

Course Numbers

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- 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

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

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

In prerequisite listings, comma means "and."

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

Accounting (Acct)

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

Acct 2101f,s. Principles of Accounting I. (3 cr. Prereq—Math 1031 or Math 1131)

Concepts of accounting cycle, cash, accounts receivable, inventories, plant assets, payroll, partnerships.

Acct 2102s. Principles of Accounting II. (3 cr. Prereq—2101)

Modern accounting concepts, including cash flow statement and consolidated statements. Introduction to management accounting topics, including cost-volume-profit relationships, costing methods, and variance analysis.

Acct 3100f. Introduction to Professional Accounting. (2 cr. Prereq—2102; may be taken concurrently with 3201)

Emphasizes accounting theory upon which financial accounting is based. Fundamental interrelationships within financial statements.

Acct 3201f. Intermediate Accounting I. (4 cr. Prereq—3101)

Detailed study of discounted cash flow techniques, current and long-term assets, current and long-term liabilities and investments.

Acct 3202s. Intermediate Accounting II. (4 cr. Prereq—3201)

Detailed study of stockholders' equity and statement of cash flows. Several complex financial accounting topics.

Acct 3300f. Government Accounting. (2 cr. Prereq—2102)

Budget preparation, appropriations, conformity to laws, integrity of special funds, preparation of reports/statements.

Acct 3301f. Cost Accounting I. (3 cr. Prereq—2102, composition requirement)

Fundamentals of cost accounting information systems, including cost-volume-profit relationships, costing in service and manufacturing sectors, cost behavior, and budget and variance analysis.

Acct 3302s. Cost Accounting II. (3 cr. Prereq—3301)

Refinements of cost accounting information systems, including management control systems, cost allocation refinements, capital budgeting, and performance measurement.

Acct 3321f. Business Law I. (3 cr. Prereq—Jr)

Principles of law in American legal system. Contracts, sales, secured transactions, agency law, employment law.

Acct 3322s. Business Law II. (3 cr. Prereq—3321)

Negotiable instruments, bank deposits/collection, bankruptcy, suretyship, partnerships, corporations, federal securities law, accountant's legal liability, property, insurance, trust, estates.

Acct 3804f,s. Individual Studies. (1-3 cr [max 6 cr]. Prereq—Jr, instructor consent)

Topic related to student's major but not covered in regularly offered courses.

Acct 4110s. Advanced Accounting. (4 cr. Prereq—3202)

Accounting for partnerships, combined corporate entities. Consolidated statements, fiduciary accounting, institutional accounting, international transactions, SEC reporting.

Acct 4210f,s. Auditing I. (3 cr. Prereq—3202)

Duties/responsibilities of auditor, kinds of audits, audit programs. Preparation of audit working papers, compilation of audit data.

Acct 4217f. Accounting Theory. (3 cr. Prereq—3202)

Conceptual framework/structure of accounting theory. Selected Financial Accounting Standard Board statements, other professional literature.

Acct 4220s. Accounting Systems. (3 cr. Prereq—Acct 3202)

Theory/methodology of analyzing, designing, implementing accounting information systems. Emphasizes integrated data processing, managerial aspects of systems design.

Acct 4310s. Auditing II. (3 cr. Prereq—4210)

Auditor's responsibility/liability, ethics, standards of professional conduct, auditing electronic data systems, applying statistical audit techniques.

Acct 4404f. Income Tax I. (3 cr. Prereq—3202 or instructor consent)

Income tax laws as they relate to individuals.

Acct 4405s. Income Tax II. (3 cr. Prereq—4404)

Income tax as it affects corporations, partnerships, estates, and trusts.

Acct 4970f,s,su. Internship. (2-12 cr [max 12 cr]. Prereq—3202, 3302)

Internship in accounting.

Aerospace Studies (AS)

AS 1100f,s. Air Force ROTC Fitness (NDSU). (1 cr [max 8 cr])

Benefits of being physically fit, participation in lifetime fitness programs. Achieving/maintaining Air Force and AFROTC fitness standards. Graded version of Enhanced Physical Fitness Training Program.

AS 1110f. The Air Force Today I (NDSU). (1 cr; A-F only)

Introduction to the United States Air Force: its characteristics, missions, organization.

AS 1120s. The Air Force Today II (NDSU). (1 cr; A-F only)

Continuation of AS 1110. Introduction to the United States Air Force: its characteristics, missions, organization.

AS 2100f,s. Leadership Laboratory (NDSU). (1 cr [max 4 cr])

Introduction to/application of Air Force customs/courtesies, drill/ceremonies, military commands. Air Force environment. Opportunities for commissioned officers.

AS 2110f. Evolution of USAF Air and Space Power I (NDSU). (1 cr)

Introduction to Air Force heritage/leaders, Quality Air Force concepts, ethics/values, leadership problems. Applying communication skills.

AS 2120s. Evolution of USAF Air and Space Power II (NDSU). (1 cr. Prereq—AS 2110)

Introduction to Air Force heritage/leaders, Quality Air Force concepts, ethics/values, leadership problems. Applying communication skills. Prepares cadets for field training. Continuation of 2110.

AS 3210f. Air Force Leadership/Management I (NDSU). (3 cr; A-F only)

Introduction to management within USAF. Communication skills (oral/written Air Force formats), interpersonal skills, Quality Air Force concepts.

AS 3220s. Air Force Leadership/Management II (NDSU). (3 cr; A-F only. Prereq—3210)

Study of leadership from military perspective. Situational leadership. Contemporary issues, including change management, professional ethics. Officer professional development topics. Case studies. Continuation of 3210.

AS 4100f,s. Leadership Laboratory (NDSU). (1 cr [max 4 cr])

Practical development of leadership skills. Students instruct, supervise, lead junior cadets participating in 2100, perform higher-level management functions within cadet corps organization. Supervised lab.

AS 4410f. Preparation for Active Duty I (NDSU). (3 cr; A-F only)

National security process, regional studies, advanced leadership ethics, Air Force doctrine, military as profession, officership, military justice, civilian control of military, current issues. Applying communication skills.

AS 4420s. Preparation for Active Duty II (NDSU). (3 cr; A-F only. Prereq—4410)

Military as profession, officership, military justice, civilian control of military, current issues. Applying communication skills. Preparation for new officer's first active-duty assignment. Continuation of 4410.

Agricultural Business (AgBu)

AgBu 1005s. Global Food Systems. (3 cr)

Historical preferences, consumer trends in diverse geographic regions. How global/national policies affect food trade.

AgBu 3050. Cereal Processing. (3 cr)

Cereal food systems. Wheat, barley, oats, rye, corn storage. Milling/processing. Baking. Snack foods. Packaging commodities. Other cereals, their processing. Malting/brewing.

AgBu 3052f,s. Meat and Dairy Processing. (3 cr)

Packaging/processing dairy/meat. Effects of hygiene/sanitation on product quality. Types of spoilage. Microbial ecology within the industry.

AgBu 3053s. Product Development Management. (3 cr. Prereq—Instructor consent)

Product formulation, ingredient interaction, packaging, analysis, consumer testing, results, data interpretation. Dynamics between new product development, sales, marketing, production.

Agricultural Economics (AgEc)

AgEc 1803f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq—Instructor consent)

Current topics not covered in regularly offered courses.

AgEc 2530f,s,su. Professional Agriselling. (3 cr; A-F only)

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 practice in making agrisales presentations.

AgEc 3050s. Economics for AgriBusiness Management. (5 cr; A-F only. Prereq—Econ 2101, Econ 2102)

Gathering, organizing, assimilating, applying information applicable to current economic environment. Behavior of individual consumers, resource owners, business firms, market operation in a free enterprise economy. Applying basic economic principles that govern profit. Elements and effects of government policy. Real-world forecasting and planning.

AgEc 3430f,s. Agricultural Commodity Marketing. (3 cr; A-F only. Prereq—Econ 2101)

Process of taking raw agricultural products from the place of initial production to the hands of the consumer. Prices and marketing costs. History and influence of government programs. Cooperatives' roles in agriculture. Marketing strategies of crops and livestock. Using the commodity futures market. Hedging and options.

AgEc 3540f,s. Farm Business Management. (4 cr; A-F only. Prereq—Econ 2101, CA 1010)

Principles of farm accounting. Financial statements, income statements, cash flow statements, depreciation methods, farm income tax, enterprise analysis, farm management decision making, budgeting and planning, computer analysis of farm business.

AgEc 3640f,s. Agricultural Finance and Valuation. (4 cr; A-F only. Prereq—[3540 or Acct 2101], Econ 2101, CA 1010)

Analysis of investment strategies and financing policies for farm and agribusiness firms and their effect on liquidity, solvency, and 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, instructor consent)

Topic related to student's major not covered in regularly offered courses.

AgEc 4460. International Marketing Problems and Practices. (4 cr)

Problems/practices facing companies in international trade. Import/export regulations, exchange rates, business practices/policies.

AgEc 4750f. Agribusiness Marketing. (3 cr. Prereq—2530)

Role of marketing in agribusiness. Marketing systems/strategies for competitiveness in a rapidly changing marketplace. Identifying strengths/opportunities to create competitive advantage.

AgEc 4760s. Agribusiness Market Plan Development. (3 cr. Prereq—4750)

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 real rural community, including implementation/financing plans.

Agricultural Systems Management (ASM)

ASM 1021f. Introduction to Agricultural Systems Management. (2 cr)

Overview of agricultural mechanization systems (engines, machinery, structures, processes).

ASM 1034f,s. Facility Maintenance and Safety. (3 cr)

Safe operation, working environment for power equipment, structures, utilities, metal fabrication.

ASM 1044f,s. Computer-Aided Drafting. (3 cr)

Sketching/dimensioning architectural/landscape projects. Use of CAD program to develop plan views, floor plans, elevations, pictorials, mechanical drawings.

ASM 1333. Agricultural Building Construction. (3 cr)

Selection/application of wood, concrete, steel building materials. Construction techniques using portable, stationary, hand construction tools. Criteria for quality building construction.

ASM 1803f,s. Directed Studies. (1-3 cr [max 6 cr])

Current topics not covered in regularly offered courses.

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

Arc/gas welding of ferrous/nonferrous metals. TIG/MIG welding. Designs for welding, economics, cost estimating. Project design/construction. Basic metal machining.

ASM 2250f. Agricultural Machinery Management. (3 cr)

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)

Selecting, testing, maintaining power units for drawbar, PTO, hydraulic applications. Spark/compression ignition systems, drive trains, DC electrical systems, air conditioning systems.

ASM 3005s. Facilities Planning and Selection. (3 cr. Prereq—1034, Math 1031, Phys 1012)

Planning facility design. Selecting materials/equipment used in manufacturing and production operations.

ASM 3009f. Surveying. (4 cr)

Principles, statistical methods, theory, applications. Measurement of distance, angles, directions using theodolites, electronic distance measurement, transits, total stations. Exercises in leveling, profiling, topographic mapping, traversing, land/construction surveying. Introduction to photogrammetry, GPS, GIS.

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

Introduction to applications of precision agriculture. Hands-on practice of mapping fields. Grid sampling techniques. Variable rate applications. Yield mapping/interpretation. Map information.

