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 UMC’s 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.
• 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 delivered by other higher education institutions.
• Students develop the ability to adapt to technological change that will be essential to career success.

Focused on three core components—communication, critical thinking, and working with others
Every program has curriculum focused on developing skills in three 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.

Curricular Programs

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

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 degree. 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 three-credit campus technology requirement. This is typically met by completing CA 1010—Introduction to Computer Technology (1 credit) and two 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 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 ten 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
Technical 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 three 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 other appropriate work experience.

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 1051—Introduction to Humanities
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)
Mas 1011—University Singers (R)
Mas 1021—Introduction to Music (also Goal Area 7)
Mas 1041—Private Music Instruction (R)
Mas 1042—Private Instruction: Class Piano (R)
Mas 1051—Band/Pep Band (R)
Mas 1071—Musical Theatre (R)
Mas 1111—Music Theory I: Foundations of Tonal Music
Mas 3011—University Singers (choir) (R)
Mas 3029—Music of the 20th Century (also Goal Area 7)
Mas 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

Lit 1016—Readings in American Life (also Goal Area 6)
Mas 1021—Introduction to Music (also Goal Area 6)
Mas 3029—Music of the 20th Century (also Goal Area 6)
Soc 1001—Introduction to Sociology (also Goal Area 5)
Sph 3001—Communication in Human Relationships

Goal Area 8: Global Perspective—one course minimum

Geo 1004—World Regional Geography (also Goal Area 5)
Hist 1021—World Civilization I
Hist 1022—World Civilization II
Hum 3110—Culture and Technology (also Goal Area 10)
Lit 1005—Introduction to Literature (also Goal Area 6)
Lit 3001—World Literature (also Goal Area 6)

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

NatR 1226—Issues in 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 Biochemistry (also Goal Area 3)
Geol 1001—Introductory Geology (also Goal Area 3)
Hum 3110—Culture and Technology (also Goal Area 5)
NatR 1226—Issues in Sustainability (also Goal Area 9)
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.

## Accounting

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.

Upon completion, the graduate may choose to take one of the following exams for certification:

- Certified Public Accountant (CPA)*
- Certified Management Accountant (CMA)
- Certified Internal Auditor (CIA)

*Most states now require 150 semester credits of education to take the CPA exam or to be licensed.

## Accounting B.S. Program Outcomes

The accounting program prepares students to become accountants in business and government, providing accounting, business, and liberal education courses. Accounting program graduates will:

- use computer technology for accounting spreadsheet applications and general ledger accounting functions;
- develop and demonstrate skills in financial and cost accounting systems that are typical of most businesses;
- develop and demonstrate skills in basic tax fundamentals for individuals and businesses;
- demonstrate skills and knowledge in auditing;
- demonstrate skills and competencies in team building and decision making;
- demonstrate skills in liberal education that provide a foundation for the applied curriculum;
- demonstrate a commitment to continuing professional development;
- demonstrate skills in communication, ethical decision making, and critical thinking.

## Accounting Course Requirements (B.S.)

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 62 credits in the major, and 13 credits in electives; 40 credits are required in upper division courses.

### Liberal Education Requirements

- CA 1010—Introduction to Computer Technology (1 cr)
- CA 1020—Spreadsheet Applications (2 cr)
- Comp 1011—Composition I (3 cr)
- Comp 1012—Composition II (3 cr)
- Comp 3303—Writing in Your Profession (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Econ 2102—Macroeconomics (3 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- Math 1150—Elementary Statistics (3 cr)
- Psy 1001—General Psychology (3 cr)
- Spch 1101—Public Speaking (3 cr)
- Liberal education electives (3 cr)
- Humanities electives (6 cr minimum from at least two departments)
- Math/natural science electives (6 cr) (at least 3 cr of lab science)

### Program Requirements

- 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 4201—Auditing I (3 cr)
- Acct 4202—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 2060—Database Management Systems (3 cr)
- Mgmt 3100—Managerial Finance (3 cr)
- Mgmt 3200—Principles of Management (3 cr)
- Mkig 3300—Principles of Marketing (3 cr)

Select 15 credits from the following:

- AgEc 3640—Agricultural Finance and Valuation (4 cr)
- Any ITM course at 2xxx or above (3-15 cr)
- Math 1142—Survey of Calculus (3 cr)
- Mgmt 3250—Operations Management (3 cr)
- Mgmt 3600—Management Case Studies (3 cr)
- Open electives (13 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.

Agricultural Business

The agricultural business program blends a strong base of agriculture, business, and liberal 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. Employment opportunities include agricultural sales and marketing, agribusiness management, agribusiness finance, agribusiness information management, food marketing management, global agribusiness, and rural economic development.

Agricultural Business B.S. Program Outcomes

Agricultural business graduates will demonstrate

- skills that lead to satisfying and rewarding opportunities for agribusiness careers in either rural or urban settings;
- knowledge of the basic liberal education that provides the foundation for applied knowledge and lifelong learning;
- the broad knowledge and technical skills required for careers in agribusiness;
- a polytechnic education that enables graduates to make immediate contributions in the work place.

Agricultural Business Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 62 credits in the major, and 13 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

- Biol 1009-General Biology (4 cr)
- CA 1010-Introduction to Information Technology (1 cr)
- CA 1020-Spreadsheet Applications (2 cr)
- Chem 1001-Introductory Chemistry (4 cr)
- Comp 1011-Composition I (3 cr)
- Comp 1013-Composition II (3 cr)
- Comp 3303-Writing in Your Profession (3 cr)
- Econ 2101-Microeconomics (3 cr)
- Econ 2102-Macroeconomics (3 cr)
- Math 1031-College Algebra and Analytical Geometry (3 cr)
- Math 1150-Elementary Statistics (3 cr)
- Psy 1001-Introduction to Psychology (3 cr)
- Spch 1101-Public Speaking (3 cr)
- Humanities electives (6 cr) (from at least two departments)

Liberal education electives (1 cr)

Program Requirements

- Acct 2101-Principles of Accounting I (3 cr)
- AgBu 1005-Global 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)
- GnAg 2899/3899-Pre-Internship Seminar (.5 cr)
- GnAg 3900-Internship (2 cr)
- GnAg 3901-Post-Internship Internship Seminar (.5 cr)
- GnAg 3909-Internship (2 cr)
- GnAg 3901-Post-Internship Internship Seminar (.5 cr)
- GnAg 4652-Agriculture and Natural Resources 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-Introduction to Soil Science (3 cr)
- CA/ITM electives (3 cr)
- Agriculture/management/technology electives (23 cr)
- Open electives (13 cr)
Programs of Study

Agricultural Business—Sustainable Development

Sustainable development is a unique blend of social, economic, and environmental factors that combine to provide long-term strategies to benefit communities. The concept of the sustainable development track focuses on living as though we plan to stay and developing leadership focuses to incorporate the three main areas of social, economic, and environmental structure that allow communities to prosper by developing the quality of place.

