



## Programs of Study

All baccalaureate degree programs at UMC

- lead to a bachelor of science or bachelor in an applied field degree.
- are applied and career-oriented. Emphasis areas permit programs to match student interests and workforce requirements.
- require a minimum of 120 total credits to permit graduation in four years.
- require a minimum of 40 credits of liberal education and 3 credits of technology (ITM or CA, including CA 1010).
- require 40 upper division credits.

In accordance with the University of Minnesota, Crookston mission, all programs are

### Employment-oriented

- Programs prepare students to participate in and manage a diverse workforce.
- Programs are linked to employers in a variety of ways (such as field trips, on-site assignments, shadowing, and shared databases).
- Programs require an internship or field experience.
- Programs respond to changes in the workforce via interaction between faculty and employers.
- Programs are evaluated by a Program Improvement Advisory Committee whose membership comes from business and industry.
- Programs are designed around active learning and responsive teaching
- Teachers are team leaders and project directors.
- Students are actively involved in the learning process.
- Programs emphasize application and solving real world problems.
- Students may develop portfolios of their experiences to demonstrate their personal and career development.

### Technology-driven

- Technology outcomes are central to every course.
- Students gain technical competence that meets or exceeds the needs of industry.
- Students use e-mail, interactive communication technology, and the Internet.
- Interactive television and online course delivery enables students to take courses offered by other higher education institutions.
- Students develop the ability to adapt to technological change—an essential ability for career success.

### Focused on three core components

Every program has curriculum focused on developing skills in the following core areas:

- **Communication**
  - Reading
  - Writing
  - Speaking
  - Listening
  - Using technology
- **Critical Thinking**
  - Problem solving
  - Applied learning
- **Working With Others**
  - Teamwork
  - Diversity

### Outcome-based

- Learner outcomes are published for each course.
- Program outcomes are published for each program.
- Active assessment of outcomes guides curriculum decisions.
- Quality is judged by measurable outcomes and programs undergo a formal review every three years.

## UMC Degrees

### **Bachelor of Science**

Accounting  
 Agricultural business  
     *Agricultural business*  
     *Sustainable development*  
 Agricultural education<sup>1</sup>  
     *Agricultural science and technology education*  
     *Natural and managed environmental education*  
 Agricultural systems management  
     *Farm and ranch management*  
     *Power and machinery*  
     *Precision agriculture*  
 Agronomy  
     *Agronomic science*  
     *Crop production*  
 Animal science  
     *Animal science*  
     *Pre-veterinary medicine*  
 Applied studies  
     *Applied studies*  
     *Respiratory care*  
 Aviation<sup>2</sup>  
     *Agricultural aviation*  
     *Law enforcement aviation*<sup>3</sup>  
     *Natural resources aviation*  
 Biology  
 Business management  
     *Business aviation*  
     *Entrepreneurship and small business management*  
     *Management*  
     *Marketing*  
 Communication  
 Computer software technology  
 Early childhood education<sup>4</sup>  
     *Primary education*  
     *Program management*  
 Equine science  
     *Equine science*  
     *Pre-veterinary medicine*  
 Golf and turf management  
 Health management  
 Health sciences  
 Horticulture  
     *Environmental landscaping*  
     *Production horticulture*  
 Hotel, restaurant, and institutional management  
     *Food service administration*  
     *Hotel/restaurant management*  
     *Resort/spa management*  
 Information technology management  
 Natural resources  
     *Natural resources management*  
     *Natural resources law enforcement*<sup>3</sup>  
     *Park management*  
     *Water resource management*  
     *Wildlife management*  
 Sport and recreation management

### **Bachelor in an Applied Field**

Applied health  
 Manufacturing management  
     *Manufacturing management*  
     *Quality management*

### **Bachelor Programs Offered Online**

Applied health  
 Business management  
 Manufacturing management  
 Psychology<sup>5</sup>

### **Minor**

Biology  
 Business management  
 Coaching  
 Communication  
 Horticulture  
 Information technology management  
 Music

### **Associate in Applied Science**

Agriculture  
 Dietetic technician  
 Hotel, restaurant, and institutional management  
 Information management  
 Marketing and management

### **Associate in Applied Science (Offered in China)**

*(The following programs are delivered to Zhejiang Economic and Trade Polytechnic Institute in China)*

Agricultural business  
 Information technology management

### **Associate in Science**

Business

### **Certificate Programs**

Hotel, restaurant, and institutional management  
 Manufacturing management

### **Program Option**

Aerospace studies Air Force ROTC<sup>6</sup>

<sup>1</sup> Degree awarded by UMC; teacher licensure awarded by the University of Minnesota, Twin Cities

<sup>2</sup> Cooperative program with University of North Dakota

<sup>3</sup> Cooperative program with Bemidji State University

<sup>4</sup> Degree awarded by UMC; teacher licensure awarded by Bemidji State University

<sup>5</sup> Cooperative program with University of Minnesota, Duluth; degree awarded by UMD

<sup>6</sup> Cooperative program with North Dakota State University

## Curricular Programs

UMC programs prepare students for successful careers and active citizenship. Students can explore their interests within the broad spectrum of the college's offerings and, because of the many requirements common to the various programs, can transfer from one program to another—including from an associate in applied science (A.A.S.) program to a bachelor of science (B.S.) program—with little loss of time.

**Degree Programs**—UMC offers programs leading to the associate in applied science (A.A.S.), the associate in science (A.S.), the bachelor of science (B.S.), and the bachelor in an applied field degrees. The A.A.S. programs require 64 credits, with 21 credits in liberal education. The A.S. programs require 64 credits, with 32 credits in liberal education. The B.S. programs require a minimum of 120 credits, with a minimum of 40 credits in liberal education. The bachelor in an applied field programs have requirements unique to each major. Upper division requirements include courses in liberal education and the major. Students must satisfy the 3-credit campus technology requirement. This is typically met by completing CA 1010—Introduction to Computer Technology (1 credit) and 2 additional credits of computer application (CA) courses. Developmental courses in reading, writing, and math skills cannot be used for credit toward graduation. These courses are identified with 09xx course numbers.

### Liberal Education Requirements for

**Baccalaureate Degrees**—An integral part of all UMC degree programs, liberal education is the set of common understanding and skills essential to successful living in a modern society and to functioning as a whole person integrated into that society. Specifically, there are three core component areas of liberal education (communication, critical thinking, and working with others) that are integrated throughout the curriculum for every degree. Bachelor of science degree programs require a minimum of 40 credits of liberal education; the bachelor's degree in an applied field and the associate degrees have separately established liberal education requirements. UMC's 40 credit liberal education requirement for all bachelor of science degrees also meets the 10 goal areas of the Minnesota Transfer Curriculum, a collaborative effort among two- and four-year public colleges and universities in Minnesota to help students transfer their work in liberal education. The faculty of the University of Minnesota, Crookston, recognizes the courses below as meeting the student competencies of the Minnesota Transfer Curriculum. Because courses may be added or deleted from the list check online or with an academic adviser for the most current updates.

**Technology Requirement**—UMC is a technologically advanced campus that embraces the use of modern communications and information technology in teaching and learning. To assure all UMC graduates are well prepared for today's technology-driven workplace, all baccalaureate programs require at least 3 credits in computer applications (CA) coursework.

**Internship Requirement**—The internship or field experience requirement helps students obtain additional skills important to successful employment in their chosen field. It may be completed through on-the-job experience in the private sector, with a government agency, or through other appropriate work experience.

The internship program can be tailored to fit the needs of individual students. Baccalaureate degree students usually complete the internship requirement during the summer term between their third and fourth year, while associate degree students do so between their first and second year. Associate degree students who decide to continue in a baccalaureate degree program may substitute an upper division course for the internship requirement.

A minimum of 450 hours of employment or volunteer assignments are usually required for satisfactory evaluation of the student's progress. The internship assignment will be supervised by the college staff in cooperation with the employer. Students must submit reports assigned by the college staff.

**Transferring to UMC**—The University of Minnesota, Crookston, values transfer students. Faculty and staff work closely with every student to make sure courses taken at other institutions are fully counted toward UMC graduation requirements. For example, students who complete the Minnesota Transfer Curriculum at any participating Minnesota college or university automatically fulfill UMC's liberal education requirements. In addition, all other previously earned credits are evaluated as to whether they fulfill graduation requirements for a specific program.

Prospective transfer students are encouraged to consult the Office of Admissions and an academic adviser in their proposed area of study for a complete transcript evaluation.

## Liberal Education Requirements—Associate Degrees

### A.A.S. Degree

**Communication**—3 credits  
**Humanities/fine arts**—3 credits  
**Math/science**—3 credits  
**Social science**—3 credits  
**Technology**—3 credits  
 CA 1010—Introduction to Computer Technology (1 cr) required  
**Liberal education electives**—6 credits  
**Major field of study**—43 credits  
**Total**—64 credits

### A.S. Degree

**Communication**—6 credits  
**Humanities/fine arts**—6 credits  
**Math/science**—6 credits  
**Social science**—6 credits  
**Technology**—3 credits  
 CA 1010—Introduction to Computer Technology (1 cr) required  
**Liberal education electives**—5 credits  
**Major field of study**—32 credits  
**Total**—64 credits

## Minnesota Transfer Curriculum and Liberal Education Requirements for Bachelor of Science Degrees

UMC bachelor of science (B.S.) degree programs require a minimum of 40 credits of liberal education. This requirement also meets the 10 goal areas of the Minnesota Transfer Curriculum.

### Goal Area 1: Written and Oral Communication—9 credits minimum

COMM 2002—Interpersonal and Group Processes  
 COMM 3431—Persuasion  
 \*COMP 1011—Composition I  
 \*COMP 1013—Composition II  
 \*SPCH 1101—Public Speaking  
*\*required for bachelor of science degrees*

### Goal Area 2: Critical Thinking

Critical thinking is taught throughout the liberal education curriculum at UMC. Upon completion of the other 9 Minnesota Transfer Curriculum goal areas, students will have met the critical thinking goal.

### Goal Area 3: Biological and Physical Sciences (with labs)—3 credits each area minimum

+BIOL 1009—General Biology (also Goal Area 10)  
 ++CHEM 1001—Introductory Chemistry  
 ++ CHEM 1021—Chemical Principles I (also Goal Area 10)  
 ++ CHEM 1401—Elementary Bioorganic Chemistry (also Goal Area 10)  
 ++GEOL 1001—Introductory Geology (also Goal Area 10)  
 +NATR 3374—Ecology  
 ++PHYS 1012—Introductory Physics (also Goal Area 10)  
 ++PHYS 1101—Introductory College Physics I  
 ++PHYS 1102—Introductory College Physics II  
*+biological sciences course*  
*++physical sciences course*

### Goal Area 4: Mathematical Thinking—3 credits minimum

MATH 1031—College Algebra  
 MATH 1142—Survey of Calculus  
 MATH 1150—Elementary Statistics  
 MATH 1250—Precalculus  
 MATH 1271—Calculus I

### Goal Area 5: History and the Behavioral and Social Sciences—6 credits minimum

ECE 2100—Child Development and Learning  
 ECON 2101—Microeconomics  
 ECON 2102—Macroeconomics  
 GEOG 1104—World Regional Geography (also Goal Area 8)  
 HIST 1301—American History I  
 HIST 1302—American History II  
 PSY 1001—General Psychology  
 PSY 1093—Lifespan Development  
 SOC 1001—Introduction to Sociology (also Goal Area 7)  
 SOC 1102—Cultural Anthropology (also Goal Area 8)

### Goal Area 6: The Humanities (the arts, literature, and philosophy)—6 credits minimum

ART 1152—Drawing and Design  
 ART 1252—Color and Design  
 ART 1352—Art Design and Techniques

ART 2000—Elementary Art  
 HUM 1301—Introduction to Humanities  
 HUM 3310—Culture and Technology (also Goal Area 8)  
 LIT 1005—Introduction to Literature (also Goal Area 8)  
 LIT 1016—Readings in American Life (also Goal Area 7)  
 LIT 3001—World Literature (also Goal Area 8)  
 MUS 1011—University Singers (R)  
 MUS 1021—Introduction to Music (also Goal Area 7)  
 MUS 1041—Private Music Instruction (R)  
 MUS 1042—Private Instruction: Class Piano (R)  
 MUS 1051—Band/Pep Band (R)  
 MUS 1071—Musical Theatre (R)  
 MUS 1111—Music Theory I: Foundations of Tonal Music  
 MUS 3011—University Singers (choir) (R)  
 MUS 3029—Music of the 20th Century (also Goal Area 7)  
 MUS 3041—Private Music Instruction (R)  
 PHIL 1001—Introduction to Philosophy (also Goal Area 9)  
 TH 1121—Theater Production (R)  
*(R) repeatable to 3 credits toward meeting Minnesota Transfer Curriculum and liberal education goal*

### Goal Area 7: Human Diversity—one course minimum

COMM 3001—Communication in Human Relationships  
 LIT 1016—Readings in American Life (also Goal Area 6)  
 MUS 1021—Introduction to Music (also Goal Area 6)  
 MUS 3029—Music of the 20th Century (also Goal Area 6)  
 SOC 1001—Introduction to Sociology (also Goal Area 5)

### Goal Area 8: Global Perspective—one course minimum

GEOG 1104—World Regional Geography (also Goal Area 5)  
 GNED 3000—Global Seminar  
 HIST 1021—World Civilization I  
 HIST 1022—World Civilization II  
 HUM 3310—Culture and Technology (also Goal Area 6)  
 LIT 1005—Introduction to Literature (also Goal Area 6)  
 LIT 3001—World Literature (also Goal Area 6)  
 SOC 1102—Cultural Anthropology (also Goal Area 5)

### Goal Area 9: Ethical and Civic Responsibility—one course minimum

NATR 1226—Environmental Science and Sustainability (also Goal Area 10)  
 PHIL 1001—Introduction to Philosophy (also goal Area 6)  
 POL 1001—American Government

### Goal Area 10: People and the Environment—one course minimum

BIOL 1009—General Biology (also Goal Area 3)  
 CHEM 1021—Chemical Principles I (also Goal Area 3)  
 CHEM 1401—Elementary Bioorganic Chemistry (also Goal Area 3)  
 GEOL 1001—Introductory Geology (also Goal Area 3)  
 NATR 1226—Environmental Science and Sustainability (also Goal Area 9)  
 PHYS 1012—Introductory Physics (also Goal Area 3)

## Accounting B.S.

### Business Department

Required credits to graduate with this degree: 120.

Accounting is an information system that represents the economic resources and responsibilities of business or nonbusiness enterprises. Monitored over time, it is used as a decision-making tool for allocating resources and evaluating responsibilities.

Accounting information affects major economic decisions that have national and international impact. The accounting program teaches analytical, theoretical, communication, and leadership skills necessary for effective accounting and advancement in public, private, and government careers.

The program prepares students to become accountants in business and government by providing accounting, business, and liberal education courses.

**Program outcomes**—graduates will

- use computer technology for accounting spreadsheet applications and general ledger accounting functions and demonstrate overall literacy in technology
- develop and demonstrate skills in financial and cost accounting systems that are common to most businesses
- develop and demonstrate skills in U.S. tax fundamentals for individuals and businesses
- demonstrate skills and knowledge in auditing
- demonstrate competencies in ethical decision making
- demonstrate knowledge of liberal education that provides a foundation for the applied curriculum
- demonstrate a commitment to continuing professional development
- demonstrate skills in communication, working with others, and critical thinking

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits are required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1020—Spreadsheet Applications (2 cr)

### Accounting Core

ACCT 2101—Principles of Accounting I (3 cr)  
 ACCT 2102—Principles of Accounting II (3 cr)  
 ACCT 3201—Intermediate Accounting I (4 cr)  
 ACCT 3202—Intermediate Accounting II (4 cr)  
 ACCT 3301—Cost Accounting I (3 cr)  
 ACCT 3302—Cost Accounting II (3 cr)  
 ACCT 4210—Auditing I (3 cr)  
 ACCT 4220—Accounting Systems (3 cr)  
 ACCT 4404—Income Tax I (3 cr)  
 ACCT 4405—Income Tax II (3 cr)  
 GBUS 3107—Legal Environment in Business (3 cr)  
 ITM 2050—Introduction to Programming I (3 cr)  
 ITM 2060—Database Management Systems (3 cr)  
 MGMT 3100—Managerial Finance (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)

## Aerospace Studies (Air Force ROTC)

*(A cooperative program with North Dakota State University.)*

UMC students may participate in the Air Force Reserve Officer Training Corps program through an agreement between UMC, North Dakota State University, the University of North Dakota, and the U.S. Air Force. The purpose of this program is to enable qualified undergraduate students to become commissioned officers in the United States Air Force. AFROTC learning experiences are of long-range value whether one pursues a military or civilian career. Upon completion of the AFROTC curriculum and graduation from UMC, students are commissioned as second lieutenants in the U.S. Air Force.

The program is conducted by North Dakota State University faculty on the University of North Dakota campus in Grand Forks, located 25 miles from the UMC campus.

The initial assignment options available to an Air Force second lieutenant include the following:

- Enter the Air Force and complete the designated technical training course prerequisite to the student's specialty, i.e., flight training, research and development, management, or support functions;
- Apply for a delay in entering active duty for the purpose of pursuing an advanced degree;
- Enroll in one of several Air Force-sponsored graduate study programs while serving with full pay as an Air Force officer.

The aerospace studies curriculum is divided into two courses of instruction: the General Military Course (GMC), which parallels the freshman and sophomore academic years, and the Professional Officer Course (POC), which parallels the junior and senior academic years. Students in the four-year program normally attend four weeks of field training at a designated Air Force base during the summer between their sophomore and junior years. The student who chooses not to enroll in the GMC (first two years) may still earn a commission by enrolling in a special two-year program during the junior and

senior years. Qualified students will then participate in a five-week field training program at an Air Force base the summer between their junior and senior year.

AFROTC college scholarships are awarded to the best-qualified students and are available for one to four years. These grants cover up to full tuition, incidental lab fees, and textbooks. Plus, cadets receive a monthly allowance from \$250 for freshmen and up to \$400 for seniors. Students interested in AFROTC can contact the University of North Dakota office at 1-800-CALL UND, ext. 4733/4957.

## Agriculture A.A.S.

### Agriculture Department

Required credits to graduate with this degree: 67 to 68.

The program provides students with the skills necessary to obtain a variety of entry-level positions in agriculture, natural resources, and related fields. Program flexibility allows students to choose the area of emphasis that most closely fits their interests and career goals. Many students pursue a baccalaureate degree upon completion of the associate degree. All credits earned will transfer to UMC's parallel baccalaureate program.

**Program outcomes**—graduates will

- possess the fundamental technical skills necessary to obtain entry-level employment in the field
- have successfully completed an internship experience emphasizing participatory learning in a “real world” setting
- be able to gather and assimilate information, follow directions, formulate ideas, and solve problems
- apply technical knowledge and basic skills to the lifelong learning requirements of a changing workplace and world
- demonstrate effective computer, communication, and interpersonal skills

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Liberal Education Requirements

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)  
 Complete 3 credits of humanities electives.  
 CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
 or CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)

#### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 Take 2 or more credit(s) from the following:  
 CA 1xxx

### Program Sub-plans

Students are required to complete one of the following sub-plans.