ASM 3511s. Yield Monitoring and Data Interpretation. (1 cr; A-F only. Prereq—3360)

Calibration of commercially available yield monitoring equipment. Operation fundamentals of various yield sensors. Interfacing sensors, data loggers, global position devices. Saving, storing, retrieving, pooling yield data. Working with data from multiple vendor models/formats. Use of commercially available software to make yield map interpretation.

ASM 3512s. Remote Sensing Applications in Precision Agriculture. (1 cr. Prereq—3360)

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 and On-Farm Trials. (1 cr. Prereq—3360)

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 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq—Jr or instructor consent)

Topic related to student's major, not covered in regularly offered courses.

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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 1001f,s. Intro to Agricultural Education and Extension (UMTC).** (1 cr; A-F only)
Historical development of agricultural education. Orientation to career opportunities. Areas/expectations of specialization. Issues.
 - AFEE 1002s. Principles of Career Planning for Agricultural Professional (UMTC).** (1 cr; A-F only)
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).** (1 cr; A-F only)
Observe schools, extension offices, agricultural-oriented businesses to learn about work/workplace in agricultural education.
 - AFEE 5111f. Agricultural Education: Methods of Teaching (UMTC).** (4 cr)
Use of teaching resources. Principles of teaching/learning. Problem-solving techniques, lesson plan construction for large group, small group, individual investigations. Student management. Assessment.
 - AFEE 5112s. Agricultural Education Program Organization and Curriculum for Youth (UMTC).** (3 cr [max 4 cr])
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)
Reflective learning on teacher preparation experience. Issues/problems facing the discipline. Needs for continual preparation, program adjustment.
 - AFEE 5116. Coordination of SAE Programs: Work-Based Learning (UMTC).** (2 cr)
Principles/techniques for coordinating work-based learning and supervised agricultural experience (SAE) 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 1030f,s. Crop and Weed Identification.** (3 cr; A-F only)
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 1183f,s. Field Crops: Production Principles.** (3 cr)
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; A-F only. Prereq-PIM 1030)
Seed laws and certification standards, purity analysis, germination tests, vigor tests, principles of seed conditioning, and handling equipment. Tours of facilities processing small grains, sunflowers, grasses, and legumes.
 - Agro 2640. Applied Agriculture Chemicals.** (3 cr. Prereq-1030)
Applied use of agriculture chemicals. Safety, toxicity, efficacy, phytotoxicity, recommendations, environmental interactions.
 - Agro 2840s. Grain and Seed Evaluation.** (4 cr; A-F only. Prereq-1063)
Analytical techniques, procedures, and practices used in interpreting official U.S. grain standards. Identifying seeds of crops, weeds, and diseases. Lab practice in grading grain according to the U.S. Standards for Grain. Lab practice in determining grain quality.

- Agro 3130f. Forages.** (3 cr; A-F only)
Characteristics, 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 3441s. Topics in Specialty Crop Production.** (1-3 cr [max 3 cr]; A-F only. Prereq-3444, PIM 1030)
Lecture and 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, and marketing.
- Agro 3444f. Crop Production.** (4 cr; A-F only. Prereq-PIM 1030)
Principles, including best cultural practices for crops of particular economic importance to the region. Oilseed, small grain, and specialty crops.
- Agro 3620f. Advanced Identification, Seed Analysis, and Grain Grading.** (3 cr. Prereq-[1030, 2840] or instructor consent)
Advanced techniques in identification, seed analysis, and grain grading.
- Agro 3640f. Weed Science.** (3 cr. Prereq-[Biol 1009, Chem 1401, Soil 1293] or instructor consent)
Mechanical, cultural, biological, and chemical weed control practices. Factors affecting control. Classification and modes of action of herbicides, insecticides, fungicides, and plant growth regulators.

Animal Science (AnSc)

- AnSc 1004f,s. Introduction to Animal Science.** (4 cr; A-F only)
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 1033f. Introduction to Companion Animals.** (3 cr)
Companion animal industry. Emphasizes identification, general management principles, health care, breeding, behavior, feeding, and humane care of companion animals.
- AnSc 1101f. Animal Evaluation.** (1 cr [max 3 cr])
Conformation, breed characteristics, type, and their importance in evaluation. Techniques of evaluation and interpretation of evaluation data.
- AnSc 1201s. Advanced Animal Evaluation.** (1 cr [max 3 cr]. Prereq-1101)
Advanced techniques in evaluating and selecting dairy or beef cattle, sheep, and swine. Preparing and delivering oral reasons.
- AnSc 1205s. Beef and Dairy Production Techniques.** (2 cr)
Skills necessary for successful/economical beef and dairy production.
- AnSc 1206s. Sheep and Swine Production Techniques.** (2 cr)
Skills necessary for successful/economical sheep/swine production.
- AnSc 1803f,s, su. Directed Studies.** (1-3 cr [max 6 cr]. Prereq-Instructor consent)
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 2104f. Feeds and Feeding.** (4 cr. Prereq-1004, high school chem or Chem 1001)
Identification and use of feed grains, forages, supplemental feeds, and additives. Bushel weights, price, and cost per unit calculations. Moisture content calculations. Factors influencing feed quality, feed value, price, and storage. Digestion, ration formulation, and feed processing methods.
- AnSc 3004f. Livestock Facilities and Environmental Systems.** (3 cr. Prereq-1203, Math 1031, or instructor consent)
Effects of environment on animal production. Principles of environmental control. Planning open, partial, and total environmentally controlled systems for livestock. Functional, economic, and environmental considerations. Feed handling systems, waste management alternatives.
- AnSc 3023f. Animal Breeding.** (3 cr. Prereq-Biol 3022 [may be taken concurrently])
Application of qualitative genetic principles to animal breeding. Introduction to quantitative genetics. Concepts of livestock improvements through breeding/selection systems.

AnSc 3104s. Applied Animal Nutrition. (4 cr. Prereq–2104, Chem 1004 or 1401)

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 3203f. Animal Anatomy and Physiology. (3 cr. Prereq–1004, Biol 1009)

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 3204f. Dairy Production. (4 cr; A-F only. Prereq–1203, 2104)

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 3205. Dairy Management Practicum. (3 cr. Prereq–Sr or instructor consent)

Management and clinical skills, including those unique to large dairy herds.

AnSc 3303f. Beef Production. (3 cr. Prereq–AnSc 1203, 2104)

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 3304s. Reproduction, AI, and Lactation. (4 cr. Prereq–3203)

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 3441s. Current Topics in Animal Science. (1 cr. Prereq–AnSc 1203, 2104, 3304 or concurrent enrollment in 3304)

Focus on one economically important or emerging topic in animal science (e.g., swine, sheep, companion animal). Lecture/discussion.

AnSc 3503s. Animal Health and Disease. (3 cr. Prereq–3203)

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 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent)

Topic related to student's major not covered in regularly offered courses.

AnSc 4204s. Animal Systems Management. (4 cr; A-F only. Prereq–1203, 3004, 3204 or 3303 or instructor consent)

Planning, budgeting (cash, feed, machinery, etc.), and implementing programs; facilities; labor force; and other factors required for operation of modern animal operations. Field trips, planning for existing operations.

Applied Business (ABus)

The following courses are bachelor of applied health (B.A.H.) requirements or offerings. The B.A.H. is a partnership degree with the College of Continuing Education, Twin Cities campus, which offers these courses via distance delivery.

ABus 4012f,s,su. Problem Solving in Complex Organizations (UMTC). (3 cr)

Develops open systems perspective. Emphasizes importance of analyzing root causes, effects of problems, solutions across boundaries in the organization. Process analysis introduced as tool for problem solving.

ABus 4022f,s,su. Managing Organizational Relationships (UMTC). (3 cr)

Complexities involved in managing organizational relationships. Political dimensions of organization life. Diagnosing how power is distributed/exercised in modern organizations. Cooperative relationships. Frameworks for analyzing motives for observed behavior.

ABus 4023f,s,su. Communicating for Results (UMTC). (3 cr)

Aspects of communication that are essential to being persuasive/influential. Organizing/presenting ideas effectively, strategies for audience analysis, choosing communication methods, appropriately using informal influence, handling dissent.

ABus 4104f,s,su. Management and Human Resource Practices (UMTC). (3 cr)

Overview of human resource practices in organizations, responsibilities of front-line managers. Emphasizes providing day-to-day leadership: organizing work, motivating employees, delegating, coordinating, achieving results.

Applied Studies (ApIS)

ApIS 3001f,s. Individual Program Development. (.5 cr. Prereq–Acceptance into applied studies degree program)

Developing degree outcomes relevant to career objectives and designing an individual program of study for the Applied Studies baccalaureate degree.

ApIS 3900f,s,su. Internship/Field Experience. (1-3 cr [max 3 cr]. Prereq–3001, adviser consent)

Supervised professional work experience in selected sites. Reports and consultation with faculty adviser and employer.

ApIS 4652f. Applied Studies Seminar. (2.5 cr. Prereq–3001, within 1 semester of graduation, adviser consent)

Capstone course. Students present projects demonstrating integration of fields of study, general education, work experience, and computer applications.

Art (Art)

Art 1152f,s. Drawing and Design. (1-3 cr [max 3 cr])

Introduces foundations of drawing/design. Offered as 1-credit art appreciation lecture or as 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

Art 1252s. Color and Design. (1-3 cr [max 3 cr])

Introduces foundations of color (painting) and design. Offered as 1-credit art appreciation lecture or as 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

Art 1352f,s. Art Design and Techniques. (1-3 cr [max 3 cr])

Introduces foundations of art techniques (3-dimensional) and design. Offered as 1-credit art appreciation lecture or as 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

Art 2000f. Elementary Art. (3 cr)

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)

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–1103 or concurrent enrollment in 1103)

Flight lab lessons leading to private pilot certificate. Flight lessons must be completed or private pilot certificate received before course credit is issued.

Avia 1221f. Basic Attitude Instrument Flying. (3 cr; A-F only. Prereq–1103, 1104 or instructor consent)

Operation, interpretation, and practical use of VOR, ADF, DME, RNAV, RMI, HSI, and GPS systems. Instrument charts required for IFR flight. Students must demonstrate adequate progress on flight lessons.

Avia 1222s. IFR Regulations and Procedures. (3 cr; A-F only. Prereq–1221)

Regulations, procedures, publications for operating IFR in national airspace system. Terminal/en route procedures. Students must demonstrate adequate progress on flight lessons.

Avia 1396f,s. Conventional Aircraft Operations. (1 cr; A-F only. Prereq–1103, 1104 or instructor consent)

Ground school, dual flight instruction for endorsement for operation of tail wheel airplanes on ground, in flight.

Avia 1803f,s,su. Directed Studies. (1-3 cr [max 6 cr]. Prereq–Instructor consent)

Current topics not covered in regularly offered courses.

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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

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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

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 3322) is in the same department as the course being described.

In prerequisite listings, comma means "and."

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

Course Numbers

- 0xxx** Courses that do not carry credit toward any University degree.
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Course Abbreviations

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

- f Fall semester
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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
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- 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 3322) is in the same department as the course being described.

In prerequisite listings, comma means "and."

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

Avia 3323f. Airplane Aerodynamics. (3 cr; A-F only. Prereq–1221, 1222) Aerodynamics, performance, stability, control, weight/balance, special flight conditions as appropriate for commercial pilots. Commercial maneuvers, flight computers, commercial regulations. Students must demonstrate adequate progress on flight lessons.