Agricultural Business—Sustainable Development B.S. Program Outcomes

Graduates will
- have a broad understanding of rural economic environment;
- be able to incorporate sustainable practices and develop regional, local, and/or business-specific plans of action based on strengths, weaknesses, opportunities, and threats;
- have an appreciation for the risks, rewards, requirements, and limitations of entrepreneurship in rural areas;
- be competent in the use of technology for information gathering, data acquisition and analysis, communication and community development;
- possess interpersonal and analytical skills for effective project, process, and personnel management;
- understand the role of ethical values in decision-making and human relations;
- communicate clearly and concisely in written, verbal, and visual mediums.

Agricultural Business—Sustainable Development Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 59 credits in the major, and 16 credits in electives; 40 credits are required in upper division courses.

Liberal education Requirements
See Agricultural Business.

Program Requirements
Acct 2101—Principles of Accounting I (3 cr)
AgBu 1005—Global 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)
AgEc 4800—Rural Economic Development Practicum (3 cr)
Entr 2200—Introduction to Entrepreneurship and Small Business Management (3 cr)
Entr 3400—Entrepreneurial and Small Business Management (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
Mgmt 3100—Managerial Finance (3 cr)
Mgmt 3200—Principles of Management (3 cr)
Mktg 3300—Principles of Marketing (3 cr)
Mktg 3360—Global Business (3 cr)
NatR 1226—I Issues in Sustainability (3 cr)
NatR 3344—Land Use Planning (3 cr)
NatR 3699—Integrated Resource Management (3 cr)
Soil 1293—Soil Science (3 cr)
CA/ITM electives (3 cr)
Open electives (16 cr)

Agricultural Education

(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.

Agricultural Education Program Requirements (B.S.)

Degree Requirements: A total of 128 credits is required for graduation. Of this total, 47 credits are required in liberal education, 43.5 credits in the major, and 37.5 credits in professional education; 40 credits are required in upper division courses.
Programs of Study

Liberal Education Requirements (both emphases)

- Biol 1009—General Biology (4 cr)
- Biol 1020—Microbiology (3 cr)
- Biol 3022—Principles of Genetics (3 cr)
- CA 1010—Introduction to Computer Technology (1 cr)
- Chem 1001—Introductory Chemistry (4 cr)
- Chem 1401—Elementary Biochemistry (4 cr)
- Comp 1011—Composition I (3 cr)
- Comp 3303—Writing in Your Profession (3 cr)
- Hist 1301—American History (3 cr)
- or Hist 1302—American History II (3 cr)
- Hum 3310—Culture and Technology (3 cr)
- Lit 3001—World Literature (3 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- Phys 1012—Introductory Physics (4 cr)
- Psy 1001—General Psychology (3 cr)
- Spch 1101—Public Speaking (3 cr)

Professional Education Requirements (both emphases)

- AFEE 1001—Introduction to Agricultural Education and Extension (UMTC) (1 cr)
- AFEE 1002—Career Planning for Agricultural Professional (UMTC) (1 cr)
- AFEE 2096—Professional Practicum: Early Experience (UMTC) (1 cr)
- AFEE 511—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 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—The American Middle School (UMTC) (3 cr)
- PubH 5003—Fundamentals of Alcohol and Drug Abuse (UMTC) (1 cr)
- WCFE 5607—Teaching Internship: School and Classroom Settings (UMTC) (2 cr)
- WCFE 5608—Teaching Internship (UMTC) (6 cr)

Agricultural Science and Technology Education Emphasis Requirements

- AgBu 1005—Global Food Systems (3 cr)
- AgEc 2530—Professional Agriselling (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- or Hort 1010—Introduction to Horticulture (3 cr)
- AnSc 1004—Introduction to Animal Science (4 cr)
- ASM 1044—Computer-Aided Drafting (3 cr)
- or ASM 3360—Applications in Precision Agriculture (3 cr)
- Econ 2101—Microeconomics (3 cr)
- or AgEc 2530—Professional Agriselling (3 cr)
- NatR 1233—Introduction to Natural Resources (3 cr)
- Soil 1293—Soil Science (3 cr)
- Agro/Hort/PIM electives (3 cr)
- AnSc/EquSc electives (2 cr)
- Natural resource electives (6 cr)
- SWM electives (4 cr)
- Agriculture electives (3.5 cr)

Natural and Managed Environmental Education Emphasis Requirements

- AgBu 1005—Global Food Systems (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- or Hort 1010—Introduction to Horticulture (3 cr)
- AnSc 1004—Introduction to Animal Science (4 cr)
- ASM 1044—Computer-Aided Drafting (3 cr)
- or ASM 3360—Applications in Precision Agriculture (3 cr)
- Econ 2101—Microeconomics (3 cr)
- or AgEc 2530—Professional Agriselling (3 cr)
- NatR 1233—Introduction to Natural Resources (3 cr)
- Soil 1293—Soil Science (3 cr)
- Agro/Hort/PIM electives (3 cr)
- AnSc/EquSc electives (2 cr)
- Natural resource electives (6 cr)
- SWM electives (4 cr)
- Agriculture electives (3.5 cr)

Agricultural Systems Management

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 multi-talented 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.

Farm and Ranch Management—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.

Power and Machinery—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.

Precision Agriculture—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.
Agricultural Systems Management B.S.
Program Outcomes
Graduates in agricultural systems management
• are well versed in agricultural foundations;
• are 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.

Agricultural Systems Management Program
Requirements (B.S.)

Degree Requirements: A total of 120 credits is
required for graduation. Of this total, 45 credits are
required in liberal education, 63 credits in the major,
and 12 credits in electives; 40 credits are required in
upper division courses.