### Agricultural Aviation Emphasis

The emphasis gives students the agronomic knowledge and aeronautical skills for careers as aerial applicators. Graduates have earned the appropriate flight certificates to pursue related careers as pilots in charter services, aerial fire fighting or photography, aviation sales, fixed-base operations, or flight instruction.

### Agricultural Aviation Emphasis Requirements

AVIA 1103—Introduction to Aviation (4 cr)  
 AVIA 1104—Introduction to Aviation Flight Lab (1 cr)  
 AVIA 1221—Basic Attitude Instrument Flying (3 cr)  
 AVIA 1222—IFR Regulations and Procedures (3 cr)  
 AVIA 1396—Conventional Aircraft Operations (1 cr)  
 AVIA 3323—Airplane Aerodynamics (3 cr)  
 AVIA 3324—Aircraft Systems and Instruments (3 cr)  
 AVIA 3396—Advanced Conventional Aircraft Operations (UND) (1 cr)  
 AVIA 3603—Aerial Application (3 cr)  
 AGRO 1030—Crop and Weed Identification (3 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 AGRO 2640—Applied Agriculture Chemicals (3 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 PIM 3230—Introduction to Plant Pathology (3 cr)  
 PIM 2573—Entomology (3 cr)  
 or SOIL 1293—Soil Science (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Agricultural Business Emphasis

Students receive a combination of liberal education, agriculture, and business courses sufficient for employment in a variety of agricultural businesses, including rural cooperatives, grain and livestock marketing firms, implement dealerships, and chemical companies.

### Agricultural Business Emphasis Requirements

Take 6 credits of agriculture or business electives, selected in consultation with an adviser, and 3 credits of open electives. Also take the following courses.

ACCT 2101—Principles of Accounting I (3 cr)  
 AGECE 2530—Professional Agriselling (3 cr)  
 AGECE 3430—Agricultural Commodity Marketing (3 cr)  
 AGECE 3540—Farm Business Management (4 cr)  
 AGECE 3640—Agricultural Finance and Valuation (4 cr)  
 ANSC 1004—Introduction to Animal Science (4 cr)  
 ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 SOIL 1293—Soil Science (3 cr)  
 MATH 1001—Technical Math (3 cr)  
 or MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)  
 HORT 1010—Introduction to Horticulture (3 cr)  
 or AGRO 1183—Field Crops: Production Principles (3 cr)

### Agriculture Emphasis

The emphasis gives students broad exposure to production agriculture and closely related industries. Students acquire practical skills and technical knowledge they will need as agricultural producers or to gain entry-level employment in the businesses and industries that support farmers and ranchers.

### Agriculture Emphasis Requirements

Take 7 credits of agriculture, natural resources, or business electives; 9 credits of upper division agriculture or natural resources electives; and 6 credits of open electives, all selected in consultation with an adviser. Also take the following courses.

AGEC 2530—Professional Agriselling (3 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 ANSC 1004—Introduction to Animal Science (4 cr)  
 ASM 1034—Facility Maintenance and Safety (4 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 SOIL 1293—Soil Science (3 cr)  
 MATH 1001—Technical Math (3 cr)  
 or MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Agronomy Emphasis

The emphasis prepares graduates to work in crop farm production operations and provides entry-level education for jobs in the agricultural services sector. Employment options include seed, feed, fertilizer, and chemical companies; grain inspection and elevator operations; and crop research support.

### Agronomy Emphasis Requirements

Take 8 credits of agriculture or business electives and 6 credits of open electives, all selected in consultation with adviser. Also take the following courses.

AGEC 3430—Agricultural Commodity Marketing (3 cr)  
 AGRO 1030—Crop and Weed Identification (3 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 AGRO 3640—Weed Science (3 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 PIM 2573—Entomology (3 cr)  
 PIM 3230—Introduction to Plant Pathology (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Animal Dairy/Equine/Meat Science Emphasis

Students within this emphasis can further focus their studies on the meat animals, dairy, or equine industries. Respectively, typical careers include rancher or assistant ranch manager, assistant herdsman, dairy equipment installer/service person, stable manager, and riding instructor.

### Animal Dairy/Equine/Meat Science Emphasis Requirements

Take 14 credits of animal/dairy/equine science electives; 6 credits of agriculture or business electives; and 5–6 credits (to total 45 credits in the emphasis) of open electives, all selected in consultation with an adviser. Also take the following courses.

AGEC 3540—Farm Business Management (4 cr)  
 ANSC 1004—Introduction to Animal Science (4 cr)  
 ANSC 2104—Feeds and Feeding (4 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 ANSC 1101—Animal Evaluation (1 cr)  
 or EQSC 1202—Equine Evaluation (2 cr)  
 MATH 1001—Technical Math (3 cr)  
 or MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Horticulture Emphasis

For students seeking careers in production of horticultural crops or in landscaping, nursery, florist, or horticultural supply and service businesses, the emphasis teaches the identification and production of horticultural plants; nutrition, soils, and pest management; and environmental health and safety.

### Horticulture Emphasis Requirements

Take 6 credits of agriculture or business electives and 7 credits of open electives, selected in consultation with an adviser. Also take the following courses.

BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 GNAG 4652—Senior Seminar (1 cr)  
 HORT 1010—Introduction to Horticulture (3 cr)  
 HORT 1021—Woody Plant Materials (4 cr)  
 HORT 3036—Plant Propagation (4 cr)  
 PIM 2573—Entomology (3 cr)  
 PIM 3230—Introduction to Plant Pathology (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Natural Resources Emphasis

Employment opportunities include technician-level jobs with conservation managers or researchers and with watershed or soil and water conservation districts. Other options include assistant-level positions with county, state, and federal parks and supervisory/maintenance work with city and county park departments.

### Natural Resources Emphasis Requirements

Take 13 credits of agriculture/natural resources electives and 6 credits of open electives, selected in consultation with an adviser. Also take the following courses.

ASM 1034—Facility Maintenance and Safety (4 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 GNAG 4652—Senior Seminar (1 cr)  
 NATR 1233—Introduction to Natural Resources (3 cr)  
 NATR 1244—Elements of Forestry (4 cr)  
 NATR 3203—Park and Recreation Management (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 MATH 1001—Technical Math (3 cr)  
 or MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 3899—Pre-Internship Seminar (0.5 cr)

## Agricultural Business B.S.

### Agriculture Department

Required credits to graduate with this degree: 120.

The program blends a strong base of agriculture, business, and general education courses while maximizing flexibility that allows students to choose electives to fit their career interests and expectations. A wide array of challenging, satisfying, and rewarding careers await graduates as demand for trained personnel in agribusiness continues to outstrip the supply of qualified graduates. Clusters of employment opportunities include agricultural sales and marketing, agribusiness management, agribusiness finance, agribusiness information management, food marketing management, global agribusiness, and rural economic development.

**Program outcomes**—graduates demonstrate

- skills that lead to satisfying and rewarding opportunities for agribusiness careers in either rural or urban settings
- knowledge of the basic general education that provides the foundation for applied knowledge and lifelong learning
- knowledge and technical skills required for careers in agribusiness
- polytechnic knowledge to make immediate contributions in the work place
- skills to advance the agricultural business program in concert with industry to ensure rapid response to evolving needs

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

#### Liberal Education Requirements

*A minimum of 40 liberal education credits are required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)
- CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)
- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- PSY 1001—General Psychology, HI/BEH/SSC (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Technology Requirements (3 cr)

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1020—Spreadsheet Applications (2 cr)

#### Agricultural Business Program Requirements (41 cr)

- ACCT 2101—Principles of Accounting I (3 cr)
- AGBU 1005—World Agricultural Food Systems (3 cr)
- AGEC 2530—Professional Agriselling (3 cr)
- AGEC 3050—Economics for AgriBusiness Management (5 cr)
- AGEC 4750—Agribusiness Marketing (3 cr)
- AGEC 4760—Agribusiness Market Plan Development (3 cr)
- COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- GNAG 1012—Introduction to Applied Agricultural Chemistry (2 cr)
- GNAG 3900—Internship (1–4 cr)
- GNAG 3901—Post Internship Seminar (0.5 cr)
- GNAG 4652—Senior Seminar (1 cr)
- MGMT 3200—Principles of Management (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)
- MKTG 3360—Global Business (3 cr)
- SOIL 1293—Soil Science (3 cr)
- GNAG 2899—Pre-Internship Seminar (0.5 cr)
- or GNAG 3899—Pre-Internship Seminar (0.5 cr)

#### Technology Electives

*Students must take 3 credits of CA or ITM courses.*

#### Open Electives

*Students must take 12 credits.*

#### Agricultural Business Options

Students are required to complete one of the following course groups.

### Agriculture/Business/Technology Electives

*Students must complete 21 credits selected in consultation with an adviser.*

-OR-

#### Sustainable Development Emphasis

*Complete the requirements in the sustainable development emphasis.*

#### Sustainable Development Emphasis

Sustainable development is a unique blend of social, economic, and environmental factors that provides long-term strategies to benefit communities. The sustainable development emphasis focuses on social, economic, and environmental leadership skills to help communities develop and sustain quality of place.

#### Sustainable Development Emphasis Requirements (21 cr)

- AGEC 4800—Rural Economic Development Practicum (3 cr)
- ENR 2200—Introduction to Entrepreneurship and Small Business (3 cr)
- ENR 3400—Entrepreneurial and Small Business Finance (3 cr)
- MGMT 3100—Managerial Finance (3 cr)
- NATR 1226—Environmental Science and Sustainability, ETH/CIV RE, PEOPLE/ENV (3 cr)
- NATR 3344—Land Use Planning (3 cr)
- NATR 3699—Integrated Resource Management (3 cr)

## Agricultural Education B.S.

### Agriculture Department

Required credits to graduate with this degree: 128.

(A collaborative program with the University of Minnesota, Twin Cities (UMTC) campus.)

Two teaching emphasis (specializations) areas available to students at UMC are agricultural science and technology and natural and managed environmental education.

Both emphases serve students preparing to teach agriscience, agribusiness, agriculture, horticulture, food systems, agrimechanics, and natural resource management, all under the licensure field of agricultural education in public schools at the 5–12 level. Graduates of the agricultural science and technology specialization also are qualified for a broad array of agriculturally related positions in sales, management, finance, and production aspects of agriculture. Graduates with the natural and managed environmental education specialization have an emphasis in natural resource management and education and are prepared for work in environmental learning centers. Specific degree requirements, admission requirements, program outcomes, and professional education course descriptions are congruent with those in the UMTC Undergraduate Catalog. Transfer within the collaborative agreement allows students to complete all four years on either the UMC or UMTC campus. It also allows students to make a seamless transfer between campuses.

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

**Liberal Education Requirements**

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 BIOL 1020—Microbiology, LIB ED ELC (3 cr)  
 BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
 CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)  
 HUM 3310—Culture and Technology, HUMANITIES, GLOB PERSP (3 cr)  
 LIT 3001—World Literature, HUMANITIES, GLOB PERSP (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)  
 HIST 1301—American History I, HI/BEH/SSC (3 cr)  
 or HIST 1302—American History II, HI/BEH/SSC (3 cr)

**Technology Requirement**

CA 1010—Introduction to Computer Technology (1 cr)

**Program Core**

AGBU 1005—World Agricultural Food Systems (3 cr)  
 ANSC 1004—Introduction to Animal Science (4 cr)  
 ASM 1034—Facility Maintenance and Safety (4 cr)  
 CI 5452—Reading in the Content Areas for Initial Licensure Candidates (1 cr)  
 NATR 1233—Introduction to Natural Resources (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 ASM 1044—Computer-Aided Drafting (3 cr)  
 or ASM 3360—Applications in Precision Agriculture (3 cr)  
 HORT 1010—Introduction to Horticulture (3 cr)  
 or AGRO 1183—Field Crops: Production Principles (3 cr)

**Professional Education Courses**

AFEE 1001—Intro to Agricultural Education and Extension (UMTC) (1 cr)  
 AFEE 1002—Principles of Career Planning for Agricultural Professional (UMTC) (1 cr)  
 AFEE 2096—Professional Practicum in Agricultural Education: Early Experience (UMTC) (1 cr)  
 AFEE 5111—Agricultural Education: Methods of Teaching (UMTC) (4 cr)  
 AFEE 5112—Agricultural Education Program Organization and Curriculum for Youth (UMTC) (3 cr)  
 AFEE 5114—Agricultural Education Teaching Seminar (UMTC) (1 cr)  
 AFEE 5116—Coordination of SAE Programs: Work-Based Learning (UMTC) (2 cr)  
 AFEE 5118—Strategies for Managing and Advising the FFA Organization (UMTC) (2 cr)  
 EDHD 5001—Learning, Cognition, and Assessment in the Schools (UMTC) (3 cr)  
 EDHD 5003—Developmental and Individual Differences in Educational Contexts (UMTC) (3 cr)  
 EDHD 5005—School and Society (UMTC) (2 cr)  
 EDHD 5007—Technology for Teaching and Learning (UMTC) (1.5 cr)  
 EDHD 5009—Human Relations: Applied Skills for School and Society (UMTC) (1 cr)  
 EDPA 5341—American Middle School (UMTC) (3 cr)  
 PUBH 3005—Fundamentals of Alcohol and Drug Abuse (UMTC) (1 cr)  
 WHRE 5697—Teaching Internship: School and Classroom Settings (UMTC) (2 cr)  
 WHRE 5698—Teaching Internship (UMTC) (6 cr)

**Program Sub-plans**

Students are required to complete one of the following sub-plans.

**Agricultural Science and Technology Education Emphasis**

Graduates with this emphasis are qualified for a broad array of agriculturally related positions in sales, management, finance, and production aspects of agriculture.

**Agricultural Science and Technology Education Emphasis Requirements**

*Take 3 credits of agricultural economics or accounting electives; 3 credits of agronomy, horticulture, or plant industries management electives; 2 credits of animal science or equine science electives; 3 credits of natural resources electives; and 2.5 credits of agriculture electives, all selected in consultation with an adviser. Also take the following courses.*

AGEC 2530—Professional Agriselling (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)

**Natural and Managed Environmental Education Emphasis**

Students with this emphasis focus on natural resource management and education and are prepared for work in environmental learning centers.

**Natural and Managed Environmental Education Requirements**

*Take 3 credits of agronomy, horticulture, or plant industries management electives; 2 credits of animal science or equine science electives; 6 credits of natural resources electives; 4 credits of soil and water management electives; and 1.5 credits of agriculture electives, all selected in consultation with an adviser. Also take one of the following courses.*

AGEC 2530—Professional Agriselling (3 cr)  
 or ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)

**Agricultural Systems Management B.S.****Agriculture Department**

Required credits to graduate with this degree: 120.

This program combines students' interest in machinery, technology, and crop and livestock production with superior people skills, creative thinking, and problem solving to build a career in the agricultural and food production industry.

Agricultural systems management graduates are well versed in agricultural foundations and have working knowledge of economic systems with a well-developed sense of professionalism. Companies are looking for multitalented people who are confident around computers, machines, and business plans. The agricultural systems management program offers three areas of emphasis to provide a unique portfolio of technical and business skills that gives graduates an edge in the job market.

**Program outcomes**—graduates will

- be well versed in agricultural foundations
- be technically proficient and knowledgeable in agricultural technologies
- have working knowledge of economic systems and financial management
- possess speaking, listening, and writing communication skills
- have a well-developed sense of professionalism

**Admission Requirements**

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits are required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement (3 cr)

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1020—Spreadsheet Applications (2 cr)

### Agricultural Systems Management Program (28 cr)

AGRO 1183—Field Crops: Production Principles (3 cr)  
 ASM 1021—Introduction to Agricultural Systems Management (2 cr)  
 ASM 1034—Facility Maintenance and Safety (4 cr)  
 ASM 3002—Agricultural Mobile Power Systems (3 cr)  
 ASM 3005—Facilities Planning and Selection (3 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)  
 GNAG 4652—Senior Seminar (1 cr)  
 SOIL 1293—Soil Science (3 cr)  
 ACCT 2101—Principles of Accounting I (3 cr)  
*or* ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 COMM 2334—Communication Topics, LIB ED ELC (3 cr)  
*or* COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
*or* COMM 3431—Persuasion, COMMUNICAT (3 cr)  
*or* COMM 3704—Business and Professional Speaking, LIB ED ELC (3 cr)  
 GNAG 2899—Pre-Internship Seminar (0.5 cr)  
*or* GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

#### ***Farm and Ranch Management Emphasis***

This emphasis focuses on a blend of business and production management. The program's goal is to provide a solid foundation to allow the graduate to be competitive and succeed in the changing world of modern agriculture.

#### **Farm and Ranch Management Emphasis Requirements (25 cr)**

AGEC 3430—Agricultural Commodity Marketing (3 cr)  
 AGECE 3540—Farm Business Management (4 cr)  
 AGECE 3640—Agricultural Finance and Valuation (4 cr)  
 ANSC 1004—Introduction to Animal Science (4 cr)  
 ASM 2053—Electricity, Controls, and Sensors in Agriculture (3 cr)  
 ASM 2250—Agricultural Machinery Management (3 cr)  
 ASM 3360—Applications in Precision Agriculture (3 cr)  
 ASM 3513—Precision Farming Data (1 cr)

#### **Agriculture/Management Electives**

*Students must take 14 credits.*

#### **Open Electives**

*Students must take 10 credits.*

### ***Power and Machinery Emphasis***

New technology and labor-saving innovations in machinery, engines, and equipment drive a multi-billion dollar global business. Excellent careers exist in servicing, testing, and sales and marketing of new products for agricultural, industrial, and consumer applications.

### **Power and Machinery Emphasis Requirements (26 cr)**

AGEC 2530—Professional Agriselling (3 cr)  
 AGECE 3050—Economics for AgriBusiness Management (5 cr)  
 AGECE 3640—Agricultural Finance and Valuation (4 cr)  
 ASM 2053—Electricity, Controls, and Sensors in Agriculture (3 cr)  
 ASM 2250—Agricultural Machinery Management (3 cr)  
 ASM 3360—Applications in Precision Agriculture (3 cr)  
 CA 1060—Database Applications (2 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)

### **Agriculture/Management Electives**

*Students must take 11 credits.*

### **Open Electives**

*Students must take 12 credits.*

### ***Precision Agriculture Emphasis***

Work in the field or in an office to help others improve agriculture production practices (chemical application, planting, pest management) by using satellites, geographical information systems (GIS), and precision data analysis. Field data collection, analysis, and application are keys to improving agricultural production management practices and implementing efficiencies.

### **Precision Agriculture Emphasis Requirements (25 cr)**

AGEC 2530—Professional Agriselling (3 cr)  
 AGRO 3640—Weed Science (3 cr)  
 ASM 2053—Electricity, Controls, and Sensors in Agriculture (3 cr)  
 ASM 3009—Surveying (4 cr)  
 ASM 3360—Applications in Precision Agriculture (3 cr)  
 ASM 3511—Yield Monitoring and Data Interpretation (1 cr)  
 ASM 3512—Remote Sensing Applications in Precision Agriculture (1 cr)  
 ASM 3513—Precision Farming Data (1 cr)  
 CA 1060—Database Applications (2 cr)  
 SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)

### **Agriculture/Management Electives**

*Students must take 12 credits.*

### **Open Electives**

*Students must take 12 credits.*

## **Agronomy B.S.**

### ***Agriculture Department***

Required credits to graduate with this degree: 120.