Avia 3324s. Aircraft Systems and Instruments. (3 cr; A-F only. Prereq–1103, 1104 or instructor consent) Flight instruments, reciprocating engines. Propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems. Commercial regulations, including FARS part 61, 91, 121, and 135.

Avia 3355f,s. Multiengine Systems and Procedures. (2 cr; A-F only. Prereq–Instructor consent; offered on-demand) Operating light twin-engine airplanes. Pilot actions for managing normal/abnormal aircraft situations. Multiengine aircraft systems. Students must complete flight lessons.

Avia 3396f,s. Advanced Conventional Aircraft Operations (UND). (1 cr; A-F only. Prereq–1396) Ground school, dual flight instruction for advanced pilot maneuvering, flight applications of tail wheel airplanes. Students must complete flight lessons.

Avia 3412f,s. CFI Certification. (4 cr. Prereq–3323, 3324, or instructor consent) 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 3413f,s. CFI Certification Flight Lab. (1 cr. Prereq–3412) 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; A-F only. Prereq–3412, 3413; offered on demand) Instrument flight instructor responsibilities and techniques. Additional study of instrument flight, ATC system, charts, publications, and rules of IFR environment as 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; A-F only) 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 3603s. Aerial Application. (3 cr; A-F only. Prereq–3323, 3324) State/federal regulations, aircraft performance, weight/balance determination, special techniques. Chemical precautions and rate calculations. Environmental issues. Flight training in aerial application procedures. Students must complete appropriate flight lessons.

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

Bachelor of Manufacturing (BM)

BM 3005s. Facilities Planning and Selection. (3 cr) 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 3007. Metrology. (3 cr) Instrument calibration, reading engineering standards, precision measurement, geometric dimensioning/tolerancing, graphical inspection analysis, measuring tools, surface plate inspection methods.

BM 3008. Regulations and Compliance. (3 cr) Contributions by Demming, Juran, Ishikawa, Feigenbaum, Crosby, and Taguchi. Global quality. International standards, including ANSI and ISO. Strategic quality planning, six-sigma management tools.

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

BM 3011f,s. Manufacturing Operations and Logistics. (3 cr. Prereq–Biol 1020, Math 1031, Phys 1012) Flow/handling of material through storage/production. Focuses on processing lines, equipment characteristics, and design.

BM 3012f. Applied Engineering Principles. (3 cr) 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; A-F only. Prereq–PMTc 2800 [Northwest Technical College]) 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) Managing responsibilities of a quality standards department. Development of grades/standards of quality, acceptance sampling/inspection, recording, reporting/use of control charts.

BM 3053s. Product Development Management. (3 cr) 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,s,su. Individual Studies. (1-3 cr [max 6 cr]; A-F only. Prereq–Jr, instructor consent) Topic related to student’s major not covered in regularly offered courses.

BM 3900s,su. Internship. (1-3 cr [max 3 cr]; A-F only. Prereq–Jr) 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 1009f,s. General Biology. (4 cr. Prereq–High school science courses) Major concepts of modern biology. Molecular structure of living things, energy recruitment/utilization, flow of genetic information through organisms/populations. Principles of inheritance, ecology, and evolution. Includes lab.

Biol 1020f,s,su. Microbiology. (3 cr. Prereq–High school biology) Morphology, classification, growth requirements, transmission, control, and culturing of bacteria and other microorganisms of economic importance.

Biol 1464f,s,su. Human Anatomy and Physiology I. (3 cr) Systems approach to basic anatomical or physiological terminology/concepts at chemical, cellular, tissue, and organ levels. Emphasizes normal placement, structures, and functions within integumentary, skeletal, muscular, nervous, and endocrine systems.

Biol 1474f,s,su. Human Anatomy and Physiology II. (3 cr. Prereq–1464) Systems approach to basic anatomical or physiological terminology/concepts at chemical, cellular, tissue, and organ levels. Emphasizes normal placement, structures, and functions within circulatory, lymphatic, respiratory, and digestive systems. Metabolism, nutrition, urinary/reproductive systems, human development, basic genetic concepts.

Biol 2012s. General Zoology. (4 cr. Prereq–1009) 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) Principles of plant biology. Organization, function, growth/development, and reproductive biology of plants and plant-like organisms. Lab included.

Biol 2032f. General Microbiology. (4 cr. Prereq–1009 or 1464, Chem 1001 or 1021) Fundamental principles of microbiology. Bacterial metabolism, growth, and genetics. Biology of viruses/fungi. Microorganisms and disease. Applied microbiology.

Biol 3022s. Principles of Genetics. (3 cr. Prereq–1009, Chem 1021 or 1401, Math 1031 or 1131 or 1150)
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])
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.

Biol 3131s. Plant Physiology. (3 cr. Prereq–2022, Chem 1401)
Plant functions with emphasis on higher plants. Growth and development, mineral nutrition, translocation, water relations, photosynthesis, and nitrogen metabolism.

Biol 3420su. Aquatic Toxicology. (3 cr. Prereq–1009, Chem 1401, Phys 1012, [1131 or 1150 or Math 1031])
Principles of aquatic toxicology. Focuses on environmental, industrial, and natural chemicals. Fate/interactions of chemicals with organisms and the aquatic environment. Insecticides, endocrine disruptors, biomarkers/bioassays, risk assessment.

Biol 3464f. Mammalogy. (3 cr. Prereq–2012)
Classification, reproduction, physiology, behavior, ecological adaptations, zoogeography of mammals. Emphasizes techniques used in field/laboratory studies.

Biol 3466s. Ornithology. (3 cr. Prereq–2012)
Classification, reproduction, physiology, behavior, ecological adaptations, zoogeography of birds. Emphasizes techniques used in field/laboratory studies.

Biol 3722s. Limnology. (3 cr. Prereq–2022, Chem 1001, Phys 1012, Math 1031 or 1131 or 1150)
Description/analysis of events in lakes, streams, and ponds, beginning with their origins and progressing through their physics, chemistry, and biology. These parameters interrelated with population of aquatic environment.

Chemistry (Chem)

Chem 992f. Basic Chemistry. (0 cr; A-F only. Prereq–High school algebra)
Measurements, metric system. Atomic/molecular structure, nomenclature, balancing chemical equations.

Chem 1001f,s. Introductory Chemistry. (4 cr. Prereq–High school algebra, high school chem)
For students who do not need professional-level general chemistry. Atomic and molecular structure, inorganic nomenclature, 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)
Concepts of inorganic chemistry, atomic theory/structure, periodicity of elements. Basic rules of oxidation and chemical combination. Molecular structure (hybridization, molecular orbitals). Thermochemistry, gases, solution process, colligative properties.

Chem 1022s. Chemical Principles II. (4 cr. Prereq–Chem 1021 minimum C grade)
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,s. Elementary Biochemistry. (4 cr. Prereq–1001 or 1005)
Begins with an introduction to organic chemistry as it is applied to important biochemical molecules. For students who require a general, nonintensive introduction to biochemistry.

Chem 2301f. Elementary Organic Chemistry I. (3 cr. Prereq–Chem 1022)
Important classes of organic compounds; their structures, reactions. Relation between structure, reactivity, and properties. Spectroscopic characterization of organic molecules.

Chem 2302s. Elementary Organic Chemistry II. (3 cr. Prereq–Chem 2301)
Reactions, synthesis, and characterization of organic compounds and biologically significant classes of organic compounds (lipids, carbohydrates, amino acids, proteins, nucleic acids). Includes lab.

Chem 2310f. Elementary Organic Chemistry Laboratory I. (2 cr. Prereq–Chem 2301 or concurrent registration)
Laboratory techniques in synthesis, purification, and characterization of organic compounds.

Chem 2311s. Elementary Organic Chemistry Laboratory II. (2 cr. Prereq–Chem 2310, concurrent enrollment in 2302)
Laboratory techniques in synthesis, purification, and characterization of organic compounds.

Chem 3021f. Biochemistry. (3 cr. Prereq–1009, Chem 2302)
Fundamentals of biochemistry. Structure/function of proteins, nucleic acids, lipids, and carbohydrates. Metabolism, regulation of metabolism. Quantitative treatments of chemistry equilibria, enzyme catalysis, and bioenergetics. Chemistry basis of genetic information.

Communication (Comm)

Comm 3000s. Communication Theory. (3 cr. Prereq–Comp 1013, Spch 1101)
Relationship between communication theory/practice within interpersonal, group, and organizational settings.

Comm 3258s. Research Methods in Communication. (3 cr. Prereq–Comp 1013, Math 1150, Spch 1101)
Quantitative/qualitative techniques for gathering, evaluating, and using information in applied communication settings.

Comm 3537s. Visual Communication. (3 cr. Prereq–CA 1030, 1040, Comp 1013, Spch 1101)
Computer applications, general photography, and graphic arts. Color theory, fundamentals of drawing, photo techniques, pen/inking, layout/design. Looks at cycle from idea to finish.

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

Comm 3900f,s,su. Internship. (3 cr [max 6 cr])
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 4800f. Crisis Communication. (3 cr. Prereq–Comp 1013, Spch 1101)
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 and Design Management. (3 cr. Prereq–CA 1030, 1040, Comp 1013, Spch 1101)
Plan/design organizational publications. Bulletins, daily news items, weekly news briefs, newsletters, journals.

Comm 4900s. Public Relations. (3 cr. Prereq–Comp 1013, Spch 1101)
Audience analysis, research techniques. Applications in business, education, government, and politics.

Composition (Comp)

Comp 1000f,s. College Writing Laboratory. (1 cr. Prereq–Concurrent enrollment in 1011)
Supplemental instruction in writing. Small group activities, individual conferencing.

Comp 1011f,s. Composition I. (3 cr; A-F only)
Process of clear, concrete, and convincing writing. Generation and discovery of subjects, revisions, editing.

Comp 1011f. Honors: Composition I. (3 cr. Prereq–Admittance in the Honors Program)
Process of clear, concrete and convincing writing. Generation and discovery of subjects, revisions, editing.

Comp 1013f,s. Composition II. (3 cr; A-F only. Prereq–1011)
Writing summaries. Writing to synthesize material from several sources. Evaluating readings and other materials. Research writing.

Comp 1013Hs. Honors: Composition II. (3 cr. Prereq–[1011 or 1011H], admittance to Honors Program)
Writing summaries, writing to synthesize material from several sources, evaluating readings and other materials, research writing.

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Comp 2223f,s,su. The Structure of English. (3 cr. Prereq–1011, 1013)
Advanced sentence/paragraph analysis techniques. Students analyze structure of writing from popular magazines and technical articles. Presentations on topics as assigned.

Comp 2334f. Technical Writing. (3 cr; A-F only. Prereq–1013)
Exposition methods and design principles in scientific/technical writing. Audience analysis. Gathering information. Assessing/using various formats. Systematic procedures to solve technical communication problems.

Comp 3008s. Business Writing. (3 cr. Prereq–1013, Spch 1101)
Practical application of writing effective business letters, memos, e-mails, faxes. Tables and other graphics. Informal/formal informational/analytical reports. Professional oral/Web presentations. Development of a personal writing style. Practice of appropriate business tone, etiquette.