Liberal Education Requirements
Biol 1009—General Biology (4 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 2334—Technical Writing (3 cr)
or Comp 3303—Writing in Your Profession (3 cr)
or Spch 3431—Persuasion (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra (3 cr)
Math 1150—Elementary Statistics (3 cr)
Phys 1012—Introductory Physics (4 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (selected from two departments)
Social science elective (3 cr)

Program Requirements (all emphases)
Acct 2101—Principles of Accounting I (3 cr)
Agro 1183—Field Crops/Production Principles (3 cr)
ASM 1021—Introduction to Agricultural Systems Management
  (2 cr)
ASM 1034—Facility Maintenance and Safety (3 cr)
ASM 3002—Agricultural Mobile Power Systems (3 cr)
ASM 3005—Facilities Planning and Selection (3 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
Soil 1293—Soil Science (3 cr)

Farm and Ranch Management Emphasis
Requirements
AgEc 3430—Agricultural Commodity Marketing (3 cr)
AgEc 3540—Agricultural Business Management (4 cr)
AgEc 3640—Agricultural Finance and Valuation (4 cr)
AnSc1004—Introduction to Animal Science (4 cr)
ASM 2250—Agricultural Machinery Management (3 cr)
ASM 3360—Applications in Precision Agriculture (3 cr)
Agriculture/management electives (18 cr)
Open electives (12 cr)

Power and Machinery Emphasis Requirements
AgEc 2530—Professional Agriselling (3 cr)
AgEc 3050—Economics of Agribusiness Management (5 cr)
AgEc 3640—Agricultural Finance and Valuation (4 cr)
ASM 2250—Agricultural Machinery Management (3 cr)
ASM 3360—Applications in Precision Agriculture (3 cr)
CA 1020—Spreadsheets Applications (2 cr)
CA 1060—Database Management Applications (2 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
Agriculture/management electives (14 cr)
Open electives (12 cr)

Precision Agriculture Emphasis Requirements
Agro 3640—Weed Science (3 cr)
ASM 3009—Surveying (4 cr)
ASM 3360—Applications in Precision Agriculture (3 cr)
ASM 3511—Yield Monitoring/Data Interpretation (1 cr)
ASM 3512—Remote Sensing Applications (1 cr)
ASM 3513—Data Management and On-Farm Trials (1 cr)
CA 1020—Spreadsheet Applications (2 cr)
CA 1060—Database Management Applications (2 cr)
Soil 3414—Soil Fertility (4 cr)
Agriculture/management electives (18 cr)
Open electives (12 cr)

Agriculture

The A.A.S. degree in agriculture 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 decide
to pursue a baccalaureate degree upon completion of
the associate degree. All of the credits earned will
transfer to UMC’s parallel baccalaureate program.

Agricultural Aviation—The agricultural aviation
emphasis gives students the agronomic knowledge
and aeronautical skills for careers as aerial
applicants. 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, and flight
instruction.

Agricultural Business—Agricultural business
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.

Agriculture—The agriculture 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 successful farmers and ranchers.

Agronomy—The agronomy 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.
Animal Dairy/Equine/Meat Science—Students within this area of emphasis can further focus their studies on the meat animals, dairy, or equine industries. Respectively, typical careers will include rancher or assistant ranch manager, assistant herdsperson, dairy equipment installer/service person, stable manager, and riding instructor.

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

Natural Resources—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.

Agriculture A.A.S. Program Outcomes

Agriculture program 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.

Agriculture Course Requirements (A.A.S.)

Degree Requirements: A total of 66-68 credits is required for graduation. Of this total, 23 credits are required in liberal education and 43-45 in an agriculture emphasis.

Liberal Education Requirements (all emphases)

- Biol 1009—General Biology (4 cr)
- CA 1010—Introduction to Computer Technology (1 cr)
- Chem 1001—Introductory Chemistry (4 cr)
- or Chem 1021—General Principles of Chemistry I (4 cr)
- Comp 1011—Composition I (3 cr)
- Econ 2102—Macroeconomics (3 cr)
- Sph 1101—Public Speaking (3 cr)
- Humanities electives (3 cr)
- CA electives (2 cr)

Agricultural Aviation Emphasis Requirements (43 cr)

- Agro 1030—Crop and Weed Identification (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- Agro 1030—Weed Science (3 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 (1 cr)
- Avia 3603—Aerial Applications (3 cr)
- Biol 2022—General Botany (3 cr)
- GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
- GnAg 3900—Internship (2 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- GnAg 3900—Internship (2 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- PIM 2573—Entomology (3 cr)
- or Soil 1293—Soil Science (3 cr)
- PIM 3230—Plant Pathology (3 cr)

Agricultural Business Emphasis Requirements (45 cr)

- Acct 2101—Principles of Accounting I (3 cr)
- AgEc 2530—Professional Agriselling (3 cr)
- AgEc 3430—Agricultural Commodity Marketing (3 cr)
- AgEc 3540—Farm Business Management (4 cr)
- AgEc 3640—Agricultural Finance and Valuation (4 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- or Hort 1010—Introduction to Horticulture (3 cr)
- AnSc 1004—Introduction to Animal Science (4 cr)
- Econ 2102—Macroeconomics (3 cr)
- GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
- GnAg 3900—Internship (2 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- Math 1001—Technical Math (3 cr)
- or Math 1031—College Algebra (3 cr)
- or Math 1150—Elementary Statistics (3 cr)
- Soil 1293—Soil Science (3 cr)
- Agriculture or business electives (6 cr)
- Open electives (3 cr)

Agriculture Emphasis Requirements (45 cr)

- AgEc 2530—Professional Agriselling (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- AnSc 1004—Introduction to Animal Science (4 cr)
- ASM 1034—Facilities Maintenance and Safety (3)
- AgEc 2530—Professional Agriselling (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- AnSc 1004—Introduction to Animal Science (4 cr)
- Econ 2101—Principles of Accounting I (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- AgEc 3640—Agricultural Finance and Valuation (4 cr)
- AgEc 3540—Farm Business Management (4 cr)
- AgEc 3430—Agricultural Commodity Marketing (3 cr)
- AgEc 2530—Professional Agriselling (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- or Soil 1293—Soil Science (3 cr)
- Agriculture/natural resource/business electives (6 cr)
- Open electives (3 cr)

Agronomy Emphasis Requirements (45 cr)

