

## Course Descriptions

This is the Course Descriptions, Organization, and Policies sections of the University of Minnesota, Crookston Catalog for 1999-2001.

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."

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### Accounting (Acct)

*The following are accounting B.S. program requirements. This program is a shared major and cooperative degree with Bemidji State University, which offers these courses.*

**Acct 1101. Principles of Accounting I.** (3 cr; QP–Math 1001 or Math 1111; SP–Math 1031 or Math 1131)  
Basic concepts of accounting cycle, cash, accounts receivable, inventories, plant assets, payroll, and partnerships.

**Acct 1102. Principles of Accounting II.** (3 cr; QP–1020; SP–1101)  
Modern accounting concepts, including the cash flow statement and consolidated statements. Introduction to management accounting topics, including cost-volume-profit relationships, costing methods, and variance analysis.

**Acct 1803. Directed Studies.** (1-3 cr [6 cr max]; SP–Instructor consent)  
Current topics not covered in regularly offered courses.

**Acct 3100. Introduction to Professional Accounting (BSU).** (2 cr; QP–1040; SP–1102; may be taken concurrently with 3201)  
Emphasizes the accounting theory upon which financial accounting is based by studying the fundamental interrelationships within the financial statements.

**Acct 3110. Accounting Systems (BSU).** (3 cr; QP–BUAD 2280 (BSU); SP–BUAD 2280 (BSU))  
Theory and methodology of analyzing, designing, and implementing accounting information systems. Emphasizes integrated data processing and the managerial aspects of systems design.

**Acct 3201. Intermediate Accounting I.** (4 cr; QP–1040; SP–3101)  
Detailed study of discounted cash flow techniques, current and long-term assets, current and long-term liabilities and investments.

**Acct 3202. Intermediate Accounting II.** (4 cr; SP–3201)  
Detailed study of stockholders' equity and statement of cash flows. Several complex financial accounting topics.

**Acct 3300. Government Accounting (BSU).** (2 cr; QP–1040; SP–1102)  
Budget preparation, appropriations, conformity to laws, integrity of special funds, and preparation of reports and statements.

**Acct 3301. Cost Accounting I.** (3 cr; QP–1040, composition requirement; SP–1102, 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 3302. Cost Accounting II.** (3 cr; QP–3120; SP–3301)  
Refinements of cost accounting information systems, including management control systems, cost allocation refinements, capital budgeting, and performance measurement.

**Acct 3321. Business Law I (BSU).** (3 cr; QP–Jr; SP–Jr)  
Study of the principles of law in the American legal system. Contracts, sales, secured transactions, agency law, and employment law.

**Acct 3322. Business Law II (BSU).** (3 cr; QP–3150; SP–3321)  
Study of negotiable instruments, bank deposits and collection, bankruptcy, suretyship, partnerships, corporations, federal securities law, accountant's legal liability, property, insurance, trust, and estates.

**Acct 3404. Income Tax I (BSU).** (4 cr; QP–1040, composition; SP–1102, composition)  
Federal income tax laws and regulations concerning taxable income and computation of tax as they affect individuals. Includes brief introduction to partnerships and corporations.

**Acct 3405. Income Tax II (BSU).** (2 cr; QP–3060; SP–3404)  
Federal income tax laws and regulations concerning taxable income and computation of tax as they affect corporations, estates, and trusts.

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

**Acct 4110. Advanced Accounting (BSU).** (4 cr; QP–3030; SP–3202)  
Accounting for partnerships and combined corporate entities, consolidated statements, fiduciary accounting, institutional accounting, international transactions, and SEC reporting.

**Acct 4210. Auditing I (BSU).** (3 cr; QP–3030, 3130, composition requirement; SP–3202, 3302, composition requirement)  
Duties and responsibilities of an auditor, kinds of audits, and audit programs. Preparation of audit working papers and compilation of audit data.

**Acct 4217. Accounting Theory (BSU).** (3 cr; QP–3030; SP–3202)  
Conceptual framework and structure of accounting theory, including study of selected Financial Accounting Standard Board statements and other professional literature.

**Acct 4307. Seminar in Management Accounting (BSU).** (3 cr; QP–Sr, instructor consent; SP–Sr, instructor consent)  
Integrates economics and business finance, organization, and behavior; ethical considerations, public reporting standards, auditing and taxes, periodic reporting for internal and external purposes and decision analysis; modeling and information systems. For students interested in management accounting and the Certificate of Management Accounting (C.M.A.).

**Acct 4310. Auditing II (BSU).** (3 cr; QP–3210; SP–4210)  
The auditor's responsibility and liability, ethics and standards of professional conduct, auditing electronic data systems, and the application of statistical audit techniques.

**Acct 4410. Financial Accounting Problems (BSU).** (2 cr; QP–3030, 3130, 3180; SP–3202, 3300, 3302)  
In-depth study of financial and non-profit accounting problems adapted to current business conditions.

**Acct 4510. Specialized Accounting Problems (BSU).** (2 cr; QP–3030, 3130; SP–3202, 3302)  
In-depth study of managerial and financial accounting problems adapted to current business conditions.

**Acct 4970. Internship (BSU).** (2-12 cr; QP–3030, 3130; SP–3202, 3302)

### Aerospace Studies (AS)

**AS 1110. The Air Force Today I.** (1 cr)  
Introduction to the United States Air Force: its basic characteristics, missions, and organization.

**AS 1120. The Air Force Today II.** (1 cr)  
Overview of basic characteristics, missions, and organization of the Air Force.

**AS 2100. Leadership Laboratory.** (0 cr; A-F only)  
Introduction to/application of Air Force customs/courtesies, drill/ceremonies, and military commands. Air Force environment. Opportunities available to commissioned officers.

**AS 2110. Evolution of USAF Air and Space Power I.** (1 cr; A-F only)  
Introduction to Air Force heritage/leaders, Quality Air Force concepts, ethics/values, leadership problems. Applying communication skills.

**AS 2120. Evolution of USAF Air and Space Power II.** (1 cr; A-F only)  
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 3210. Air Force Leadership/Management I.** (3 cr)  
Introduction to management within USAF. Communication skills (oral/written Air Force formats), interpersonal skills, Quality Air Force concepts.

**AS 3220. Air Force Leadership/Management II.** (3 cr)  
Study of leadership from military perspective. Situational leadership. Contemporary issues, including change management and professional ethics. Officer professional development topics. Case studies. Continuation of 3210.

**AS 4100. Leadership Laboratory.** (1 cr)  
Practical development of leadership skills. Students instruct, supervise, and lead junior cadets participating in AS 2100 and perform higher-level management functions within the cadet corps organization. Supervised lab.

**AS 4410. Preparation for Active Duty I.** (3 cr)  
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 4420. Preparation for Active Duty II.** (3 cr)  
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 Aviation (AgAv)

**AgAv 1102. Introduction to Aviation.** (5 cr; A-F only)  
Preparation for the FAA private pilot written and flight examination. FAA regulations, weather, air and radio navigation, flight safety, and emergency procedures. Students must demonstrate adequate progress on appropriate flight lessons or complete private pilot test course.

**AgAv 1251. Aircraft Systems and Instruments.** (3 cr; SP-1102, co-requisite 1252; A-F only)  
In-depth study of flight instruments, reciprocating engines, and propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems.

**AgAv 1252. Basic Attitude Instrument Flying.** (3 cr; SP-1102, co-requisite 1251; A-F only)  
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.

**AgAv 1396. Conventional Aircraft Operations.** (1 cr; SP-1102; A-F only)  
Ground school and dual flight instruction for endorsement for operation of tailwheel airplanes on the ground and in flight.

**AgAv 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**AgAv 3353. Airplane Aerodynamics.** (3 cr; SP-1251, 1252, co-requisite 3354; A-F only)  
Aerodynamics, performance, stability, control, weight and balance, and special flight conditions as appropriate for commercial pilots. Commercial maneuvers, flight computers, and commercial regulations. Students must demonstrate adequate progress on flight lessons.

**AgAv 3354. IFR Regulations and Procedures.** (3 cr; SP-1251, 1252, co-requisite 3353; A-F only)  
Detailed study of regulations, procedures, and publications for operating IFR in national airspace system. Terminal and en route procedures. Students must demonstrate adequate progress on flight lessons.

**AgAv 3355. Multiengine Systems and Procedures.** (2 cr; SP-3353, 3354; A-F only)  
Operating light twin-engine airplanes. Pilot actions for managing normal and abnormal aircraft situations; multiengine aircraft systems. Students must complete appropriate flight lessons.

**AgAv 3396. Advanced Conventional Aircraft Operations.** (1 cr; SP-1396; A-F only)  
Ground school and dual flight instruction for advanced pilot maneuvering and flight applications of tailwheel airplanes. Students must complete appropriate flight lessons.

**AgAv 3414. CFI Certification.** (5 cr; SP-3353, 3354; A-F only)  
Flight instructor responsibilities and teaching concerns. Effective teaching methods, the learning process, flight training syllabi, effective evaluations. Analysis of flight maneuvers associated with private pilot, commercial pilot, and flight instructor certificates. Practical teaching experience. Students must complete CFI certificate.

**AgAv 3415. Instrument CFI Certification.** (4 cr; SP-3414; A-F only)  
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.

**AgAv 3416. Multiengine CFI Certification.** (2 cr; SP-3414, 3415; A-F only)

Teaching in a multiengine airplane. Multiengine aerodynamics and performance, analysis of multiengine operations, engine-out operations and procedures, flight instructor responsibilities, flight safety concerns, and instrument flight maneuvers. Students must obtain a multiengine airplane rating for CFI certification.

**AgAv 3603. Aerial Application.** (3 cr; SP-3353, 3354, 3396; A-F only)

State and federal regulations, aircraft performance, weight and balance determination, and special techniques. Chemical precautions and rate calculations, environmental issues, and flight training in aerial application procedures. Students must complete appropriate flight lessons.

**AgAv 3722. CFI Practicum.** (1 cr; SP-3414; A-F only)  
Practical work experience as a CFI in a FAR 141-approved curriculum supervised by an experienced flight instructor.

**AgAv 3804. Individual Studies.** (1-3 cr [6 cr max]; SP-Jr, instructor consent)  
Topic related to student's major not covered in regularly offered courses.

## Agricultural Economics (AgEc)

**AgEc 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**AgEc 2530. 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 3050. Economics for Agribusiness Management.** (5 cr; QP-Econ 1101, Econ 1102; SP-Econ 1101, Econ 1102; A-F only)  
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 3430. Agricultural Commodity Marketing.** (3 cr; SP-Econ 1101; A-F only)  
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 3540. Farm Business Management.** (4 cr; SP-Econ 1101, INM 1010; A-F only)  
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 3640. Agricultural Finance and Valuation.** (4 cr; SP-3540, Acct 1020, Econ 1101, INM 1010; A-F only)  
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 3804. Individual Studies.** (1-3 cr [6 cr max]; SP-Jr, instructor consent)  
Topic related to student's major not covered in regularly offered courses.