Comp 3303f,s. Writing in Your Profession. (3 cr; A-F only. Prereq–1011, 1013)
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.

Comp 3313s. Advanced Technical Writing: Software Documentation. (3 cr; A-F only. Prereq–2334)
Designing software documentation and help modules. Emphasizes user needs, using long-document software.

Computer Applications (CA)

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

CA 1011f,s. Introduction to Computer Systems Architecture. (2 cr)
Foundations of computer hardware, software, telecommunications, systems design/deployment.

CA 1012f. Application Suite Software. (2 cr)
Introduction to word processing, spreadsheet, and presentation graphics.

CA 1015f,s. Word Processing Applications. (2 cr)
Creation, generation, and development of advanced/integrated word processing documents/publications.

CA 1020f,s. Spreadsheet Application. (2 cr)
Personal/presentation use of spreadsheets that include formulas, functions, what-if analysis, and charts.

CA 1030f,s. Multimedia Graphics. (2 cr)
Developing advanced graphics, animation, and audio/video materials for personal/professional presentations.

CA 1040f,s. Web Site Development. (2 cr)
Web site design. HTML/XML, scripting, graphics, Web services, user interface design.

CA 1055f,s,su. Animation Software Applications With Flash MX. (2 cr)
Fundamentals of Flash MX Animation. Students create animated Flash page for Web sites and interactive learning components for E-learning.

CA 1060f,s. Database Applications. (2 cr. Prereq–1010)
Techniques for creating, querying, reporting, and maintaining databases with MS Access.

CA 1070f,s,su. Desktop Publishing. (2 cr)
Publishing software. Emphasizes layout, style, color, and message delivery in print and on the Internet.

CA 1080s,su. Audio-Visual Production Applications. (2 cr)
Using editing/designing software in creating interactive streaming audio-video presentations for courseware, training modules, and marketing/management promotional products.

Computer Software (CS)

CS 1500s. Discrete Structures I. (3 cr)
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–1500)
Predicate logic, recurrence relations, graphs, trees, matrices, computational complexity, elementary compatibility, discrete probability.

CS 2090f. Data Structures and Algorithms. (3 cr)
Recursion, underlying philosophy of object-oriented programming. Fundamental data structures (including stacks, queues, linked lists, hash tables, trees, graphs). Algorithmic analysis. Principles of language translation.

CS 2100f. Microcomputer Systems Architecture. (3 cr)
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)
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)
Low-level software design issues, including formal approaches.

CS 2400s. Software Engineering Approach to Human Computer Interaction. (3 cr. Prereq–2200)
Topics relating to designing/evaluating user interfaces. Psychological background needed to understand people.

CS 3200f. Software Design and Architecture. (3 cr. Prereq–2200)
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)
Software quality assurance. Reviews/inspections, testing, formal verification methods, process management/improvement, defect prevention.

CS 3400s. Software Requirements Analysis. (3 cr. Prereq–2200)
Discovering/eliciting 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. Prereq–2200, Mgmt 3200)
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 3820. Gaming: Real-Time Systems. (3 cr. Prereq–3050, Math 1272, Phys 1102)
Mathematical foundations/modeling techniques, mapping, anti-aliasing, real-time rendering, binary space partition trees, object control issues.

CS 3900f,s,su. Internship. (3 cr [max 6 cr])
Students identify employment opportunities in the field.

CS 4500f. Senior Project I. (3 cr. Prereq–3500)
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)
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.

Continuing Education (CnEd)

Continuing Education (CnEd) special classes in general, adult, and continuing education offered in response to student and community needs and interests.

CnEd 1000-1999. Selected Topics. (Cr vary)

Criminal Justice (CrJs)

The following are natural resources law enforcement requirements. These courses are delivered by the criminal justice department at Bemidji State University.

CrJs 1120s. Criminal Justice and Society (BSU). (4 cr)
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 3304f. Police Process (BSU). (3 cr. Prereq-1120)
Function of law enforcement, roles of police, in modern society. Police organizations, police officers, police work. Critical police-problems.

CrJs 3305s. Judicial Process (BSU). (3 cr. Prereq-1120)
Criminal justice judicial process. Judicial involvement: from pre-arrest warrant issuance to appellate court review. Role/behavior of prosecutors, defense attorneys, judges.

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

CrJs 3334f. Criminal Justice Planning (BSU). (3 cr. Prereq-1120, 3304, 3305)
Overview of crime prevention. Presented within a framework of a planned, proactive response to crime by all components of the criminal justice system. Principles of planning, research, and evaluation as applied to crime prevention.

CrJs 3358f. Criminal Law (BSU). (3 cr)
Basic concepts of criminal law and of 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 3359f. Criminal Investigation (BSU). (3 cr)
Problems, concepts, principles, techniques involved in investigation of crime. Rules of evidence.

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

CrJs 4100f. Applied Ethics (BSU). (3 cr. Prereq-1120)
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)
Dynamics of class, race, and gender as they intersect with social realities of crime/justice 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 4480s. Policing People (BSU). (3 cr. Prereq-1120, 3304)
Addresses several Minnesota Board of Police Officer Standards and Training learning objectives: victimization, dealing with the mentally disturbed, police/minority relations, police/community relations.

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. In this collaborative degree and licensure program with Bemidji State University (BSU), the courses are offered by UMC faculty and may be delivered through ITV for BSU students.

ECE 2100f,s. Child Development and Learning. (3 cr; A-F only)
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 3410s. Learning Environments for Infants and Toddlers. (4 cr; A-F only. Prereq-2100)
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; A-F only. Prereq-2100)
Understanding/applying practices to promote emotional/social development in infancy/toddlerhood. Principles of caregiving. Relationship to teaching/learning environment. Developmentally appropriate guidance, collaborative parent/staff relationships, respecting family/cultural values/experiences.

ECE 3500f,s. Young Children With Special Needs. (3 cr; A-F only. Prereq-3410)
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.

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

ECE 4440f,s,su. Infant and Toddler Student Teaching. (6 cr. Prereq-3410, 3420)
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 4700f. Developmentally Appropriate Preprimary Education I. (3 cr. Prereq-2100, Ed 3670)
Students integrate theory/practice related to preprimary (preschool, kindergarten) education. Development related to learning environment, curriculum, and teaching methods. Developmentally appropriate approaches to subject matter in language arts, literacy, and expressive arts. Field experiences.

ECE 4702s. Developmentally Appropriate Preprimary Education II. (3 cr. Prereq-4700)
Students integrate theory/practice related to preprimary education (preschool, kindergarten). Development related to learning environment, curriculum, and teaching methods. Developmentally appropriate approaches to subject matter in mathematics and in physical/social sciences.

ECE 4730f,s. Understanding and Supporting Parenting. (3 cr. Prereq-2100, jr or sr)
Parent-child relationships, adult development, family systems theory, parental authority, child compliance, developmental interaction during child rearing years. Parenting in diverse family configurations, in diverse cultures/lifestyles, and in high-risk families. Emphasizes knowledge of research for application.

ECE 4750f,s. Family, School, and Community Relations. (3 cr. Prereq-3410, 3420, 4700, Ed 3670, 3677)
Emphasizes family involvement as essential to successful education. Patterns in family-school relations, trends, problems that inhibit parent involvement, strategies for productive family involvement. Community/cultural considerations.

ECE 4811f,s,su. Preprimary Student Teaching I. (4 cr. Prereq-4700, 4702, Ed 3677)
Students integrate theory/practice as member of teaching team. Portfolio-based student-teaching experience. Focuses on selected BOT competencies and indicators. University approved classroom placement in preschool-aged setting.

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ECE 4812f,s. Preprimary Student Teaching II (K). (4 cr. Prereq—4700, 4702, Ed 3677)
Students integrate theory/practice as member of teaching team. Portfolio-based student-teaching experience. Focuses on selected BOT competencies/indicators. University approved classroom placement in a kindergarten classroom.

ECE 4880f,s. Administration of Early Childhood Programs. (3 cr. Prereq—3410, 4700)
Application of developmental theory, human ecological systems framework, management theory. Survey of management processes, principles, tasks. Emphasizes government regulations, community relations, staff development, advocacy, financial resource management.

Economics (Econ)

Econ 2101f,s. Microeconomics. (3 cr. Prereq—Math 0991 or 2 yrs high school algebra or equiv)

Basic economic principles of pricing, resource allocation, and consumption. Supply/demand, cost of production, consumer behavior. Competition and influences of market structure.

Econ 2102f,s. Macroeconomics. (3 cr. Prereq—Econ 2101)
"Big picture" of economy. Determinants of national income, national income accounting, unemployment, inflation, economic growth. Classical, Keynesian, and more recent theoretical approaches to modifying economic activity. Monetary/fiscal policies. International economic relations.

Education (Ed)

The following 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. Most courses are offered by Bemidji State University (BSU) faculty in this collaborative degree and licensure program and typically are delivered through ITV for UMC students.

Ed 3100f. Introduction to the Foundations of Education (BSU). (3 cr. Prereq—Preprofessional Skills Test [PPST])
Roles, responsibilities, duties, functions, routines, requirements of public school teachers. Historical, social, political foundations of public education. Role of education in a pluralistic society. Issues affecting education in American public schools.

Ed 3110f,s. Educational Psychology (BSU). (3 cr. Prereq—3100)
Teaching/learning process: (1) planning/effective instruction; (2) behavioral/cognitive views. Emphasizes how learning is affected by development, individual differences, motivation.

Ed 3201s. Language Arts in the Primary Grades. (3 cr. Prereq—3670)
Various approaches and multiplicity of tasks involved in teaching primary language arts.

Ed 3301f. Creative Expression in Elementary Education (BSU). (3 cr. Prereq—3670)
Children's literature as vehicle for teaching primary-grade learners confidence/competence in expressive arts. Emphasizes theme-oriented literature-extension approach. Listening, speaking, reading/writing. Aesthetic expression in visual art, music, movement, creative drama. Field experiences.

Ed 3670f. Foundations of Early Childhood Education (BSU). (3 cr; A-F only. Prereq—Completion of Pre-Professional Skills Test [PPST]; minimum GPA of 2.50)
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.

Ed 3677s. Relations and Management in Early Childhood Education (BSU). (3 cr; A-F only. Prereq—Completion of Pre-Professional Skills Test [PPST]; Ed 3670; minimum GPA of 2.50)
Students study, gain skills in relations with young children, parents, coworkers. Guidance, group management techniques for working effectively with prekindergarten and young school-age children. Experience in early childhood classrooms.

Ed 3870s. Mathematics in the Primary Grades (BSU). (3 cr. Prereq—3670)
Mathematical background including teaching aids, games, projects, activities that relate to K-3 level. Set theory, numeration, systems of whole/rational numbers. Basic mathematical operations presented from concrete standpoint.

Ed 3877f,s. Social Studies and Sciences in the Primary Grades (BSU). (4 cr. Prereq—3670)
Concepts/tools for teaching physical/social sciences. Ability to wonder, curiosity, respect for world/environment/life. Emphasizes integrated approach to sciences: classroom, neighborhood, community, world. Basic skills of scientific inquiry: asking questions, qualified conclusions.