The B.S. in agronomy is a career-oriented program that combines science-based agriculture training and education with a strong liberal arts background to produce graduates skilled in the highly technical fields of agronomic science and crop production. The flexibility of the two tracks, agronomy and crop production enables students to build a thorough understanding of crop science with a concentration in areas such as crop production, agricultural chemicals, fertilizers, integrated pest management, seed conditioning and technology, and other areas related to production and quality in the food and fiber industry.

**Program outcomes**—graduates will

- demonstrate appropriate skills necessary for employment in agronomic sciences or crop production
- demonstrate skills in general education and management that provide a foundation for the applied curriculum
- develop and demonstrate an attitude of continued inquiry and lifelong learning

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)
- BIOL 2022—General Botany, LIB ED ELC (3 cr)
- CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)
- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

### Technology Requirement (3 cr)

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1xxx

### Agronomy Program Requirements (50 cr)

- AGRO 1030—Crop and Weed Identification (3 cr)
- AGRO 1183—Field Crops: Production Principles (3 cr)
- AGRO 1540—Seed Conditioning and Technology (4 cr)
- AGRO 2640—Applied Agriculture Chemicals (3 cr)
- AGRO 2840—Grain and Seed Evaluation (4 cr)
- AGRO 3130—Forages (3 cr)
- AGRO 3444—Crop Production (4 cr)
- GNAG 1012—Introduction to Applied Agricultural Chemistry (2 cr)
- GNAG 3900—Internship (1–4 cr)
- GNAG 3901—Post Internship Seminar (0.5 cr)
- GNAG 4652—Senior Seminar (1 cr)
- PIM 2573—Entomology (3 cr)
- PIM 3023—Plant Breeding and Genetics (4 cr)
- PIM 3230—Introduction to Plant Pathology (3 cr)
- PIM 3630—Integrated Crop Management (Capstone) (3 cr)
- SOIL 1293—Soil Science (3 cr)
- SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)
- GNAG 2899—Pre-Internship Seminar (0.5 cr)
- or GNAG 3899—Pre-Internship Seminar (0.5 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

#### **Agronomic Science Emphasis**

The agronomic science track allows students to build a thorough understanding of crop science with a concentration in areas such as agricultural chemicals, fertilizers, integrated pest management, and seed conditioning and technology.

#### **Agronomic Science Emphasis Requirements (13 cr)**

- AGRO 3640—Weed Science (3 cr)
- CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)
- BIOL 3131—Plant Physiology, LIB ED ELC (3 cr)
- PIM 3030—Research Techniques (3 cr)

#### **Agriculture/Natural Resources Electives**

*Students must take 5 credits of agriculture/natural resources electives selected from the following departments: AGBU, AGECE, AGRO, ASM, ANSC, GNAG, HORT, NATR, GFTS, PIM.*

#### **Open Electives**

*Students must take 9 credits.*

#### **Crop Production Emphasis**

The crop production track, along with building strong agronomic skills, has an agricultural business component that allows students to develop their marketing and farm business management skills.

#### **Crop Production Emphasis Requirements (11 cr)**

- AGEC 3430—Agricultural Commodity Marketing (3 cr)
- AGEC 3540—Farm Business Management (4 cr)
- SWM 3224—Soil and Water Conservation (4 cr)

#### **Agriculture/Natural Resources Electives**

*Students must take 7 credits of agriculture/natural resources electives selected from the following departments: AGBU, AGECE, AGRO, ASM, ANSC, GNAG, HORT, NATR, GFTS, PIM.*

#### **Open Electives**

*Students must take 9 credits.*

## Animal Science B.S.

### **Agriculture Department**

Required credits to graduate with this degree: 120 to 124.

The B.S. in animal science leads to careers in livestock production and management or one of the many allied industries such as feed production, artificial insemination, and livestock or farm equipment support and sales. In addition, students can meet the requirements to attend graduate school or veterinary college.

Coursework includes computer and communications training, sales, and business management. Other required coursework is traditional to livestock degrees, but students have the option of taking courses specific to their interests. Options also exist for students who wish to pursue pre-veterinary studies.

**Program outcomes**—graduates will

- demonstrate competencies in dairy/livestock management
- demonstrate individual communication skills
- demonstrate personal problem solving, decision-making, and critical thinking skills
- demonstrate technology skills used for dairy/livestock management decision making and problem solving
- work effectively in teams;
- be able to obtain a career in the dairy/livestock industry

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)

Take 2 or more credit(s) from the following:

CA 1xxx

### Program Requirements

ANSC 1004—Introduction to Animal Science (4 cr)  
 ANSC 1101—Animal Evaluation (1 cr)  
 ANSC 2104—Feeds and Feeding (4 cr)  
 ANSC 3004—Livestock Facilities and Environmental Systems (3 cr)  
 ANSC 3023—Animal Breeding (3 cr)  
 ANSC 3104—Applied Animal Nutrition (4 cr)  
 ANSC 3203—Animal Anatomy and Physiology (3 cr)  
 ANSC 3204—Dairy Production (4 cr)  
 ANSC 3303—Beef Production (3 cr)  
 ANSC 3304—Reproduction, AI, and Lactation (4 cr)  
 ANSC 3503—Animal Health and Disease (3 cr)  
 ANSC 4204—Animal Systems Management (4 cr)  
 BIOL 2032—General Microbiology, LIB ED ELC (4 cr)  
 BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)  
 GNAG 4652—Senior Seminar (1 cr)  
 ANSC 1205—Beef and Dairy Production Techniques (2 cr)  
 or ANSC 1206—Sheep and Swine Production Techniques (2 cr)  
 GNAG 3899—Pre-Internship Seminar (0.5 cr)  
 or GNAG 2899—Pre-Internship Seminar (0.5 cr)  
 GNAG 3900—Internship (1–4 cr)  
 GNAG 3901—Post Internship Seminar (0.5 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

#### Animal Science Emphasis

This emphasis leads graduates to careers within the livestock industry such as production and management, feed production, artificial insemination, livestock and farm equipment support/sales, pharmaceutical sales, and veterinary technician. Students are exposed to classroom instruction and hands-on experiential learning in the laboratory. Coursework includes computer and communications training, sales training, and business management. Other required coursework is traditional to livestock degrees and may include nutrition, breeding, reproduction, evaluation, feeds, production and management, and facilities. Students can take courses specific to their interest.

#### Animal Science Emphasis Requirements

In addition to the specific courses listed below, students must complete 3 credits of agricultural economics electives and 9 credits of agriculture electives selected in consultation with their adviser.

AGEC 3540—Farm Business Management (4 cr)  
 ANSC 1201—Advanced Animal Evaluation (1 cr)  
 CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)

GNAG 3203—Ag Products and Processing (3 cr)  
 CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
 or CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)

### Pre-Veterinary Medicine Emphasis

The pre-veterinary medicine emphasis meets the course entry requirements for admission to the University of Minnesota College of Veterinary Medicine; however, similar entry requirements among colleges of veterinary medicine, coupled with sufficient flexibility within the curriculum, allow graduates to meet the admission requirements for many other institutions. Students who graduate are well prepared to pursue their career goal of becoming a veterinarian. Students are exposed to traditional classroom instruction as well as hands-on/experiential learning in the laboratory.

### Pre-Veterinary Medicine Emphasis Requirements

In addition to the specific courses listed below, students must complete 6 credits of agriculture electives selected in consultation with their adviser.

BIOL 2012—General Zoology, LIB ED ELC (4 cr)  
 CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)  
 CHEM 1022—Chemical Principles II, LIB ED ELC (4 cr)  
 CHEM 2301—Organic Chemistry I, LIB ED ELC (3 cr)  
 CHEM 2310—Organic Chemistry Laboratory I, LIB ED ELC (2 cr)  
 CHEM 3021—Biochemistry, LIB ED ELC (3 cr)  
 PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)  
 PHYS 1102—Introductory College Physics II, PHYS SCI (4 cr)

## Applied Health B.A.H.

### Math, Science and Technology Department

Required credits to graduate with this degree: 120.

The bachelor of applied health (B.A.H.) is an integrated four-year baccalaureate degree program delivered via distance education through the Web. The program includes a liberal education core curriculum, clinical occupational field, and management component. The applied curriculum combines the knowledge and experiences necessary to provide clinical leadership in the changing health care arena and in entrepreneurial health care settings where clinical expertise is valued.

**Program outcomes**—graduates will

- communicate effectively and work as a team in a health care setting
- demonstrate leadership ability in problem solving, conflict resolution, and change management
- understand the legal, regulatory, and ethical issues inherent to health care
- show the ability to adapt to changing public policy, economic, and financial issues in health care
- demonstrate assessment skills related to improving clinical care and customer service
- understand technology and how to apply it to the workplace

### Admission Requirements

Students must complete an associate degree in a health care field before enrolling in this degree program.

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

## Liberal Education Requirements

Students must take 6 credits of humanities from at least two departments in addition to the following.

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 or SOC 1001—Introduction to Sociology, HI/BEH/SSC,  
 HUMAN DIV (3 cr)

## Science Electives

Students must take 9 credits.

## Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 Take 2 or more credit(s) from the following:  
 CA 1xxx

## Program Core Requirements

HSM 3020—Quality Improvement and Risk Management (4 cr)  
 HSM 3100—Essentials of Managed Care (3 cr)  
 HSM 3130—Health Management Information Systems (3 cr)  
 HSM 3200—Health Care Leadership and Planning (4 cr)  
 HSM 3230—Administration of Continuum Care Facilities (3 cr)  
 HSM 3240—Health Care Policy and Comparative Systems (3 cr)  
 HSM 3900—Internship (1–3 cr)  
 HSM 4100—Health Care Finance (3 cr)  
 HSM 4210—Health Care Law and Biomedical Ethics (4 cr)  
 HSM 4212—Regulatory Management (3 cr)  
 ABUS 4012—Problem Solving in Complex Organizations  
 (UMTC) (3 cr)  
 or MGMT 3210—Supervision and Leadership (3 cr)  
 ABUS 4023—Communicating for Results (UMTC) (3 cr)  
 or COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 ABUS 4104—Management and Human Resource Practices  
 (UMTC) (3 cr)  
 or MGMT 3220—Human Resource Management (3 cr)

## Occupational Course Requirements

Students must take 42 credits of occupational courses from partner schools, selected in consultation with an adviser.

## Electives

Students must take 6 credits of electives.

## Applied Studies B.S.

### Arts, Humanities, Social Science Department

Required credits to graduate with this degree: 120.

The applied studies program addresses the needs of individuals whose educational objectives cannot be met through traditional degree programs. It provides a professionally accommodating entry point for students with previous educational and technical competencies to develop an individualized B.S. degree. Examples of the types of previous college credits that transfer to the degree include those from the allied health field such as respiratory care and radiologic technology. Transfer students with credits from the Community College of the Air Force and who are enrolled in the Air Force ROTC program can use the aerospace studies courses to meet program requirements for the applied studies B.S. degree.

**Program outcomes**—graduates will

- complete an individually tailored course of study that builds upon prior education and experience
- demonstrate technical competencies in selected areas of study in an internship setting

- demonstrate skills in communication, problem solving and working with others in a capstone experience
- meet career development goals related to achieving a baccalaureate degree

### Applied Studies—Articulation Agreements

The University of Minnesota, Crookston has an articulation agreement with Northland Community and Technical College, East Grand Forks. Students who complete the A.T.S. degree in respiratory care or the A.A.S in radiologic technology at Northland can move into the B.S. degree in applied studies at UMC. The skills and competencies developed at the technical college combined with achieving the B.S. degree provide students with advancement opportunities in hospital, clinic, or home care settings.

## Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

## Program Requirements

Students develop a program of study selected to meet career goals. A specific program track in respiratory care is also available. Students must complete 40 upper division credits.

## Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

## Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1xxx

## Applied Studies Seminar

APLS 4652—Applied Studies Seminar (2.5 cr)

## Applied Studies Options

Students either design a program with two fields of study, in consultation with an adviser, or they complete the respiratory care requirements.

Students are required to complete one of the following course groups.

## Self-Designed Program

Students complete at least two areas of study, with at least one area having an occupational direction. Technical courses taken at a technical college may be used to complete one area of study. The first area of study requires at least 27 credits of technical or occupational courses. The second area of study requires at least 18 credits of additional courses selected across the curriculum to meet specific career objectives. All courses must be selected in consultation with an adviser.

APLS 3001—Individual Program Development (0.5 cr)  
 APLS 3900—Internship/Field Experience (1–3 cr)  
 First area of study  
 Second area of study

-OR-

## Respiratory Care

Complete the requirements in the respiratory care emphasis.

### **Respiratory Care Emphasis**

**Program outcomes**—graduates will

- demonstrate respiratory care competencies in clinical settings as appropriate for certification in respiratory care
- demonstrate skills in communication, problem solving and working with others in an appropriate capstone experience
- meet career development goals related to achieving a baccalaureate degree

Courses taken at Northland Community and Technical College, East Grand Forks, will be transferred in to complete the first area (23 credits) and second area (31 credits) of study.

#### **1st Area of Study**

*Courses taken at Northland Community and Technical College—minimum 23 credits: BIOL 2221, 2252, 2254, RESP 1104, 1110, 1120, 1124*

#### **2nd Area of Study**

*Courses taken at Northland Community and Technical College—minimum 31 credits: RESP 2206, 2212, 2242, 2248, 2252, 2258, 2262, 2266, 2276*

## **Aviation B.S.**

### **Natural Resources Department**

Required credits to graduate with this degree: 120. (A collaborative program with the University of North Dakota Aerospace Foundation)

The aviation program trains students to excel in the increasingly sophisticated and competitive profession of aviation. Extensive coursework in aviation, liberal education, and other disciplines provides the graduate with the skills for success. The University of North Dakota (UND AEROSPACE), an internationally recognized collegiate flight training center, provides aircraft, simulators, flight instructors, and aviation course materials under a collaborative agreement.

Only full-time students (taking 12 credits or more) may enroll in flight training courses; others must obtain consent from the aviation program manager. Pilot certification courses include private pilot, commercial pilot, instrument rating, certified flight instructor, instrument flight instructor, multi-engine rating, and multi-engine flight instructor. Non-certification courses include conventional gear (tail wheel) operations, advanced conventional gear operations, aerial applicator training, and natural resources/law enforcement applications. Students enrolling with previous flight training or experience may receive college credit after a practical test is administered by the aviation program manager or an appointed check pilot. Aviation students attend all classes on the UMC campus. Flight training is conducted at the UMC flight training center located at the Crookston Municipal Airport, three miles north of the campus.

The aviation program includes flight courses for which students incur costs over and above regular tuition rates. These costs vary and depend on the courses taken as well as the aircraft and flight instructor time used. Call the aviation program manager (218-281-8114) or check the aviation Web site at [www.aero.und.edu/crookston/](http://www.aero.und.edu/crookston/) for current cost estimates.

Depending upon their career interest, students may choose from three areas of emphasis: agricultural, law enforcement, or natural resources aviation.

Business aviation is offered as an emphasis within business management.

### **Admission Requirements**

No medical or physical limitation that would prevent the student from holding a FAA second class medical certificate.

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### **Program Requirements**

Students must complete 40 upper division credits.

### **Liberal Education Requirements**

*A minimum of 40 liberal education credits are required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)
- CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)
- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### **Technology Requirement (3 cr)**

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1xxx

### **Aviation Program Requirements (29 cr)**

- AVIA 1103—Introduction to Aviation (4 cr)
- AVIA 1104—Introduction to Aviation Flight Lab (1 cr)
- AVIA 1221—Basic Attitude Instrument Flying (3 cr)
- AVIA 1222—IFR Regulations and Procedures (3 cr)
- AVIA 1396—Conventional Aircraft Operations (1 cr)
- AVIA 3323—Airplane Aerodynamics (3 cr)
- AVIA 3324—Aircraft Systems and Instruments (3 cr)
- AVIA 3396—Advanced Conventional Aircraft Operations (UND) (1 cr)
- BIOL 2022—General Botany, LIB ED ELC (3 cr)
- COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- NATR 3900—Internship (1–4 cr)
- NATR 3901—Post-Internship Seminar (0.5 cr)
- NATR 4652—Seminar (1 cr)
- NATR 2899—Pre-Internship Seminar (0.5 cr)
- or NATR 3899—Pre-Internship Seminar (0.5 cr)

### **Program Sub-plans**

Students are required to complete one of the following sub-plans.

#### **Agricultural Aviation Emphasis**

This emphasis leads to careers in aerial application, aerial firefighting, aerial photography, charter pilot, or pilot representative for an agricultural business. UMC also offers an associate in applied science degree in agriculture with an emphasis in agricultural aviation.

**Program outcomes**—graduates will

- demonstrate competency in aeronautics
- demonstrate competency in applied agronomy
- demonstrate the use of current technology in aviation, agriculture, and applied business
- demonstrate critical thinking to analyze situations in aeronautics and applied agriculture

### Agricultural Aviation Emphasis Requirements (33 cr)

AGRO 1030—Crop and Weed Identification (3 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 AGRO 2640—Applied Agriculture Chemicals (3 cr)  
 AGRO 3444—Crop Production (4 cr)  
 AVIA 3603—Aerial Application (3 cr)  
 ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 MKTG 3200—Personal Selling (3 cr)  
 PIM 2573—Entomology (3 cr)  
 PIM 3230—Introduction to Plant Pathology (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 SWM 3103—Meteorology and Climatology (2 cr)

### Agriculture/Natural Resources Electives

*Students must take 7 credits.*

### Open Electives

*Students must take 8 credits.*

### Law Enforcement Aviation Emphasis

This emphasis provides training in aviation, law enforcement, and liberal education. Careers include positions as law enforcement pilots employed by local, state, and federal agencies such as the U.S. Customs and Border Protection, state and federal conservation agencies, and state/county/local law enforcement agencies.

**Program outcomes**—graduates will

- demonstrate competency in aeronautics
- perform group problem solving, decision making, and conflict management activities
- demonstrate critical thinking to analyze situations in aeronautics and law enforcement
- be prepared to attend the peace officer's skills training academy

After completing all required coursework, students may attend a skills session and take the Minnesota Peace Officer Standards and Training (POST) certification examination as coordinated by Bemidji State University.

### Law Enforcement Aviation Emphasis Requirements (36 cr)

AVIA 3602—Natural Resources and Enforcement Applications (2 cr)  
 CRJS 1120—Criminal Justice and Society (BSU), LIB ED ELC (4 cr)  
 CRJS 3304—Police Process (BSU) (3 cr)  
 CRJS 3305—Judicial Process (BSU), LIB ED ELC (3 cr)  
 CRJS 3320—Juvenile Delinquency and Justice (BSU) (3 cr)  
 CRJS 3334—Criminal Justice Planning (BSU) (3 cr)  
 CRJS 3358—Criminal Law (BSU) (3 cr)  
 CRJS 3359—Criminal Investigation (BSU) (3 cr)  
 CRJS 3360—Criminal Procedure (BSU) (3 cr)  
 CRJS 4100—Applied Ethics (BSU) (3 cr)  
 CRJS 4103—Criminal Justice Diversity (BSU) (3 cr)  
 CRJS 4480—Policing People (BSU) (3 cr)

### Agriculture/Natural Resources/Business Electives

*Students must take 9 credits.*

### Open Electives

*Students must take 3 credits.*

### Natural Resources Aviation Emphasis

This emphasis leads to careers as natural resource pilots employed by state and federal agencies such as the National Park Service, U.S. Fish and Wildlife Service, and Forest Service, and state departments of natural resources.