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**AgEc 4750. Agricultural Marketing Management.** (3 cr; QP-1584; SP-2530)  
Role of marketing in agribusiness; marketing systems and strategies for competitiveness in a rapidly changing marketplace. Identifying strengths and opportunities to create competitive advantage.

**AgEc 4760. Agricultural Marketing Management Practicum.** (2 cr; QP-3784; SP-4750)  
Capstone course in which students work with an agribusiness firm to assess current situation and future challenges/opportunities. Student teams conduct research, analyze results, and formulate a marketing plan. Findings and recommendations are presented to the business.

## Agriculture and Food Systems Management (AFSM)

**AFSM 1005. Global Food Systems.** (3 cr)  
Historical preferences and consumer trends in diverse geographic regions. How global politics and national policies impact food trade.

**AFSM 1021. Introduction to Agriculture and Food Systems.** (1 cr)  
Overview of agricultural mechanization systems (engines, machinery, structures, and processing).

**AFSM 1034. Facility Maintenance and Safety.** (3 cr)  
Safe operation and working environment for power equipment, structures, utilities, and metal fabrication.

**AFSM 1044. Computer-Aided Drafting.** (3 cr)  
Sketching/dimensioning architectural/landscape projects. Use of computer-aided drafting program to develop plan views, floor plans, elevations, pictorials, and mechanical drawings.

**AFSM 1333. Agricultural Building Construction.** (3 cr)  
Selection/application of wood, concrete, and steel building materials. Construction techniques using portable, stationary, and hand construction tools. Criteria for quality building construction.

**AFSM 1803. Directed Studies.** (1-3 cr [3 cr max])  
Topics in agriculture and food systems.

**AFSM 2043. Welding and Manufacturing Processes.** (3 cr)  
Arc/gas welding of ferrous/nonferrous metals. TIG/MIG welding. Designs for welding, economics, and cost estimating. Project design/construction. Basic metal machining.

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

**AFSM 3002. Agricultural Mobile Power Systems.** (3 cr; SP-Phys 1001)  
Selecting, testing, and maintaining power units for drawbar, PTO, and hydraulic applications. Spark and compression ignition systems, drive trains, DC electrical and air conditioning systems.

**AFSM 3005. Facilities Planning and Selection.** (3 cr; SP-1034, Math 1031, Phys 1001)  
Planning and selecting materials/equipment used in livestock production, commodity storage, food processing, and service shops. Functionality and environmental and materials handling considerations.

**AFSM 3008. Surveying and Geomatics I.** (2 cr; SP-Math 1004 and Math 1031)  
Survey principles/theory. Measurements of distances, corrections to measurements, statistical methods/applications. Use of optical/electronic levels of theodolites, electronic distance measurement (EDM), and total stations. Introduction to angle measurement. Exercises in land measurement, differential leveling, profiles/cross-sections, and topographic surveys.

**AFSM 3010. Surveying and Geomatics II.** (2 cr; SP-3008)  
Measuring angles/directions with transits, theodolites, and total stations. Traversing, area computation, land surveys,

control surveys, and State Plane coordinate systems. Global Positioning System (GPS) and Geographic Information Systems (GIS). Photogrammetry/mapping. Construction surveys, volumes, horizontal/vertical curves.

**AFSM 3011. Manufacturing Operations and Logistics.** (3 cr; SP-Biol 1020, Math 1031, Phys 1001)  
Flow/handling of material through storage/production. Processing lines, equipment characteristics, sanitary design.

**AFSM 3012. Applied Engineering Principles.** (3 cr)  
Practical applications/calculations of mass balances, heat/mass transfer, fluid flow, and pressure.

**AFSM 3030. Food Safety and Microbiology.** (3 cr; QP-Biol 1665; SP-Biol 1020)  
Identification of critical control points that present hazards to food industry. Risk management. Food products and growth/destruction of undesirable/desirable organisms.

**AFSM 3040. Production Methods and Analysis.** (3 cr; QP-Chem 1001; SP-Chem 1001)  
Chemical changes in food during processing. Methods of food analysis. Chemical/physical factors affecting quality.

**AFSM 3050. Cereal Processing.** (3 cr)  
Cereal food systems. Wheat, barley, oats, rye, and corn storage. Milling/processing. Baking. Snack foods. Packaging commodities. Other cereals and their processing. Malting/brewing.

**AFSM 3052. 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.

**AFSM 3053. Product Development.** (3 cr; SP-3050 or 3052)  
Product formulation, ingredient interaction, packaging, analysis, consumer testing, results, data interpretation. Dynamics between new product development, sales, marketing, and production.

**AFSM 3360. Applications in Precision Agriculture.** (3 cr; QP-INM 1010, Soil 1294; SP-INM 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.

**AFSM 3804. Individual Studies.** (1-3 cr [6 cr max]; QP-Jr, instructor consent; SP-Jr, instructor consent)  
Topic related to student's major and not covered in regular courses.

**AFSM 4034. Quality Standards.** (3 cr)  
Responsibilities of QC department. Attributes, color, viscosity, texture/mouth feel, flavor. Development of grades/standards of quality. Acceptance sampling/inspection, recording, reporting, using control charts.

## Agronomy (Agro)

**Agro 1030. 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 1540. Seed Conditioning and Technology.** (4 cr; SP-PIM 1030; A-F only)  
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 2840. Grain and Seed Evaluation.** (4 cr; SP-1063; A-F only)  
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 3130. Forages.** (3 cr; QP-1184; 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.

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**Agro 3441. Topics in Specialty Crop Production.** (1-3 cr [3 cr max]; SP-3444, PIM 1030; A-F only)  
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 3444. Crop Production.** (4 cr; QP-1184, 1644; SP-PIM 1030; A-F only)  
Principles, including best cultural practices for crops of particular economic importance to the region. Oilseed, small grain, and specialty crops.

## Animal Science (AnSc)

**AnSc 1004. 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 1101. Animal Evaluation.** (1 cr [3 cr max])  
Conformation, breed characteristics, type, and their importance in evaluation. Techniques of evaluation and interpretation of evaluation data.

**AnSc 1201. Advanced Animal Evaluation.** (1 cr [3 cr max]; QP-1141; SP-1101)  
Advanced techniques in evaluating and selecting dairy or beef cattle, sheep, and swine. Preparing and delivering oral reasons.

**AnSc 1203. Animal Production Techniques.** (1-3 cr; QP-1014; SP-1004)  
Skills necessary for successful and economical livestock production.

**AnSc 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**AnSc 2104. Feeds and Feeding.** (4 cr; QP-High school chem or Chem 1001; SP-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 3004. Livestock Facilities and Environmental Systems.** (3 cr; QP-Math 1111; SP-Math 1111)  
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 and waste management alternatives.

**AnSc 3023. Animal Breeding.** (3 cr; QP-Biol 3022; SP-May be taken concurrently with Biol 3022)  
Application of qualitative genetic principles to animal breeding. Introduction to quantitative genetics. Concepts of livestock improvements through breeding/selection systems.

**AnSc 3104. Applied Animal Nutrition.** (4 cr; QP-1204; SP-2104)  
Continuation of digestion and metabolism to include modifications and control. Application of nutritional principles to economical feeding of different farm animal species. Nutrient requirements and modifications due to weather, stress, feeding objectives, environment, and metabolic limitations. Computer formulation of rations.

**AnSc 3203. Animal Anatomy and Physiology.** (3 cr; QP-Biol 1009; SP-Biol 1009)  
Anatomy and physiology of cattle, sheep, swine, and horses. Organization of body from cells into tissues and organs; identification, comparison, and contrast of the different species; growth development and function of selected bodily systems; pathological conditions that can be anticipated in each.

**AnSc 3204. Dairy Production.** (4 cr; QP-1014, 3004 or instructor consent; SP-1004, 2104 or instructor consent; A-F only)  
Growth and development of dairy cattle. Genetics and breeding, dairy nutrition, growth and development of the heifer to first calving, getting cows into production and their subsequent management, including milking management skills.

**AnSc 3205. Dairy Management Practicum.** (3 cr; SP-Sr or instructor consent)  
Management and clinical skills, including those unique to large dairy herds.

**AnSc 3303. Beef Production.** (3 cr; SP-1203, 2104; A-F only)  
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 3304. Reproduction, AI, and Lactation.** (4 cr; QP-3454; SP-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 3441. Current Topics in Animal Science.** (1 cr; SP-1203, 2104; A-F only)  
Focus on one economically important or emerging topic in animal science (e.g., swine, sheep, companion animal). Lecture/discussion.

**AnSc 3503. Animal Health and Disease.** (3 cr; QP-3454; SP-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 3804. Individual Studies.** (1-3 cr [6 cr max]; SP-Jr, instructor consent)  
Topic related to student's major not covered in regularly offered courses.

**AnSc 4101. Animal Science Seminar.** (1 cr; QP-Senior standing or instructor consent; SP-Senior standing or instructor consent)  
Survey of current literature; preparation and oral delivery of special topics. Preparation of abstracts, outlines, and visual aids as appropriate. Evaluation of seminars. Using library and other resources, including computerized search. Course delivery includes use of newer technologies.

**AnSc 4204. Animal Systems Management.** (4 cr; QP-3604, AgEc 3554; SP-1203, 3204 or instructor consent; A-F only)  
Planning, budgeting (cash, feed, machinery, etc.), and implementing programs, facilities, labor force, and other factors required for successful operation of modern animal operations. Field trips and 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 University College, Twin Cities campus, which offers these courses via distance delivery.*

**ABus 4011. Historical Perspectives and Contemporary Business Challenges (University College).** (3 cr)  
Overview of major challenges faced by contemporary businesses: global competitiveness, product and service quality, information revolution, and changing customer and workforce demographics. Approaches to meeting these contemporary challenges are studied against a historical backdrop of evolving management practices.

**ABus 4012. Problem Solving in Complex Organizations (University College).** (3 cr; SP-3031)  
An open systems perspective is developed. Emphasis on importance of analyzing root causes; effects of problems and solutions across boundaries in the organization. Process analysis introduced as a tool for problem solving.

**ABus 4021. Small-Group Behavior and Teamwork (University College).** (3 cr)  
Dynamics of small-group behavior with emphasis on work groups in organizations. Factors affecting performance and productivity. Various formal and informal roles. Both effective leadership skills and followership are explored and practiced.

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**ABus 4022. Managing Organizational Relationships (University College).** (3 cr)

Complexities involved in managing organizational relationships. Political dimensions of organization life; diagnosing how power is distributed and exercised in modern organizations. Cooperative relationships; frameworks for analyzing motives for observed behavior.

**ABus 4023. Communicating for Results (University College).** (3 cr)

Aspects of communication that are essential to being persuasive and influential. Organizing and presenting ideas effectively, strategies for audience analysis, choosing communication methods, making appropriate use of informal influence methods, and handling dissent.

**ABus 4031. Accessing and Using Information Effectively (University College).** (3 cr; SP-INM 1010)

Overview of information resources available to businesses and how to use these resources. A typology of information is represented and applied in short case studies and exercises, including databased, text-based, oral, written, and multimedia forms of information.

