphasis on decision-making process.

NATR 3800f.s. Individual Studies. (1-3 cr [max 6 cr]. Prereq-Jr, instructor consent, every year)
Topic related to student’s major not covered in regularly offered courses.

NATR 3899f. Pre-Internship Seminar. (5 cr, every year)
Expectations/responsibilities of internship. Preparing for a job search. Presentations about internship experiences by those who have recently completed internship. Discussion between students, staff, and invited guests.

NATR 3900f.s.u. Internship. (1-4 cr [max 4 cr]. Prereq-2899 or 3899, every year)
Supervised professional work experience in natural resource agencies, private companies, and businesses. Report/consultation with faculty adviser/employer.

NATR 3901f. Post-Internship Seminar. (5 cr. Prereq-3900, every year)
Students who have recently completed internships, prepare/deliver a PowerPoint presentation of experience/knowledge gained. Discussion between post pre-internship students, staff, and invited guests.
Networking and Telecommunications (NT)

NT 3120f,s. Networking Standards and Protocols. (3 cr. Prereq-ITM 3110, every year)

NT 3215f,s. Information Assurance and Systems Security. (3 cr. Prereq-ITM 3110, ITM 3110, every year)
Hacking culture. Impact of computer crime and Internet fraud. How a network/systems administrator can design/implement countermeasures to defend/protect systems assets.

Occupational Therapy (OT)
OT 1003f,s. Orientation to Occupational Therapy. (1 cr, every year)
Survey of profession. Lectures, films, demonstrations, tours.

Philosophy (PHIL)

PHIL 1001f,s,su. Introduction to Philosophy. (3 cr, every year)
Critical introduction to three fundamental questions of philosophy: What can I know? What can I believe? What ought I to do? Emphasis on developing ability to think, speak, and write critically.

PHIL 2002f,s. Introduction to Ethics. (3 cr, every year)
Foundational concepts of ethics. Applications in various contexts.

PHIL 3003f,su. Applied Ethics. (3 cr. Prereq-1001, every year)
Interdisciplinary examination of four areas of contemporary ethical concern: research ethics, agricultural ethics, business ethics, and biomedical ethics.

Physical Education and Recreation (PER)

PER 1151f. Golf. (1 cr, offered when feasible)
Introduction to and practice of the fundamentals of golf.

PER 1201f. Dance (Folk, Social, Modern, Western). (1 cr, every year)
An alternative for aerobic activity. Acquaints students with dance and dance variety. Recreational dance course.

PER 1341f. Court Activities. (1 cr, every year)
Introduces fundamental skills, rules, and strategies of volleyball, racquetball, tennis, and badminton. Progressing toward optimum ability. Achieving lifetime fitness.

PER 1451f,s. Fitness for Better Health. (1 cr [max 2 cr], offered when feasible)
Individualized approach to designing and following through with a personalized fitness program. Exercise programs and activities in the fitness area. A form of wellness program, with emphasis on fitness.

PER 1461f,s. Physical Training and Conditioning. (1 cr, every year)
Promotion and development of lifetime fitness through weight training and conditioning.

PER 1471f. Olympic Weight Training. (1 cr. Prereq-PER 1461, every year)
Techniques for advanced strengthening/conditioning.

PER 1481f,s. Aerobic Exercise. (1 cr [max 4 cr], offered when feasible)
Promotes overall fitness. Incorporates aerobic movement for cardiovascular workout plus light weight training for strength and endurance. Stretching, flexibility, and relaxation.

PER 1601s. Aquatic Activities (Beg Swim, Adv Beg, Intermediate, Swimmer, Lifeguard Trng/WSI, Aqua Aerobics). (1 cr [max 4 cr], every year)
Strokes, personal safety, and basic rescue skills in accordance with guidelines established by the American Red Cross.

PER 1701f. Varsity Sports: Football. (1 cr, every year)
To study, practice, and participate in all individual and team skills of football.

PER 1711f. Varsity Sports: Volleyball. (1 cr, every year)
Varsity collegiate volleyball experience.

PER 1712f,s. Varsity Sports: Tennis (W). (1 cr, every year)
For students who wish to participate at the intercollegiate level.

PER 1714f. Varsity Sports: Golf (W). (1 cr, every year)
Daily practice sessions, game competition. Evaluation based on satisfactory participation, completion of golf season.