**Program outcomes**—graduates will

- demonstrate competency in aeronautics
- apply an integrated approach to resource management that incorporates environmental/economic/social considerations
- perform group problem solving, decision making, and conflict management activities
- understand ecological/management principles that apply to wildlife/fish/forest/soil/water/recreation resources

### Natural Resources Aviation Emphasis Requirements (45 cr)

AVIA 3602—Natural Resources and Enforcement Applications (2 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 NATR 1233—Introduction to Natural Resources (3 cr)  
 NATR 1244—Elements of Forestry (4 cr)  
 NATR 2630—Introduction to Geographic Information Systems (3 cr)  
 NATR 3203—Park and Recreation Management (3 cr)  
 NATR 3344—Land Use Planning (3 cr)  
 NATR 3364—Plant Taxonomy (3 cr)  
 NATR 3374—Ecology, BIOL SCI (4 cr)  
 NATR 3654—Wildlife Ecology and Management (4 cr)  
 NATR 3699—Integrated Resource Management (3 cr)  
 SOIL 1293—Soil Science (3 cr)  
 SWM 3224—Soil and Water Conservation (4 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 or HORT 1010—Introduction to Horticulture (3 cr)

### Open Electives

*Students must take 3 credits.*

## Biology B.S.

### Math, Science and Technology Department

Required credits to graduate with this degree: 120.

The B.S. in biology provides students with a broad knowledge of the biological sciences while introducing them to the practical skills needed in today's biotech industries and the background required to be successful applicants to graduate programs. Students may choose from advanced courses designed to emphasize studies in either animal or plant systems while participating in a common core of courses which provide knowledge in the basic principles relevant to both areas.

**Program outcomes**—graduates will

- explain and reconstruct the scientific method and can apply this mode of inquiry in a laboratory setting
- explain and apply basic principles of biology in work setting
- demonstrate teamwork skills
- apply, critique, and synthesize protocols from current literature
- demonstrate and critique effective oral and written communication skills
- formulate proper data collection and analysis methods
- interpret and practice professional and ethical behavior related to biological research
- identify, provide examples, differentiate, and integrate current biology techniques into their scientific investigations

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Biology Core Requirements

BIOL 1001—Nature of Life (1 cr)  
 BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 BIOL 2032—General Microbiology, LIB ED ELC (4 cr)  
 BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)  
 BIOL 3027—Cell Biology, LIB ED ELC (3 cr)  
 BIOL 3122—Evolution, LIB ED ELC (3 cr)  
 BIOL 3822—Techniques in Molecular Biology (4 cr)  
 BIOL 3899—Pre-Internship Seminar (0.5 cr)  
 BIOL 3900—Internship (1–2 cr)  
 BIOL 3901—Post-Internship Seminar (0.5 cr)  
 BIOL 4101—Biology Seminar (1 cr)  
 COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 NATR 3374—Ecology, BIOL SCI (4 cr)  
 BIOL 2012—General Zoology, LIB ED ELC (4 cr)  
 or BIOL 2022—General Botany, LIB ED ELC (3 cr)

#### Chemistry Core Requirements

CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)  
 CHEM 1022—Chemical Principles II, LIB ED ELC (4 cr)  
 CHEM 2301—Organic Chemistry I, LIB ED ELC (3 cr)  
 CHEM 2302—Organic Chemistry II, LIB ED ELC (3 cr)  
 CHEM 2310—Organic Chemistry Laboratory I, LIB ED ELC (2 cr)  
 CHEM 2311—Organic Chemistry Laboratory II, LIB ED ELC (2 cr)  
 CHEM 3021—Biochemistry, LIB ED ELC (3 cr)

#### Math and Physics Core Requirements

MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 MATH 1271—Calculus I, MATH THINK (4 cr)  
 PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)  
 PHYS 1102—Introductory College Physics II, PHYS SCI (4 cr)

#### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)



### Technology Requirement

*In addition to the course below, student must take 2 CA electives.*

CA 1010—Introduction to Computer Technology (1 cr)

### Biology Major Electives

*Students must take 11–13 credit(s) from the following:*

ANSC 3203—Animal Anatomy and Physiology (3 cr)  
 ANSC 3304—Reproduction, AI, and Lactation (4 cr)  
 BIOL 2103—Human Anatomy and Physiology I, LIB ED ELC (4 cr)  
 BIOL 2104—Human Anatomy and Physiology II, LIB ED ELC (4 cr)  
 BIOL 3131—Plant Physiology, LIB ED ELC (3 cr)  
 BIOL 3140—Histology (4 cr)  
 BIOL 3464—Mammalogy, LIB ED ELC (3 cr)  
 BIOL 3466—Ornithology, LIB ED ELC (3 cr)  
 BIOL 3720—Plant Form and Function (3 cr)  
 BIOL 3722—Limnology, LIB ED ELC (3 cr)  
 BIOL 3994—Undergraduate Research (1–3 cr)  
 BIOL 4361—Developmental Biology (4 cr)  
 GEOL 1001—Introductory Geology, PHYS SCI, PEOPLE/ENV (3 cr)  
 MATH 1272—Calculus II, LIB ED ELC (4 cr)  
 NATR 3364—Plant Taxonomy (3 cr)  
 SOIL 1293—Soil Science (3 cr)

## Biology Minor

### Math, Science and Technology Department

Required credits in this minor: 30 to 31.

The biology minor program introduces students to the core concepts in a broad range of biological areas with two possible emphases, animal or plant biology. It is designed to compliment majors in animal sciences, agriculture, and natural resources but can be tailored for students in other majors as well.

### Minor Requirements

BIOL 1001—Nature of Life (1 cr)  
 BIOL 2032—General Microbiology, LIB ED ELC (4 cr)  
 BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)  
 BIOL 3027—Cell Biology, LIB ED ELC (3 cr)  
 BIOL 3122—Evolution, LIB ED ELC (3 cr)  
 BIOL 4101—Biology Seminar (1 cr)  
 CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)  
 NATR 3374—Ecology, BIOL SCI (4 cr)

### Biology Minor Requirements

BIOL 2012—General Zoology, LIB ED ELC (4 cr)  
 or BIOL 2022—General Botany, LIB ED ELC (3 cr)

### Biology Electives

*Students must take 4 credits of 3xxx or 4xxx biology electives.*

## Business General A.S.

### Business Department

Required credits to graduate with this degree: 64.

The business-general program prepares students for transfer to an upper division baccalaureate program.

**Program outcomes**—graduates will

- demonstrate a basic understanding of business decision-making
- demonstrate the ability to communicate effectively
- demonstrate a basic understanding of computer software applications

- demonstrate basic knowledge of ethical/environmental issues
- demonstrate basic knowledge and competency in the application of business management and marketing skills
- demonstrate understanding and capability in business sufficient for transition to a bachelor of science degree program

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Liberal Education Requirements

Take 5 credits of liberal education electives, 6 credits of humanities/fine arts electives, and 6 credits of math/science electives, all selected in consultation with an adviser. Also take the following courses.

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)

#### Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1020—Spreadsheet Applications (2 cr)

#### Program Requirements

Take 17 credits of business/technology electives, selected in consultation with an adviser. Also take the following courses.

- ACCT 2101—Principles of Accounting I (3 cr)
- ACCT 2102—Principles of Accounting II (3 cr)
- GBUS 3107—Legal Environment in Business (3 cr)
- MGMT 3200—Principles of Management (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)

## Business Management B.S.

### Business Department

Required credits to graduate with this degree: 120.

A variety of organizations require competent managers to plan, organize, lead, and evaluate the organization's activities. Organizations need individuals who can manage resources, identify and solve problems, work with others, understand markets and advertising, collect and analyze data, and evaluate results.

The program prepares graduates for management positions in business firms, institutions, small businesses, and other organizations. It provides a well-rounded education in business operations, preparing individuals for a variety of management positions in business and government.

**Program outcomes**—graduates will

- demonstrate analytical and critical-thinking skills with direct application to business environments
- demonstrate the ability to communicate clearly and concisely in personal and business communication
- demonstrate capability to effectively manage human relations and diversity in professional and business environments
- demonstrate capability to apply global multidisciplinary concepts in business and industry
- demonstrate skill in the use of technology and computer software applications in business and industry
- demonstrate capability to apply ethical and environmental values to general business principles and practices

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

#### Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- PSY 1001—General Psychology, HI/BEH/SSC (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1020—Spreadsheet Applications (2 cr)

#### Business Management Core

- ACCT 2101—Principles of Accounting I (3 cr)
- ACCT 2102—Principles of Accounting II (3 cr)
- GBUS 3107—Legal Environment in Business (3 cr)
- MGMT 3100—Managerial Finance (3 cr)
- MGMT 3200—Principles of Management (3 cr)
- MGMT 3900—Internship (1–3 cr)
- MKTG 3300—Principles of Marketing (3 cr)

#### Program Sub-plans

Students are required to complete one of the following sub-plans.

#### Business Aviation Emphasis

The business management aviation emphasis includes courses and experiences that enhance students' opportunities for entry into aviation management. Students who complete the program and the appropriate number of flight hours and flight examinations may earn the following certifications: private pilot, (FAA), commercial pilot (FAA), instrument rating, multi-engine certification, certified flight instructor, instrument flight instructor, and multi-engine flight instructor.

**Program outcomes**—graduates will

- demonstrate technical competency in aeronautics
- demonstrate the use of current technology in aviation and applied business

#### Business Aviation Emphasis Requirements

- AVIA 1103—Introduction to Aviation (4 cr)
- AVIA 1104—Introduction to Aviation Flight Lab (1 cr)
- AVIA 1221—Basic Attitude Instrument Flying (3 cr)
- AVIA 1222—IFR Regulations and Procedures (3 cr)
- AVIA 3323—Airplane Aerodynamics (3 cr)
- AVIA 3324—Aircraft Systems and Instruments (3 cr)
- AVIA 3412—CFI Certification (4 cr)
- AVIA 3413—CFI Certification Flight Lab (1 cr)
- AVIA 3415—Instrument CFI Certification (4 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- MGMT 4800—Strategic Management (3 cr)
- PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)
- SWM 3103—Meteorology and Climatology (2 cr)
- MGMT 3220—Human Resource Management (3 cr)
- or MKTG 3250—Promotional Strategies (3 cr)

MGMT 3250—Operations Management (3 cr)  
 or MKTG 3360—Global Business (3 cr)  
 COMM 2334—Communication Topics, LIB ED ELC (3 cr)  
 or COMM 3008—Business Writing, LIB ED ELC (3 cr)

**Entrepreneurship and Small Business Management Emphasis**

The business management entrepreneurship emphasis focuses on small business development and growth. Students learn how to identify and capitalize on entrepreneurial opportunities. Careers for the emphasis include small business management, rural economic development, and small business ownership.

**Program outcomes**—graduates will

- demonstrate the capability and initiative to identify entrepreneurial opportunity, assess and evaluate risk, and plan for small business ventures
- demonstrate the leadership and entrepreneurial competencies required to conceptualize, plan, finance, resource, manage, and grow small business

**Entrepreneurship and Small Business Management Emphasis Requirements**

ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 ENTR 3200—Business Plan Development (3 cr)  
 ENTR 3400—Entrepreneurial and Small Business Finance (3 cr)  
 ENTR 4100—International Entrepreneurship (3 cr)  
 ENTR 4200—Field Studies in Entrepreneurship and Small Business (3 cr)  
 ENTR 4800—Entrepreneurship and Small Business Strategies (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MKTG 3360—Global Business (3 cr)  
 COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)

**Business/Technology Electives**

*Students must take 14 credits.*

**Computer Applications Electives**

*Students must take 4 or more credit(s) from the following:*

CA 1030—Multimedia Graphics (2 cr)  
 CA 1040—Web Site Development (2 cr)  
 CA 1055—Animation Software Applications With Flash MX (2 cr)  
 CA 1060—Database Applications (2 cr)  
 CA 1070—Desktop Publishing (2 cr)  
 CA 1080—Audio-Visual Production Applications (2 cr)

**Management Emphasis**

The business management management emphasis gives graduates the know-how to effectively and efficiently manage people, methods, materials, equipment, and money. The program focuses on entrepreneurial leadership, effective communication, technology mastery, critical thinking, and teamwork.

**Program outcomes**—graduates will

- demonstrate knowledge and skill of leadership required to effectively and efficiently plan, organize, and control an organization for a competitive advantage
- demonstrate skill in problem definition, problem solving, resource allocation and decision-making

**Management Emphasis Requirements**

ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 MGMT 3220—Human Resource Management (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MGMT 3600—Management Case Studies (3 cr)  
 MGMT 4800—Strategic Management (3 cr)  
 MKTG 3360—Global Business (3 cr)  
 COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)

**Business/Technology Electives**

*Students must take 14 credits.*

**Computer Applications Electives**

*Students must take 4 or more credit(s) from the following:*

CA 1030—Multimedia Graphics (2 cr)  
 CA 1040—Web Site Development (2 cr)  
 CA 1055—Animation Software Applications With Flash MX (2 cr)  
 CA 1060—Database Applications (2 cr)  
 CA 1070—Desktop Publishing (2 cr)  
 CA 1080—Audio-Visual Production Applications (2 cr)

**Management Emphasis (Distance)**

The bachelor of science in business (B.S.B.) program is designed to prepare graduates for management positions in business firms, institutions, small businesses, and other organizations. The B.S.B. provides a well-rounded education in business operations, preparing individuals for a variety of management positions in business and government. The B.S.B. is available entirely online. Requirements are identical to the bachelor of science in business management management emphasis taught on campus.

**Management Emphasis (Distance) Requirements**

ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 MGMT 3220—Human Resource Management (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MGMT 3600—Management Case Studies (3 cr)  
 MGMT 4800—Strategic Management (3 cr)  
 MKTG 3360—Global Business (3 cr)  
 COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)

**Business/Technology Electives**

*Students must take 14 credits.*

**Computer Applications Electives**

*Students must take 4 or more credit(s) from the following:*

CA 1030—Multimedia Graphics (2 cr)  
 CA 1040—Web Site Development (2 cr)  
 CA 1055—Animation Software Applications With Flash MX (2 cr)  
 CA 1060—Database Applications (2 cr)  
 CA 1070—Desktop Publishing (2 cr)  
 CA 1080—Audio-Visual Production Applications (2 cr)

**Marketing Emphasis**

The business management marketing emphasis prepares graduates for a variety of careers in marketing, including sales, advertising, and retailing. Marketing principles, relationship marketing, marketing communications, personal selling, consumer behavior, and marketing strategies are stressed throughout the coursework.

**Program outcomes**—graduates will

- understand the importance of having a consumer orientation and demonstrate how to effectively establish, develop, and maintain business relationships
- demonstrate working knowledge of technological and global developments that are changing the scope of the marketing discipline

**Marketing Emphasis Requirements**

ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MKTG 3200—Personal Selling (3 cr)  
 MKTG 3250—Promotional Strategies (3 cr)  
 MKTG 3310—Buyer Behavior (3 cr)  
 MKTG 3360—Global Business (3 cr)  
 MKTG 4200—Marketing Research (3 cr)  
 MKTG 4800—Marketing Strategies (3 cr)  
 COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)

**Business/Technology Electives**

*Students must take 14 credits*

**Computer Applications Electives**

*Students must take 4 or more credit(s) from the following:*

CA 1030—Multimedia Graphics (2 cr)  
 CA 1040—Web Site Development (2 cr)  
 CA 1055—Animation Software Applications With Flash MX (2 cr)  
 CA 1060—Database Applications (2 cr)  
 CA 1070—Desktop Publishing (2 cr)  
 CA 1080—Audio-Visual Production Applications (2 cr)

**Business Management Minor****Business Department**

Required credits in this minor: 21.

The business management minor introduces students to current business theories and practices in one of four business management clusters: entrepreneurship, international business, management, or marketing. A common core of business courses provides a basic business knowledge foundation and the cluster allows students to select other courses in a specific area of interest.

The business management minor gives students interested in business more marketability in all types of professions from agriculture and natural sciences to information technology and more.

The demand for professionals in entrepreneurship, international business, management, and marketing continues to grow at a fast pace.

Program outcomes: students who earn a business management minor will

**Entrepreneurship Cluster**

- demonstrate an understanding of small business financing options
- demonstrate an understanding of legal forms of business establishment
- demonstrate the ability to develop effective business plans

**International Business Cluster**

- demonstrate an understanding of global marketing issues
- develop an appreciation for diverse cultures
- demonstrate an understanding of political and legal differences worldwide

**Management Cluster**

- demonstrate an understanding of the management roles of planning, leading, organizing, and controlling
- demonstrate the ability to use management planning tools
- develop an understanding of the impact of human relations and interpersonal effectiveness in the workplace

**Marketing Cluster**

- demonstrate an understanding of product, price, distribution, and promotion decisions faced by marketers
- demonstrate an understanding of the promotional mix
- develop the skills to create promotional campaigns for business

**Minor Requirements (12 cr)**

MGMT 3100—Managerial Finance (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)

**Business Management Minor Clusters**

Students are required to complete one of the following course groups.

**Entrepreneurship Cluster (9 cr)**

ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 ENTR 3200—Business Plan Development (3 cr)  
 ENTR 3400—Entrepreneurial and Small Business Finance (3 cr)  
 or ENTR 4100—International Entrepreneurship (3 cr)  
 -OR-

**International Business Cluster (9 cr)**

GBUS 3190—Topics in Business (1–3 cr)  
 MKTG 3360—Global Business (3 cr)  
 ENTR 4100—International Entrepreneurship (3 cr)  
 or GBUS 1010—Global Trade (3 cr)  
 -OR-

**Management Cluster (9 cr)**

MGMT 3210—Supervision and Leadership (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 MGMT 3220—Human Resource Management (3 cr)  
 or MGMT 4200—Project Management (3 cr)  
 -OR-

**Marketing Cluster (9 cr)**

MKTG 3250—Promotional Strategies (3 cr)  
 MKTG 3360—Global Business (3 cr)  
 MKTG 3200—Personal Selling (3 cr)  
 or MKTG 3310—Buyer Behavior (3 cr)

**Coaching Minor****Business Department**

Required credits in this minor: 19.

The coaching minor develops future coaches by teaching current theories and practices in coaching and with practical experience through the coaching practicum. This helps to prepare students for coaching at the youth, elementary, high school, college, or even professional levels. The minor can be taken by students in any major and has a requirement of 18 credits.

Since 1997, Minnesota has not required a teaching or coaching license to coach high school athletics. The coaching minor helps train and develop future coaches in the areas of practice planning, skill development, and coaching strategies in their sport of interest. In addition, it gives those students interested in coaching more marketability for coaching positions.

Any student, regardless of major, can earn a coaching minor.