**ABus 4032. Quantitative Skills for Decision Making (University College).** (3 cr; SP-Math 1111, Math 1150)

Methods for analyzing and using quantitative information to support problem solving and decision making in business. Exploratory data analysis, visual display of data, and basic mathematical and statistical techniques for analysis are studied and applied.

**ABus 4041. Leadership in a Global and Diverse Workplace (University College).** (3 cr)

Developing a global perspective, developing an ethical perspective to help navigate the sometimes confusing crosscurrents of change, and acquiring skills for working in settings of high diversity.

**ABus 4042. Planning and Implementation at the Business Unit Level (University College).** (3 cr)

Creating and implementing operating plans at the business unit level. Types of plans: operations flow charts, budgets, schedules, and staffing plans. Importance of integrating plans with the overall business strategy; developing strategies for change.

**ABus 4043. Project Management in Practice (University College).** (3 cr; SP-3031)

Project management and the various tools and techniques available to support the project leader in such areas as scheduling, coordinating, and allocating resources; field project putting tools of project management into practice.

**ABus 4101. Accounting and Finance for Managers (University College).** (3 cr; SP-Acct 1101, Acct 1102, INM 1010)

Business decision making from an accounting and financial perspective; analysis of cost-volume-profit relationships, capital budgeting, variances, uses and sources of funds, and valuation

**ABus 4102. Operations in Manufacturing and Service Businesses (University College).** (3 cr)

Introduction to concepts and principles related to management of operations functions, including operations strategy, process, design, just-in-time, forecasting, inventory management, principles of scheduling, and quality improvement; relationships between operations and the environment.

**ABus 4103. Marketing and Sales (University College).** (3 cr)

Legal, behavioral, ethical, competitive, economic, and technological factors as they affect product pricing, promotion, and marketing channel decisions; emphasis on sales force organization, selection, training, motivation, compensation, forecasting, budgeting, and control.

**ABus 4104. Management and Human Resource Practices (University College).** (3 cr)

Broad overview of human resource practices in organizations, as well as basic responsibilities of front-line managers. Emphasis on providing day-to-day leadership, including organizing work, motivating employees, delegating, coordinating, and achieving results.

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## Applied Studies (ApIS)

**ApIS 3001. Individual Program Development.** (0.5 cr; QP-Acceptance into Applied Studies degree program; SP-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 3804. Individual Studies.** (1-3 cr [6 cr max]; QP-Jr, instructor consent; SP-Jr, instructor consent) Topic related to student's major not covered in regularly offered courses.

**ApIS 3900. Internship/Field Experience.** (1-3 cr [3 cr max]; QP-Consent of adviser; SP-Consent of adviser) Supervised professional work experience in selected sites. Reports and consultation with faculty adviser and employer.

**ApIS 4652. Applied Studies Seminar.** (1.5 cr; QP-Within 18 cr of degree completion, adviser consent; SP-Within 15 cr of degree completion, adviser consent) Capstone course in which students present projects demonstrating integration of coursework, application of technology, and senior-level competence in selected areas of study.

## Art (Art)

**Art 1152. Drawing and Design.** (1-3 cr) Introduces foundations of drawing/design. Offered as a 1-credit art appreciation lecture or a 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

**Art 1252. Color and Design.** (1-3 cr) Introduces foundations of color (painting) and design. Offered as a 1-credit art appreciation lecture or a 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

**Art 1352. Art Design and Techniques.** (1-3 cr) Introduces foundations of art techniques (3-dimensional) and design. Offered as a 1-credit art appreciation lecture or a 3-credit studio lab/lecture. Lecture studies concepts/history of drawing/design. Studio work is practical application.

## Bachelor of Applied Health (BAH)

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

**BAH 3010. Budget Planning, Development, and Management.** (3 cr) Budgeting and fiscal resource allocation for health care facilities. Interpreting financial information. Monitoring financial performance and position to make managerial decisions.

**BAH 3020. Quality Assurance, Risk Management, and Utilization Review.** (3 cr; SP-HSM 3100, HSM 3200) Quality assessment activities in health care facilities. Emphasis on case management, utilization review, patient care evaluation, and risk management activities. Methodologies and strategies include quantitative and qualitative analysis of data. Students generate or update a Quality Assurance Plan.

**BAH 3804. Individual Studies.** (1-3 cr [6 cr max]; SP-Jr, instructor consent) Topic related to student's major not covered in regularly offered courses.

# Bachelor of Manufacturing (BM)

**BM 3005. Facilities Planning and Selection.** (3 cr)  
Planning/selecting materials/equipment used in livestock production, commodity storage, food processing, and service shops. Functionality, environmental, and materials-handling considerations.

**BM 3011. Manufacturing Operations and Logistics.** (3 cr; SP–Biol 1020, Math 1031, Phys 1001)  
Flow/handling of material through storage/production. Processing lines, equipment characteristics, sanitary design.

**BM 3012. Applied Engineering Principles.** (3 cr)  
Practical application/calculation of mass balance, heat/mass transfer, fluid flow, and pressure.

**BM 3020. Industrial Safety.** (3 cr; QP–PMTc 2800 (Northwest Technical College); SP–PMTc 2800 (Northwest Technical College); A-F only)  
Comprehensive approach to safety problems in the workplace, including OSHA standards, attitude development, safety auditing, and hazard analysis.

**BM 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent; A-F only)  
Topic related to student's major not covered in regularly offered courses.

**BM 3900. Internship.** (1-3 cr; QP–Jr; SP–Jr; A-F only)  
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.

**BM 4034. Quality Standards.** (3 cr)  
Responsibilities of QC department. Attributes, color, viscosity, texture/mouth feel, flavor, development of grades/standards of quality, acceptance sampling/inspection, recording, reporting, use of control charts.

## Biology (Biol)

**Biol 1009. General Biology.** (3 cr)  
Introduction to ecology, evolution, population dynamics, genetics, cell biology, photosynthesis, respiration, and human biology.

**Biol 1020. Microbiology.** (3 cr; QP–1009; SP–High school biology)  
Morphology, classification, growth requirements, transmission, control, and culturing of bacteria and other microorganisms of economic importance.

**Biol 1103. General Botany.** (3 cr; QP–1009; SP–1009)  
Introduction to protist, fungal, monera, and plant structure, development, reproduction, and physiology.

**Biol 1106. General Zoology.** (3 cr; QP–1009; SP–1009)  
Survey of animal phyla, emphasizing structure, function, behavior, adaptation, and evolutionary relationships.

**Biol 1464. Human Anatomy and Physiology I.** (3 cr)  
Systems approach to basic anatomical and/or physiological terminology and concepts at the chemical, cellular, tissue, and organ levels. Emphasis on normal placement, structures, and functions within the integumentary, skeletal, muscular, circulatory, lymphatic, and respiratory systems.

**Biol 1474. Human Anatomy and Physiology II.** (3 cr; QP–1464; SP–1464)  
Systems approach to basic anatomical and/or physiological terminology and concepts at the chemical, cellular, tissue, and organ levels. Emphasis on structures and processes associated with the nervous and endocrine systems, the digestive system, metabolism and nutrition, the urinary and reproductive systems, and basic genetic concepts.

**Biol 3022. Principles of Genetics.** (3 cr; QP–1009, Chem 1001; SP–1009, [Chem 1004 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 3131. Plant Physiology.** (3 cr; QP–1103, Chem 1401; SP–1103, Chem 1401)

Plant functions with emphasis on higher plants. Growth and development, mineral nutrition, translocation, water relations, photosynthesis, and nitrogen metabolism.

**Biol 3722. Limnology.** (3 cr; QP–1009, Chem 1004; SP–1103, Chem 1001, Phys 1001, [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. Interrelationships of these parameters and their effects on the population of the aquatic environment.

## Chemistry (Chem)

**Chem 0992. Basic Chemistry.** (3 cr; QP–High school algebra; SP–High school algebra; A-F only)

Measurements and metric system. Atomic and molecular structure, nomenclature, balancing chemical equations.

**Chem 1001. Introductory Chemistry.** (4 cr; QP–High school algebra, high school chem; SP–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 1004. General Principles of Chemistry I.** (4 cr; QP–2 yrs high school algebra, 1 yr high school chem; high school phys and college algebra recommended; SP–2 yrs high school algebra, 1 yr high school chem; high school phys and college algebra recommended)

Concepts of inorganic chemistry, atomic theory and structure, periodicity of elements, basic rules of oxidation and chemical combination, molecular structure (hybridization and molecular orbitals), thermochemistry, gases and solution process and colligative properties.

**Chem 1005. General Principles of Chemistry II.** (4 cr; QP–1004; SP–1004)

Behavior of gases, thermodynamics, properties of solutions, solution equilibria, and oxidation/reduction reactions. This rigorous course develops the chemical foundations required in some agriculture, environmental, and pre-professional programs.

**Chem 1401. Elementary Biochemistry.** (4 cr; QP–1001 or 1005; SP–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.

## Composition (Comp)

**Comp 1011. Composition I.** (3 cr; A-F only)

Process of clear, concrete, and convincing writing. Generation and discovery of subjects, revisions, editing.

**Comp 1013. Composition II.** (3 cr; QP–1011; SP–1011; A-F only)

Writing summaries, writing to synthesize material from several sources, evaluating readings and other materials, research writing.

**Comp 1334. Technical Writing.** (3 cr; QP–1013; SP–1013; A-F only)

Exposition methods and design principles in scientific and technical writing; types of reports; systematic procedures to solve technical and communication problems; audience analysis; practice in report writing.

**Comp 3303. Writing in Your Profession.** (3 cr; QP–1011, 1013; SP–1011, 1013; A-F only)

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.

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**Comp 3313. Advanced Technical Writing.** (3 cr; QP-1334; SP-1334; A-F only)  
Designing documents and reports to meet user's needs and transfer technical and scientific knowledge for specific audiences.

## 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 1120. Criminal Justice and Society.** (4 cr; A-F only)  
Introduction to philosophies, principles, and social aspects that underlie the formulation of law and administration of justice in the United States. Overview of the agencies that constitute the criminal justice system.

**CrJs 3304. Police Process.** (4 cr; SP-1120; A-F only)  
Function of law enforcement and roles of police in modern society. Police organizations, police officers, police work. Critical police-problems.

**CrJs 3305. Judicial Process.** (3 cr; SP-1120; A-F only)  
Criminal justice judicial process. Judicial involvement: from pre-arrest warrant issuance to appellate court review. Role and behavior of prosecutors, defense attorneys, and judges.

**CrJs 3315. Criminology.** (3 cr; SP-1120; A-F only)  
Extent and character of crime in the United States. Critical examination of explanations of crime and juvenile delinquency. Analysis of social processes leading to criminal behavior.

**CrJs 3334. Criminal Justice Planning.** (4 cr; SP-3304, 3305; A-F only)  
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 3358. Criminal Law.** (3 cr; A-F only)  
Basic concepts of criminal law and of elements of criminal offenses in Minnesota in particular. Includes crimes against persons, crimes against property, and crimes against the administration of justice. Case method is used to define the contours of judicial interpretation of criminal law.