- 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 (3 cr)
- GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
- GnAg 3900—Internship (2 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- PIM 2573—Entomology (3 cr)
- or Soil 1293—Soil Science (3 cr)
- PIM 3230—Plant Pathology (3 cr)
- or Soil 1293—Soil Science (3 cr)
- Soil 3414—Soil Fertility and Plant Nutrition (4 cr)
- Agriculture or business electives (6 cr)
- Open electives (3 cr)
Animal Dairy/Equine/Meat Science Emphasis Requirements (45 cr)
AgEc 3540—Farm Business Management (4 cr)
AnSc 1004—Introduction to Animal Science (4 cr)
AnSc 1101—Animal Evaluation (1 cr)
or EqSc 1202—Equine Evaluation (2 cr)
AnSc 2104—Feed and Feeding (4 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
Math 1001—Technical Math (3 cr)
or Math 1031—College Algebra (3 cr)
or Math 1150—Elementary Statistics (3 cr)
Animal/dairy/equine science electives (14 cr)
Agriculture or business electives (6 cr)
Open electives (5-6 cr)

Horticulture Emphasis Requirements (44 cr)
Biol 2022—General Botany (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources 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 3250—Plant Pathology (3 cr)
Soil 1293—Soil Science (3 cr)
Soil 3414—Soil Fertility and Plant Nutrition (4 cr)
Agriculture or business electives (6 cr)
Open electives (7 cr)

Natural Resources Emphasis Requirements (45 cr)
ASM 1014—Facilities Maintenance and Safety (3 cr)
Biol 2022—General Botany (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
Math 1001—Technical Math (3 cr)
or Math 1031—College Algebra (3 cr)
or Math 1150—Elementary Statistics (3 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)
Agriculture/natural resource electives (13 cr)
Open electives (6 cr)

Agronomy
See Plant Industries Management.

Animal Industries Management
The animal industries management major leads to careers in livestock production and management, pre-veterinary medicine, or one of the many allied industries such as feed, pharmaceuticals, artificial insemination, and livestock or farm equipment.

While earning a degree, students can also be fulfilling the requirements for the newly designed pre-veterinary curriculum. Details on the pre-veterinary program curriculum requirements can be found on page 52 of this catalog under Health Sciences—Pre-Veterinary Medicine.
A total of 120 credits is required for graduation. Of this total, 30 credits are required in liberal education, 42 credits in the major, and 48 credits in occupational course requirements. 

**Applied Studies**

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.

The program is also appropriate for students who want to complete a B.S. degree while fulfilling pre-professional program requirements in the fields of pre-pharmacy, pre-medicine, pre-dentistry, and pre-veterinary.

**Applied Studies B.S. 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 an appropriate capstone experience;
- meet career development goals related to achieving a baccalaureate degree.

**Applied Studies Course Requirements (B.S.)**

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 48 credits are required in liberal education, 51 credits in the major, and 21 credits in electives; 40 credits are required in upper division courses.

**Program Requirements**

- ABus 4012—Problem Solving in Complex Organizations (3 cr)
- ABus 4022—Managing Organizational Relationships (3 cr)
- ABus 4023—Communicating for Results (3 cr)
- ABus 4044—Management and Human Resources Practices (3 cr)
- HSM 3020—Quality Improvement and Risk Management (3 cr)
- HSM 3100—Essentials of Managed Care (3 cr)
- HSM 3130—Health Management Information Systems (3 cr)
- HSM 3200—Health Care Leadership and Planning (3 cr)
- HSM 3240—Health Care Policy and Comparative Systems (3 cr)
- HSM 3900—Internship (3 cr)
- HSM 4100—Health Care Finance (3 cr)
- HSM 4210—Health Care Law and Biomedical Ethics (3 cr)
- HSM 4212—Regulatory Management (3 cr)
- Upper division electives (3 cr)
- Occupational course requirements (48 cr) (from partner schools)

**Applied Health**

The Bachelor of Applied Health (B.A.H.) is an integrated four-year baccalaureate degree program delivered via distance education through the World Wide Web and ITV. The program of study includes a fully integrated liberal education core curriculum, clinical occupational field, and skill-oriented 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.

**Applied Health B.A.H. Program Outcomes**

Bachelor of applied health program 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.

**Applied Health Course Requirements (B.A.H.)**

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 30 credits are required in liberal education, 42 credits in the major, and 48 credits in occupational course requirements.

**Liberal Education Requirements**

- Biol 1020—Microbiology (3 cr)
- Biol 1464—Human Anatomy and Physiology I (3 cr)
- Biol 1474—Human Anatomy and Physiology II (3 cr)
- CA 1010—Introduction to Computer Technology (1 cr)
- Comp 1011—Composition I (3 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- or Math 1150—Elementary Statistics (3 cr)
- or Psy 1001—General Psychology (3 cr)
- or Soc 1001—Introduction to Sociology (3 cr)
- Spch 1101—Public Speaking (3 cr)
- CA electives (2 cr)
- Humanities electives (6 cr)

**Program Requirements**

- ABus 4012—Problem Solving in Complex Organizations (3 cr)
- ABus 4022—Managing Organizational Relationships (3 cr)
- ABus 4023—Communicating for Results (3 cr)
- ABus 4044—Management and Human Resources Practices (3 cr)
- HSM 3020—Quality Improvement and Risk Management (3 cr)
- HSM 3100—Essentials of Managed Care (3 cr)
- HSM 3130—Health Management Information Systems (3 cr)
- HSM 3200—Health Care Leadership and Planning (3 cr)
- HSM 3240—Health Care Policy and Comparative Systems (3 cr)
- HSM 3900—Internship (3 cr)
- HSM 4100—Health Care Finance (3 cr)
- HSM 4210—Health Care Law and Biomedical Ethics (3 cr)
- HSM 4212—Regulatory Management (3 cr)
- Upper division electives (3 cr)
- Occupational course requirements (48 cr) (from partner schools)
Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
Comp 101—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Communication electives (3 cr)
Humanities electives (6 cr) (from at least two departments)
Mathematics/natural science electives (12 cr) (at least 3 cr math and 3 cr lab science)
Social science electives (6 cr) (from at least two departments)
Liberal education electives (9 cr)

Program Requirements
AplS 3001—Individual Program Development (.5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

First Area of Study

Technical or occupational (27 cr min)

Open electives (21 cr)

Applied Studies—Pre-Professional Areas of Study
Pre-professional curriculum prepares students for entrance into professional schools such as pharmacy, dentistry, or veterinary. Students are advised to earn a bachelor’s degree while completing the pre-professional program. Students should work closely with their academic advisers and obtain up-to-date entrance and course requirements from the professional degree-granting institution.