Ed 4827f,s. Primary Student Teaching. (8 cr. Prereq—3207, 3301, 3870, 3877)
Students teach in public school classroom with guidance/supervision by University supervisors/assigned school personnel. Classroom placement in first, second, or third grades. Portfolio-based student teaching experience. Focuses on selected INTASC/BOT indicators.

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)
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 5003s. Developmental and Individual Differences in Educational Contexts (UMTC). (3 cr)
Overview of developmental/individual differences of children/adolescents in educational contexts. Emphasizes dynamic systems perspective. Developmental transitions. Interactions between student, environment, task. Accommodations/adaptations for students in special education.

EdHD 5005s. School and Society (UMTC). (2 cr)
Readings in history, philosophy, social sciences, law that reveal diverse educational values in a pluralistic society. Multiple expectations of schools. Civil liberties, rights, community. Varying cultural backgrounds of students, family circumstances, exceptional needs.

EdHD 5007s. Technology for Teaching and Learning (UMTC). (1.5 cr)
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). (1 cr)
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)
Uniqueness of the early adolescent. Appropriate learning situations for educators working with middle-level students.

Entrepreneurship (Entr)

Entr 2200f,s. Introduction to Entrepreneurship and Small Business. (3 cr)
Entrepreneurship and the economy. Traits/skills of entrepreneurs, opportunities in entrepreneurship, legal forms of business establishment, self-analysis/fitness for entrepreneurship.

Entr 3200f,s. Business Plan Development. (3 cr. Prereq–Mgmt 3100, 3200, Mktg 3300)
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–Mgmt 3100)
Start-up/expansion financing, requirements for economic development groups. SBA loan guarantees, venture capitalists, small business valuation techniques. Cessation, related tax planning strategies.

Entr 4100s. International Entrepreneurship. (3 cr. Prereq–Mktg 3260)
Opportunities in international expansion/development, including import-export and franchising. International risk assessment, financial/legal implications, cultural issues.

Entr 4200f. Field Studies in Entrepreneurship and Small Business. (3 cr. Prereq–3200, 3400)
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)
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 1000f,s. Light Horse Driving. (2 cr)
Types of driving vehicles and harness, including fine harness, heavy harness, and competitive driving. Hitching and driving the fine harness horse. Techniques for training the fine harness horse to drive. Negotiating obstacles while driving.

EqSc 1100f,s. Western Equitation. (3 cr)
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)
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)
Conformation, breed characteristics, and type and their importance in evaluation. Performance evaluation, criteria, and scoring methods. Preparation and delivery of oral reasons.

EqSc 1300s. Saddle Seat Equitation. (3 cr. Prereq–EqSc 1100 or 1200 or instructor consent)
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)
Current topics not covered in regularly offered courses.

EqSc 2102f. Horse Production. (4 cr. Prereq–AnSc 1004)
Fundamentals of horse care. Equine nutrition, behavior, diseases. Hoof care. First aid, health care, disease prevention. Parasites.

EqSc 2112f,s. Riding Instructor Training. (2 cr. Prereq–Any two of the following: 1100, 1200, 1300)
Formulating lesson plans. Teaching methods for individuals or group. Safety, insurance, liability, management. Student’s teaching methods are evaluated.

EqSc 3305s. Equine Reproductive Techniques. (3 cr. Prereq–2101, AnSc 3203, 3304 or instructor consent)
Breeding management practices/techniques. Gestation, fetal development, endocrinology, estrus manipulation, artificial insemination, embryo transfer, cooled and cryopreservation of semen, teasing, and foaling. Lab emphasizes skills required in equine industry. Lecture emphasizes reproductive theory.

EqSc 3403s. Equine Exercise Physiology. (3 cr. Prereq–2102, AnSc 3203)
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], [3412 or concurrent registration in 3412])
Work with untrained young horse or older show horse to correct problems or maintain the horse.

EqSc 3441f. Topics in Advanced Western Equitation. (1.5 cr. Prereq–Instructor consent)
Experience in reining maneuvers. Students refine skills.

EqSc 3443f. Topics in Advanced Equitation Over Fences. (1.5 cr. Prereq–Instructor consent)
Experience in riding more challenging course of jumps.

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

EqSc 4102s. Equine Management. (3 cr. Prereq–Econ 1101)
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)
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)
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–1123)
Influence of age, growth, and normal development on nutritional requirements.

FScN 1654s. Nutritional Care: Practices and Procedures. (3 cr)
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)
Current topics not covered in regularly offered courses.

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

FScN 3203f,s. Community Nutrition. (3 cr. Prereq–1123)
Nutrition programs in the community, including those serving infants, children, and the elderly. Sociocultural and ethnic food consumption issues. Instructional methods for individuals and groups.

FScN 3211s. Professional Issues in Dietetics. (1 cr)
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)
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)
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)
Supervised professional work experience at selected sites. Reports/consultation with faculty adviser/employer.

General Agriculture (GnAg)

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

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GnAg 2899f. Pre-Internship Seminar. (.5 cr; A-F only)
Expectations/responsibilities of internships. Preparing for a job search. Presentations about internship experiences by those who have recently completed 3900. Discussions between students, staff, and invited guests.

GnAg 3203s,su. Ag Products and Processing. (3 cr; S-N only. Prereq–Jr)
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–Jr, instructor consent)
Topic related to student’s major not covered in regularly offered courses.

GnAg 3899f. Pre-Internship Seminar. (.5 cr; A-F only)
Expectations/responsibilities of internships. Preparing for a job search. Presentations about internship experiences by those who have recently completed 3900. Discussions between students, staff, and invited guests.

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

GnAg 3901f. Post Internship Seminar. (.5 cr; A-F only. Prereq–3900)
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.

GnAg 4652f,s. Agriculture and Natural Resources Seminar. (1 cr. Prereq–Sr or instructor consent)
Survey of current literature. Preparation/delivery of special topics. Preparation of abstracts, papers, and visual aids. Evaluation of seminars. Use of library and other resources, including computer information search. Use of new technology.

General Business (GBus)

GBus 1603s. Principles of Insurance. (3 cr)
Principles and fundamentals of insurance of various types, risk of retailing, managing retail risks, buying insurance, handling claims.

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

GBus 1981s. Internship Seminar. (1 cr)
Planning for securing and successfully completing an internship. Internship policies and objectives; samples of forms.

GBus 3107f,s. Legal Environment in Business. (3 cr; A-F only)
Fundamental concepts of business law, with emphasis on the legal system, contracts, bailments, agency, business organizations, and the fundamentals of commercial law.

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

General Education (GnEd)

GnEd 1000f,s. Seminar for New Students. (1 cr)
Skills for adjusting to college-level academics.

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

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

GnEd 1900f,s. Chancellor’s Academic Success Seminar. (.5 cr. Prereq–Student must be on academic contract)
Comprehensive study program to help strengthen learning skills. Includes some monitoring of contract requirements.

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

GnEd 3809f,s. Teaching and Learning Assistance. (1 cr [max 4 cr]. Prereq–Jr status, instructor consent, minimum GPA 3.00 in subject matter)
Skills/techniques in disciplinary content associated with college teaching. Supervised by faculty monitor and site supervisor.

Geography (Geog)

Geog 1104f,s. World Regional Geography. (3 cr)
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 1001f,s. Introductory Geology. (3 cr; A-F only)
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.

Golf Facilities and Turf Systems (GFTS)

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

GFTS 3072s. Principles of Turf Management. (3 cr. Prereq–Biol 1103, Hort 1010, Soil 1293)
Species identification. Cultural requirements/principles for establishing, producing, and maintaining turf. Golf course turf care/maintenance.

GFTS 3074s. Turfgrass Pest Management. (3 cr. Prereq–3072, PIM 1573)
Identification/control of turfgrass diseases, weeds, and insects. Emphasizes integrated cultural/chemical management methods.

GFTS 3076f. Turfgrass Management Systems. (3 cr. Prereq–3074)
Advanced skills for establishment, maintenance, and renovation. Strategies for developing turfgrass management systems. Decision-making and problem-solving in applied-business context. Professional skills development.

GFTS 3077s. Turf and Landscape Irrigation Design and Installation. (2 cr; A-F only)
Basic irrigation design, including pipe sizing/selection, pressure loss, sprinkler types/selection. Installation equipment, techniques. Lab.

GFTS 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr])
Topics not included in regularly scheduled courses.

Health (Hlth)

Hlth 1062f,s. First Aid and CPR. (2 cr)
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 1072f,s. Wellness. (3 cr)
Students develop a personal wellness plan.

Health Science (HSci)

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

HSci 3900. Internship. (1-3 cr [max 3 cr])
Supervised professional work experience in health care facility. Report/consultation with faculty adviser/employer.

Health Systems Management (HSM)

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

HSM 1803f,s,su. Directed Studies. (1-3 cr [max 6 cr]. Prereq–Instructor consent)

Current topics not covered in regularly offered courses.

HSM 2010f. Introduction to Health Services Organizations. (2 cr; A-F only)

Major developments in the evolution of health care in the United States. Education and training of health care personnel. Service providers. Public, private, voluntary agency initiatives. Major stakeholders; rural and urban priorities.

HSM 3020s. Quality Improvement and Risk Management. (3 cr. Prereq–3100, 3200)

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 3030f,s. Health Care and Medical Needs. (2 cr. Prereq–1010; Biol 1464)

Common health conditions, diseases, disabilities. Intervention/treatment issues. Health care and medical needs across age continuum. Medical/pharmacologic terminology.

HSM 3100f,s. Essentials of Managed Care. (3 cr. Prereq–2010)

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)

Data accumulation, storage, integration, manipulation, and presentation. Strategic uses of data. Information access/security, their relation to patient confidentiality.

HSM 3200f. Health Care Leadership and Planning. (3 cr. Prereq–2010)

Organizational management characteristics for modern health care settings. Management process and managerial roles addressing resource allocation, delivery of clinical services, governance, patient satisfaction, and outcome evaluation.

HSM 3230f,s. Administration of Continuum Care Facilities. (3 cr)

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 3240f,s. Health Care Policy and Comparative Systems. (3 cr)

Analysis/comparison of world health problems and delivery systems. Geographic, political, and economic relationships affecting health care system.

HSM 3804f,s,su. Individual Studies. (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent)

Topic related to student's major not covered in regularly offered courses.

HSM 3900f,s,su. Internship. (1-3 cr [max 3 cr]. Prereq–3200, 3230, 4210, 4212, instructor consent)

Ten-week field experience under direction of a faculty member in a health care organization or agency. Internship plan must be coordinated with and approved in advance by HSM program director. Students complete agency/organization assessment and major project. May be repeated in different health care setting.

HSM 4100s. Health Care Finance. (3 cr. Prereq–Acct 2101, Acct 2102)

Finance structure of U.S. health care system. Reimbursement mechanisms. Financial information in management decision making. Financial planning/control. Analysis of financial statements/budgets in health care system.

HSM 4210f,s. Health Care Law and Biomedical Ethics. (3 cr. Prereq–3200)

Legal/bioethical issues in health care management. Professional licensing, certification, and reporting. Liability, negligence, malpractice. Patient rights/responsibilities. Clinical outcomes assessment/measurement.

HSM 4212f,s,su. Regulatory Management. (3 cr. Prereq–3200)

Health care funding/reimbursement processes. Compliance/regulatory mechanisms. Federal/state surveys.