PER 1716f. Varsity Sports: Golf (M). (1 cr, every year)
Daily practice sessions, game competition. Evaluation based on satisfactory participation, completion of golf season.

PER 1722f,s. Varsity Sports: Soccer (W). (1 cr, every year)
Rules and basic strategies of soccer. Basic techniques of the major components of soccer. Appreciating and practicing the game of soccer.

PER 1731s. Varsity Sports: Basketball (W). (1 cr, every year)
Varsity collegiate basketball experience.

PER 1741s. Varsity Sports: Basketball (M). (1 cr, every year)
Varsity collegiate basketball experience.

PER 1751s. Varsity Sports: Hockey. (1 cr, every year)
Basic principles and participation; helps students progress toward optimum ability.

PER 1761s. Varsity Sports: Equestrian. (1 cr, every year)
Students participate/compete in equestrian events at collegiate level.

PER 1781s. Varsity Sports: Softball (W). (1 cr, every year)
For athletes who wish to compete at the intercollegiate level.

PER 1791s. Varsity Sports: Baseball (M). (1 cr, every year)
For study, practice, and participate in all individual and team skills of baseball.

Physics (PHYS)

PHYS 1001f,s. Elementary Physics. (3 cr. Prereq-Math 1011, every year)
Fundamental laws of mechanics, fluids, temperature, gas laws, electricity, wave motion, origins of modern physics, radioactivity.

PHYS 1003f,s. Introduction to Astronomy. (3 cr, every year)
Human’s place in Universe. Earth, other planets, sun, stars, galaxies. Background/fragility of life on Earth. Scale, origin, history of Universe.

PHYS 1012f,s,su. Introductory Physics. (3 cr. Prereq-Math 1011, every year)
Newtonian mechanics. Emphasizes applications.

PHYS 1102s. Introductory College Physics II. (3 cr. Prereq-1012, every year)
Electricity, magnetism. Emphasizes applications.

PHYS 1103f. Introductory College Physics I. (4 cr. Prereq-Math 1031, every year)
First of two-semester sequence. Algebra-based introduction to physics and physics problem solving. Motion, forces, torque, momentum, energy, thermal energy/heat. Topics presented in applied context.

PHYS 1108s. Introductory College Physics II. (4 cr. Prereq-Math 1031, Phys 1101, every year)

Note: Courses listed in this catalog PDF are current as of June 2009.
Political Science (POL)

POL 1001f,s. American Government. (4 cr, every year)
Introduction to politics/government in the United States.
Constitutional origins/development, major institutions, parties,
interest groups, elections, participation, public opinion. Ways of
explaining politics. Nature of political science.

POL 1054f,s. Comparative Government. (3 cr, offered when feasible)
Government systems of the United States, Soviet Union, Great
Britain, Japan, and France. Third World and Middle Eastern
countries' political and social impacts studied through current
events.

Public Health (PUBH)

PUBH 3005f. Alcohol and College Life (UMTC). (1 cr. Prereq–Fr or soph or pse, every year)
Facts about how alcohol affect college life. Personal prevention
strategies. Maximizing student/campus safety. Web-based
distance learning format.

PUBH 3005s. Fundamentals of Alcohol and Drug Abuse (UMTC). (1 cr. Prereq–Jr or sr, every year)
Scientific, sociocultural, and attitudinal aspects of alcohol and
other drug abuse problems. Emphasizes incidence, high risk
populations, prevention, intervention. Lecture, discussion,
special readings.

Scientific and Technical Communication (STC)

STC 3701f,s. Rhetoric Theory: Persuasion and the Literature of Science. (3 cr. Prereq–Comp 1011 or 1013, Sph 1101, offered when feasible)
Principles/history of rhetorical theory/criticism. Classical
theories, especially Aristotle’s Rhetoric. Aristotelian concepts
applied to examples of contemporary communication.
Relation of classical theory to scientific discourse/technical
communication.

Sociology (SOC)

SOC 1001f,s. Introduction to Sociology. (3 cr, every year)
Culture, social institutions, socialization, groups, social class,
race and ethnicity, collective behavior, and social deviance.

SOC 1102f. Cultural Anthropology. (3 cr, offered when feasible)
Human culture from advent of agriculture to present. Methods
used in cultural anthropology; linguistics; general theories of
culture; functions of religion, law, kinship, systems, and other
major influences in selected cultures.