The following curricula present opportunities for students to earn the bachelor of science in applied studies while fulfilling certain pre-professional requirements. Each of the tracks require a total of 120 credits, including 48 credits in liberal education and 40 credits in upper-level courses.

Bachelor of Science in Applied Studies—Pre-Dentistry

Liberal Education Requirements (48 cr)
Communication and Using Technology (15 cr)
CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Electronic Spreadsheets (2 cr)
Comp 101—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Spch 1101—Public Speaking (3 cr)

Humanities (9 cr)

Lit 3001—World Literature (3 cr)
Phil 1001—Introduction to Philosophy (3 cr)
Art electives (3 cr)

Mathematical Thinking/Natural Science (15 cr)

Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

Social Science (9 cr)

Hist 3054—Topics in History (3 cr)
Psy 1093—Developmental Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

Program Requirements (65 cr)
AplS 3001—Individual Program Development (.5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

Second Area of Study

Technical or occupational (27 cr min)

Open electives (21 cr)

Applied Studies—Pre-Professional Areas of Study
Pre-professional curriculum prepares students for entrance into professional schools such as pharmacy, dentistry, or veterinary. Students are advised to earn a bachelor’s degree while completing the pre-professional program. Students should work closely with their academic advisers and obtain up-to-date entrance and course requirements from the professional degree-granting institution.

The following curricula present opportunities for students to earn the bachelor of science in applied studies while fulfilling certain pre-professional requirements. Each of the tracks require a total of 120 credits, including 48 credits in liberal education and 40 credits in upper-level courses.

Bachelor of Science in Applied Studies—Pre-Medicine

Liberal Education Requirements (48 cr)
Communication and Using Technology (15 cr)
CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Electronic Spreadsheets (2 cr)
Comp 101—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Spch 1101—Public Speaking (3 cr)

Humanities (6 cr)

Lit 3001—World Literature (3 cr)
Phil 1001—Introduction to Philosophy (3 cr)

Mathematical Thinking/Natural Science (15 cr)

Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

Social Science (12 cr)

Hist 3054—Topics in History (3 cr)
Psy 1093—Developmental Psychology (3 cr)
Psy 3604—Abnormal Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

Program Requirements (67 cr)
AplS 3001—Individual Program Development (.5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

First Area of Study

Technical or occupational (27 cr min)

Open electives (21 cr)

Applied Studies—Pre-Professional Areas of Study
Pre-professional curriculum prepares students for entrance into professional schools such as pharmacy, dentistry, or veterinary. Students are advised to earn a bachelor’s degree while completing the pre-professional program. Students should work closely with their academic advisers and obtain up-to-date entrance and course requirements from the professional degree-granting institution.

The following curricula present opportunities for students to earn the bachelor of science in applied studies while fulfilling certain pre-professional requirements. Each of the tracks require a total of 120 credits, including 48 credits in liberal education and 40 credits in upper-level courses.
**Second Area of Study**

AplS 3804—Individual Studies (1 cr)
Biol 2032—General Microbiology (4 cr)
Biol 3464—Mammalogy (3 cr)
Math 1250—Precalculus (4 cr)
HSM 3200—Management, Leadership, and Health Planning (3 cr)
HSM 4210—Health Care Law and Biomedical Ethics (3 cr)
Phil 3003—Applied Ethics (3 cr)
Soc 3937—Social Gerontology: Elders in American Society (3 cr)
Electives (5 cr)

Students may transfer in any courses from an accredited college. With adviser approval, some course substitutions may be appropriate.

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**Bachelor of Science in Applied Studies—Pre-Pharmacy**

**Liberal Education Requirements (48 cr)**

**Communication and Using Technology (15 cr)**

CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Electronic Spreadsheets (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Spc 1101—Public Speaking (3 cr)

**Humanities (12 cr)**

Hist 3054—Topics in History (3 cr)
Hum 3310—Culture and Technology (3 cr)
Lit 3001—World Literature (3 cr)
Phil 1001—Introduction to Philosophy (3 cr)

**Mathematical Thinking/Natural Science (15 cr)**

Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

**Social Science (6 cr)**

Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

**Program Requirements (67 cr)**

AplS 3001—Individual Program Development (5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

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**First Area of Study**

AplS 3804—Individual Studies (1 cr)
Biol 1464—Human Anatomy and Physiology I (3 cr)
Biol 1474—Human Anatomy and Physiology II (3 cr)
Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

**Mathematical Thinking/Natural Science (15 cr)**

Phys 1102—Introductory College Physics II (4 cr)
Phys 1101—Introductory College Physics I (4 cr)
or Math 1150—Elementary Statistics (3 cr)
Math 1142—Survey of Calculus (3 cr)
Phys 1102—Introductory College Physics II (4 cr)

**Social Science (6 cr)**

Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

**Program Requirements (67 cr)**

AplS 3001—Individual Program Development (5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

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**Second Area of Study**

AplS 3804—Individual Studies (3 plus 1 cr)
HSM 3200—Management, Leadership, and Health Planning (3 cr)
HSM 4210—Health Care Law and Biomedical Ethics (3 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
Phil 3003—Applied Ethics (3 cr)
Spc 3604—Abnormal Psychology (3 cr)
Soc 3937—Social Gerontology: Elders in American Society (3 cr)
Electives (5 cr)

Students may transfer in any courses from an accredited college. With adviser approval, some course substitutions may be appropriate.