### Minor Requirements

#### Program Core Requirements

- BIOL 2103—Human Anatomy and Physiology I, LIB ED ELC (4 cr)
- SRM 2000—Prevention and Care of Athletic Injuries (3 cr)
- SRM 2100—Psychology of Sport (3 cr)
- SRM 3001—Sports Nutrition (3 cr)
- SRM 3010—Topics in Coaching (2 cr)
- SRM 3020—Coaching Practicum (1 cr)
- SRM 3320—Exercise Physiology (3 cr)

### Communication B.S.

#### Arts, Humanities, Social Science Department

Required credits to graduate with this degree: 120.

The B.S. in communication prepares students to be effective communicators in many professional settings. Graduates can expect to find or create jobs in areas as such as corporate e-learning, general corporate management, health management, human resources, marketing, public relations, sports information, and technical communication. Communication graduates also may hold jobs as communication consultants, editors, event planners, political campaign leaders, public affairs officers, public information officers, publication designers and editors, speech writers, and Web site designers.

The program emphasizes communication theory and practice in the creation, development, presentation, and evaluation of coherent messages. Students use communication technologies to create publications (newsletters, brochures, flyers, news releases, communication plans), design Web resources, plan events, and manage projects.

The concentration lets students select courses to focus their professional career preparation.

**Program outcomes:** students will demonstrate

- proficiencies in applying theory, listening, reading, speaking, and writing in the profession
- technology proficiencies in computer applications, including graphic design and Web page development
- critical thinking and problem-solving skills, including analyzing, interpreting, and evaluating applied communication
- proficiencies in interpersonal and group processes, conflict management, collaboration, team building, and leadership
- understanding of the ethical behavior practiced in the profession
- awareness and sensitivity required for communicating in culturally diverse groups

#### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

#### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Campus Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1xxx

#### Communication Core

- COMM 3000—Communication Theory, LIB ED ELC (3 cr)
- COMM 3001—Communication in Human Relationships, HUMAN DIV (3 cr)
- COMM 3258—Research Methods in Communication, LIB ED ELC (3 cr)
- COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- COMM 3431—Persuasion, COMMUNICAT (3 cr)
- COMM 3704—Business and Professional Speaking, LIB ED ELC (3 cr)
- COMM 3900—Internship (3 cr)
- COMM 4703—Communication Ethics, LIB ED ELC (3 cr)
- COMM 4704—Organizational Communication, LIB ED ELC (3 cr)

#### Technology Electives

*Students must take 6 or more credit(s) from the following:*

- CA 1011—Introduction to Computer Systems Architecture (2 cr)
- CA 1012—Application Suite Software (2 cr)
- CA 1015—Word Processing Applications (2 cr)
- CA 1020—Spreadsheet Applications (2 cr)
- CA 1030—Multimedia Graphics (2 cr)
- CA 1040—Web Site Development (2 cr)
- CA 1070—Desktop Publishing (2 cr)

#### Communication Electives

*Students must take 12 or more credit(s) from the following:*

- COMM 2223—English Grammar and Usage, LIB ED ELC (3 cr)
- COMM 2334—Communication Topics, LIB ED ELC (3 cr)
- COMM 3008—Business Writing, LIB ED ELC (3 cr)
- COMM 3537—Visual Communication, LIB ED ELC (3 cr)
- COMM 4800—Crisis Communication, LIB ED ELC (3 cr)
- COMM 4802—Publication Design and Management, LIB ED ELC (3 cr)
- COMM 4900—Public Relations, LIB ED ELC (3 cr)
- COMM 2002—Interpersonal and Group Processes, COMMUNICAT (3 cr)
- COMM 2434—Oral Interpretation and Performance Techniques, LIB ED ELC (3 cr)

#### Concentration Courses

*Select 18 credits in consultation with an adviser, focusing on a defined area of study.*

### Communication Minor

#### Arts, Humanities, Social Science Department

Required credits in this minor: 18.

The communication minor complements all UMC degree programs by preparing students to be effective communicators in any profession. The program emphasizes communication theory and practice as well as the creation, development, presentation, and evaluation of coherent messages.

The minor also provides students with the flexibility to select courses that enhance their professional career preparations.

**Program outcomes**—students will

- demonstrate proficiencies in applying theory, listening, reading, speaking, and writing in the profession
- demonstrate technology proficiencies in computer applications
- demonstrate critical thinking and problem-solving skills, including analyzing, interpreting, and evaluating applied communication
- demonstrate proficiencies in interpersonal and group processes, conflict management, collaboration, team building, and leadership
- demonstrate understanding of the ethical behavior practiced in the profession
- demonstrate awareness and sensitivity required for communicating in culturally diverse groups

### Minor Requirements

#### Required Courses

*Required Courses—12 credits*

- COMM 3000—Communication Theory, LIB ED ELC (3 cr)  
 COMM 3001—Communication in Human Relationships, HUMAN DIV (3 cr)  
 COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 COMM 3704—Business and Professional Speaking, LIB ED ELC (3 cr)

#### Electives

*Students must take 2 or more course(s) totaling a minimum of 6 or more credit(s) from the following:*

- COMM 2002—Interpersonal and Group Processes, COMMUNICAT (3 cr)  
 COMM 2223—English Grammar and Usage, LIB ED ELC (3 cr)  
 COMM 2334—Communication Topics, LIB ED ELC (3 cr)  
 COMM 2434—Oral Interpretation and Performance Techniques, LIB ED ELC (3 cr)  
 COMM 3008—Business Writing, LIB ED ELC (3 cr)  
 COMM 3258—Research Methods in Communication, LIB ED ELC (3 cr)  
 COMM 3431—Persuasion, COMMUNICAT (3 cr)  
 COMM 3537—Visual Communication, LIB ED ELC (3 cr)  
 COMM 3804—Individual Studies (1–3 cr)  
 COMM 3855—Topics in Communication, LIB ED ELC (3 cr)  
 COMM 3900—Internship (3 cr)  
 COMM 4703—Communication Ethics, LIB ED ELC (3 cr)  
 COMM 4704—Organizational Communication, LIB ED ELC (3 cr)  
 COMM 4800—Crisis Communication, LIB ED ELC (3 cr)  
 COMM 4802—Publication Design and Management, LIB ED ELC (3 cr)  
 COMM 4900—Public Relations, LIB ED ELC (3 cr)

## Computer Software Technology B.S.

### *Math, Science and Technology Department*

Required credits to graduate with this degree: 120.

As technology penetrates every sector of the economy, software needs are becoming increasingly complex. This need has seen the evolution of a relatively new area of study, software engineering. The U.S. Department of Labor, Bureau of Labor Statistics state that computer software engineering will be among the fastest growing occupations over the next 10 years.

The computer software technology program combines the theory behind good software engineering practices along with applied projects throughout the IEEE standardized curriculum. This approach

provides graduates the knowledge and skills to be successful in the workplace or in graduate studies.

**Program outcomes**—graduates will

- show mastery of the software engineering knowledge and skills and professional issues necessary to begin practice as a software engineer
- work as an individual and as part of a team to develop and deliver quality software artifacts
- reconcile conflicting project objectives, finding acceptable compromises within limitations of cost, time, knowledge, existing systems, and organizations
- design appropriate solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal, and economic concerns
- demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for problem identification and analysis, software design, development, implementation, verification, and documentation
- demonstrate an understanding and appreciation for the importance of negotiation, effective work habits, leadership, and good communication with stakeholders in a typical software development environment
- learn new models, techniques, and technologies as they emerge and appreciate the necessity of such continuing professional development

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

#### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 HUM 3310—Culture and Technology, HUMANITIES, GLOB PERSP (3 cr)  
 PHIL 1001—Introduction to Philosophy, HUMANITIES, ETH/CIV RE (3 cr)  
 PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 MATH 1271—Calculus I, MATH THINK (4 cr)  
 MATH 1150—Elementary Statistics, MATH THINK (3 cr)

#### Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1xxx

#### Program Requirements

*Students must complete 17 open electives.*

*Recommended electives for Financial/E-Commerce Systems Specialization: ACCT 2101, ITM 3215, MGMT 3100, MGMT 3270*

*Recommended electives for Network-Centric Systems Specialization: ITM 3130, ITM 3145, ITM 3200, ITM 3215*

- CS 1500—Discrete Structures I (3 cr)  
 CS 1600—Discrete Structures II (3 cr)  
 CS 2090—Data Structures and Algorithms (3 cr)  
 CS 2100—Microcomputer Systems Architecture (3 cr)

CS 2200—Introduction to Software Engineering (3 cr)  
 CS 2300—Software Construction (3 cr)  
 CS 2400—Software Engineering Approach to Human Computer Interaction (3 cr)  
 CS 3200—Software Design and Architecture (3 cr)  
 CS 3300—Software Quality Assurance and Testing (3 cr)  
 CS 3400—Software Requirements Analysis (3 cr)  
 CS 3700—Software Project Management (3 cr)  
 CS 3900—Internship (3 cr)  
 CS 4500—Senior Project I (3 cr)  
 CS 4510—Senior Project II (3 cr)  
 ITM 2050—Introduction to Programming I (3 cr)  
 ITM 2060—Database Management Systems (3 cr)  
 ITM 2070—Introduction to Programming II (3 cr)  
 ITM 3110—Microcomputer Operating Systems (3 cr)  
 ITM 3120—Networking and Telecommunications (3 cr)  
 MGMT 3200—Principles of Management (3 cr)

## Dietetic Technician A.A.S.

### Math, Science and Technology Department

Required credits to graduate with this degree: 76.

The program prepares students to be registered dietetic technicians. The program is accredited by the Commission on Accreditation for Dietetic Education of the American Dietetic Association. Dietetic technicians are employed by hospitals, public health nutrition programs, long-term care facilities, child nutrition and school lunch programs, nutrition programs for the elderly, and food service systems management firms.

**Program outcomes**—graduates will

- demonstrate foundation knowledge and practice skills for entry-level dietetic technician as identified by the Commission on Accreditation for Dietetic Education of the American Dietetic Association
- demonstrate foundation knowledge in communication, physical and biological sciences, social sciences, research, food, nutrition, management, and health care systems
- demonstrate management skills including the teamwork needed to be an effective food service director in a health care or institutional setting
- practice the clinical and communication skills needed of a dietetic technician in a hospital, nursing home, or community setting
- demonstrate abilities in critical thinking, problem solving, and self-assessment needed to maintain competency as a dietetic professional

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Liberal Education Requirements

*Take 4 credits of chemistry electives, 3 credits of math electives, and 3 credits of social science electives, all selected in consultation with an adviser. Also take the following courses.*  
 BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 BIOL 2103—Human Anatomy and Physiology I, LIB ED ELC (4 cr)  
 BIOL 2104—Human Anatomy and Physiology II, LIB ED ELC (4 cr)  
 CA 1010—Introduction to Computer Technology (1 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)

### Technology Requirement

*Take 2 or more credit(s) from the following:*

CA 1xxx

### Program Core Requirements

*Take 3 credits of hotel, restaurant, and institutional management electives, selected in consultation with an adviser. Also take the following courses.*

FSCN 1123—Fundamentals of Nutrition (3 cr)  
 FSCN 1273—Medical Nutrition Therapy (4 cr)  
 FSCN 1313—Life Cycle Nutrition (3 cr)  
 FSCN 1654—Nutritional Care: Practices and Procedures (3 cr)  
 FSCN 1999—Dietetic Practicum (1–3 cr)  
 FSCN 3203—Community Nutrition (3 cr)  
 FSCN 3211—Professional Issues in Dietetics (1 cr)  
 FSCN 3310—Elements of Food Science (3 cr)  
 HRI 1111—Introduction to Food Preparation (3 cr)  
 HRI 1112—Sanitation and Safety (2 cr)  
 HRI 2124—Quantity Foods Systems Management (4 cr)  
 HSM 1010—Medical Terminology (2 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)

*Take 1 or more course(s) totaling 2 or more credit(s) from the following:*

FSCN 3900—Internship (1–3 cr)

## Early Childhood Education B.S.

### Arts, Humanities, Social Science Department

Required credits to graduate with this degree: 120 to 124.

(A collaborative baccalaureate degree and teacher licensure program with Bemidji State University.)

The B.S. degree in early childhood education is a career-oriented program that prepares students to be effective teachers of young children from birth through age eight or third grade.

Graduates of this teacher education program design, implement, and evaluate developmentally appropriate learning experiences for young children in a variety of early childhood settings. They are prepared to work collaboratively with families and in the community. Significant opportunities for professional positions exist in these educational programs: infant and toddler care and education, preschool programs, K–3 classrooms, Head Start, and early childhood family education.

This degree program has four academic core areas of required coursework—education core, early childhood and family core, infant and toddler education core, and preprimary education core—and two areas of emphasis—primary education and program management.

Students who expect to apply for teacher licensure must complete the primary education emphasis. Graduates with the primary education emphasis will demonstrate competencies as described in the MN Board of Teaching, Rules 8710.3000, Standard for Teachers of Early Childhood Education (ECE) and in MN Rules 8710.2000, Standards for Effective Practice for all Teachers. See program outcomes listed in the emphasis descriptions below.

### Admission Requirements

A GPA above 2.00 is preferred for the following:

- 2.50 for students already admitted to the degree-granting college.
- 2.50 for students transferring from another University of Minnesota college.
- 2.50 for students transferring from outside the University.

In addition, students must have:

1. A minimum GPA of 2.50 overall.
2. Completed the Praxis I: Pre-Professional Skills Test (PPST).
3. Personal Liability Insurance which is usually obtained inexpensively through an annual student membership in Education Minnesota.

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits. Students must maintain a minimum GPA of 2.50 throughout their enrollment in the program and must earn a C- or better in all program required courses plus ART 2000 and ECE 2100.

### Liberal Education Requirements

*A minimum of 40 liberal education credits are required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required.*

ART 2000—Elementary Art, HUMANITIES (3 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECE 2100—Child Development and Learning, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirements (3 cr)

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1012—Application Suite Software (2 cr)

### Early Childhood and Family Core (17 cr)

ECE 3672—Promoting Children's Physical Health (2 cr)  
 ECE 4500—Young Children With Special Needs (3 cr)  
 ECE 4730—Understanding and Supporting Parenting (3 cr)  
 ECE 4750—Family, School, and Community Relations (3 cr)  
 ECE 4880—Administration of Early Childhood Programs (3 cr)  
 ED 3670—Foundations of Early Childhood Education (BSU) (3 cr)

### Education Core (9 cr)

ECE 3901—The Professional Teacher I (0.5 cr)  
 ECE 3902—The Professional Teacher II (0.5 cr)  
 ED 3100—Introduction to the Foundations of Education (3 cr)  
 ED 3110—Educational Psychology (3 cr)  
 EDHD 5009—Human Relations: Applied Skills for School and Society (UMTC) (1 cr)  
 PUBH 3005—Fundamentals of Alcohol and Drug Abuse (UMTC) (1 cr)

### Infant and Toddler Education Core (13 cr)

ECE 3410—Learning Environments for Infants and Toddlers (4 cr)  
 ECE 3420—Nurturing and Collaborative Relationships for Infants and Toddlers (3 cr)  
 ECE 4440—Infant and Toddler Student Teaching (6 cr)

### Preprimary Education Core (17 cr)

ECE 4700—Developmentally Appropriate Preprimary Education I (3 cr)  
 ECE 4702—Developmentally Appropriate Preprimary Education II (3 cr)  
 ECE 4811—Preprimary Student Teaching I (4 cr)  
 ECE 4812—Preprimary Student Teaching II (K) (4 cr)  
 ED 3677—Relations and Management in Early Childhood Education (BSU) (3 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

### Primary Education Emphasis

The primary education emphasis is for students who wish to teach in public school classrooms with kindergarten through third grade.

**Program outcomes**—graduates will

- promote child development/learning
- encourage infant/toddler development/learning
- facilitate preprimary-aged children's development/learning
- facilitate primary-aged children's development/learning
- assist in building family relationships
- document and assess to support young children
- become a reflective professional

The emphasis requires 25 credits and completes requirements for Board of Teaching licensure.

### Primary Education Emphasis Requirements (25 cr)

ED 3201—Language Arts in the Primary Grades (4 cr)  
 ED 3301—Creative Expression in Elementary Education (BSU) (3 cr)  
 ED 3870—Mathematics in the Primary Grades (BSU) (3 cr)  
 ED 3877—Social Studies and Sciences in the Primary Grades (BSU) (4 cr)  
 ED 4827—Primary Student Teaching (8 cr)  
 MATH 1011—Mathematics for Elementary School Teachers (BSU), LIB ED ELC (3 cr)

### Program Management Emphasis

The program management emphasis is for students who wish to increase their academic preparation for supervisory, management and/or leadership roles in developmental child care facilities.

**Program outcomes**—graduates will

- promote child development/learning
- encourage infant/toddler development/learning
- facilitate preprimary-aged children's development/learning
- assist in building family relationships
- document and assess to support young children
- become a reflective professional
- demonstrate ability to perform tasks associated with planning, organizing, staffing, leading, monitoring and controlling for quality in childcare programs

The emphasis requires 19 credits without Board of Teaching licensure.

### Program Management Emphasis Requirements (19 cr)

ACCT 2101—Principles of Accounting I (3 cr)  
 ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)  
 4 credits of electives selected in consultation with and approved by the student's adviser

### Open Electives

*Students must take 2 credits.*



## Equine Science B.S.

### Agriculture Department

Required credits to graduate with this degree: 120 to 124.

Graduates of UMC's equine science program understand and are able to meet the daily care, nutrition, health care, and exercise/training needs of horses in their care. They have the knowledge and skills necessary to succeed in equine or equine-related employment and have the business and management experience necessary to operate an equine or related business. The program balances the practical skills students need to work with and care for horses and the theory required to build a successful career. The focus is on the business and management aspects of the horse industry, thus providing a broad-based education which appeals to employers. Options also exist for students who wish to pursue graduate school or pre-veterinary studies.

**Program outcomes**—graduates will

- demonstrate knowledge of theory and practical experience in physiology, nutrition, health, and reproduction of the horse
- demonstrate a working knowledge of equine ownership responsibility and husbandry
- be able to apply management theories and software and marketing strategies to equine and related enterprises
- demonstrate horsemanship and training skills in a variety of disciplines and discern what methods work most effectively with horses of different temperaments and breeding/conformation
- have practical skills and knowledge that will lead to a variety of employment opportunities in the equine industry

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)
- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)

Take 2 or more credit(s) from the following:

CA 1xxx

### Equine Science Core Requirements

In addition to the courses below, students must take 3 credits of agricultural electives, selected in consultation with an adviser.