History (Hist)

Hist 1021f,s. World Civilization I. (3 cr)

Ancient Near East, Greece, Egypt, Rome, and Medieval Europe.

Hist 1022f,s. World Civilization II. (3 cr)

Renaissance and Modern Europe from Reformation to present.

Hist 1301f. American History I. (3 cr)

Colonial era and early national period from the Revolution through the Civil War and Reconstruction.

Hist 1302f,s. American History II. (3 cr)

Gilded Age to present with emphasis on foreign involvements and wars, New Deal, civil rights, and economic developments.

Hist 3054f,s. Topics in History. (3 cr [max 6 cr])

Topics of regional, national, or international importance, such as Minnesota history, U.S. Civil War, Japanese history.

Horticulture (Hort)

Hort 1010f,s. Introduction to Horticulture. (3 cr)

Environmental considerations, planting, propagation, pruning, and protection of horticultural crops. Greenhouse/field experience.

Hort 1021f. Woody Plant Materials. (4 cr; A-F only. Prereq–1010 or instructor consent)

Identification, ecology, and use of deciduous and evergreen trees, shrubs, and vines.

Hort 1030s. Residential Landscape Design. (3 cr. Prereq–1010)

Planning and developing formal and informal landscape sites for residential uses.

Hort 1031f. Herbaceous Perennial Plant Materials. (2 cr; A-F only)

Identification, classification, ecology, and landscape uses of perennial flowers, bulbs, ground covers, and wildflowers.

Hort 1091f. Indoor Ornamental Plants. (2 cr)

Identification, culture, and propagation of foliage plants used in interior decoration.

Hort 1092s. Floral Design. (2 cr)

Principles for design related to floral arrangement, identification, use, and care of cut flowers common to florist industry.

Hort 1093s. Advanced Floral Design and Florist Operations. (2 cr. Prereq–1092)

Advanced floral design. Management/business issues unique to floral industry.

Hort 3033f. Commercial Floriculture Crops–Fall. (4 cr. Prereq–1010)

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)

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)

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. Commercial Landscape Design and Grounds Maintenance. (4 cr. Prereq–1030)

Drawing landscape plans for commercial property. Reading blueprints/commercial bids. Applied horticulture skills in transplanting, storing, and planting landscape materials. Power equipment demonstration/use (e.g., tree spade, box scraper, tractors, mowers).

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UMTC University of Minnesota, Twin Cities

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cr credit

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fr, soph, jr, sr freshman, sophomore, junior, senior

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Hotel, Restaurant, and Institutional Management (HRI)

- HRI 1111f,s,su. Introduction to Food Preparation.** (3 cr)
Fundamentals of food preparation and equipment use. Culinary vocabulary, cooking methods, and recipe development. Stocks, soups, sauces, seafood, poultry, meats, vegetables, salads, baking, and desserts.
- HRI 1112s,su. Sanitation and Safety.** (2 cr)
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,su. Directed Studies.** (1-3 cr [max 6 cr]. Prereq–Instructor consent)
Current topics not covered in regularly offered courses.
- HRI 2124f,s. Quantity Foods Systems Management.** (4 cr. Prereq–1111, 1112)
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 Management.** (3 cr)
Professional hotel/resort rooms management, relevant operational procedures. Emphasizes issues related to management of front office and housekeeping operations.
- HRI 2231f,su. Menu Design and Analysis.** (3 cr. Prereq–1111)
Principles of menu design, pricing, and analysis. Menus for varied establishments of the hospitality industry.
- HRI 3241s. Hospitality Selection and Procurement.** (3 cr. Prereq–1111)
Purchasing, receiving, storing, and issuing of products. Formulating specifications, judging quality, selecting products to meet specific needs, and developing security measures.
- HRI 3311f,s. Restaurant Operational Management.** (3 cr. Prereq–1111, 2121)
Students compare/contrast types of service (e.g., modified American, French, Russian); and develop/apply menu planning techniques, cost controls, and personnel organization. Gueridon preparation/service with product merchandising.
- HRI 3331f,su. Global Tourism.** (3 cr. Prereq–Econ 2101)
Tourism as a product and its effect on the local economy. Developing tourism plan and strategy; their impact on the community. Travel trends, motivations, handler profile. Issues related to international tourism, travel sales distribution systems, and regulations governing travel agencies.
- HRI 3341f,s,su. Hospitality Marketing and Sales.** (3 cr)
Issues related to strategic marketing, market analysis, and market segmentation. Developing a hotel marketing plan. Processes involved in pre-opening marketing of a new hotel. Emphasis on considerations for hospitality products and services marketing.
- HRI 3411s. Facility Layout and Design.** (3 cr. Prereq–1111, 2124, 2231)
Impact of feasibility studies and customer profiles. Students design a food service facility and hotel guest room, using interior design concepts. Emphasizes equipment and furnishing selection, tabletop design product, or guest flow concepts. Students are encouraged to attend UPS show in Minneapolis.
- HRI 3804f,s,su. Individual Studies.** (1-3 cr [max 6 cr]. Prereq–Jr, instructor consent)
Topic related to student's major not covered in regularly offered courses.
- HRI 3900f,s,su. Internship.** (1-3 cr [max 6 cr]. Prereq–Instructor consent)
Supervised professional work experience at selected sites. Reports/consultation with faculty adviser/employer.
- HRI 4321s. Food, Beverage, and Labor Control.** (3 cr. Prereq–3241, Acct 2101)
Food service operations cost calculations. Relationship between cost volume and profit. Management processes used in food service to keep costs at realistic levels and achieve desired goals. Implementing electronic spreadsheets to track profit/loss.
- HRI 4421f,s,su. Hospitality Law.** (3 cr. Prereq–Sr)
Laws/cases applicable to operation of hotels, restaurants, motels, and other hospitality establishments.

- HRI 4431s. Beverage Technology.** (3 cr. Prereq–2231)
Wines, beers, liquors. Laws governing manufacture, classification, and sale of alcoholic beverages. Characteristics of various wines with food. Emphasis on operation of a professional beverage facility.
- HRI 4441s. Catering On and Off Premise.** (3 cr. Prereq–1111, 2124, 2231, 3311)
Theory/application of operational/managerial principles for off- and on-premise catering for banquets, buffets, weddings, ceremonies, teas, and other special events. Working with tallow and other selected products.
- HRI 4451s. Cases and Trends in Hospitality Management.** (3 cr. Prereq–Sr)
Hospitality topics explored using a critical incident approach, which encourages thorough analysis of a prominent issue rather than superficial analysis of a complicated case. UPS show attendance required.

Humanities (Hum)

- Hum 1301f,s. Introduction to Humanities.** (3 cr)
The arts as a reflection of our search for understanding of the human condition. Beliefs and attitudes presented through creative expressions from around the world.
- Hum 3310f,s. Culture and Technology.** (3 cr)
Analysis of historical and cultural factors shaping technology. Synthesis of integrated relationships among technology, the arts, societal practices, and values.

Information Technology Management (ITM)

- ITM 1803f,s,su. Directed Studies.** (1-3 cr [max 6 cr]. Prereq–Instructor consent)
Current topics not covered in regularly offered courses.
- ITM 2050f,s. Introduction to Programming I.** (3 cr. Prereq–Math 1031 or equiv of 2 yrs high school algebra or ACT score of 20)
Structured and object oriented programming with current industry accepted languages. Basic data, selection, and iteration structures. Input/output operations, class definitions, interfaces, exception handling, inheritance, composition, polymorphism.
- ITM 2060f,s,su. Database Management Systems.** (3 cr; A-F only)
Introduction to database design management/implementation. Data modeling, normalization, DML, DDL. Use of common DBMSs and modeling tools.
- ITM 2070s. Introduction to Programming II.** (3 cr. Prereq–2050)
Java programming language and development process. Objects, classes, packages, applets.
- ITM 3110f,s. Microcomputer Operating Systems.** (3 cr; A-F only)
Introduction to DOS, Windows 3.1, Windows 95, Windows NT, and UNIX operating systems. Single-user vs. multi-user systems, control operations, utilities, hardware, application software specifications.
- ITM 3120f,s. Networking and Telecommunications.** (3 cr; A-F only. Prereq–ITM 3110)
Design, implementation, and management of an enterprise network. Introduces building blocks of network design such as servers, routers, bridges, gateways, transmission media, communications protocols, network security, and performance tuning.
- ITM 3130f,s. Messaging Systems.** (3 cr. Prereq–ITM 3110, 3120)
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 3145f,s. HTML/XML.** (3 cr. Prereq–ITM 2060, 2070)
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, CSLT, XPath, XLink, HTML, and CSS.
- ITM 3190f,s. Topics in Information Technology Management.** (3 cr [max 9 cr]. Prereq–2050, 2060)
Topics may include cold fusion, asp, net, and other emerging platforms.

ITM 3200f,s. Internet Standards and Protocols-TCP/IP. (3 cr. Prereq-3110)

Overview of computer connectivity through the Internet. Internetworking hardware/software, system design considerations, protocols, security, management.

ITM 3215f,s. Information Assurance and Systems Security. (3 cr. Prereq-3110, 3120)

Hacking culture. Impact of computer crime and Internet fraud. How a network/systems administrator can design/implement countermeasures to defend/protect systems assets.

ITM 3804f,s.su. Individual Studies. (1-3 cr [max 6 cr]; A-F only. Prereq-Jr, instructor consent)

Topic related to student's major, not covered in regularly offered courses.

ITM 3900f,s.su. Internship. (1-3 cr [max 6 cr]. Prereq-Jr or instructor consent)

Supervised experience in an information or networking entity within a business firm or agency. Reports/consultations with faculty advisers and employers.

ITM 4020f,s. Analysis and Design of Information Systems. (3 cr. Prereq-2050, 2060, 3110)

Systems development life cycle. Needs assessment, hierarchical diagramming, entity-relationships, data-flow diagramming. Project-focused review.

ITM 4900s. Senior Project in Information Technology Management. (3 cr. Prereq-Sr)

Students complete an extensive IT design/development project under guidance of faculty member and present the project to ITM faculty and senior peers.

Literature (Lit)

Lit 1005f,s. Introduction to Literature. (3 cr; A-F only)

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 1016f,s. Readings in American Life. (3 cr; A-F only)

American literature from Puritans to present. Developing an informed, personal response to that literature. Major concerns of American writers in different eras. Introduction to interpretative skills required for an appreciation of literature.

Lit 3001s. World Literature. (3 cr; A-F only)

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 1803f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instructor consent)

Current topics not covered in regularly offered courses.

Mgmt 3100f,s. Managerial Finance. (3 cr; A-F only. Prereq-Acct 2102, Econ 2102, Math 1150)

Principle financial considerations and ratio analysis of a business. Cost of capital, asset management, capital structure planning, financial statement analysis, working capital management, short-term financing, budgeting. Integrates theory and applications.

Mgmt 3200f,s. Principles of Management. (3 cr; A-F only. Prereq-Psy 1001 or instructor consent)

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. (3 cr; A-F only)

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; A-F only. Prereq-3200)

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.su. Operations Management. (3 cr; A-F only. Prereq-3200, Math 1150 or instructor consent)

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 3260f,s. Current Topics. (3 cr. Prereq-3200, Mktg 3200 or instructor consent)

Emerging trends in business theory/applications. Introduction to major trends, their implications.