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**Bachelor of Science in Applied Studies—Pre-Veterinary**

**Liberal Education Requirements (48 cr)**

**Communication and Using Technology (15 cr)**

CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Electronic Spreadsheets (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Spc 1101—Public Speaking (3 cr)

**Humanities (9 cr)**

Hum 3310—Culture and Technology (3 cr)
Lit 3001—World Literature (3 cr)
Phil 1001—Introduction to Philosophy (3 cr)

**Program Requirements (51-52 cr)**

AplS 3001—Individual Program Development (5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

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**First Area of Study**

AplS 3804—Individual Studies (3 cr)
Biol 1464—Human Anatomy and Physiology I (3 cr)
Biol 1474—Human Anatomy and Physiology II (3 cr)
Biol elective (3 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

**Mathematical Thinking/Natural Science (15 cr)**

Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)

**Social Science (9 cr)**

Hist 3054—Topics in History (3 cr)
Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

**Program Requirements (51-52 cr)**

AplS 3001—Individual Program Development (5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

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**Second Area of Study**

AplS 3804—Individual Studies (3 plus 1 cr)
HSM 3200—Management, Leadership, and Health Planning (3 cr)
HSM 4210—Health Care Law and Biomedical Ethics (3 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
Phil 3003—Applied Ethics (3 cr)
Soc 3937—Social Gerontology: Elders in American Society (3 cr)
Electives (20-21 cr)

Students may transfer in any courses from an accredited college. With adviser approval, some course substitutions may be appropriate.
Mathematical Thinking/Natural Science (18 cr)
Biol 1009—General Biology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)

Social Science (6 cr)
Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)

Program Requirements (67 cr)
AplS 3001—Individual Program Development (.5 cr)
AplS 3900—Internship/Field Experience (3 cr)
AplS 4652—Applied Studies Seminar (2.5 cr)

First Area of Study
Biol 2012—General Zoology (3 cr)
Biol 2032—General Microbiology (4 cr)
Biol 3022—Principles of Genetics (3 cr)
Chem 2301—Elementary Organic Chemistry I (3 cr)
Chem 2302—Elementary Organic Chemistry II (3 cr)
Chem 2310—Elementary Organic Chemistry Lab I (2 cr)
Chem 2311—Elementary Organic Chemistry Lab II (2 cr)
Chem 3021—Biochemistry (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Phys 1102—Introductory College Physics II (4 cr)

Second Area of Study
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 3503—Animal Health and Disease (3 cr)
Math 1142—Survey of Calculus (3 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
Phil 3003—Applied Ethics (3 cr)
Electives (5 cr)

Students may transfer in any courses from an accredited college. With adviser approval, some course substitutions may be appropriate.

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.

For information about the articulation agreement for radiologic technology, please contact the applied studies program faculty.

Applied Studies B.S.—Respiratory Care 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.

Applied Studies—Respiratory Care Course Requirements (B.S.)
Degree Requirements: A minimum of 120 credits is required for graduation. Of this total, 40 credits are required in liberal education, 35 credits in the major, and 11 credits in electives; 40 credits are required in upper division courses. Also see graduation residency requirements.

Liberal Education Requirements
See Applied Studies Liberal Education Requirements.

Program Requirements
AplS 4652—Applied Studies Seminar (2.5 cr)

First Area of Study
Respiratory care courses taken at Northland Community and Technical College, East Grand Forks
Resp 1104—Non Acute Respiratory Care (4 cr)
Resp 1110—Adult Critical Care (4 cr)
Resp 1120—Cardiopulmonary Physiology Assessment (3 cr)
Resp 1124—Clinical I (3 cr)
Resp 2206—Clinical II (3 cr)
Resp 2248—Clinical III (4 cr)
Resp 2212—Diagnostic Procedures (3 cr)
Resp 2276—Advanced Practice Registry Review (3 cr)

Second Area of Study
Respiratory care courses taken at Northland Community and Technical College, East Grand Forks
Resp 2242—Pediatric/Neonatal Respiratory Care (4 cr)
Resp 2252—Advanced Critical Care (4 cr)
Resp 2258—Clinical IV (4 cr)
Resp 2262—Clinical V (3 cr)
Resp 2266—Clinical VI (3 cr)
Electives (11 cr)

Aviation
(A collaborative program with the University of North Dakota.)
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, helps provides aircraft, simulators, flight instructors, and aviation course materials.

Only full-time students (taking 12 credits or more) may enroll in flight training courses; others must obtain consent from the aviation program manager. FAA 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-certificate 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 University.

The aviation program includes flight courses for which students incur costs over and above regular tuition rates. UMC is committed to keeping costs as low as possible for flight students. These costs do 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](http://www.aero.und.edu) for current cost estimates.

Students may choose between three areas of emphasis (listed below) depending upon their career interest.

**Aviation—Agricultural Aviation**

The agricultural aviation program provides training in aviation, agriculture, business management and liberal education. This program leads to possible careers in aerial application, aerial firefighting, aerial photography, aviation sales representative, charter pilot, fixed base operation manager, or pilot representative for an agricultural business. UMC also offers an associate in applied science degree in agriculture with an emphasis in agricultural aviation.

Information on this program can be found on page 32.

**Aviation—Agricultural Aviation B.S. Program Outcomes**

The agricultural aviation student 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;
- demonstrate effective communications in working collaboratively with government agencies, industry, and academic experts.

**Aviation—Agricultural Aviation Course Requirements (B.S.)**

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

**Admission Requirement:** No medical or physical limitation that would prevent the student from holding a F.A.A. second class medical certificate.

**Liberal Education Requirements**

- Biol 1009—General Biology (4 cr)
- Biol 2022—General Botany (3 cr)
- CA 1010—Introduction to Computer Technology (1 cr)
- Chem 1001—Introductory Chemistry (4 cr)
- Comp 1011—Composition I (3 cr)
- Comp 1013—Composition II (3 cr)
- Comp 3303—Writing in your Profession (3 cr)
- Hlth 1062—First Aid (2 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- or Math 1150—Elementary Statistics (3 cr)
- Spch 1101—Public Speaking (3 cr)
- CA electives (2 cr)
- Humanities electives (6 cr) (selected from two departments)
- Social science electives (6 cr) (selected from two departments)
- Liberal education electives (2 cr)