**CrJs 3359. Criminal Investigation.** (3 cr; A-F only)  
Problems, concepts, principles, and techniques involved in the investigation of a crime. Rules of evidence for the criminal investigator.

**CrJs 3360. Criminal Procedure.** (3 cr; A-F only)  
Rights of the criminally accused, primarily those involved in the pre-trial stages of the criminal process. Bill of Rights as it pertains to the criminally accused.

**CrJs 4480. Policing People.** (3 cr; SP-3304; A-F only)  
Primarily for those entering the police profession. 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)

*The following courses (3000 and above) are restricted to students who have been admitted to and retained in the teacher education licensure program embedded within 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 typically are delivered through ITV for BSU students.*

**ECE 1803. Directed Studies.** (1-3 cr [6 cr max]; QP-Instructor consent; SP-Instructor consent)  
Topics not covered in regularly offered courses.

**ECE 2100. Child Development and Learning.** (3 cr)  
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 3410. Learning Environments for Infants and Toddlers.** (4 cr; SP-2100; S-N only)  
Designing, organizing, and maintaining developmentally appropriate 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. Team teaching.

**ECE 3420. Nurturing and Collaborative Relationships for Infants and Toddlers.** (2 cr; SP-2100, concurrent enrollment in 3430)  
Understanding/applying practices to promote emotional/social development in infancy/toddlerhood. Principles of caregiving and their relationship to teaching/learning environment. Developmentally appropriate guidance, collaborative parent/staff relationships, respecting family/cultural values/experiences. Field experiences.

**ECE 3430. Teaching Practicum: Infants and Toddlers.** (3 cr; SP-2100, 3410, concurrent enrollment in 3420; A-F only)  
Students plan/implement curriculum, provide guidance, and work on teaching team in infant or toddler classroom. Supervised placement in campus Early Childhood Development Center. Weekly seminars.

**ECE 3440. Infant and Toddler Student Teaching.** (5 cr; SP-3410, 3420, 3430; A-F only)  
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. Weekly seminars. University approved placement.

**ECE 3500. Young Children With Special Needs.** (3 cr; SP-2100)  
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 3804. Individual Studies.** (1-3 cr [6 cr max]; SP-Jr, instructor consent; A-F only)  
Topic related to student's major and not covered in regularly offered courses.

**ECE 4700. Developmentally Appropriate Preprimary Education.** (3 cr; SP-2100, Ed 3670; A-F only)  
Students integrate theory/practice related to preprimary education. Development related to learning environment, curriculum/teaching methods. Developmentally appropriate approaches to subject matter in language/expressive arts and in social/physical sciences. Field experiences.

**ECE 4710. Child Guidance Theories and Practice.** (3 cr; SP-Ed 3677; A-F only)  
Theories, principles, and practices of child guidance. Emphasizes development of child's social competence, prevention of guidance problems, empathy training, impulse control, social problem-solving, conflict resolution, violence prevention, and anger management in classroom settings. Field experiences.

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**ECE 4720. Teaching Practicum: Preprimary.** (3 cr; SP-2100, 4700, Ed 3677; A-F only)  
Students plan/implement curriculum, provide guidance, and work on teaching team in preprimary/preschool classroom. Supervised placement in campus Early Childhood Development Center. Weekly seminars.

**ECE 4730. Understanding and Supporting Parenting.** (3 cr; SP-2100, [jr or sr]; A-F only)  
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 4750. Family, School, and Community Relations.** (3 cr; SP-3410, 3420, 4700, Ed 3670, Ed 3677; A-F only)  
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. Field experiences.

**ECE 4811. Preprimary Student Teaching.** (5 cr; SP-4700, 4710, 4720, Ed 3677; A-F only)  
Students integrate theory/practice as member of teaching team in a split prekindergarten/kindergarten placement. Portfolio-based student-teaching experience. Focuses on selected INTASC/BOT indicators. University approved classroom placement.

**ECE 4880. Administration of Early Childhood Programs.** (4 cr; SP-3410, 3430, 4700, 4720; A-F only)  
Application of developmental theory, human ecological systems framework, and management theory. Survey of management processes, principles, and tasks. Emphasizes government regulations, community relations, staff development, advocacy, and financial resource management. Field experiences.

## Economics (Econ)

**Econ 1101. Microeconomics.** (3 cr)  
Basic economic principles of pricing, resource allocation, and consumption. Supply/demand, cost of production, consumer behavior. Competition and influences of market structure.

**Econ 1102. Macroeconomics.** (3 cr)  
The “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 embedded within the early childhood education degree program. The 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 3102. Introduction to and Foundations of Education.** (3 cr; SP-Completion of Preprofessional Skills Test (PPST); A-F only)  
Introduction to roles, responsibilities, duties, functions, routines, and requirements of public school teachers. Historical, social, and political foundations of public education. Role of education in a pluralistic society. Issues affecting education in American public schools.

**Ed 3110. Psychological Foundations for Teaching.** (3 cr; SP-3102; A-F only)  
Teaching/learning process: (1) planning/effective instruction; (2) behavioral/cognitive views emphasizing how learning is affected by development, individual differences, and motivation.

**Ed 3140. Human Relations in Education.** (2 cr; SP-Completion of Pre-Professional Skills Test (PPST), 3670, minimum 2.50 GPA; A-F only)  
Causes and psychological dynamics of racism, sexism, and other forms of human oppression

**Ed 3207. Reading in Primary Grades.** (3 cr; SP-3670; A-F only)  
Approaches, methods, and materials in teaching for literacy development in primary grades. Home-family literacy connection, writing into reading, whole language. Emphasizes phonemic, semantic, and graphemic cueing systems.

**Ed 3408. Creative Expression in Elementary Education.** (3 cr; SP-3670; A-F only)  
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, and creative drama. Field experiences.

**Ed 3670. Foundations of Early Childhood Education.** (3 cr; SP-Completion of Pre-Professional Skills Test (PPST), minimum 2.50 GPA; A-F only)  
Philosophical, historical, pedagogical, societal, and institutional foundations of infant/toddler, preprimary, and 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 3677. Relations and Management in Early Childhood Education.** (3 cr; SP-Completion of Pre-Professional Skills Test (PPST), 3670, minimum 2.50 GPA; A-F only)  
Students study and gain skills in relations with young children, parents, and coworkers. Guidance and group management techniques for working effectively with prekindergarten and young school-age children. Experience in early childhood classrooms.

**Ed 3770. Mathematics in Primary Education.** (3 cr; SP-3670; A-F only)  
Mathematical background including teaching- aids, games, projects, and activities that relate to the K-3 level. Set theory, numeration, systems of whole/rational numbers. Basic mathematical operations presented from concrete standpoint.

**Ed 3777. Social and Physical Sciences in Primary Education.** (3 cr; SP-3670; A-F only)  
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 4827. Primary Student Teaching.** (8 cr; SP-3670; S-N only)  
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.

## Equine Science (EqSc)

**EqSc 1000. 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 1100. 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 1200. Hunt Seat and 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 1202. 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 1300. Saddle Seat Equitation.** (3 cr)  
Saddling, mounting, seat and hands, other saddle seat techniques. Developing equitation skills for saddle seat riding and showing.

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**EqSc 1803. Directed Studies.** (1-3 cr [6 cr max]; QP–Instructor consent; SP–Instructor consent)  
Current topics not covered in regularly offered courses.

**EqSc 2102. Horse Production.** (2 cr; QP–AnSc 1014; SP–AnSc 1004)

Fundamentals of horse care. Equine nutrition, behavior, and diseases; hoof care; first aid and health care and disease prevention; parasites.

**EqSc 2112. Riding Instructor Training.** (2 cr; QP–Two from 1113, 1213, 1313; SP–Two from 1100, 1200, 1300)

Formulating lesson plans. Teaching methods for individuals or a group. Safety, insurance, liability, management. Student's teaching methods are evaluated.

**EqSc 3102. Equine Management.** (3 cr; QP–1103; SP–2102, AnSc 1004)

Fundamentals of horse management. Record keeping (traditional and computer based), marketing, and sales techniques. Legal aspects such as contracts, zoning, liability, and insurance. Management project that involves establishing, maintaining, and improving an equine business.

**EqSc 3303. Equine Reproductive Techniques.** (3 cr; QP–3624, AnSc 3322, AnSc 3454 recommended; SP–2102, AnSc 3203, AnSc 3304)

Breeding management practices/techniques, including gestation, fetal development, endocrinology, estrus manipulation, artificial insemination, embryo transfer, cooled and cryopreservation of semen, teasing, and foaling. Lab emphasis on skills required in equine industry. Lecture emphasis on reproductive theory.

**EqSc 3403. Equine Exercise Physiology.** (3 cr; QP–AnSc 3454; SP–2101, 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 3413. Horse Training and Showing.** (3-6 cr [6 cr max]; QP–Two of the following: 1113 or 1213 or 1313; SP–Two of the following: 1100 or 1200 or 1300)

Work with untrained young horse or older show horse to correct problems or maintain the horse.

**EqSc 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent)

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

**EqSc 3900. Equine Internship.** (1-4 cr; QP–Soph; SP–Soph)

Supervised professional work experience in equine businesses. Reports/consultations with employers/faculty advisers.

## Food Science and Nutrition (FScN)

**FScN 1123. 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 1273. Medical Nutrition Therapy.** (3 cr)

Modifying diet in disease. Calculating diets for common conditions, e.g., hypertension, obesity, diabetes, diverticular disease. Measuring and calculating body composition.

**FScN 1313. Life Cycle Nutrition.** (3 cr; SP–1123)

Influence of age, growth, and normal development on nutritional requirements.

**FScN 1654. 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 1803. Directed Studies.** (1-3 cr [6 cr max]; SP–Instructor consent)

Current topics not covered in regularly offered courses.

**FScN 1999. Dietetic Practicum.** (1-4 cr)

Supervised experience in variety of health care and nutrition settings. Application of classroom theories to actual operations.

**FScN 3203. Community Nutrition.** (3 cr; QP–1123; SP–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 3211. 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 3310. 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 3494. Food Systems Management.** (4 cr)

Comprehensive overview of food management within an institutional setting. Menu planning, equipment, food purchasing, food distribution and delivery systems, personnel, finance, and regulatory agencies.

**FScN 3804. Individual Studies.** (1-3 cr [6 cr max]; SP–Jr, instructor consent)

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

**FScN 3900. Internship.** (1-3 cr [3 cr max]; QP–Instructor consent; SP–Instructor consent)

Supervised professional work experience at selected sites. Reports/consultation with faculty adviser/employer.

## General Agriculture (GnAg)

**GnAg 1803. Directed Studies.** (1-3 cr [6 cr max]; QP–Instructor consent; SP–Instructor consent)

Current topics not covered in regularly offered courses.

**GnAg 3203. Agricultural Products and Processing.** (3 cr; QP–Jr; SP–Jr; S-N only)

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 3652. Agriculture and Natural Resources Seminar.** (1 cr; QP–Jr or sr; SP–Jr or sr)

Current issues in agriculture and natural resources. Oral presentations and discussions by students, faculty, and/or invited guests.