Mgmt 3270f,s. Fundamentals of E-Business. (3 cr. Prereq-3200, ITM 1200, Mktg 3300)

Emerging trends/technologies defining rules of business in emerging information economy. Business-to-consumer, business-to-distribution channel, and business-to-supply-chain software. Skills in HTML/XML.

Mgmt 3600f,su. Management Case Studies. (3 cr. Prereq-3100, 3200, Mktg 3300 or instructor consent)

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 3804f,s.su. Individual Studies. (1-3 cr [max 6 cr]; A-F only. Prereq-Jr, instructor consent)

Topic related to student's major not covered in regularly offered courses.

Mgmt 3900f,s.su. Internship. (1-3 cr [max 3 cr]. Prereq-Jr)

Students are employed as interns in a business firm, institution, or agency to gain an in-depth understanding of their field of study. Reports and consultations with faculty and employers required.

Mgmt 4200f,s. Project Management. (3 cr. Prereq-3200)

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.

Mgmt 4800s. Strategic Management. (3 cr; A-F only. Prereq-Taken final sem or adviser approval)

Capstone, integrative course for senior business management, management emphasis students. Students chart future direction of organizations by formulating, implementing, evaluating strategies. Individual/group creative problem-solving exercises. Students make objective strategic decisions and justify them through oral/written communication.

Marketing (Mktg)

Mktg 1803f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instructor consent)

Current topics not covered in regularly offered courses.

Mktg 3200f,s. Personal Selling. (3 cr; A-F only)

Introduction to selling principles and processes, industrial vs. ultimate consumer selling, persuasive communication, selling vs. buying process, and time management of the sales professional. Emphasis on developing long-term buying and selling relationships.

Mktg 3250f,s. Promotional Strategies. (3 cr; A-F only. Prereq-3200, 3300)

Principles involved in developing and managing advertising, personal selling, public relations, and sales promotion programs. Introduction to promotional strategies through studying the promotional mix, marketing communications, theory, research, and marketing management. Students develop and present a promotional campaign for an actual company.

Mktg 3300f,s. Principles of Marketing. (3 cr; A-F only. Prereq-Econ 2101 or 2102, Psy 1001 or instructor consent)

Introduction to marketing and strategic marketing process. Team development of marketing plan that implements product, pricing, distribution, and promotional strategies.

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Mktg 3310f,s. Buyer Behavior. (3 cr; A-F only. Prereq–3300)
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. Global Business. (3 cr; A-F only. Prereq–3300, Mgmt 3200)
Factors affecting marketing of goods and services and managing the organization in the international environment. Students complete a team marketing plan for a product being marketed internationally.

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

Mktg 4200f. Marketing Research. (3 cr; A-F only. Prereq–3300, Math 1150)
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; A-F only. Prereq–3250, 3350; taken final semester)
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.

Mathematics (Math)

Math 981f,s. Basic Math. (0 cr)
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–0981 or equiv)
Signed numbers, first-degree equations/inequalities, fractional equations, exponents, polynomials, factoring, rational expressions, radical expressions, graphing, systems of equations, functions.

Math 992f,s. Intermediate Algebra. (0 cr)
Review of elementary algebra, polynomials, factoring, rational expressions, radical expressions, graphing systems of equations. Introduction to functions.

Math 1001f,s. Technical Math. (3 cr. Prereq–Math 0981 or equivalent; will not satisfy math/sci distribution requirements for baccalaureate degrees; no credit granted if taken after 1031 or 1150)
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)
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 and Analytical Geometry. (3 cr. Prereq–Math 0991 or 0992)
Basic algebraic operations, linear and quadratic equations and inequalities, variation, functions and their graphs, theory of equations, exponential and logarithmic functions, systems of equations, matrices and determinants.

Math 1142f,s. Survey of Calculus. (3 cr. Prereq–Math 1031)
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)
Descriptive statistics, elementary probability, normal distribution, binomial distribution, confidence intervals, tests of hypotheses, correlation, regression, chi-square, ANOVA.

Math 1250f,s,su. Precalculus. (4 cr. Prereq–Math 1031 or placement exam)
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)
Limits, differential calculus of functions of a single variable, applications. Introduction to integral calculus of a single variable.

Math 1272s. Calculus II. (4 cr. Prereq–Math 1271)
Techniques of integration, calculus involving transcendental functions, polar coordinates, Taylor polynomials, vectors/curves in space, cylindrical/spherical coordinates.

Music (Mus)

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

Mus 1021f. Introduction to Music. (3 cr)
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])
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])
Study of piano technique/musicianship in classroom setting using multiple electronic keyboards. Musical concepts, including melody, harmony, rhythm, repertoire.

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

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

Mus 1111f. Music Theory I: Foundations of Tonal Music. (3 cr)
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 1121s. Music Theory II: Diatonic Tonality, Harmony and Voice Leading. (3 cr. Prereq–Mus 1111)
Basic harmonic and contrapuntal relationships. Sonata, rondo, variation, minuet, and other standard categories of tonal composition. Chromatic tonal practices; expanded choral vocabulary, voice leading analysis. Basic theories of 20th-century music.

Mus 3011f,s. University Singers (Choir). (1 cr [max 6 cr]. Prereq–1011, audition demonstrating skill in [sight-reading, accuracy of pitch, basic musicianship])
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 3029s. Music of the Twentieth Century. (3 cr. Prereq–Mus 1021 or instructor consent)
Compares various styles of 20th-century music to develop an understanding of human expression; compares musical forms and trends.

Mus 3041f,s. Private Instruction. (1 cr [max 6 cr]. Prereq–Instructor consent)
Advanced music instruction.

Mus 3051f,s. Band/Pep Band. (1 cr [max 6 cr]. Prereq–Audition)
Students serve as section leaders, are required to review music to be rehearsed by ensemble before the music is "handed out."

Mus 3091s. Instrumental and Choral Conducting. (2 cr. Prereq–At least 2 cr of 1011 and/or 1051, instructor consent)
Conduct UMC ensembles to develop score reading skills, conducting techniques.

Mus 3604f. Music Methods and Materials for Children. (3 cr)
Current curriculum, methodologies, techniques, materials, instruments appropriate for teaching music in pre-kindergarten through 10 years. Orff, Kodaly, Dalcroze, eclectic methodology, vocal techniques, lesson planning, effective communication, evaluation. Emphasizes integrating diverse curriculum/music learning for children with varying disabilities.

Natural Resources (NatR)

NatR 1226f. Issues in Sustainability. (3 cr)

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 1233f. Introduction to Natural Resources. (3 cr; A-F only)

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 1244s. Elements of Forestry. (4 cr; A-F only. Prereq-1233)

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 1663s. Principles of Fisheries Management. (3 cr; A-F only. Prereq-1233)

Fisheries management and fish species of Minnesota. Identification, ecology, population assessment, application of appropriate management techniques.

NatR 1803f,s. Directed Studies. (1-3 cr [max 6 cr]. Prereq-Instructor consent)

Current topics not covered in regularly offered courses.

NatR 2573f. Entomology. (3 cr; A-F only. Prereq-Agro 1183 or Hort 1010)

Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

NatR 3203s. Park and Recreation Management. (3 cr; A-F only. Prereq-NatR 1233)

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 private and public recreational area manager.

NatR 3296f,s,su. Special Topics in Wildlife Management. (1-3 cr [max 6 cr]. Prereq-Sr or instructor consent)

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)

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-Sr or instructor consent)

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 3364s. Plant Taxonomy. (3 cr; A-F only. Prereq-Biol 1103 or instructor consent)

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 3374f. Ecology. (4 cr; A-F only. Prereq-Biol 1009, Soil 1293)

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. (2 cr. Prereq-3374)

Ecology and management of wetland and riparian lands from global, continental, and Minnesota perspective. General ecology, structure/function, delineation, wetland plant identification, restoration/regulation programs.

NatR 3464f. Mammalogy. (3 cr)

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

NatR 3466s. Ornithology. (3 cr)

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

NatR 3468f. Wildlife Habitat Management Techniques. (3 cr)

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 3495s. Special Topics in Wilderness Management. (1-3 cr [max 12 cr]; A-F only. Prereq-3203)

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 planning. Involves significant use of new communications technologies.

NatR 3630s. Geographic Information Systems. (4 cr; A-F only. Prereq-1244, Math 1031)

Application and use of computer-based information systems in natural resource management and regional planning. Applying GIS (geographic information systems) technology to management problem solving; its integration with related technologies such as GPS (global positioning systems) and various types of remote sensing. Labs using a variety of software.

NatR 3654f. Wildlife Ecology and Management. (4 cr; A-F only. Prereq-3374)

Application of ecological principles to studying and managing wildlife populations, with emphasis on habitat management. Management plan preparation. Field and lab techniques used by natural resource agencies.

NatR 3660s. Prairie Ecosystem Management. (2 cr; A-F only. Prereq-3374)

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; A-F only. Prereq-Sr or instructor consent)

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 3804f,s. Individual Studies. (1-3 cr [max 6 cr]. Prereq-Jr, instructor consent)

Topic related to student's major not covered in regularly offered courses.

Philosophy (Phil)

Phil 1001f,s,su. Introduction to Philosophy. (3 cr; A-F only)

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 3003f,s,su. Applied Ethics. (3 cr; A-F only. Prereq-Phil 1001)

Interdisciplinary examination of four primary areas of contemporary ethical concern: research ethics, agricultural ethics, business ethics, and biomedical ethics.

Physical Education and Recreation (PER)

PER 1151f. Golf. (1 cr)

Introduction to and practice of the fundamentals of golf.

PER 1201f. Dance (Folk, Social, Modern, Western). (1 cr)

An alternative for aerobic activity. Acquaints students with dance and dance variety. Recreational dance course.

PER 1321f. Net Activities (Volleyball, Earthball, Cageball, Walleyball). (1 cr)

Introduces the fundamental skills, rules, and strategies of volleyball, earthball, cageball, and walleyball through class participation. On-line research into each of these activities.

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Other abbreviations

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PER 1331f,s. Racquet Activities (Tennis, Badminton, Racquetball, Pickleball). (1 cr)
Introduces tennis, pickleball, racquetball, and badminton. Rules, fundamentals, and skills; helps students progress toward their optimum abilities.

PER 1451f,s. Fitness for Better Health. (1 cr [max 2 cr])
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)
Promotion and development of lifetime fitness through weight training and conditioning.

PER 1471s. Olympic Weight Training. (1 cr. Prereq–1461)
Techniques for advanced strengthening/conditioning.

PER 1481f,s. Aerobic Exercise. (1 cr [max 4 cr])
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])
Strokes, personal safety, and basic rescue skills in accordance with guidelines established by the American Red Cross.

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

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

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

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

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

PER 1722f. Varsity Sports: Soccer (W). (1 cr; A-F only)
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; A-F only)
Varsity collegiate basketball experience.

PER 1741s. Varsity Sports: Basketball (M). (1 cr; A-F only)
Varsity collegiate basketball experience.

PER 1751s. Varsity Sports: Hockey. (1 cr; A-F only)
Basic principles and participation; helps students progress toward optimum ability.