**Program Requirements**

- Agro 1030—Crop and Weed Identification (3 cr)
- Agro 1183—Field Crops: Production Principles (3 cr)
- Agro 3444—Crop Production (4 cr)
- Agro 3640—Weed Science (3 cr)
- Aiv 1103—Introduction to Aviation (4 cr)
- Aiv 1104—Introduction to Aviation Flight Lab (1 cr)
- Aiv 2211—Basic Attitude Instrument Flying (3 cr)
- Aiv 1222—IFR Regulations and Procedures (3 cr)
- Aiv 1396—Conventional Aircraft Operations (1 cr)
- Aiv 3323—Airplane Aerodynamics (3 cr)
- Aiv 3324—Aircraft Systems and Instruments (3 cr)
- Aiv 3396—Advanced Conventional Aircraft Operations (1 cr)
- Aiv 3603—Aerial Application (3 cr)
- Entr 2200—Introduction to Entrepreneurship and Small Business (3 cr)
- GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
- GnAg 3900—Internship (2 cr)
- GnAg 3901—Post-Internship Internship Seminar (.5 cr)
- GnAg 4652—Agricultural and Natural Resources Seminar (1 cr)
- Mktg 3200—Personal Selling (3 cr)
- PIM 2573—Entomology (3 cr)
- PIM 3230—Plant Pathology (3 cr)
- Soil 1293—Soil Science (3 cr)
- SWM 3103—Meteorology (2 cr)
- Agriculture electives (7 cr)
- Open electives (12 cr)

**Aviation—Law Enforcement Aviation**

The law enforcement aviation program provides training in aviation, law enforcement, and liberal education. This program leads to possible careers as law enforcement pilots employed primarily by local, state, and federal agencies such as the U.S. Border Patrol, U.S. Customs Services, F.A.A. Inspectors, U.S. Sky Marshals, state and federal conservation offices, state, county, and local law enforcement agencies.

**Aviation—Law Enforcement Aviation B.S. Program Outcomes**

The law enforcement aviation student will:

- demonstrate competency in aeronautics;
- demonstrate oral and written communications skills appropriate for a beginning professional;
- perform group problem solving, decision making, and conflict management activities so as to function effectively in society;
- demonstrate critical thinking to analyze situations in aeronautics and law enforcement;
- be prepared to attend the peace officer’s skills training academy.

**Aviation—Law Enforcement Aviation Course Requirements (B.S.)**

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 67 credits in the major, and 8 credits in electives; 40 credits are required in upper division courses.

**Admission Requirement:** No medical or physical limitation that would prevent the student from holding a F.A.A. second class medical certificate.
Programs of Study

**Liberal Education Requirements**
See Aviation—Agricultural Aviation.

**Program 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 (1 cr)
Avia 3602—Natural Resources and Enforcement Applications (2 cr)
CrJs 1120—Criminal Justice and Society (BSU) (4 cr)
CrJs 3304—Police Process (BSU) (3 cr)
CrJs 3305—Judicial Process (BSU) (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)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
Open electives (8 cr)

After completion of the coursework, students may attend a skills session and take the Minnesota Peace Officer Standards and Training (P.O.S.T.) certification examination as coordinated by Bemidji State University.

**Aviation—Natural Resources Aviation**

The natural resources aviation program provides training in aviation, natural resources, and liberal education. This program leads to possible careers as natural resources pilots and wilderness pilots employed primarily by state and federal agencies such as the National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and State Department of Natural Resources.

Aviation—Natural Resources Aviation B.S. Program Outcomes

- demonstrate competency in aeronautics;
- apply an integrated approach to resource management that incorporates environmental, economic and social considerations;
- demonstrate the appropriate technical knowledge base and practical applications necessary for employment in the natural resource field;
- demonstrate oral and written communication skills appropriate for a beginning professional;
- perform group problem solving, decision making, and conflict management activities so as to function effectively in society;
- understand ecological and management principles that apply to wildlife, fish, forest, soil, water, and recreation resources.

**Aviation—Natural Resources Aviation Course Requirements (B.S.)**

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 70 credits in the major, and 5 credits in electives; 40 credits are required in upper division courses.

**Admission Requirement:** No medical or physical limitation that would prevent the student from holding a F.A.A. second class medical certificate.

**Liberal Education Requirements**
See Aviation—Agricultural Aviation.

**Program Requirements**

Agro 1183—Field Crops: Production Principles (3 cr)
or Hort 1010—Introduction to Horticulture (3 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 (1 cr)
Avia 3602—Natural Resources and Enforcement Applications (2 cr)
CrJs 2899/3899—Pre-Internship Seminar (.5 cr)
CrJs 3900—Internship (2 cr)
CrJs 3901—Post-Internship Internship Seminar (.5 cr)
CrJs 4480—Policing People (BSU) (3 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
GnAg 4899/5899—Pre-Internship Seminar (.5 cr)
Open electives (8 cr)

After completion of the coursework, students may attend a skills session and take the Minnesota Peace Officer Standards and Training (P.O.S.T.) certification examination as coordinated by Bemidji State University.

**Business—General**

The A.S. degree in business prepares students for transfer to an upper division baccalaureate program.

**Business—General A.S. Program Outcomes**

Graduates of the business—general A.S. program 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 prerequisite core course requirements for transition to a bachelor of science degree program.
Business—General Course Requirements (A.S.)

Degree Requirements: A minimum of 64 credits is required for graduation, at least half of which must be in liberal education courses.

Liberal education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Spreadsheet Applications (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1012—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Econ 2102—Macroeconomics (3 cr)
Liberal education electives (5 cr)
Humanities/fine arts electives (6 cr)
Math/science electives (6 cr)

Business Management

The B.S. in business management prepares students for careers in general business and industry. Students may choose between four areas of emphasis (listed below) depending upon their career interest.

Business Management B.S. Program Outcomes
Graduates of the business management program 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.

Business Management—Business Aviation

The business aviation emphasis in business management prepares students for careers in a wide variety of fields, but includes specialized courses and experiences that enhance the student’s opportunities for entry into the management of aviation enterprises. The importance of liberal education is strongly emphasized, as is a core of traditional business courses in accounting, computers, finance, marketing, and management. These courses are then complemented with aviation courses and aviation industry experience. Students graduate with the necessary tools to meet the increasingly sophisticated and technologically demanding requirements of twenty-first century business and aviation. Students who successfully complete the program and the appropriate number of flight hours and flight examinations may earn the following certifications: private pilot (F.A.A.), commercial pilot (F.A.A.), instrument rating, certified flight instructor, and multi-engine certification.

This area of emphasis is offered in collaboration with the University of North Dakota (UND) Center for Aerospace Sciences. UND Aerospace, an internationally recognized collegiate flight training center, provides aircraft, simulators, flight instructors, and aviation course materials.

Typical business aviation career opportunities include commercial pilot, air taxi and charter pilot, corporate pilot, airport manager, aviation pilot, airport manager, aviation sales representative, fixed base operation manager, and professional flight instructor.