**GnAg 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent)

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

**GnAg 3900. Internship.** (1-4 cr [4 cr max]; QP–Soph; SP–Soph or sr; A-F only)

Supervised professional work experience in agricultural business and governmental agencies to help students gain an in-depth understanding of their field of study. Reports and consultations with faculty advisers and employers.

## General Business (GBus)

*The following are accounting B.S. program requirements. This program is a shared major and cooperative degree with Bemidji State University, which offers these courses.*

**GBus 1603. Principles of Insurance.** (3 cr)

Principles and fundamentals of insurance of various types, risk of retailing, managing retail risks, buying insurance, handling claims.

**GBus 1803. Directed Studies.** (1-3 cr [6 cr max]; QP–Instructor consent; SP–Instructor consent)

Current topics not covered in regularly offered courses.

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**GBus 1981. Internship Seminar.** (1 cr)

Planning for securing and successfully completing an internship. Internship policies and objectives; samples of forms.

**GBus 3107. 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 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent)

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

## General Education (GnEd)

**GnEd 1000. Seminar for New Students.** (1 cr)

Skills for adjusting to college-level academics.

**GnEd 1803. Directed Studies.** (1-3 cr [6 cr max]; QP–Instructor consent; SP–Instructor consent)

Current topics not covered in regularly offered courses.

**GnEd 1900. Chancellor's Academic Success Seminar.** (0.5 cr; QP–Student on academic contract; SP–Student on academic contract)

Comprehensive study program to help strengthen learning skills. Includes some monitoring of contract requirements.

**GnEd 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent)

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

## Geography (Geog)

**Geog 1104. 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 1001. 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 3072. Principles of Turf Management.** (3 cr; QP–Soil 1294; SP–Biol 1103, PIM 1030, PIM 1032, Soil 1293)

Species identification. Cultural requirements/principles for establishing, producing, and maintaining turf. Golf course turf care/maintenance.

**GFTS 3074. Turfgrass Pest Management.** (3 cr; SP–3072, PIM 3072)

Identification/control of turfgrass diseases, weeds, and insects. Emphasizes integrated cultural/chemical management methods.

**GFTS 3076. Turfgrass Management Systems.** (3 cr; SP–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.

## Health (Hlth)

**Hlth 1062. 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 1072. Wellness.** (3 cr)

Students develop a personal wellness plan.

**Hlth 3400. Health and Drugs in Society (BSU).** (2 cr)

Study of chemical use/abuse as related to personal/community health. Various drugs and drug-taking behaviors defined/discussed. Historical, cultural, educational, and legal perspectives. Prevention/rehabilitation strategies.

## Health Systems Management (HSM)

**HSM 1010. 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 1803. Directed Studies.** (1-3 cr [6 cr max]; QP–Instructor consent; SP–Instructor consent)

Current topics not covered in regularly offered courses.

**HSM 2010. 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 2030. Health Care and Medical Needs.** (3 cr)

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

**HSM 3100. Essentials of Managed Care.** (3 cr; SP–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 3200. Management, Leadership, and Health Planning.** (3 cr; SP–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 3230. Management and Administration in Continuum/Extended Care Facilities.** (3 cr)

Programs and services designed 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 the changing work force. Governance and operations oversight.

**HSM 3240. Comparative Systems and Global Issues in Health Care Management.** (2 cr)

Analysis and comparison of world health problems and delivery systems. Geographic, political, and economic relationships.

**HSM 3804. Individual Studies.** (1-3 cr [6 cr max]; QP–Jr, instructor consent; SP–Jr, instructor consent)

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

**HSM 3900. Internship.** (1-3 cr [3 cr max]; QP–3200, 3230, 3310; SP–3200, 3230, 4210, 4212)

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.

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In prerequisite listings, comma means "and."

All courses beginning with 09 cannot be used for credit toward graduation.

**HSM 4210. Regulatory Management I.** (3 cr; SP-3200)  
Legal and bioethical issues in health care management. Professional licensing, certification, and reporting. Liability, negligence, malpractice. Patient rights and responsibilities. Clinical outcomes assessment and measurement.

**HSM 4212. Regulatory Management II.** (3 cr; QP-Acct 1020, Acct 1030, Acct 1040; SP-3200, Acct 1102)  
Health care funding and reimbursement processes. Compliance and regulatory mechanisms. Federal and state surveys.

## Health, Physical Education, and Recreation (HPER)

**HPER 1151. Golf.** (1 cr)  
Introduction to and practice of the fundamentals of golf.

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

**HPER 1321. Net Activities (Volleyball, Earthball, Cagball, Walleyball).** (1 cr)  
Introduces the fundamental skills, rules, and strategies of volleyball, earthball, cagball, and walleyball through class participation. On-line research into each of these activities.

**HPER 1331. 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.

**HPER 1451. Fitness for Better Health.** (1 cr [2 cr max])  
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.

**HPER 1461. Physical Training and Conditioning.** (1 cr)  
Promotion and development of lifetime fitness through weight training and conditioning.

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

**HPER 1601. Aquatic Activities (Beg, Adv Beg, Intermed Swimming; Swimmer; Lifeguard Trng/WSI; Aqua Aerobics).** (1 cr [4 cr max])  
Strokes, personal safety, and basic rescue skills in accordance with guidelines established by the American Red Cross.

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

**HPER 1711. Varsity Sports: Volleyball.** (1 cr)  
Varsity collegiate volleyball experience.

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

**HPER 1722. 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.

**HPER 1731. Varsity Sports: Basketball (W).** (1 cr; A-F only)  
Varsity collegiate basketball experience.

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

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

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

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

## History (Hist)

**Hist 1021. World Civilization I.** (3 cr)  
Ancient Near East, Greece, Egypt, Rome, and Medieval Europe.

**Hist 1022. World Civilization II.** (3 cr)  
Renaissance and Modern Europe from Reformation to present.

**Hist 1301. American History I.** (3 cr)  
Colonial era and early national period from the Revolution through the Civil War and Reconstruction.

**Hist 1302. American History II.** (3 cr)  
Gilded Age to present with emphasis on foreign involvements and wars, New Deal, civil rights, and economic developments.

**Hist 3054. Topics in History.** (3 cr [6 cr max])  
Topics of regional, national, or international importance, such as Minnesota history, U.S. Civil War, Japanese history.

## Horticulture (Hort)

**Hort 1021. Woody Plant Materials.** (4 cr; SP-PIM 1032 or instructor consent; A-F only)  
Identification, ecology, and use of deciduous and evergreen trees, shrubs, and vines.

**Hort 1030. Residential Landscape Design.** (3 cr; QP-1010; SP-PIM 1030; A-F only)  
Planning and developing formal and informal landscape sites for residential uses.

**Hort 1031. Herbaceous Perennial Plant Materials.** (2 cr; SP-PIM 1032 or instructor consent; A-F only)  
Identification, classification, ecology, and landscape uses of perennial flowers, bulbs, ground covers, and wildflowers.

**Hort 1081. Floral Design and Foliage Plants.** (2 cr; SP-PIM 1030 or instructor consent)  
Principles of design related to floral arrangement. Identification, use, and culture primarily of foliage plants used in interior decoration. Reference reading and field trips.

**Hort 1082. Floral Design and Florist Operations.** (2 cr; SP-1081, PIM 1030)  
Advanced principles of flower arrangement and design. Management problems and decisions in retail florist operations.

**Hort 3033. Commercial Floriculture Crops: Fall.** (4 cr; QP-1010; SP-PIM 1030 with Hort lab)  
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 3034. Commercial Floriculture Crops: Spring.** (4 cr; QP-1010; SP-PIM 1030)  
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 3036. Plant Propagation.** (4 cr; QP-1010, Biol 1009; SP-Biol 1030, PIM 1030)  
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 3040. Commercial Landscape Design and Grounds Maintenance.** (4 cr; QP-Hort 1030; SP-Hort 1030)  
Drawing landscape plans for commercial property. Reading blueprints and 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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# Hotel, Restaurant, and Institutional Management (HRI)

## HRI 1111. 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 1112. 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 1121. Principles of Quantity Food Production. (3 cr; QP-1112; SP-1111)

Supervising and managing quantity food production in UMC's Dining Services. Applying principles of menu planning, food preparation, staffing, purchasing, storage, sanitation, safety, and equipment operation in on-the-job setting.

## HRI 1211. Rooms Division Management. (3 cr)

Professional hotel and resort rooms management and relevant operational procedures. Emphasis on issues related to management of front office and housekeeping operations.

## HRI 1231. Menu Design and Analysis. (3 cr; SP-1111)

Principles of menu design, pricing, and analysis. Menus for varied establishments of the hospitality industry.

## HRI 1803. Directed Studies. (1-3 cr [6 cr max]; SP-Instructor consent)

Current topics not covered in regularly offered courses.

## HRI 3241. Hospitality Selection and Procurement. (3 cr; SP-1111)

Purchasing, receiving, storing, and issuing of products. Formulating specifications, judging quality, selecting products to meet specific needs, and developing security measures.

## HRI 3311. Restaurant Operational Management. (3 cr; QP-1113, 1211, 1251, 3321; SP-1111, 1121)

Compare and contrast types of service (e.g., modified American, French, Russian); develop and apply menu planning techniques, cost controls, and personnel organization. Gueridon preparation and service with product merchandising.

## HRI 3321. Food, Beverage, and Labor Control. (3 cr; SP-3241, Acct 1101, INM 1010)

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 3331. Global Tourism. (3 cr; QP-Econ 1101; SP-Econ 1101)

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 3341. 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 3411. Facility Layout and Design. (3 cr; QP-1211, 1251; SP-1121, 1231)

Impact of feasibility studies, customer profile emphasized. Students design a food service facility and hotel guest room using interior design concepts. Emphasis on equipment and furnishing selection, tabletop design product, and/or guest flow concepts. Students encouraged to attend UPS show in Minneapolis.

## HRI 3421. Hospitality Law. (3 cr; SP-Sr)

Laws and cases applicable to operation of hotels, restaurants, motels, and other hospitality establishments.

## HRI 3431. Beverage Technology. (3 cr; QP-1251; SP-1231)

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 3441. Catering On and Off Premise. (3 cr; QP-1112, 1221, 1231, 1251, 3321, 3331; SP-1111, 1121, 1231, 3311)

Theory and application of operational and 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 3451. Cases and Trends in Hospitality Management. (3 cr; SP-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.

## HRI 3804. Individual Studies. (1-3 cr [6 cr max]; SP-Jr, instructor consent)

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

## HRI 3900. Internship. (1-3 cr [3 cr max]; QP-Instructor consent; SP-Instructor consent)

Supervised professional work experience at selected sites. Reports/ consultation with faculty adviser/employer.

# Humanities (Hum)

## Hum 1301. 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 3310. 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 Networking Management (INM)

## INM 1010. Introduction to Information Technology. (3 cr; A-F only)

Handling and care of a computer; basic computer terminology; electronic mail; accessing the Internet; word processing, presentation, spreadsheet and database software applications.