- ANSC 1004—Introduction to Animal Science (4 cr)
- ANSC 2104—Feeds and Feeding (4 cr)
- ANSC 3023—Animal Breeding (3 cr)
- ANSC 3104—Applied Animal Nutrition (4 cr)
- ANSC 3203—Animal Anatomy and Physiology (3 cr)
- ANSC 3304—Reproduction, AI, and Lactation (4 cr)
- ANSC 3503—Animal Health and Disease (3 cr)
- BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)
- EQSC 1202—Equine Evaluation (2 cr)
- EQSC 2102—Horse Production (4 cr)
- EQSC 3403—Equine Exercise Physiology (3 cr)
- EQSC 4102—Equine Management (3 cr)
- GBUS 3107—Legal Environment in Business (3 cr)
- GNAG 4652—Senior Seminar (1 cr)
- GNAG 2899—Pre-Internship Seminar (0.5 cr)  
or GNAG 3899—Pre-Internship Seminar (0.5 cr)
- GNAG 3900—Internship (1–4 cr)
- GNAG 3901—Post Internship Seminar (0.5 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

### Equine Science Emphasis

This emphasis leads graduates to equine careers including management, training/showing, riding instruction, breeding/reproduction, feed production/sales, sales of equestrian equipment or pharmaceutical/health care products, and veterinary technician. Students receive classroom instruction and hands-on experiential learning. Focus is on the business/management aspect of the horse industry. Curriculum includes computer, communications training and sales training. Coursework includes riding instruction, nutrition, breeding, reproduction, horse production, evaluation, feeds, health/disease, management, training/showing, and facilities. Students can take courses specific to their interest.

### Equine Science Emphasis Requirements

- AGEC 3540—Farm Business Management (4 cr)
- AGEC 4750—Agribusiness Marketing (3 cr)
- CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)
- EQSC 3305—Equine Reproductive Techniques (3 cr)
- EQSC 3413—Horse Training and Showing (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
or CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)

### Equine Science Electives

Students must take 6 or more credit(s) from the following:

- EQSC 1000—Light Horse Driving (2 cr)
- EQSC 1100—Western Equitation (3 cr)
- EQSC 1200—Hunt Seat & Dressage Equitation (3 cr)
- EQSC 1300—Saddle Seat Equitation (3 cr)
- EQSC 3441—Topics in Advanced Western Equitation (1.5 cr)
- EQSC 3443—Topics in Advanced Equitation Over Fences (1.5 cr)

### Pre-Veterinary Medicine Emphasis

The pre-veterinary medicine emphasis meets the course entry requirements for admission to the University of Minnesota College of Veterinary Medicine; however, similar entry requirements among colleges of veterinary medicine coupled with sufficient flexibility within the curriculum allow graduates to meet the admission requirements for many other institutions. Students who graduate are well prepared to pursue their career goal of becoming a veterinarian. Students are exposed to traditional classroom instruction as well as hands-on/experiential learning in the laboratory.

### Pre-Veterinary Emphasis Requirements

- BIOL 2012—General Zoology, LIB ED ELC (4 cr)
- BIOL 2032—General Microbiology, LIB ED ELC (4 cr)
- CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ENV (4 cr)
- CHEM 1022—Chemical Principles II, LIB ED ELC (4 cr)
- CHEM 2301—Organic Chemistry I, LIB ED ELC (3 cr)
- CHEM 2310—Organic Chemistry Laboratory I, LIB ED ELC (2 cr)
- CHEM 3021—Biochemistry, LIB ED ELC (3 cr)
- PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)
- PHYS 1102—Introductory College Physics II, PHYS SCI (4 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- or MATH 1142—Survey of Calculus, MATH THINK (3 cr)

### Pre-Veterinary Electives

Students must take 3 or more credit(s) from the following:

- EQSC 1000—Light Horse Driving (2 cr)
- EQSC 1100—Western Equitation (3 cr)
- EQSC 1200—Hunt Seat & Dressage Equitation (3 cr)
- EQSC 1300—Saddle Seat Equitation (3 cr)
- EQSC 3441—Topics in Advanced Western Equitation (1.5 cr)
- EQSC 3443—Topics in Advanced Equitation Over Fences (1.5 cr)

## Golf and Turf Management B.S.

### Natural Resources Department

Required credits to graduate with this degree: 120.

Golf course superintendents and turf grass professionals use technology and talent to balance the needs of people with those of nature. The golf facilities and turf systems degree provides students with skills and experiences to build and maintain functional, recreational, and aesthetically pleasing turf grass environments. Extensive coursework in plant science, horticulture, and turf management helps students develop the technical skills needed to be successful. Complementary courses in facility management and communication provide the fundamentals for managing employees and interacting with customers.

Student learning incorporates hands-on activities along with technological applications in a practical, career-oriented environment. Internships may be completed at golf courses, athletic fields, park and recreation areas, or with industry suppliers. Graduates will hold positions in the golf industry, sports field management, lawn care, sod production, grounds maintenance, sales, or pursue advanced degrees.

*Program outcomes*—graduates will

- demonstrate competencies in turf grass management
- demonstrate problem-solving skills in relation to turf grass pests and fertility issues
- understand the use of integrated pest management and resource preservation
- demonstrate an awareness of the need for continual professional development
- demonstrate skills in written and oral communication and human resource management

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Program Requirements (34 cr)

- BIOL 2022—General Botany, LIB ED ELC (3 cr)
- HORT 1010—Introduction to Horticulture (3 cr)
- HORT 1021—Woody Plant Materials (4 cr)
- NATR 3900—Internship (1–4 cr)
- NATR 3901—Post-Internship Seminar (0.5 cr)
- NATR 4652—Seminar (1 cr)
- PIM 2573—Entomology (3 cr)
- PIM 3230—Introduction to Plant Pathology (3 cr)
- SOIL 1293—Soil Science (3 cr)
- SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)
- SPAN 1104—Beginning Spanish I (4 cr)
- COMM 3008—Business Writing, LIB ED ELC (3 cr)
- or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- or COMM 3431—Persuasion, COMMUNICAT (3 cr)
- NATR 2899—Pre-Internship Seminar (0.5 cr)
- or NATR 3899—Pre-Internship Seminar (0.5 cr)

### Major Requirements (21 cr)

- HORT 3040—Landscape Installation and Maintenance (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- SPAN 1204—Beginning Spanish II (4 cr)
- TURF 1072—Principles of Turf Management (3 cr)
- TURF 3074—Turf grass Pest Management (3 cr)
- TURF 3076—Turf grass Management Systems (3 cr)
- TURF 3077—Turf and Landscape Irrigation Design and Installation (2 cr)

### Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

- BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)
- CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)
- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

### Technology Requirements (3 cr)

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1xxx

### Program Electives

Students must take 12 or more credit(s) from the following:

- AGRO 2640—Applied Agriculture Chemicals (3 cr)
- ASM 1034—Facility Maintenance and Safety (4 cr)
- ASM 2043—Welding and Manufacturing Processes (3 cr)
- ASM 2250—Agricultural Machinery Management (3 cr)
- ASM 3009—Surveying (4 cr)

BIOL 3131—Plant Physiology, LIB ED ELC (3 cr)  
 CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)  
 HORT 3030—Landscape Design (4 cr)  
 HORT 3031—Herbaceous Perennial Plant Materials (2 cr)  
 HORT 3034—Commercial Floriculture Crops-Spring (4 cr)  
 HORT 3036—Plant Propagation (4 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3220—Human Resource Management (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 NATR 2630—Introduction to Geographic Information Systems (3 cr)  
 NATR 3203—Park and Recreation Management (3 cr)  
 NATR 3344—Land Use Planning (3 cr)  
 NATR 3468—Wildlife Habitat Management Techniques (3 cr)  
 PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)  
 SRM 3000—Foundations of Sport and Recreation Management (3 cr)  
 SRM 3003—Facility and Equipment Management (3 cr)  
 SWM 3225—Watershed Management (3 cr)

### Open Electives

*Students must take 10 credits.*

## Health Management B.S.

### Math, Science and Technology Department

Required credits to graduate with this degree: 120.

The health management program provides career-entry opportunities for high school graduates and professional advancement opportunities for health care personnel. Career opportunities for students with baccalaureate degrees in health management include management positions in hospitals, long-term care facilities, health maintenance and other managed care organizations, public health departments, community-based and home health agencies, medical equipment companies, government regulatory agencies, and health insurance companies. The health management program focuses on developing managerial, administrative, and computer skills, supplementing those skills with an in-depth knowledge of the health care system. The program prepares graduates to offer managerial excellence to employers.

**Long-Term Care Administration**—The health management program has been approved by the Minnesota Board of Examiners for Nursing Home Administrators and meets Minnesota regulations for long-term health care administration. Health management program graduates are eligible to take the Minnesota licensure examination for nursing home administration.

**Program outcomes**—graduates will

- communicate effectively and work as a team in a health care setting
- demonstrate leadership ability in problem solving, conflict resolution, and change management
- understand the legal, regulatory, and ethical issues inherent to health care
- show the ability to adapt to changing public policy, economic, and financial issues in health care
- demonstrate assessment skills related to improving clinical care and customer service
- understand technology and how to apply it to the workplace

## Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

## Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement (3 cr)

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1xxx

### Health Management Core Requirements (59 cr)

ACCT 2101—Principles of Accounting I (3 cr)  
 ACCT 2102—Principles of Accounting II (3 cr)  
 CA 1020—Spreadsheet Applications (2 cr)  
 HSM 1010—Medical Terminology (2 cr)  
 HSM 2010—Introduction to Health Services Organizations (2 cr)  
 HSM 3020—Quality Improvement and Risk Management (4 cr)  
 HSM 3030—Health Care and Medical Needs (2 cr)  
 HSM 3100—Essentials of Managed Care (3 cr)  
 HSM 3130—Health Management Information Systems (3 cr)  
 HSM 3200—Health Care Leadership and Planning (4 cr)  
 HSM 3230—Administration of Continuum Care Facilities (3 cr)  
 HSM 3240—Health Care Policy and Comparative Systems (3 cr)  
 HSM 3900—Internship (1–3 cr)  
 HSM 4100—Health Care Finance (3 cr)  
 HSM 4210—Health Care Law and Biomedical Ethics (4 cr)  
 HSM 4212—Regulatory Management (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 MGMT 3220—Human Resource Management (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)

### Computer Applications Electives

*Students must take 2 credits of CA electives.*

### Electives

*Students must take 16 credits*

## Health Sciences Pre-Professional B.S.

### Math, Science and Technology Department

Required credits to graduate with this degree: 120.

The B.S. in health sciences provides students with the prerequisite knowledge and skills required for admission to professional programs in chiropractic, dentistry, medicine, optometry, occupational therapy, pharmacy, and physical therapy. UMC also provides a two-year pre-nursing course of study. Admission is competitive and specific admission requirements, including courses and experiences, vary by professional program and institution. Completion of the B.S. does not guarantee admission to professional programs at the University of Minnesota or other universities. The course requirements shown are common to similar programs at other institutions; however, students are advised to check with their specific professional program to be sure all prerequisite courses are met. Most professional programs

have additional admission requirements, and students are advised to contact the program(s) to which they plan to apply to identify all admission requirements.

**Program outcomes**—graduates will

- explain and reconstruct the scientific method and can apply this mode of inquiry in a laboratory setting
- explain and apply basic principles of biology in work setting
- demonstrate teamwork skills
- apply, critique, and synthesize protocols from current literature
- demonstrate and critique effective communication skills orally and in writing
- formulate proper data collection and analysis methods
- interpret and practice professional and ethical behavior related to biological research
- identify, provide examples, differentiate, and integrate current biology techniques into their scientific investigations
- produce evidence of their ability to be admitted into health science professional programs

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits. Students work with their adviser to develop an individualized program of study that meets their health science educational goals (pre-chiropractic, pre-dentistry, pre-medicine, pre-occupational therapy, pre-pharmacy, pre-physical therapy).

### Core Curriculum

*These courses are common to all pre-health sciences programs.*

CHEM 1021—Chemical Principles I, PHYS SCI, PEOPLE/ ENV (4 cr)

CHEM 1022—Chemical Principles II, LIB ED ELC (4 cr)

COMP 1011—Composition I, COMMUNICAT (3 cr)

COMP 1013—Composition II, COMMUNICAT (3 cr)

PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)

PHYS 1102—Introductory College Physics II, PHYS SCI (4 cr)

PSY 1001—General Psychology, HI/BEH/SSC (3 cr)

SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

## Horticulture B.S.

### Natural Resources Department

Required credits to graduate with this degree: 120.

The B.S. in horticulture is a career-oriented program that combines science-based education, liberal arts education, and technical training. All horticulture students are introduced to botany, woody plants, entomology, plant pathology, and soil science as part of the program requirements. These courses together with liberal arts courses and program specific courses prepare students for careers in the Green Industry. Students select from two emphases: environmental landscaping or horticulture production.

**Program outcomes**—graduates will

- demonstrate competency in identification of plant species, diseases, pests and disorders of horticultural plants

- understand the use of horticultural plants for aesthetic improvement and sustainability of the environment
- apply principles of plant science, nutrition, soils, and pest management, and exhibit an awareness of environmental health and safety issues
- demonstrate an awareness of the need for continuing professional development
- demonstrate communication skills, ability to make sound decisions, and willingness to work as part of a team, providing leadership and accountability
- use computer technology to effectively communicate, manage, and enhance business operations

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)

CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)

COMP 1011—Composition I, COMMUNICAT (3 cr)

COMP 1013—Composition II, COMMUNICAT (3 cr)

SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

MATH 1031—College Algebra, MATH THINK (3 cr)

or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

### Technology Requirement (3 cr)

CA 1010—Introduction to Computer Technology (1 cr)

CA 1xxx

### Program Requirements (34 cr)

BIOL 2022—General Botany, LIB ED ELC (3 cr)

HORT 1010—Introduction to Horticulture (3 cr)

HORT 1021—Woody Plant Materials (4 cr)

NATR 3900—Internship (1–4 cr)

NATR 3901—Post-Internship Seminar (0.5 cr)

NATR 4652—Seminar (1 cr)

PIM 2573—Entomology (3 cr)

PIM 3230—Introduction to Plant Pathology (3 cr)

SOIL 1293—Soil Science (3 cr)

SOIL 3414—Soil Fertility and Plant Nutrition (4 cr)

SPAN 1104—Beginning Spanish I (4 cr)

NATR 2899—Pre-Internship Seminar (0.5 cr)

or NATR 3899—Pre-Internship Seminar (0.5 cr)

COMM 3008—Business Writing, LIB ED ELC (3 cr)

or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)

or COMM 3431—Persuasion, COMMUNICAT (3 cr)

### Program Sub-plans

Students are required to complete one of the following sub-plans.

### Environmental Landscaping Emphasis

The environmental landscaping track includes courses in landscape design, planning and development of residential and commercial landscapes, and plant science. Impact on the environment and sustainability are a major focus as well as appropriate use of plants and proper installation and management of landscape features. Many students include business courses in their elective curriculum to prepare them for all aspects of the industry. Graduates are prepared to be a landscape designer, installer, or

contractor. They may also choose landscape supply sales, nursery management, land reclamation, or garden center management.

**Environmental Landscaping Emphasis Requirements (22 cr)**

- HORT 3030—Landscape Design (4 cr)
- HORT 3031—Herbaceous Perennial Plant Materials (2 cr)
- HORT 3034—Commercial Floriculture Crops-Spring (4 cr)
- HORT 3036—Plant Propagation (4 cr)
- HORT 3040—Landscape Installation and Maintenance (3 cr)
- TURF 1072—Principles of Turf Management (3 cr)
- TURF 3077—Turf and Landscape Irrigation Design and Installation (2 cr)

**Environmental Landscaping Electives**

*Students must take 12 or more credit(s) from the following:*

- ACCT 2101—Principles of Accounting I (3 cr)
- AGRO 2640—Applied Agriculture Chemicals (3 cr)
- ASM 1034—Facility Maintenance and Safety (4 cr)
- ASM 1044—Computer-Aided Drafting (3 cr)
- ASM 3009—Surveying (4 cr)
- BIOL 3131—Plant Physiology, LIB ED ELC (3 cr)
- CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)
- ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)
- HORT 3033—Commercial Floriculture Crops-Fall (4 cr)
- MGMT 3200—Principles of Management (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- MGMT 3220—Human Resource Management (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)
- NATR 2630—Introduction to Geographic Information Systems (3 cr)
- NATR 3203—Park and Recreation Management (3 cr)
- NATR 3344—Land Use Planning (3 cr)
- NATR 3364—Plant Taxonomy (3 cr)
- NATR 3374—Ecology, BIOL SCI (4 cr)
- SPAN 1204—Beginning Spanish II (4 cr)
- TURF 3074—Turf grass Pest Management (3 cr)

**Open Electives**

*Students must take 9 credits.*

**Production Horticulture Emphasis**

The production horticulture emphasis concentrates on crops produced in greenhouses or nurseries. Students experience plant propagation, identification of herbaceous plants, cultivation of indoor and outdoor plants and floral design. In greenhouse production courses, students produce crops that are sold to industry businesses. Graduates are employed as greenhouse or nursery growers, garden center managers, garden designers, floral designers, and floriculture extension specialists. Faculty work with students to develop a plan of study tailored to the individual.

**Production Horticulture Emphasis Requirements (23 cr)**

- HORT 1091—Indoor Flowering and Foliage Plants (2 cr)
- HORT 3030—Landscape Design (4 cr)
- HORT 3031—Herbaceous Perennial Plant Materials (2 cr)
- HORT 3033—Commercial Floriculture Crops-Fall (4 cr)
- HORT 3034—Commercial Floriculture Crops-Spring (4 cr)
- HORT 3036—Plant Propagation (4 cr)
- NATR 3364—Plant Taxonomy (3 cr)

**Production Horticulture Electives**

*Students must take 12 or more credit(s) from the following:*

- ACCT 2101—Principles of Accounting I (3 cr)
- AGRO 2640—Applied Agriculture Chemicals (3 cr)

- ASM 1034—Facility Maintenance and Safety (4 cr)
- BIOL 3022—Principles of Genetics, LIB ED ELC (3 cr)
- BIOL 3131—Plant Physiology, LIB ED ELC (3 cr)
- CHEM 1401—Elementary Bioorganic Chemistry, PHYS SCI, PEOPLE/ENV (4 cr)
- ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)
- ENTR 3200—Business Plan Development (3 cr)
- HORT 1092—Floral Design (2 cr)
- HORT 3040—Landscape Installation and Maintenance (3 cr)
- HORT 3093—Advanced Floral Design and Florist Operations (2 cr)
- MGMT 3200—Principles of Management (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- MGMT 3220—Human Resource Management (3 cr)
- MKTG 3200—Personal Selling (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)
- PIM 3023—Plant Breeding and Genetics (4 cr)
- SPAN 1204—Beginning Spanish II (4 cr)
- TURF 1072—Principles of Turf Management (3 cr)
- TURF 3077—Turf and Landscape Irrigation Design and Installation (2 cr)

**Open Electives**

*Students must take 8 credits.*

**Horticulture Minor**

**Natural Resources Department**

Required credits in this minor: 18.

The horticulture minor is offered to provide an opportunity for students in other majors (e.g., natural resources related, agronomy, ag business, business management, golf and turf management) to take a selected group of horticulture classes and strengthen their credentials in this area.