SOC 3937f,s. Social Gerontology: Elders in American Society. (3 cr, every year)
Survey of characteristics/concerns of older persons. Physical,
social, psychological, and cultural factors associated with aging.
Individual outside work with older person.

Soil and Water Management (SWM)

SWM 3009s. Hydrology and Water Quality. (4 cr. Prereq–Chem 1001, Math 1031, Soil 1293, jr, or instructor consent, every year)
Principles/descriptive aspects of surface/ground water quality,
including but not limited to water budget, hydrologic cycle,
weather quantities, Darcy’s Law, water quality units and flow rates,
hydraulic conductivity/permeability, and laboratory tests for and
maintenance of water quality.

SWM 3103s. Meteorology and Climatology. (3 cr. Prereq–PHYS 1012, every year)
Fundamentals of weather/climate. Energy balance, weather
chart analysis, composition/circulation patterns of atmosphere,
climates of continents.

SWM 3224f. Soil and Water Conservation. (4 cr. Prereq–Soil 1293, jr, or instructor consent, every year)
Management principles and practices used to increase
productivity and conserve soil and water resources for
agricultural crops. Maintaining wildland and environmental
quality through use of shelterbelts.
Turf (TURF)

TURF 1072s. Principles of Turf Management. (3 cr, every year)
Species identification. Cultural requirements/principles for establishing, producing, and maintaining turf. Golf course turf care/maintenance.

TURF 1803f,s,su. Directed Studies. (1-3 cr [max 6 cr], every year)
Topics not offered in regularly scheduled courses.

TURF 3074s. Turfgrass Pest Management. (3 cr, Prereq-3072 or inst. approval, every year)
Identification/control of turfgrass diseases, weeds, and insects. Emphasizes integrated cultural/chemical management methods.

Note: Courses listed in this catalog PDF are current as of June 2009.
Course Descriptions

**Course Numbers**

0xxx ........ Courses that do not carry credit toward any University degree.
1xxx ........ Courses primarily for undergraduate students in their first year of study.
2xxx ........ Courses primarily for undergraduate students in their second year of study.
3xxx ........ Courses primarily for undergraduate students in their third year of study.
4xxx ........ Courses primarily for undergraduate students in their fourth year of study.
5xxx ........ Courses primarily for graduate students; undergraduate students in their third or fourth year may enroll in such courses.

**Course Abbreviations**

Letters following course numbers indicate what term(s) the course is taught:
f .............fall semester
s .............spring semester
m ...........May session
su ..........summer term

A notation following course prerequisites indicates whether the course is offered every year, or in even or odd years.

Abbreviations in parentheses following a course name indicate the university that offers the course:

BSU ........ Bemidji State University
NDSU ...... North Dakota State University
UMTC .... University of Minnesota, Twin Cities
UND ...... University of North Dakota

**Other Abbreviations**

Prereq ........ course prerequisites
cr ........ credit
equiv .......... equivalent
fr, soph, jr, sr ........ freshman, sophomore, junior, senior
=............Credit will not be granted for the course if credit has been received for the course(s) listed in brackets following this symbol.
, ............In prerequisite listings, a comma means “and.”

A prerequisite course listed by number only (e.g., prereq 3322) is in the same department as the course being described.

Courses beginning with 09 cannot be used for credit toward graduation or transfer.

**TURF 3076f. Turfgrass Management Systems.** (3 cr.
Prereq–3074, every year)

**TURF 3077s. Turf and Landscape Irrigation Design and Installation.** (2 cr, every year)
Basic irrigation design, including pipe sizing/selection, pressure loss, sprinkler types/selection. Installation equipment techniques. Lab.

**TURF 380af,s,su. Individual Studies.** (1-3 cr [max 6 cr], every year)
Topics not included in regularly scheduled courses.

**Work and Human Resource Education (WHRE)**

The following courses are required for the undergraduate agricultural education major. This major is a collaborative agreement with the University of Minnesota, Twin Cities, which offers these courses via ITV.

**WHRE 5697f. Teaching Internship: School and Classroom Settings (UMTC).** (2 cr, every year)
Part-time supervised teaching experience in a school. Seminars on managing students’ learning in work/community/family education programs in contemporary schools and on becoming a reflective educator.

**WHRE 5698s. Teaching Internship (UMTC).** (6 cr, every year)
Teaching experience in school system that provides programs for grades 5-12.