## INM 1015. Basics of Microcomputer Hardware and Software. (3 cr; SP-1010; A-F only)

Hands-on course that prepares students to set up their own computers, perform basic maintenance and upgrade functions, and understand storage, communications, and ethical issues of computers.

## INM 1020. Electronic Spreadsheets. (2 cr; QP-1010, Math 1111 or Math 1001; SP-1010)

Personal and presentation use of spreadsheets that include formulas, functions, what-if analysis, and charts.

## INM 1060. Introduction to Database Management. (2 cr; QP-1010; SP-1010; A-F only)

Introduction to basic use of database management software and database file structures. Field definition, record management, data entry form design, and management report specifications.

## INM 1200. Publishing and Programming on the Internet. (3 cr; QP-1010; SP-1010)

Introduction to HTML and page design using CGI (common gateway interface) for delivery via the Internet. Page design, graphics preparation, sound, and video.

## INM 1803. Directed Studies. (1-3 cr [6 cr max]; QP-Instructor consent; SP-Instructor consent)

Current topics not covered in regularly offered courses.

## INM 3010. New Advances in Technology and Telecommunications. (1 cr [3 cr max])

Instruction and applications focusing on significant innovations in computer hardware, software, and information technologies.

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**INM 3040. Principles of Object-Oriented Programming.** (3 cr; QP-1010; SP-1010; A-F only)  
Hands-on course focuses on structured programming techniques using a visual object-oriented programming language learned by exploring the program command and object structure and by writing program modules.

**INM 3050. Advanced Object-Oriented Programming.** (3 cr; QP-3110; SP-3040; A-F only)  
Programming with Visual Basic and other object-oriented languages. Program language structure, application design, and systems implementation.

**INM 3060. Advanced Database Management.** (2 cr; QP-1010; SP-1060; A-F only)  
Continuation of the use of database management software and database file structures, providing more advanced concepts of record management, needs evaluation, form design, macros, and management applications of a fully integrated database.

**INM 3090. Internship Seminar.** (3 cr; A-F only)  
Students investigate and prepare for their internship and subsequent employment in an ever-changing technology environment. They prepare a digitized professional portfolio to properly demonstrate their experience, skills, and accomplishments in a manner specific to technology.

**INM 3100. Microcomputer Systems Architecture.** (3 cr; QP-3080; SP-3110; A-F only)  
Comprehensive study of the systems and services used to fine tune an operating system. Systems installation and configuration procedures, troubleshooting, initialization file modification, system utilities and commands.

**INM 3110. Microcomputer Operating Systems.** (3 cr; QP-1010; SP-1010; 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, and application software specifications.

**INM 3120. Managing Local Area Networks.** (3 cr; QP-3080; SP-3110; A-F only)  
Design, implementation, and management of an enterprise local area network. Introduces the building blocks of network design such as servers, routers, bridges, gateways, transmission media, communications protocols, network security, and performance tuning.

**INM 3150. Graphic and Interface Design.** (3 cr; QP-1010; SP-1010; A-F only)  
Basic concepts of computer interface and graphic design as it relates to visual communication. Use of computer graphics programs to enhance communications. Projects result in hard copy and Internet products.

**INM 3160. Digital Audio and Video Production.** (3 cr; SP-3150; A-F only)  
Students learn the basics and create projects applicable to the Internet and other technologies, such as desktop video conferencing.

**INM 3210. Introduction to Analysis and Design of Information Systems.** (2 cr; QP-1010; SP-1010)  
Project-focused review. Systems development life cycle, including needs assessment, hierarchical diagramming, entity-relationships, and data-flow diagramming.

**INM 3220. Advanced Design and Management of Information Systems.** (1 cr; SP-3210)  
Emphasis on use of Computer-Assisted Software Engineering (CASE) methodologies, resulting in a project.

**INM 3804. Individual Studies.** (1-3 cr [6 cr max]; QP-Jr, instructor consent; SP-Jr, instructor consent; A-F only)  
Topic related to student's major not covered in regularly offered courses.

**INM 3900. Internship.** (3 cr [6 cr max])  
Supervised experience in an information or networking entity within a business firm or agency. Reports and consultations with faculty advisers and employers.

**INM 4010. Wide-Area Networking With TCP/IP.** (3 cr; QP-3080, 3130; SP-3120; A-F only)  
Overview of computer connectivity through the Internet. Internetworking hardware and software, system design considerations, protocols, security, and management.

**INM 4020. Project Management in Technology and Telecommunications.** (3 cr; SP-3210, sr, instructor consent; A-F only)

Project management procedures, team leadership skills, and resource management using computer software designed specifically for these tasks. Application and evaluation involving identifying a project and carrying out all steps necessary to achieve satisfactory completion in a team environment.

## Literature (Lit)

**Lit 1005. Form and Idea in 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 1016. 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 interpretive skills required for an appreciation of literature.

**Lit 3001. 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 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**Mgmt 3100. Principles of Finance.** (3 cr; QP-Acct 1102, Econ 1101, Econ 1102, algebra course; SP-Acct 1030, Econ 1101, Econ 1102, algebra course; A-F only)  
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 3200. Principles of Management.** (3 cr; QP-Acct 1101, Psy 1001, Econ 1101 or instructor consent; SP-Acct 1020, Psy 1001, Econ 1101 or instructor consent; A-F only)  
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 3210. 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 3220. Human Resource Management.** (3 cr; QP-3200; SP-3200; A-F only)  
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 3250. Operations Management.** (3 cr; QP-3100, Mktg 3300 or instructor consent; SP-3100, Mktg 3300 or instructor consent; A-F only)  
Concepts, procedures, and technologies used by managers, administrators, and employees in operation of an organization. Levels of planning, material and inventory management, improving products and systems, and project management.

**Mgmt 3260. Current Topics.** (3 cr; SP-[3200, Mktg 3300] or instructor consent)  
Examination of emerging trends in business theory/applications. Introduction to major trends and exploration of their implications.

**Mgmt 3320. Small Business Management.** (3 cr; QP-3200, Mktg 3300; SP-3200, Mktg 3300; A-F only)  
Acquaints students with small business management, entrepreneurship, and problems of organizing and operating a small business. Students develop a business plan for a new venture or acquisition of an existing business. Plan must be of a quality acceptable to a capital supplier and will be evaluated on both form and substance.

**Mgmt 3600. Management Decision Making.** (3 cr; QP-3100, 3200, Mktg 3300 or instructor consent; SP-3100, 3200, Mktg 3300 or instructor consent; A-F only)  
Specialized studies and 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 3800. Studies in Management Strategies.** (3 cr; QP-Taken final qtr or adviser consent; SP-Taken final semester or adviser consent; A-F only)  
Capstone, integrative course for senior business management, management emphasis students. Students chart future direction of organizations by formulating, implementing, evaluating strategies. Individual and group creative problem-solving exercises. Students make objective strategic decisions and justify them through oral and written communication.

**Mgmt 3804. Individual Studies.** (1-3 cr [6 cr max]; QP-Jr, instructor consent; SP-Jr, instructor consent; A-F only)  
Topic related to student's major not covered in regularly offered courses.

**Mgmt 3900. Internship.** (1-3 cr; QP-Jr; SP-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.

## Marketing (Mktg)

**Mktg 1100. Introduction to Entrepreneurship.** (3 cr)  
Economical, cultural, political, sociological, psychological perspectives on creation and evolution of entrepreneurial ventures. Students assess personal fitness for a career as entrepreneurs and small business managers. Exploration of Internet sites of interest to entrepreneurs; group projects outside classroom. Presentation(s) by off-campus speaker(s).

**Mktg 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**Mktg 3200. 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 3250. Promotional Strategies.** (3 cr; QP-3200, 3300; SP-3200, 3300; A-F only)  
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 3300. Principles of Marketing.** (3 cr; QP-Econ 1101, Psy 1001 or instructor consent; SP-Econ 1101, Psy 1001 or instructor consent; A-F only)  
Introduction to marketing and the strategic marketing process. Team development of a marketing plan implementing product, pricing, distribution, and promotional strategies.

**Mktg 3310. Buyer Behavior.** (3 cr; QP-3300; SP-3300; A-F only)  
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 3340. Marketing Research.** (3 cr; QP-3300, Math 1150; SP-3300, Math 1150; A-F only)  
The research process from a marketing perspective. Problem formulation, scientific research methods, analysis and interpretation of marketing data, research report writing, and decision-making process derived from market research.

**Mktg 3350. Marketing Management.** (3 cr; QP-3300, Mgmt 3200; SP-3300, Mgmt 3200; A-F only)  
In-depth marketing management concepts and strategies related to retail, wholesale, manufacturing functions. Management of product, pricing, distribution, promotion strategies; services, non-profit organizations, international marketing strategies. Students apply concepts to "real-world" computer simulation game. Group projects in and outside classroom.

**Mktg 3360. Global Business.** (3 cr; QP-3300, Mgmt 3200; SP-3300, Mgmt 3200; A-F only)  
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 3800. Studies in Creative Marketing.** (3 cr; QP-3250, 3350; final quarter; SP-3250, 3350; final semester; A-F only)  
Marketing topics explored using case studies and selected readings. Analysis of marketing decisions, creative problem-solving exercises, and presentation of case analyses and marketing plans. Individual and group projects. Students critique current marketing articles.

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

## Mathematics (Math)

**Math 0981. Basic Mathematics.** (3 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. (Credit does not apply toward graduation or transfer.)

**Math 0991. Algebra.** (5 cr; QP-0965 or equiv; SP-0981 or equiv)  
Signed numbers, first-degree equations and inequalities, fractional equations, exponents, polynomials, factoring, quadratic equations, rational expressions, radical expressions, graphing, systems of equations, functions. For students with very limited or no background in algebra. (Credit does not apply toward graduation or transfer.)

**Math 1001. Technical Mathematics.** (3 cr; QP-0965 or equiv; SP-0981 or equiv)  
Signed numbers, calculator use, percentage problems, graphing, exponents, formulas, area and volume, solving linear equations, unit conversions, agriculture and business examples. (Cannot be used to satisfy the math/science distribution requirements for baccalaureate degrees; no credit granted if taken after Math 1031 or 1150.)

**Math 1004. Trigonometry.** (1 cr; QP-0980; SP-0991 or 1001)  
Angle measurement; review of equation solving; basic right angle trigonometry, including use of sine, cosine, and tangent functions.

**Math 1031. College Algebra and Analytical Geometry.** (3 cr; QP-0995; SP-0991)  
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 1131. Finite Mathematics.** (3 cr; QP-0995; SP-0991)  
Linear equations (graphing and modeling), systems of linear equations and matrices, linear programming, sets, counting techniques, probability, mathematics of finance.

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**Math 1142. Survey of Calculus.** (3 cr; QP-1111; SP-1031)  
Derivatives, integrals, differential equations, maxima and minima, partial differentiation, applications.