**Minor Requirements**

**Core Requirements**

- HORT 1010—Introduction to Horticulture (3 cr)
  - HORT 1021—Woody Plant Materials (4 cr)
  - HORT 3036—Plant Propagation (4 cr)
  - HORT 3033—Commercial Floriculture Crops-Fall (4 cr) *or* HORT 3034—Commercial Floriculture Crops-Spring (4 cr)
- Take 3 or more credit(s) from the following:*
- HORT 3030—Landscape Design (4 cr)
  - HORT 3031—Herbaceous Perennial Plant Materials (2 cr)
  - HORT 1091—Indoor Flowering and Foliage Plants (2 cr)
  - HORT 1092—Floral Design (2 cr)
  - HORT 3093—Advanced Floral Design and Florist Operations (2 cr)
  - HORT 3040—Landscape Installation and Maintenance (3 cr)

**Hotel, Restaurant, and Institutional Management Certificate**

The HRI certificate program is designed to enhance students' job skill through courses that are directly applicable to hospitality management. The program is employment oriented and designed around active, results oriented learning. All courses are online (internet based) for distance delivery. All credits can be applied towards the associate or bachelor's degree. The certificate program provides both depth and breadth.

Students who complete the hotel, restaurant, and institutional management certificate program will be able to

- show competency in industry standards regarding financial accountability;
- demonstrate communication skills appropriate for the industry;

- use critical thinking processes to analyze hospital-ity systems.

### Certificate Requirements

A minimum of 23 credits is required for completion.

- HRI 1111—Introduction to Food Preparation (3 cr)
- HRI 1112—Sanitation and Safety (2 cr)
- HRI 2231—Menu Design and Analysis (3 cr)
- HRI 3241—Hospitality Selection and Procurement (3 cr)
- HRI 3321—Food Beverage and Labor Control (3 cr)
- HRI 3332—Global Tourism and Marketing (3)
- HRI 3421—Hospitality Law (3 cr)

Select one of the following:

- HRI 2124—Quantity Food Systems Management (4)
- or FSCN 1123—Fundamentals of Nutrition (3)

## Hotel, Restaurant, and Institutional Management A.A.S.

### Business Department

Required credits to graduate with this degree: 64.

The hotel, restaurant, and institutional management program prepares students for supervisory or entry-level management positions in the hospitality industry.

**Program outcomes**—graduates will

- show competency in industry standards regarding financial accountability
- demonstrate communication skills appropriate for the industry
- use critical thinking processes to analyze hospital-ity systems
- demonstrate collaboration within team settings
- demonstrate appropriate use of technology as used in the hospitality industry

Career positions include front desk supervisor or assistant manager, assistant restaurant manager, assistant banquet manager, housekeeping floor super-visor, assistant manager in university food service cafeteria, food service supervisor in hospital food service, beverage controller, and assistant purchasing steward.

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Liberal Education Requirements

Take 6 credits of liberal education electives, 3 credits of humanities/fine arts electives, 3 credits of math/science electives, and 3 credits of social science electives, selected in consultation with an adviser. Also take the following course.

- COMP 1011—Composition I, COMMUNICAT (3 cr)

#### Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)

Take 2 or more credit(s) from the following:

- CA 1xxx

### Program Requirements

- ACCT 2101—Principles of Accounting I (3 cr)
- HRI 1111—Introduction to Food Preparation (3 cr)
- HRI 1112—Sanitation and Safety (2 cr)
- HRI 3241—Hospitality Selection and Procurement (3 cr)
- HRI 3900—Internship (1–3 cr)
- HRI 4421—Hospitality Law (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)

Take 12 or more credit(s) from the following:

- HRI 2124—Quantity Foods Systems Management (4 cr)
- HRI 2211—Rooms Division Operational Management (3 cr)
- HRI 2231—Menu Design and Analysis (3 cr)
- HRI 3311—Restaurant Operational Management (3 cr)
- HRI 3332—Global Tourism and Marketing (3 cr)
- HRI 3411—Facility Management (3 cr)
- HRI 4321—Food, Beverage, and Labor Control (3 cr)
- HRI 4451—Cases and Trends in Hospitality Management (3 cr)

### Adviser Approved Electives

Students must take 11 credits of adviser approved electives.

## Hotel, Restaurant, and Institutional Management B.S.

### Business Department

Required credits to graduate with this degree: 120.

The hotel, restaurant, and institutional management program at UMC prepares students for managerial positions in the rapidly growing hospitality industry. Students can specialize in working with food, lodg- ing, travel, tourism, and entertainment.

UMC's program offers three distinct areas of emphasis allowing students the flexibility to pursue their individual interests: food service administra- tion, hotel/restaurant management, and resort/spa management. Students graduating with this degree possess the technical and intellectual skills required of the 21st century hospitality professional.

**Program outcomes**—graduates will

- show competency in industry standards regarding financial accountability
- demonstrate communication skills appropriate for the industry
- use critical thinking processes to analyze hospital-ity systems
- demonstrate collaboration within team settings
- demonstrate appropriate use of technology as used in the hospitality industry

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.



### Program Requirements

Students must complete 40 upper division credits.

#### Hotel, Restaurant, and Institutional Management Program Requirements (39 cr)

*Students must complete 2 separate internships (HRI 3900). Internship I: 1–3 credits; Internship II: 2–3 credits.*

ACCT 2101—Principles of Accounting I (3 cr)  
 ACCT 2102—Principles of Accounting II (3 cr)  
 HRI 1111—Introduction to Food Preparation (3 cr)  
 HRI 1112—Sanitation and Safety (2 cr)  
 HRI 2231—Menu Design and Analysis (3 cr)  
 HRI 3241—Hospitality Selection and Procurement (3 cr)  
 HRI 3900—Internship (1–3 cr)  
 HRI 4321—Food, Beverage, and Labor Control (3 cr)  
 HRI 4421—Hospitality Law (3 cr)  
 HRI 4451—Cases and Trends in Hospitality Management (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)  
 SPAN 1104—Beginning Spanish I (4 cr)

#### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
*Take 2 or more credit(s) from the following:*  
 CA 1xxx

#### Program Sub-plans

Students are required to complete one of the following sub-plans.

#### Food Service Administration Emphasis

Students in this emphasis focus on the daily management of food preparation needs in larger institutions, such as hospitals, schools, universities, managed care facilities, and corporations. The curriculum focuses on quantity food production, nutrition, inventory management, cost control, and developing sanitation and security measures.

#### Food Service Administration Emphasis Requirements (24 cr)

FSCN 1123—Fundamentals of Nutrition (3 cr)  
 FSCN 1273—Medical Nutrition Therapy (4 cr)  
 FSCN 1654—Nutritional Care: Practices and Procedures (3 cr)  
 FSCN 3211—Professional Issues in Dietetics (1 cr)  
 FSCN 3310—Elements of Food Science (3 cr)  
 HRI 2124—Quantity Foods Systems Management (4 cr)  
 HRI 3311—Restaurant Operational Management (3 cr)  
 HRI 3411—Facility Management (3 cr)

#### Open Electives

*Students must take 14 credits.*

#### Hotel/Restaurant Management Emphasis

Managers in this facet of the industry have responsibilities in practically every aspect of the business, but they deal primarily with lodging and meal preparation and the related needs. Majors develop skills that allow them to supervise staff, work in hotel sales and catering, direct banquets for over 1,000 guests, create

and analyze menus, design attractive facilities and surroundings, and perform front office, reservation, and auditing procedures.

#### Hotel/Restaurant Management Emphasis Requirements (25 cr)

GBUS 3107—Legal Environment in Business (3 cr)  
 HRI 1001—Introduction to Hospitality and Tourism (1 cr)  
 HRI 2211—Rooms Division Operational Management (3 cr)  
 HRI 3311—Restaurant Operational Management (3 cr)  
 HRI 3332—Global Tourism and Marketing (3 cr)  
 HRI 3411—Facility Management (3 cr)  
 HRI 4431—Wine, Beverage, and Food Pairing (3 cr)  
 HRI 4441—Catering On and Off Premise (3 cr)  
 MGMT 3100—Managerial Finance (3 cr)

#### Liberal Education Requirements (3 cr)

*Will count towards the 40 credits required in liberal education.*

ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)

#### Open Electives

*Students must take 10–13 credits.*

#### Resort and Spa Management Emphasis

More and more people are discovering the importance of the integrated relationship in health. In this context health is not the absence of illness, but rather the feeling of balance of mind, body, and spirit. The resort and spa management curriculum involves a balance of hospitality management and customer service, business management and marketing, and health, wellness, specialized treatments, and nutrition.

#### Resort and Spa Management Emphasis Requirements (13 cr)

GBUS 3107—Legal Environment in Business (3 cr)  
 HRI 1001—Introduction to Hospitality and Tourism (1 cr)  
 HRI 2211—Rooms Division Operational Management (3 cr)  
 HRI 3332—Global Tourism and Marketing (3 cr)  
 MGMT 3100—Managerial Finance (3 cr)

#### Liberal Education Requirement (3 cr)

*Will count towards the 40 credits required in liberal education.*

ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)

#### Resort and Spa Management Electives

*Students must take 12 or more credit(s) from the following:*

FSCN 1123—Fundamentals of Nutrition (3 cr)  
 FSCN 1273—Medical Nutrition Therapy (4 cr)  
 FSCN 1313—Life Cycle Nutrition (3 cr)  
 HLTH 1062—First Aid and CPR (2 cr)  
 HLTH 1072—Wellness (3 cr)  
 HRI 2124—Quantity Foods Systems Management (4 cr)  
 HRI 3311—Restaurant Operational Management (3 cr)  
 HRI 3411—Facility Management (3 cr)  
 HRI 4431—Wine, Beverage, and Food Pairing (3 cr)  
 HRI 4441—Catering On and Off Premise (3 cr)  
 PER 1451—Fitness for Better Health (1 cr)  
 PER 1461—Physical Training and Conditioning (1 cr)  
 PER 1481—Aerobic Exercise (1 cr)  
 PER 1601—Aquatic Activities (Beg Swim, Adv Beg, Intermediate, Swimmer, Lifeguard Trng/WSI, Aqua Aerobics) (1 cr)  
 SRM 3001—Sports Nutrition (3 cr)  
 SRM 3003—Facility and Equipment Management (3 cr)  
 SRM 3320—Exercise Physiology (3 cr)

#### Open Electives

*Students must take 10–13 credits.*

## Information Management A.A.S.

### *Math, Science and Technology Department*

Required credits to graduate with this degree: 64.

The two-year information management program offers courses in microcomputer systems, networking and programming basics, accounting and management foundations, and liberal education topics. It prepares graduates for employment as network technicians, systems administrators, Web site developers, and other business positions requiring technology, networking, and computer skills.

**Program outcomes**—graduates will:

- demonstrate abilities in the use of information systems hardware, operating systems, and application software made by industry leading computer companies
- use computer technology to communicate globally for a variety of information and business purposes
- demonstrate clear and concise written and oral communication skills
- demonstrate interpersonal communication skills
- develop and demonstrate an attitude of continuing inquiry and lifelong learning

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

#### Liberal Education Requirements

Take 3 credits of humanities electives, 3 credits of natural science electives, and 3 credits of liberal education electives, selected in consultation with an adviser. Also take the following courses.

COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1011—Introduction to Computer Systems Architecture (2 cr)

#### Program Requirements

Take 8 credits of business/technology electives, selected in consultation with an adviser. Also take the following courses.

ACCT 2101—Principles of Accounting I (3 cr)  
 ACCT 2102—Principles of Accounting II (3 cr)  
 CA 1060—Database Applications (2 cr)  
 GBUS 3107—Legal Environment in Business (3 cr)  
 ITM 2050—Introduction to Programming I (3 cr)  
 ITM 2070—Introduction to Programming II (3 cr)  
 ITM 3110—Microcomputer Operating Systems (3 cr)  
 ITM 3120—Networking and Telecommunications (3 cr)  
 MGMT 3200—Principles of Management (3 cr)

## Information Technology Management B.S.

### *Math, Science and Technology Department*

Required credits to graduate with this degree: 120.

The information technology management program prepares students for technical and management positions in business and industry. Graduates have the knowledge, experience, and skills to succeed in technology related careers as well as the business

and management competencies for mid-management positions such as information technology specialists, application developers, network administrators, Webmasters, technology project and information systems managers.

**Program outcomes**—graduates will

- demonstrate abilities in the use of information systems hardware, operating systems, programming languages, and application software
- use computer technology in preparing programs, presentations, and written reports
- demonstrate the ability to communicate clearly and concisely in written and oral communications through technical reports, solutions to information technology problems, and feasibility studies
- demonstrate human relations and career/life adaptability skills in problem solving, decision making, and responding to change
- demonstrate an environmental perspective in the development of solutions for business and information technology problem solving
- demonstrate global and ethical perspectives in information technology management
- demonstrate an understanding of the role of finance, marketing, and management as job responsibilities of the information technology professional

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

#### Liberal Education Requirements

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)  
 HUM 3310—Culture and Technology, HUMANITIES, GLOB PERSP (3 cr)  
 MATH 1031—College Algebra, MATH THINK (3 cr)  
 MATH 1150—Elementary Statistics, MATH THINK (3 cr)  
 PHIL 1001—Introduction to Philosophy, HUMANITIES, ETH/CIV RE (3 cr)  
 PHYS 1101—Introductory College Physics I, PHYS SCI (4 cr)  
 PSY 1001—General Psychology, HI/BEH/SSC (3 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

#### Technology Requirement

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1011—Introduction to Computer Systems Architecture (2 cr)

#### Information Technology Management Core

ACCT 2101—Principles of Accounting I (3 cr)  
 ACCT 2102—Principles of Accounting II (3 cr)  
 CA 1030—Multimedia Graphics (2 cr)  
 CA 1040—Web Site Development (2 cr)  
 CA 1060—Database Applications (2 cr)  
 CS 2100—Microcomputer Systems Architecture (3 cr)  
 CS 2400—Software Engineering Approach to Human Computer Interaction (3 cr)  
 GBUS 3107—Legal Environment in Business (3 cr)  
 ITM 2050—Introduction to Programming I (3 cr)  
 ITM 2060—Database Management Systems (3 cr)  
 ITM 2070—Introduction to Programming II (3 cr)

ITM 3110—Microcomputer Operating Systems (3 cr)  
 ITM 3120—Networking and Telecommunications (3 cr)  
 ITM 3900—Internship (1–3 cr)  
 ITM 4020—Analysis and Design of Information Systems (3 cr)  
 ITM 4900—Senior Project in Information Technology Management (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3270—Fundamentals of E-Business (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)

## Specializations

*Complete one 12-credit specialization.*

Students are required to complete one of the following course groups.

### Application Development

CS 2090—Data Structures and Algorithms (3 cr)  
 CS 2200—Introduction to Software Engineering (3 cr)  
 CS 3200—Software Design and Architecture (3 cr)  
 ITM 3145—HTML/XML (3 cr)  
 -OR-

### Computer Applications

CA 1012—Application Suite Software (2 cr)  
 CA 1015—Word Processing Applications (2 cr)  
 CA 1020—Spreadsheet Applications (2 cr)  
 CA 1055—Animation Software Applications with Flash MX (2 cr)  
 CA 1070—Desktop Publishing (2 cr)  
 CA 1080—Audio-Visual Production Applications (2 cr)  
 -OR-

### Networking and Telecommunications

ITM 3130—Messaging Systems (3 cr)  
 ITM 3190—Topics in Information Technology Management (3 cr)  
 ITM 3200—Internet Standards and Protocols-TCP/IP (3 cr)  
 ITM 3215—Information Assurance and Systems Security (3 cr)

## Information Technology Management Minor

### *Math, Science, and Technology Department*

Required credits in this minor: 18.

An information technology management minor gives students a general background in technology, computer applications, services, and systems.

Students completing the information technology management minor will:

- demonstrate abilities in the use of information systems hardware, operating systems, and industry leading computer applications
- use computer technology in preparing programs, presentations, and written reports
- demonstrate the ability to communicate clearly and concisely in written and oral communications through technical reports, solutions to information technology problems, and feasibility studies
- demonstrate human relations and career/life adaptability skills in problem solving, decision making, and responding to change
- demonstrate an environmental perspective in the development of solutions for business and information technology problem solving
- demonstrate global and ethical perspectives in information technology management

### Minor Requirements

#### Program Core Requirements

ITM 2050—Introduction to Programming I (3 cr)  
 ITM 2060—Database Management Systems (3 cr)

ITM 3110—Microcomputer Operating Systems (3 cr)  
*Take 9 or more credit(s) from the following:*  
 ITM 2070—Introduction to Programming II (3 cr)  
 ITM 3120—Networking and Telecommunications (3 cr)  
 ITM 3130—Messaging Systems (3 cr)  
 ITM 3145—HTML/XML (3 cr)  
 ITM 3190—Topics in Information Technology Management (3 cr)  
 ITM 3200—Internet Standards and Protocols-TCP/IP (3 cr)  
 ITM 3215—Information Assurance and Systems Security (3 cr)  
 ITM 4020—Analysis and Design of Information Systems (3 cr)

## Manufacturing Management Certificate

The manufacturing management certificate is a workplace centered continuing education program designed to meet the increasing demand for management skills in a production based industrial environment. The program content provides an educational base that enables employees to meet the demands of modern management within a technological work setting.

This flexible program fits the schedules of part-time students and students already in the workplace and is offered for credit or noncredit based on the students' background. The courses taken for the certificate program will transfer into the bachelor of manufacturing program.

### Certificate Requirements

*A minimum of 18 credits is required for completion.*

BM 3011—Manufacturing Operations and Logistics (3 cr)  
 BM 4034—Quality Management Systems (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 MGMT 4200—Project Management (3 cr)

### Electives (6 cr)

*Courses from two areas are strongly recommended)*

BM 3005—Facilities Planning and Selection (3 cr)  
 BM 3012—Applied Engineering Principles (3 cr)  
 BM 3020—Industrial Safety (3 cr)  
 MGMT 3100—Managerial Finance (3 cr)  
 MGMT 3200—Principles of Management (3 cr)  
 MGMT 3250—Operations Management (3 cr)  
 MKTG 3300—Principles of Marketing (3 cr)

## Manufacturing Management B.M.M.

### *Business Department*

Required credits to graduate with this degree: 120.

The bachelor of manufacturing management (B.M.M.) is a career-oriented program that prepares students to manage people and machines in a manufacturing environment. Graduates will be able to supervise a manufacturing process, manage human and mechanical resources within budgetary constraints, and assure product quality.

The program is designed to meet the needs of people already in the workplace and two-year graduates who want to continue their education to the bachelor's degree level with seamless integration of prior credits earned. The program is available for in-class instruction on campus and at various locations in Minneapolis and St. Paul as well as through online education. The online education components of the program are delivered through asynchronous electronic communication technologies and self-directed learning.

**Program outcomes**—graduates will

- play a growing role in their workplace especially in supervision and management
- contribute to manufacturing system technology and quality control
- establish a quality control department and train staff to meet quality audits
- develop grades and standards of quality
- set up acceptance sampling and inspection procedures
- prepare quality control charts and reports
- control the movement of materials in the most efficient manner at the right time, to and from the correct place in the required quantity
- do a safety audit through a comprehensive approach to problems of safety in the workplace, including meeting the OSHA standards

**Admission Requirements**

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

**Program Requirements**

Students must complete 40 upper division credits.

**Liberal Education Requirements**

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

**Manufacturing Management Core**

- ACCT 2101—Principles of Accounting I (3 cr)
- BM 3012—Applied Engineering Principles (3 cr)
- BM 3034—Quality Management Systems (3 cr)
- MGMT 3200—Principles of Management (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)

**Manufacturing Management Options**

Students are required to complete either the additional requirements for the manufacturing management program as listed below or the requirements for the quality management emphasis.