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

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

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

Physics (Phys)

Phys 1001f,s,su. Elementary Physics. (3 cr; A-F only. Prereq–Math 1031)
Fundamental laws of mechanics, fluids, temperature, gas laws, electricity, wave motion, origins of modern physics, radioactivity.

Phys 1012f,s,su. Introductory Physics. (4 cr. Prereq–Math 1031)
Motion, forces, torque, energy, heat, sound, light, electricity, magnetism. Emphasizes applications.

Phys 1101f. Introductory College Physics I. (4 cr. Prereq–Math 1031)
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 1102s. Introductory College Physics II. (4 cr. Prereq–1101, Math 1031)

Second of two-semester sequence. Algebra-based introduction to physics and physics problem solving. Vibrations, light, sound, electricity, magnetism. Selected modern physics topics (e.g., radiation). Topics presented in applied context.

Plant Industries Management (PIM)

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

PIM 2573f. Entomology. (3 cr; A-F only. Prereq–1030)
Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

PIM 3023f. Plant Breeding. (3 cr; A-F only. Prereq–Biol 3022 [may be taken concurrently])
Principles of plant breeding. Emphasizes application of genetic principles to plant breeding. Genetic variation, selection methods, cultivar development. Examples from common field/horticultural crops.

PIM 3030s. Research Techniques. (3 cr; A-F only. Prereq–Jr or sr)
Experimental design and methodology in plant science research. Basic philosophy, data interpretation and analysis, and application of research information to practical management situations.

PIM 3230f. Introduction to Plant Pathology. (3 cr; A-F only. Prereq–1003, Biol 1009)
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.

PIM 3630s. Integrated Crop Management (Capstone). (3 cr; A-F only. Prereq–1030, 1530, 2640, 3020, 3030, 3230, Soil 3414)
Capstone course. Students investigate, research, and study problems of agronomic crops and make recommendations. Students individually and in teams solve problems using scientific methods.

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

Political Science (Pol)

Pol 1001f,s. American Government. (3 cr)
American government and political institutions at national, state, and local levels. Emphasis on the Constitutional basis of the American system, its history and authority, and the evolution of the system due to governmental and societal changes.

Pol 1054f,s. Comparative Government. (3 cr)
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.

Psychology (Psy)

Psy 1001f,s,su. General Psychology. (3 cr)
Overview of psychology as scientific study of human/animal behavior. Emphasizes goals of psychology: to describe, understand, predict, and control behavior. Biological, cognitive, affective, and social perspectives.

Psy 1093f,s,su. Lifespan Development. (3 cr)
Human life span perspective. Integrates developmental principles through research of social issues. Theories of major developmental theorists, recent challenges from changes in society/family interrelationships. Total environmental issues. Progress in genetics/medicines toward a better understanding of human development.

Psy 3604f. Abnormal Psychology. (3 cr. Prereq–Psy 1001)
Comprehensive study of abnormal behavior. Focuses on causal factors, treatment, and outcome of maladaptive behavior. Systematic study of biological, behavioral, and psychosocial therapies as modes of treatment and prevention of disorders. Lectures, case studies, videos, group discussions, oral presentations, term paper.

Public Health (PubH)

PubH 5003 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.

PubH 1003f,s. Alcohol and College Life (UMTC). (1 cr. Prereq—Fr or soph or PSEO)

Facts about how alcohol affects college life. Personal prevention strategies. Maximizing student/campus safety. Web-based distance learning format.

PubH 5003f,s. Fundamentals of Alcohol and Drug Abuse (UMTC). (1 cr. Prereq—Jr or sr only)

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, Spch 1101)

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,su. Introduction to Sociology. (3 cr)

Culture, social institutions, socialization, groups, social class, race and ethnicity, collective behavior, and social deviance.

Soc 1102f. Cultural Anthropology. (3 cr)

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. Social Gerontology: Elders in American Society. (3 cr)

Survey of characteristics and concerns of older persons, including physical, social, psychological, and cultural factors associated with aging. Individual outside work with an older person.

Soil and Water Management (SWM)

SWM 3009s. Hydrology and Water Quality. (4 cr. Prereq—Chem 1021, Math 1031, Soil 1293, jr, or instructor consent)

Principles/theory of surface/ground water quality, including but not limited to water budget, hydrologic cycle, water quantities, Darcy's Law, water quality units and flow rates, hydraulic conductivity/permeability, and laboratory tests for and maintenance of water quality.

SWM 3103f. Meteorology and Climatology. (2 cr; A-F only. Prereq—Phys 1012)

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)

Management principles and practices used to increase productivity and conserve soil and water resources for agronomic crops. Maintaining wildland and environmental quality through use of shelterbelts.

SWM 3225f. Watershed Management. (3 cr)

Precipitation, infiltration, evapo-transpiration, runoff from small watersheds. Application to design of structures, water/wind erosion practices. Design principles/techniques in constructing small impoundments and waste holding facilities, and in restoring wetlands. Selecting/applying irrigation/drainage systems.

Soil Science (Soil)

Soil 1293f,s. Soil Science. (3 cr. Prereq—Chem 1001)

Formation, classification, and composition of soils, with emphasis on environmental quality, chemical and physical properties affecting growth and nutrition of plants, management principles and practices used to increase productivity and conserve soil and water resources for agronomic crops.

Soil 3414f,s. Soil Fertility and Plant Nutrition. (4 cr. Prereq—1293, soph, or instructor consent)

Soil fertility management and its effect on crop growth. Uptake and use of specific important nutrients; use of fertilizers, their composition and characteristics; importance of residue management to maintain high productivity; environmental impact of certain agronomic practices.

Spanish (Span)

Span 1104f,s. Beginning Spanish I. (4 cr)

Conversational Spanish centered on day-to-day experiences. Emphasis on verb conjugation, rules of grammar, and vocabulary building. Cultural awareness and appreciation.

Span 1204f,s. Beginning Spanish II. (4 cr. Prereq—1104 or 2 years high school Spanish)

Emphasis on verb conjugation with the addition of compound tenses, indicative and subjective moods. Vocabulary building; dialogue concerning sports, travel, service information. Cultural and political dimensions of Spanish-speaking countries.

Speech (Spch)

Spch 1101f,s,su. Public Speaking. (3 cr; A-F only)

Topic selection, research, organization, rehearsal, and extemporaneous delivery of informative and persuasive speeches.

Spch 2002f. Interpersonal and Group Processes. (3 cr)

Interpersonal/group dynamics/relationships.

Spch 2434f. Oral Interpretation and Performance Techniques. (3 cr)

Analyzing prose, poetry, and drama. Preparing material for presentation. Giving stimulating oral readings to an audience. Critical appreciation of literature, use of voice/gesture. Critiquing performances.

Spch 3001f. Communication in Human Relationships. (3 cr)

Interpersonal/group processes, conflict management, team building, collaboration, leadership.

Spch 3431f,s,su. Persuasion. (3 cr. Prereq—1101)

Persuasion in interpersonal, organizational, intracultural, and intercultural relationships. Contemporary persuasion with historical segments. Focuses on argumentative claims and how to analyze and respond coherently to them.

Spch 3704f. Business and Professional Speaking. (3 cr. Prereq—1101, Comp 1013)

Leadership, interviewing, hiring, firing. Speeches for CEO's. Strategies for organizational responses to crises, disasters, and emergency situations.

Spch 4703f. Communication Ethics. (3 cr. Prereq—1101, Comp 1013)

Literature pertaining to ethics in organizations. Relativism, subjectivism, objectivism, utilitarianism, Kantianism, virtue ethics, existentialism.

Spch 4704s. Organizational Communication. (3 cr. Prereq—1101, Comm 3000, Comp 1013)

Characteristics/role of communication in organizations. Leading and managing. Analyzing communication in an organizational setting.

Sport and Recreation Management (SRM)

SRM 1050f,s. Officiating Team Sports. (3 cr; A-F only)

Team sport rules/regulations. Protocol to follow as an athletic official.

SRM 1803f,s,su. Directed Studies. (1-3 cr [max 6 cr]. Prereq—Instructor consent)

Current topics not covered in regularly offered courses.

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SRM 2000s. Prevention and Care of Athletic Injuries. (3 cr; A-F only)
Instruction/practice in fundamental athletic training skills. Historical perspective of athletic training as a career. Basic terminology of injuries. Prevention, taping, immediate care.

SRM 2100s. Psychology of Sport. (3 cr)
Sport in terms of motivation/performance. Sport and human development.

SRM 3000s. Foundations of Sport and Recreation Management. (3 cr)
Scope/extent of sport/recreation management. Accounting, career opportunities, composition, computer applications, facility/equipment management, fundraising, grant writing, health/wellness, human communication, law, multilevel scheduling, management principles, marketing, promotions.

SRM 3001s. Sports Nutrition. (3 cr. Prereq–Biol 1009 or Chem 1001 or FScN 1123)
Nutrition principles applied to fitness and sport. The six nutrients, body composition, training and conditioning, weight maintenance, nutrition in competitive sports.

SRM 3002f. Sport and Recreation Law. (3 cr. Prereq–GBus 3107)
Legal principles affecting managers, sponsors, and users of sport and recreation programs, including the vocabulary of contract negotiation and civil rights in planning, developing, maintaining, and managing sport and recreation organizations.

SRM 3003s. Facility and Equipment Management. (3 cr)
Design, layout, and maintenance strategies for managing sports facilities. Purchasing, organizing, and maintenance strategies for managing equipment used for multiple sport and recreation activities.

SRM 3005f. Sports Information and Newsletters. (3 cr. Prereq–CA 1070, Comp 3008 or Comp 3303, Math 1150)
Media relations, public relations, data gathering/analysis, presenting information to public/media.

SRM 3006f. Sports Marketing. (3 cr. Prereq–Mktg 3300)
Applying theories/principles of marketing to sport industry. How marketing is used in various SRM settings, from local sporting and amateur events to professional leagues.

SRM 3010f,s. Topics in Coaching. (2 cr [max 6 cr])
Philosophies, theories, methods, and techniques of coaching different sports.

SRM 3020f,s,su. Coaching Practicum. (1 cr. Prereq–3010)
Students apply coaching technique in clinical setting.

SRM 3320f. Exercise Physiology. (3 cr. Prereq–Biol 1464)
Responses/adaptations of body's physiological systems to physical activity, biochemical foundations of these changes. Sport nutrition. Exercise and immune function. Body composition analysis, muscle metabolism, exercise bioenergetics.

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

SRM 3900f,s,su. Internship in Sport and Recreation Management. (3 cr. Prereq–Jr, instructor consent)
Field-based learning experience.

SRM 4099s. Seminar in Sport and Recreation Management. (1 cr. Prereq–Sr, instructor consent)
Capstone course emphasizing design, implementation, and evaluation of an entire sport or recreation program in terms of a virtual portfolio.

Theatre (Th)

Th 1121f,s. Theatre Production. (1 cr [max 6 cr])
Involvement in one or more of the following: acting, directing, costuming, set construction, makeup, publicity, coaching, lighting, sound.

Work, Community, and Family Education (WCFE)

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.

WCFE 5697f. Teaching Internship: School and Classroom Settings (UMTC). (2 cr)
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.

WCFE 5698s. Teaching Internship (UMTC). (6 cr)
Teaching experience in school system that provides programs for grades 5-12.