**Math 1150. Elementary Statistics.** (3 cr; QP-0995 or 2 yrs high school algebra; SP-0991 or 2 yrs high school algebra)  
Descriptive statistics, elementary probability, normal distribution, binomial distribution, confidence intervals, tests of hypotheses, correlation, regression, chi-square, ANOVA.

## Music (Mus)

**Mus 1011. University Singers.** (1 cr [9 cr max])  
Performing group that provides experience in many areas of choral music. Open to all students with choral music experience and/or ability to sing "in pitch." Students may be asked to take Mus 1041 if voice development necessary.

**Mus 1021. 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 1041. Private Music Instruction.** (1 cr)  
Individual music lessons in voice or instruments. One half-hour lesson per week.

**Mus 1042. Private Instruction: Class Piano.** (1 cr [9 cr max])  
Study of piano technique and musicianship in a classroom setting using multiple electronic keyboards. Musical concepts, including melody, harmony, rhythm, and repertoire. Suitable for beginning and intermediate piano students.

**Mus 1051. Music Ensemble: Community Band/Pep Band.** (1 cr)  
Ensemble of musicians who play brass, woodwind, and percussion instruments at concerts on and off campus and at selected UMC athletic events.

**Mus 1071. Musical Theater.** (1 cr)  
Involvement in a musical theater presentation, which may include musical accompaniment, acting, singing, or working on technical support.

**Mus 1091. Instrumental and Choral Conducting.** (2 cr; QP-Instructor consent; SP-Instructor consent)  
Conduct UMC ensembles to develop score reading skills and conducting techniques.

**Mus 1111. 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 1121. Music Theory II: Diatonic Tonality, Harmony, and Voice Leading.** (3 cr; QP-1121; SP-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 3029. Music of the 20th Century.** (3 cr; QP-1021 or instructor consent; SP-1021 or instructor consent)  
Compares various styles of 20th-century music to develop an understanding of human expression; compares musical forms and trends.

## Natural Resources (NatR)

**NatR 1233. 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 1244. Elements of Forestry.** (4 cr; QP-1223; SP-1233; A-F only)  
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 1464. Wildlife Identification.** (3 cr; QP-Biol 1009; SP-Biol 1009; A-F only)  
Identifying birds, mammals, reptiles, and amphibians, with emphasis on the Upper Midwest. Field study and use of museum specimens.

**NatR 1663. Principles of Fisheries Management.** (3 cr; QP-1223, Biol 1009; SP-1233; A-F only)  
Fisheries management and fish species of Minnesota: identification, ecology, population assessment, application of appropriate management techniques.

**NatR 1803. Directed Studies.** (1-3 cr [6 cr max]; SP-Instructor consent)  
Current topics not covered in regularly offered courses.

**NatR 2573. Entomology.** (3 cr; QP-Biol 1009; SP-PIM 1030; A-F only)  
Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

**NatR 3203. Park and Recreation Management.** (3 cr; SP-1233; A-F only)  
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 3344. Land Use Planning.** (4 cr; QP-Sr or instructor consent; SP-Sr or instructor consent; A-F only)  
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 3364. Plant Taxonomy.** (3 cr; QP-Biol 1103 or instructor consent; SP-Biol 1103 or instructor consent; A-F only)  
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 3374. Ecology.** (4 cr; QP-Biol 1009, Soil 1294; SP-Biol 1009, Soil 1293; A-F only)  
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 3495. Special Topics in Wilderness Management.** (1-3 cr [12 cr max]; QP-1203; SP-3203; A-F only)  
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 3630. Geographic Information Systems.** (4 cr; QP-1654; SP-1244, Math 1111; A-F only)  
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 3654. Wildlife Ecology and Management.** (4 cr; QP-3554; SP-3374; A-F only)  
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 3660. Prairie Management.** (3 cr; QP-3554; SP-3374; A-F only)  
Description of the prairie biome of North America and its livestock, wildlife, and recreational uses. Ecology of grassland ecosystems, role of fire, grazing management, establishment and restoration techniques, carrying capacity, and range assessment principles. Identifying prairie and wetland plants.

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**NatR 3699. Integrated Resource Management.** (3 cr; QP–Sr or instructor consent; SP–Sr or instructor consent; A-F only)  
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 3804. Individual Studies.** (1-3 cr [6 cr max]; SP–Jr, instructor consent)  
Topic related to student's major not covered in regularly offered courses.

## Philosophy (Phil)

**Phil 1001. 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 3003. Applied Ethics.** (3 cr; SP–1001; A-F only)  
Interdisciplinary examination of four primary areas of contemporary ethical concern: research ethics, agricultural ethics, business ethics, and biomedical ethics.

## Physics (Phys)

**Phys 1001. Elementary Physics.** (3 cr; QP–Math 1111; SP–Math 1031; A-F only)  
Fundamental laws of mechanics, fluids, temperature, gas laws, electricity, wave motion, origins of modern physics, radioactivity.

## Plant Industries Management (PIM)

**PIM 1030. Introduction to Plant Science.** (2 cr; A-F only)  
Principles and cultural practices used in growing agronomic and horticultural crops. Students should or may enroll concurrently in 1031 or 1032.

**PIM 1031. Introduction to Agronomy Laboratory.** (1 cr; SP–1030 or concurrent with 1030; A-F only)  
Identification of agronomic crops and the principles and cultural practices used in growing them.

**PIM 1032. Introduction to Horticulture Laboratory.** (1 cr; SP–1030 or concurrent with 1030; A-F only)  
Identification of horticulture crops and the principles and cultural practices used in growing them.

**PIM 1803. Directed Studies.** (1-3 cr [6 cr max]; SP–Instructor consent)  
Current topics not covered in regularly offered courses.

**PIM 2573. Entomology.** (3 cr; QP–Biol 1009; SP–1030; A-F only)  
Insect taxonomy, anatomy, and physiology. Emphasis on insects of economic importance, especially in the Upper Midwest. Control methods, including integrated pest management.

**PIM 2640. Weed Science.** (4 cr; QP–Biol 1009, Soil 1294; SP–Biol 1009, SWM 1293; A-F only)  
Mechanical, cultural, biological, and chemical weed control practices. Factors affecting control. Classification and modes of action of herbicides, insecticides, fungicides, and plant growth regulators.

**PIM 3023. Plant Breeding.** (3 cr; QP–Biol 3022; SP–May be taken concurrently with Biol 3022; A-F only)  
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 3030. Research Techniques.** (3 cr; QP–Jr or sr; SP–Jr or sr; A-F only)  
Experimental design and methodology in plant science research. Basic philosophy, data interpretation and analysis, and application of research information to practical management situations.

**PIM 3230. Introduction to Plant Pathology.** (4 cr; QP–Agro 1184 or Hort 1010, Biol 1009; SP–1003, Biol 1009; A-F only)  
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 3630. Integrated Crop Management.** (3 cr; SP–1030, 1530, 2640, 3020, 3030, 3230, Soil 3414; A-F only)  
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 3804. Individual Studies.** (1-3 cr [6 cr max]; SP–Jr, instructor consent)  
Topic related to student's major not covered in regularly offered courses.

**PIM 4630. Senior Seminar in Horticulture and Agronomy.** (1 cr; QP–Sr; SP–Sr; A-F only)  
Individual and team preparation, presentation, and discussion of current topics. Students polish and demonstrate research, problem-solving, technology, and presentation skills.

## Political Science (Pol)

**Pol 1001. 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 1054. 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 1001. General Psychology.** (3 cr)  
Overview of psychology as the scientific study of human and animal behavior, with emphasis on the goals of psychology: to describe, understand, predict, and control behavior. Biological, cognitive, affective, and social perspectives. Fundamental principles of psychology as a science.

**Psy 1093. Developmental Psychology.** (3 cr)  
Human life-span perspective integrating developmental principles through research of social issues. Theories of major developmental theorists, as well as recent challenges from changes in society and family interrelationships. Total environmental issues and progress in genetics and medicines toward a better understanding of human development.

**Psy 3604. Abnormal Psychology.** (3 cr; QP–1001; SP–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.

## Reading (Rdng)

**Rdng 0951. Reading and Writing Essentials I.** (3 cr; QP–Adviser recommendation or placement test results; SP–Adviser recommendation or placement test results)  
Develops students' essential reading and writing skills for application to college assignments and for career preparation. (Credit does not apply toward graduation or transfer.)

**Rdng 0952. Reading and Writing Essentials II.** (1-3 cr; QP–0951; SP–0951)  
Continues to develop students' essential reading and writing skills for application to college assignments and for career preparation. Open to students upon adviser recommendation and required for students who successfully completed 0951 but did not demonstrate significant gains in post-testing results. (Credit does not apply toward graduation or transfer.)

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## Rhetoric (Rhet)

*The following courses are scientific and technical communication (STC) requirements and/or offerings. The STC major is a cooperative degree with the University of Minnesota, Twin Cities (Department of Rhetoric), which offers these courses via ITV and Internet.*

### **Rhet 1001. Introduction to the Major of Scientific and Technical Communications.** (1 cr)

History of technical communication. Definitions. Introduction to topics. Applications in health science, computer science, agriculture, and engineering. Employment (marketing) portfolio, student/professional organizations, trade/scholarly journals.

### **Rhet 3221. Theories of Human Communication.** (3 cr; QP–Spch 1101; SP–Spch 1101)

Theories/practices of interpersonal, small group, organizational, scientific, and technical communication. Lecture, discussion, simulations, and small-group work.

### **Rhet 3257. Scientific and Technical Presentations.** (3 cr; QP–Spch 1101; SP–Spch 1101)

Oral presentation skills specific to scientific or technical topics. Techniques for visual communication, audience analysis, organizing a presentation, and presenting complex material. Emphasizes use of computers.

### **Rhet 3401. Accessing Information Through Electronic Media.** (3 cr; A-F only)

Current/developing tools of Internet-based communication. Concepts of e-mail, Usenet news, mailing lists, Web-based chats, MOOs, and Internet relay chat. Examining technology, assessing information delivered, and developing criteria for disseminating information.

### **Rhet 4105. Corporate Video for Technical Communicators.** (3 cr; QP–Comp 1011, 1013, 1334; SP–Comp 1011, 1013, 1334; A-F only)

Introduction to products, professionals, and processes of corporate video. Students submit a proposal, treatment, and script for a video; maintain a journal; complete an interactive unit on production; and conduct research on a video-related topic of their choice.

### **Rhet 4561. Editing and Style for Technical Communicators.** (3 cr; SP–STC major; A-F only)

Editorial process, levels of style, ethical considerations. Practice editing skills: working with cohesion, clarity, coherence, organization, and audience. Writer-editor relationship. Editing material in mark-up language. Copyright issues.

### **Rhet 4573. Writing and Managing Projects and Proposals.** (3 cr; A-F only)

Research funding sources, interpreting an RFP or program announcement, letters of intent, grant preparation following the guidelines of an RFP or program announcement. Proposals for nonprofits or research or business. Using Microsoft Project.

### **Rhet 4671. Principles and Application of Project Management and Design I.** (3 cr; SP–STC major; A-F only)

Design principles. Displaying data, managing publications (e.g., newsletters, brochures, scientific posters). Relevant computer software.