**Manufacturing Management Courses**

*In addition to the courses listed below, students must complete the following:*

13 credits of upper division business/technology credits (ACCT, BM, CS, ENTR, GBUS, ITM, MGMT MKTG) and 59 transfer credits or open electives.

- MGMT 3100—Managerial Finance (3 cr)
- MGMT 3250—Operations Management (3 cr)
- COMM 3431—Persuasion, COMMUNICAT (3 cr)
- COMM 3008—Business Writing, LIB ED ELC (3 cr)
- or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- OR-

**Quality Management Emphasis**

The quality management emphasis prepares graduates for employment in industry and public regulatory agencies. UMC graduates have the knowledge and skills to contribute to the quality functions at their prospective employers.

Quality management graduates will leave UMC with

- statistical preparation
- foundations in the principles of engineering

- strong communication, critical thinking, and teamwork skills
- effective business management training
- technology skills that meet or exceed industry demands

These skills are essential not only to help secure an entry level position, but also to increase the frequency and likelihood of promotion.

**Quality Management Emphasis Requirements**

*In addition to the courses listed below, students must complete the following: 10 credits of upper division electives (suggested electives include BM 3011, BM 3804, GBUS 3107, MGMT 3100, MGMT 3250) and 58 transfer credits or open electives.*

- BM 3006—Maintenance and Safety Management (3 cr)
- BM 3007—Metrology (3 cr)
- BM 3008—Regulations and Compliance (3 cr)
- BM 3009—Quality Auditing Certification (1 cr)
- BM 3053—Product Development Management (3 cr)
- COMM 4800—Crisis Communication, LIB ED ELC (3 cr)
- or COMM 3431—Persuasion, COMMUNICAT (3 cr)

**Marketing and Management A.A.S.**

**Business Department**

Required credits to graduate with this degree: 64.

The marketing and management program prepares students for supervisory or entry-level management positions in business organizations. Career options include retail store manager, assistant general manager, physical distribution manager, sales representative, purchasing agent, warehouse manager, and consumer service manager.

**Program outcomes**—graduates will

- demonstrate a basic understanding of business decision-making
- demonstrate the ability to communicate effectively
- demonstrate a basic understanding of computer software applications
- demonstrate basic knowledge of ethical/environmental issues
- demonstrate basic knowledge and competency in the application of business management skills
- demonstrate the capability to directly apply basic management leadership skills and principles to functional areas in a variety of career options

**Admission Requirements**

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

**Program Requirements**

**Liberal Education Requirements**

*Take 3 credits of liberal education electives and 3 credits of humanities/fine arts electives, selected in consultation with an adviser. Also take the following courses.*

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- PSY 1001—General Psychology, HI/BEH/SSC (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- or MATH 1031—College Algebra, MATH THINK (3 cr)

**Technology Requirement**

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1020—Spreadsheet Applications (2 cr)

### Program Requirements

Take 16 credits of business/technology electives. *GBUS 1603 and GBUS 1981 are recommended. Also take the following courses.*

- ACCT 2101—Principles of Accounting I (3 cr)
- ACCT 2102—Principles of Accounting II (3 cr)
- ENTR 2200—Introduction to Entrepreneurship and Small Business (3 cr)
- GBUS 3107—Legal Environment in Business (3 cr)
- MGMT 3200—Principles of Management (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)
- MGMT 3900—Internship (1–3 cr)
- MKTG 3250—Promotional Strategies (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)

### Music Minor

#### Arts, Humanities, Social Science Department

Required credits in this minor: 18.

The music minor allows students to develop a concentrated course of studies in the area of music while pursuing a major in another area. It is primarily for students who plan to earn a baccalaureate degree at UMC and who are able to complete the music coursework over a period of at least four years. Students completing the minor may pursue opportunities in teaching beginning to intermediate piano lessons, playing church organ, directing volunteer choirs, directing community musicals, etc. The minor complements all UMC major degree programs.

**Program outcomes**—students develop

- broader knowledge of music
- vocal or instrumental skills for performance
- enhanced appreciation of the performing arts
- skills for part-time employment in music field

#### Minor Requirements

- MUS 1021—Introduction to Music, HUMANITIES, HUMAN DIV (3 cr)
- MUS 1111—Music Theory I: Foundations of Tonal Music, HUMANITIES (3 cr)
- MUS 1121—Music Theory II: Diatonic Tonality, Harmony and Voice Leading, LIB ED ELC (3 cr)

Take 3 or more credit(s) from the following:

- MUS 1011—University Singers, HUMANITIES (1 cr)
  - MUS 1041—Private Music Instruction, HUMANITIES (1 cr)
  - MUS 1042—Private Instruction: Class Piano, HUMANITIES (1 cr)
  - MUS 1051—Band/Pep Band, HUMANITIES (1 cr)
  - MUS 1071—Musical Theater, HUMANITIES (1 cr)
- Take 6 or more credit(s) from the following:
- MUS 3011—University Singers (Choir), HUMANITIES (1 cr)
  - MUS 3029—Music of the Twentieth Century, HUMANITIES, HUMAN DIV (3 cr)
  - MUS 3041—Private Instruction, HUMANITIES (1 cr)
  - MUS 3051—Band/Pep Band, LIB ED ELC (1 cr)
  - MUS 3091—Instrumental and Choral Conducting, LIB ED ELC (2 cr)
  - MUS 3604 {Inactive}

### Natural Resources B.S.

#### Natural Resources Department

Required credits to graduate with this degree: 120.

Concern for managing natural resources is becoming more important each day as a result of increasing human populations and limited natural resources and habitats. Natural resource managers help balance the needs of people with the ability of ecosystems to sustainably support soil, water, forests, wildlife, fish, and recreational resources.

UMC's bachelor of science (B.S.) in natural resources provides an integrated approach to soil and water conservation, wildlife and fisheries management, forestry, and recreation. This combination enables graduates to work with a variety of resources and people and to build a career tailored to their interests. Students select one of the following emphases:

- natural resources management
- wildlife management
- park management
- water resource management
- natural resources law enforcement

**Program outcomes**—graduates will

- apply an integrated approach to resource management that incorporates environmental, economic, and social considerations with a goal of long-term sustainability
- demonstrate appropriate technical knowledge and practical applications necessary for employment in the natural resources field
- perform group problem solving, decision-making, and conflict management activities to function effectively in society
- demonstrate oral and written communication skills appropriate for a beginning natural resource professional
- be aware of the necessity of continuing education/development to be successful in a changing natural resources workplace

#### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

#### Program Requirements

Students must complete 40 upper division credits.



**Liberal Education Requirements**

A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required.

BIOL 1009—General Biology, BIOL SCI, PEOPLE/ENV (4 cr)  
 CHEM 1001—Introductory Chemistry, PHYS SCI (4 cr)  
 COMP 1011—Composition I, COMMUNICAT (3 cr)  
 COMP 1013—Composition II, COMMUNICAT (3 cr)  
 PHYS 1012—Introductory Physics, PHYS SCI, PEOPLE/ENV (4 cr)  
 SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

**Technology Requirement (3 cr)**

CA 1010—Introduction to Computer Technology (1 cr)  
 CA 1xxx

**Natural Resources Program Requirements (33 cr)**

COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)  
 MGMT 3210—Supervision and Leadership (3 cr)  
 NATR 1233—Introduction to Natural Resources (3 cr)  
 NATR 1244—Elements of Forestry (4 cr)  
 NATR 2630—Introduction to Geographic Information Systems (3 cr)  
 NATR 3344—Land Use Planning (3 cr)  
 NATR 3364—Plant Taxonomy (3 cr)  
 NATR 3374—Ecology, BIOL SCI (4 cr)  
 NATR 3900—Internship (1–4 cr)  
 NATR 3901—Post-Internship Seminar (0.5 cr)  
 NATR 4652—Seminar (1 cr)  
 SOIL 1293—Soil Science (3 cr)  
 NATR 2899—Pre-Internship Seminar (0.5 cr)  
 or NATR 3899—Pre-Internship Seminar (0.5 cr)

**Program Sub-plans**

Students are required to complete one of the following sub-plans.

**Natural Resources Law Enforcement Emphasis**

(A collaborative program with Bemidji State University)

This emphasis provides integrated instruction in natural resources law enforcement. General classes in natural resources, wildlife and fisheries management, recreation, and land use planning are combined with criminal justice/law enforcement classes. After completing coursework and training in first aid and traffic law, students may attend a skills session and take the Minnesota Peace Officer Standards and Training (POST) certification examination.

**Program outcomes**—graduates will

- understand the role of education/law enforcement in natural resource management
- attend the peace officer's skills training academy

**Natural Resources Law Enforcement Emphasis Requirements (41–42 cr)**

CRJS 1120—Criminal Justice and Society (BSU), LIB ED ELC (4 cr)  
 CRJS 3304—Police Process (BSU) (3 cr)  
 CRJS 3305—Judicial Process (BSU), LIB ED ELC (3 cr)  
 CRJS 3320—Juvenile Delinquency and Justice (BSU) (3 cr)  
 CRJS 3334—Criminal Justice Planning (BSU) (3 cr)  
 CRJS 3358—Criminal Law (BSU) (3 cr)  
 CRJS 3359—Criminal Investigation (BSU) (3 cr)  
 CRJS 3360—Criminal Procedure (BSU) (3 cr)  
 CRJS 4100—Applied Ethics (BSU) (3 cr)  
 CRJS 4103—Criminal Justice Diversity (BSU) (3 cr)  
 CRJS 4480—Policing People (BSU) (3 cr)

NATR 3654—Wildlife Ecology and Management (4 cr)  
 BIOL 2012—General Zoology, LIB ED ELC (4 cr)  
 or BIOL 2022—General Botany, LIB ED ELC (3 cr)

**Liberal Education Requirement (3 cr)**

Will count towards the 40 credits required in liberal education.

MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

**Open Electives**

Students must take 2–3 credits.

**Natural Resources Management Emphasis**

This emphasis provides an integrated approach to land use and the conservation of wildlife, fish, forest, and recreation resources. This major is especially appropriate for students seeking a broad understanding of resource management principles and environmental issues. A combination of coursework in natural resources, agriculture, and liberal education prepares students for land management positions in which a balance between environmental, economic, and social concerns is sought.

**Program outcomes**—graduates will

- understand ecological and management principles that apply to wildlife, fish, forest, soil, water, and recreation resources

**Natural Resources Management Emphasis Requirements (26 cr)**

ASM 3009—Surveying (4 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 NATR 3203—Park and Recreation Management (3 cr)  
 NATR 3654—Wildlife Ecology and Management (4 cr)  
 NATR 3660—Prairie Ecosystem Management (2 cr)  
 NATR 3699—Integrated Resource Management (3 cr)  
 SWM 3224—Soil and Water Conservation (4 cr)  
 AGRO 1183—Field Crops: Production Principles (3 cr)  
 or HORT 1010—Introduction to Horticulture (3 cr)

**Liberal Education Requirement**

Will count towards the 40 credits required in liberal education.

MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

**Agriculture/Natural Resources Electives**

Students must take 9 credits selected in consultation with an adviser.

**Open Electives**

Students must take 9 credits.

**Park Management Emphasis**

This emphasis provides an integrated approach to park and recreation area management. A combination of natural resources, horticulture, and management courses prepare students for park and resource management positions, typically with federal/state/county/city recreation agencies. A series of wilderness management coursework is delivered collaboratively from the University of Montana School of Forestry. Flexibility in the choice of elective courses in the major allows students to build a customized program that meets their specific career goals.

**Program outcomes**—graduates will

- understand the interrelatedness of and techniques used to manage both visitor use and recreational resources

**Park Management Emphasis Requirements (9 cr)**

BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 NATR 3203—Park and Recreation Management (3 cr)  
 NATR 3699—Integrated Resource Management (3 cr)

**Liberal Education Requirement (3 cr)**

*Will count towards the 40 credits required in liberal education.*

MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

**Agriculture/Natural Resources Electives**

*Students must take 15 credits.*

**Horticulture Electives**

*Students must take 7 credits.*

**Management Electives**

*Students must take 3 credits.*

**Open Electives**

*Students must take 10 credits.*

**Water Resource Management Emphasis**

This emphasis blends courses in natural resources with agriculture, geology, soils, fisheries management, water quality, and land use planning to provide a background focused on water resources. Watersheds studies by land cover and mapping technologies in relationship to field monitoring of lakes and streams.

**Program outcomes**—graduates will

- understand methods of assessing land management practices at the watershed scale and how they affect water quality
- be able to measure and use appropriate water quality parameters to assess the health of aquatic systems
- be able to recommend appropriate land/water management practices to achieve soil conservation and water quality goals

**Water Resource Management Emphasis Requirements (36 cr)**

AGRO 1183—Field Crops: Production Principles (3 cr)  
 ASM 3009—Surveying (4 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 BIOL 3722—Limnology, LIB ED ELC (3 cr)  
 GEOL 1001—Introductory Geology, PHYS SCI, PEOPLE/ENV (3 cr)  
 NATR 1663—Principles of Fisheries Management (3 cr)  
 NATR 3376—Wetland and Riparian Ecology and Management (3 cr)  
 NATR 3699—Integrated Resource Management (3 cr)  
 SWM 3009—Hydrology and Water Quality (4 cr)  
 SWM 3224—Soil and Water Conservation (4 cr)  
 SWM 3225—Watershed Management (3 cr)

**Liberal Education Requirement (3 cr)**

*Will count towards the 40 credits required in liberal education.*

MATH 1031—College Algebra, MATH THINK (3 cr)  
 or MATH 1150—Elementary Statistics, MATH THINK (3 cr)

**Open Electives**

*Students must take 8 credits.*

**Wildlife Management Emphasis**

This emphasis concentrates on wildlife and habitats. The major focuses on land and wetland habitats and their animal associates with some emphasis on fisheries management. Graduates fulfill the educational requirements for certification as an Associate Wildlife Biologist by The Wildlife Society. Professional relationships and student development are enhanced by a student chapter of The Wildlife Society.

**Program outcomes**—graduates will

- understand the interrelatedness and techniques used to manage vertebrate populations and their habitat
- understand the dynamics of wildlife populations/habitats, and appropriate monitoring techniques

A minimum GPA of 3.00 is required for graduation.

**Wildlife Management Emphasis Requirements (39 cr)**

ANSC 3203—Animal Anatomy and Physiology (3 cr)  
 ASM 1034—Facility Maintenance and Safety (4 cr)  
 ASM 3009—Surveying (4 cr)  
 BIOL 2012—General Zoology, LIB ED ELC (4 cr)  
 BIOL 2022—General Botany, LIB ED ELC (3 cr)  
 NATR 3464—Mammalogy (3 cr)  
 NATR 3466—Ornithology (3 cr)  
 NATR 3468—Wildlife Habitat Management Techniques (3 cr)  
 NATR 3654—Wildlife Ecology and Management (4 cr)  
 NATR 3660—Prairie Ecosystem Management (2 cr)  
 NATR 3699—Integrated Resource Management (3 cr)  
 PIM 3030—Research Techniques (3 cr)

**Liberal Education Requirement (6 cr)**

*Will count towards the 40 credits required in liberal education.*

MATH 1031—College Algebra, MATH THINK (3 cr)  
 MATH 1150—Elementary Statistics, MATH THINK (3 cr)

**Open Electives**

*Students must take 5 credits.*

**Sport and Recreation Management B.S.**

**Business Department**

Required credits to graduate with this degree: 120.

The sport and recreation management program gives students the opportunity to develop knowledge and expertise in sport and recreation with an orientation toward management. It is employment-oriented, designed around active learning and responsive teaching, and technology-driven, focused on communication and human relations.

Program graduates will be able to manage, assist in the management of, or find employment in sport and recreation organizations. Career opportunities include positions in professional sport franchises, sport and recreation facilities, participative sport event management, spectator sport event management, licensed athletic apparel companies, corporate fitness programs, college and university athletic departments, park and tourist attraction sites, community centers, senior centers, health clubs, sport and recreation camps, clinics, and seminars.

**Program outcomes**—graduates will demonstrate

- competencies in general business disciplines (i.e. management, marketing, finance) as related to sport and recreation management
- skills in written and oral communication that relate to the sport and recreation industry
- ability to apply industry-specific technological tools and operating procedures for sport and recreation
- team building skills and the ability to work in groups

### Admission Requirements

For information about UMC admission requirements, visit the UMC Office of Admissions Web site.

### Program Requirements

Students must complete 40 upper division credits.

### Liberal Education Requirements

*A minimum of 40 liberal education credits required. Students must complete the 10 goal areas of the Minnesota Transfer Curriculum with the following specific liberal education courses required:*

- COMP 1011—Composition I, COMMUNICAT (3 cr)
- COMP 1013—Composition II, COMMUNICAT (3 cr)
- ECON 2101—Microeconomics, HI/BEH/SSC (3 cr)
- ECON 2102—Macroeconomics, HI/BEH/SSC (3 cr)
- MATH 1031—College Algebra, MATH THINK (3 cr)
- MATH 1150—Elementary Statistics, MATH THINK (3 cr)
- SPCH 1101—Public Speaking, COMMUNICAT (3 cr)

### Technology Requirement

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1070—Desktop Publishing (2 cr)

### Sport and Recreation Management Core

- ACCT 2101—Principles of Accounting I (3 cr)
- ACCT 2102—Principles of Accounting II (3 cr)
- GBUS 3107—Legal Environment in Business (3 cr)
- HLTH 1062—First Aid and CPR (2 cr)
- HLTH 1072—Wellness (3 cr)
- MGMT 3100—Managerial Finance (3 cr)
- MGMT 3200—Principles of Management (3 cr)
- MKTG 3250—Promotional Strategies (3 cr)
- MKTG 3300—Principles of Marketing (3 cr)
- SRM 2100—Psychology of Sport (3 cr)
- SRM 2200—Sociology of Sport (3 cr)
- SRM 3000—Foundations of Sport and Recreation Management (3 cr)
- SRM 3002—Sport and Recreation Law (3 cr)
- SRM 3003—Facility and Equipment Management (3 cr)
- SRM 3005—Sports Information and Newsletters (3 cr)
- SRM 3006—Sports Marketing (3 cr)
- SRM 3010—Topics in Coaching (2 cr)
- SRM 3900—Internship in Sport and Recreation Management (1–3 cr)



- SRM 4099—Seminar in Sport and Recreation Management (1 cr)
- COMM 3008—Business Writing, LIB ED ELC (3 cr)  
or COMM 3303—Writing in Your Profession, LIB ED ELC (3 cr)
- MGMT 3210—Supervision and Leadership (3 cr)  
or MGMT 3220—Human Resource Management (3 cr)  
or MGMT 3600—Management Case Studies (3 cr)  
or MKTG 4200—Marketing Research (3 cr)
- Take 4 or more credit(s) from the following:*
- PER 1xxx
- Take 2 or more credit(s) from the following:*
- CA 1xxx
- ITM 1xxx
- ITM 2xxx
- ITM 3xxx
- ITM 4xxx
- MGMT 3xxx
- MGMT 4xxx
- MKTG 3xxx
- MKTG 4xxx