### **Rhet 4672. Principles and Application of Project Management and Design II.** (3 cr; SP–4671; A-F only)

Introduction to design principles, visual display of data, and management of various publications (newsletters, brochures, scientific posters). Computer software to aid in these tasks.

## Scientific and Technical Communication (STC)

### **STC 3258. Information Gathering Techniques in Scientific and Technical Communication.** (3 cr; A-F only)

Questionnaire development, informational/focus group interviewing. Emphasizes guides, schedules, questioning techniques, and communication theories. Descriptive statistics used to analyze data for various projects.

### **STC 3652. Senior Seminar in Scientific and Technical Communication.** (3 cr; A-F only)

Student project that integrates coursework, technology, and senior-level skills. Selected area of study. Capstone course.

### **STC 3701. Rhetorical Theory: Persuasion and the Literature of Science.** (3 cr; QP–[Comp 1011 or 1013], Spch 1101; SP–[Comp 1011 or 1013], Spch 1101; A-F only)

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.

### **STC 3900. Internship in Scientific and Technical Communication.** (3-6 cr [6 cr max]; A-F only)

Internship sites may include the University, industry, or government agencies. Internship proposal, progress report, and final report with letter from internship supervisor are required.

## Sociology (Soc)

### **Soc 1001. Introduction to Sociology.** (3 cr)

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

### **Soc 1102. 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 3007. Family Relationships.** (3 cr)

Evolution and developmental stages of the family as an institution in American society. Emphasis on functions of the family, interaction among members, and psychological and cultural forces affecting the family.

### **Soc 3937. 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 3009. Hydrology and Water Quality.** (4 cr; QP–Math 1111, Soil 1294; SP–Chem 1004, Math 1111, Soil 1293, jr or instructor consent)

Principles and theory of surface water and 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 and permeability, and laboratory tests for and maintenance of water quality.

### **SWM 3011. Principles of Soil and Water Management.** (1 cr; QP–MAg 3009; SP–Soil 1293; A-F only)

Soil and water conservation issues and practices and most effective use of each. Surveying and gathering natural resources information; identifying natural resource degradation problems, including soil erosion and quantifying soil losses by wind and water.

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**SWM 3012. Water Management Systems and Design.** (1 cr; QP–MAg 3009; SP–3011; A-F only)

Engineering design selection for vegetated waterways and their restoration management. Design principles and techniques in construction and restoration of structures for wetlands.

**SWM 3013. Irrigation and Drainage Systems.** (1 cr; QP–MAg 3009; SP–3011; A-F only)

Selecting and applying irrigation and drainage systems for farms and natural areas. Understanding basic hydrologic principles and designing crop-specific irrigation scheduling. Incorporating efficient drainage systems to maximize economic and environmental benefits.

**SWM 3103. Meteorology and Climatology.** (2 cr; QP–Phys 1001; SP–Phys 1001; A-F only)

Fundamentals of weather and climate. Energy balance, weather chart analysis, composition and circulation patterns of the atmosphere, climates of the continents.

**SWM 3224. Soil and Water Conservation.** (4 cr; QP–Soil 1294; SP–Soil 1293, jr or instructor consent)

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

## Soil Science (Soil)

**Soil 1293. Soil Science.** (3 cr; QP–Chem 1000 or equiv; SP–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 3414. Soil Fertility and Plant Nutrition.** (4 cr; QP–1294; SP–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.

**Soil 3519. Soil Morphology.** (3 cr; QP–3225; SP–1293, 3414 or SWM 3224 or instructor consent)

Soil development, morphology, and description principles in the field for land use interpretations. Field and lab procedures used in soil survey investigations.

## Spanish (Span)

**Span 1104. Beginning Spanish I.** (4 cr; A-F only)

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

**Span 1204. Beginning Spanish II.** (4 cr; QP–1104 or 2 yrs high school Spanish; SP–1104 or 2 yrs high school Spanish; A-F only)

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 1101. Public Speaking.** (3 cr; A-F only)

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

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

Theory, research, and application of interpersonal communication in face-to-face, familial, intimate, cross-cultural, and colleague relationships.

**Spch 3431. Persuasion.** (3 cr; QP–1101; SP–1101)

Persuasion in interpersonal, organizational, intracultural and intercultural relationships. Contemporary persuasion with historical segments. Focuses on becoming aware of argumentative claims, learning to analyze them, and responding coherently to them..

## Sport and Recreation Management (SRM)

**SRM 1803. Directed Studies.** (1-3 cr [6 cr max]; SP–Instructor consent)

Current topics not covered in regularly offered courses.

**SRM 3000. Foundations of Sport and Recreation Management.** (3 cr; QP–Mgmt 3200)

Overview of scope and extent of sport and recreation management, including accounting, career opportunities, composition, computer applications, facility and equipment management, fundraising, health and wellness, human communication, law, multilevel scheduling, management principles, marketing, and promotions.

**SRM 3001. Sports Nutrition.** (3 cr; QP–Biol 1009 or Chem 1001 or FScN 1123; SP–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 3002. Sport and Recreation Law.** (3 cr; QP–GBus 3107, Phil 1003; SP–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 3003. 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 3005. Sports Information and Newsletters.** (3 cr; QP–Comp 3024 or Comp 3033, INM 1060 or INM 1200, Math 1150, Spch 3001; SP–Comp 3024 or Comp 3033, INM 1060 or INM 1200, Math 1150)

Media relations, public relations, data gathering and analysis, presenting information to the public and media.

**SRM 3804. Individual Studies.** (1-3 cr [6 cr max]; SP–Jr, instructor consent)

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

**SRM 3900. Internship.** (3 cr; QP–Jr, instructor consent; SP–Jr, instructor consent)

Field-based learning experience.

**SRM 4099. Seminar in Sport and Recreation Management.** (1 cr; QP–Sr, instructor consent; SP–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 1121. Theatre Production.** (1 cr)

Involvement in one or more of the following: acting, directing, costuming, set construction, makeup, publicity, coaching, lighting, sound.

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## University Regents

Patricia B. Spence, Rice, Chair  
 Maureen K. Reed, Stillwater, Vice Chair  
 Anthony R. Baraga, Side Lake  
 Robert S. Bergland, Roseau  
 Dallas Bohnsack, New Prague  
 William E. Hogan II, Minnetonka  
 Warren C. Larson, Bagley  
 David R. Metzen, South St. Paul  
 H. Bryan Neel III, Rochester  
 Michael O'Keefe, Minneapolis  
 William R. Peterson, Eagan  
 Jessica J. Phillips, Bloomington

## University Administrators

Mark G. Yudof, President  
 Robert Bruininks,  
 Executive Vice President and Provost  
 Frank B. Cerra, Senior Vice President  
 for Health Sciences  
 McKinley Boston, Jr., Vice President  
 for Student Development & Athletics  
 Carol Carrier, Vice President for Human Resources  
 Sandra Gardebring, Vice President for Institutional  
 Relations  
 Eric Kruse, Vice President for University Services  
 Philip Larsen, Interim Vice President for  
 Agricultural Policy  
 Christine M. Maziar, Vice President for Research  
 and Dean of the Graduate School  
 Mark B. Rotenberg, General Counsel

## Crookston Campus Administration, Faculty, and Staff

Aakre, Paul, M.S., Assistant Professor, Program  
 Manager, Agriculture and Food Systems  
 Management  
 Almlie, Curt, M.S., Director, Institutional Relations  
 Baird, Philip, M.S., Associate Professor, Natural  
 Resources  
 Barton, Claudia, M.S., Program Adviser, Student  
 Support Services  
 Brorson, Bruce, M.S., Associate Professor,  
 Marketing/Management, Information  
 Networking Management, Senior Associate for  
 Technology  
 Brorson, Sue, Ph.D., Professor, Marketing/  
 Management; Program Manager, Business  
 Management  
 Campoverde, Marcelo, B.S., Head Women's Soccer  
 Coach  
 Camrud, Connie, B.S., Manager, Children's Center  
 Carlson, James, M.S.L.S., Assistant Librarian  
 Cavalier, Donald, M.S., Director, Counseling and  
 Career Center  
 Christenson, Richard, Ed.D., Associate Professor,  
 Communication  
 Conati, Collette, Coordinator of Campus Ministry  
 Crawford, David, M.P.A., C.P.A., Assistant  
 Professor, Accounting  
 Curfman, Michael, M.B.A., Head Women's  
 Basketball Coach  
 DeMuth, David, Ph.D., Assistant Professor,  
 Mathematics and Physics  
 Eldridge, Frederic, B.S., Assistant Director,  
 Computer Services

Ellram, Alex, M.S., Assistant Professor, Program  
 Director, Golf Facilities and Turf Systems  
 Management  
 Freberg, Kenton, M.S., Assistant Professor,  
 Director, Facilities Management  
 French, George, M.M.,  
 Associate Professor, Music and Theatre  
 Gevens, Lynn, B.A., Teaching Specialist, Academic  
 Assistance Center/Student Support Services  
 Grave, Marilyn, M.S., Associate Professor, Program  
 Manager, Early Childhood Education  
 Grosz, Arlyss, Ed.D., Program Manager, Health  
 Management and Applied Health  
 Grunewald, Stacey, B.S.N., Coordinator, Health  
 Service  
 Habstritt, Charles, M.S., Associate Professor,  
 Agronomy; Program Manager, Plant Industries  
 Management  
 Harrison, Timothy, M.S., Assistant Director,  
 Residential Life  
 Hier, Leela, B.S., Manager, Bookstore  
 Hoff, David, M.S., Assistant Professor, Agricultural  
 Economics  
 Holder, Bobby, Ph.D., Associate Professor, Soil  
 Science  
 Hollands, Kelly, M.S., Head Volleyball Coach  
 Holm, Paul, Ph.D., Associate Professor, Chemistry  
 Holsinger-Fuchs, Pamela, M.A., Director of Student  
 Activities and Service Learning  
 Hower, Melissa, Ph.D., Assistant Professor,  
 Program Manager, Equine Science  
 Huglen, Mark, Ph.D., Head Hockey Coach,  
 Assistant Professor, Communication  
 Huus, Larry, Ph.D., C.P.A., Associate Professor,  
 Program Manager, Accounting  
 Johnson, Les, M.S., Director, Human Resource  
 Development  
 Johnson, Robert, M.S., Assistant Professor, Biology  
 Johnson, Wendell, M.S., Associate Professor,  
 Biology  
 Kelly, Traci, Ph.D., Assistant Professor,  
 Communication; Program Manager, Scientific  
 and Technical Communication  
 Kerr, Brad, M.Ed., Athletic Director  
 King, Steve, M.S., Head Baseball Coach,  
 Equipment Manager  
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 Nelson, Robert, Ph.D., Vice Chancellor, Student  
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 Oseth, Jeff, B.S., Head Women's Tennis Coach,  
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 Sargeant, Donald, Ph.D., Professor, Chancellor  
 Selzler, Bernard, Ed.D., Professor, Communication  
 Senske, Gary, M.S., Head Men's Basketball Coach  
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