Business Management—Business Aviation B.S. Program Outcomes
Graduates of the business management program—business aviation emphasis will
• demonstrate competency in aeronautics;
• demonstrate the use of current technology in aviation and applied business.

Business Management—Business Aviation Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 61 credits in the major, and 14 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Spreadsheet Applications (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1012—Composition II (3 cr)
Comp 2334—Technical Writing (3 cr)
or Comp 3008—Business Writing (3 cr)
Econ 2101—Microeconomics (3 cr)
Econ 2102—Macroeconomics (3 cr)
GnEd 1000—Seminar for New Students (1 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Phys 1012—Introductory Physics (4 cr)
Psi 1001—General Psychology (3 cr)
Spch 1101—Public Speaking (3 cr)
Liberal education electives (1 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements
Acct 2101—Principles of Accounting I (3 cr)
Acct 2102—Principles of Accounting II (3 cr)
GBus 3107—Legal Environment in Business (3 cr)
Mktg 3300—Principles of Marketing (3 cr)
Business/technology electives (17 cr)

Programs of Study
A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

Program Requirements
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)
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)
GBus 3107—Legal Environment in Business (3 cr)
Mgmt 3100—Managerial Finance (3 cr)
Mgmt 3200—Principles of Management (3 cr)
Mgmt 3270—Fundamentals of E-Business (3 cr)
Mgmt 3900—Internship (3 cr)
Mktg 3300—Principles of Marketing (3 cr)
Mktg 3360—Global Business (3 cr)
CA electives (select 3 credits from the following): CA 1010—Introduction to Computer Technology (1 cr)
CA 1015—Word Processing Applications (1 cr)
CA 1030—Presentation Graphics (1 cr)
CA 1040—Web Site Development (1 cr)
CA 1050—Web Site Graphics (1 cr)
CA 1060—Database Management Applications (2 cr)
CA 1070—Desktop Publishing (2 cr)
CA 1099—Emerging Applications (1 cr)
Business/technology electives (15 cr)
Open electives (12 cr)
Program Requirements

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 3100—Managerial Finance (3 cr)
Mgmt 3200—Principles of Management (3 cr)
Mgmt 3270—Fundamentals of E-Business (3 cr)
Mgmt 3900—Internship (3 cr)
Mktg 3200—Personal Selling (3 cr)
Mktg 3250—Promotional Strategies (3 cr)
Mktg 3300—Principles of Marketing (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)

CA electives (select 3 credits from the following):
CA 1011—Introduction to Computer Concepts (1 cr)
CA 1015—Word Processing Applications (1 cr)
CA 1030—Presentation Graphics (1 cr)
CA 1040—Web Site Development (1 cr)
CA 1050—Web Site Graphics (1 cr)
CA 1060—Database Management Applications (2 cr)
CA 1070—Desktop Publishing (2 cr)
CA 1099—Emerging Applications (1 cr)
Business/technology electives (15 cr)
Open electives (12 cr)

Business Management—Marketing

A marketing emphasis in business management prepares students for career fields in marketing. The program emphasizes a consumer orientation and focuses on researching, identifying, market segmenting, and satisfying the consumer. The program also highlights global issues, creativity, competition, and consumer psychology. Career fields for this emphasis may include advertising, research, sales, distribution, purchasing, or product management.

Business Management—Marketing B.S.

Program Outcomes

Graduates of the business management program—marketing emphasis will

• understand the importance of having a consumer orientation and demonstrate how to effectively establish and develop business relationships;
• be aware of technological and global developments that are changing the scope of the marketing discipline.

Business Management—Marketing Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

See Business Management—Entrepreneurship and Small Business Management.

Program Requirements

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 3100—Managerial Finance (3 cr)
Mgmt 3200—Principles of Management (3 cr)
Mgmt 3270—Fundamentals of E-Business (3 cr)
Mgmt 3900—Internship (3 cr)
Mktg 3200—Personal Selling (3 cr)
Mktg 3250—Promotional Strategies (3 cr)
Mktg 3300—Principles of Marketing (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)

CA electives (select 3 credits from the following):
CA 1011—Introduction to Computer Concepts (1 cr)
CA 1015—Word Processing Applications (1 cr)
CA 1030—Presentation Graphics (1 cr)
CA 1040—Web Site Development (1 cr)
CA 1050—Web Site Graphics (1 cr)
CA 1060—Database Management Applications (2 cr)
CA 1070—Desktop Publishing (2 cr)
CA 1099—Emerging Applications (1 cr)
Business/technology electives (15 cr)
Open electives (12 cr)

Business Management Minor

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

• Any student—regardless of area of emphasis—can earn a business management minor.
• 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 workers skilled in management, marketing, and small business continues to grow at a fast pace.

Course Requirements (21 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)

Plus 9 credits from ONE cluster:

Management Cluster

Mgmt 3210—Supervision and Leadership (3 cr)
Mgmt 3250—Operations Management (3 cr)
Mktg 3200—Personal Selling (3 cr)
or Mgmt 4200—Project Management (3 cr)

Marketing Cluster

Mktg 3250—Promotional Strategies (3 cr)
Mktg 3360—Global Business (3 cr)
Mktg 4200—Marketing Research (3 cr)
or Mktg 3310—Buyer Behavior (3 cr)
Entrepreneurship Cluster
Entr 2200—Introduction to Entrepreneurship and Small Business (3 cr)
Entr 3200—Business Plan Development (3 cr)
Choose one of the following:
Entr 3400—Entrepreneurial and Small Business Finance (3 cr)
or Entr 4100—International Entrepreneurship (3 cr)

Coaching Minor
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.

• 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.
• Since 1997, Minnesota does not require a teaching or coaching license to coach high school athletics.
• The coaching minor gives those students interested in coaching more marketability for coaching positions.
• Any student, regardless of major, can earn a coaching minor.

Course Requirements (18 cr)
Biol 1464—Human Anatomy and Physiology I (3 cr)
SRM 1050—Officiating Team Sports (3 cr)
SRM 2000—Prevention and Care of Athletic Injuries (3 cr)
SRM 2100—Psychology of Sport (3 cr)
SRM 3010—Topics in Coaching (select at least one: basketball, baseball, football, hockey, soccer, softball, volleyball) (2 cr)
SRM 3020—Coaching Practicum (1 cr)
SRM 3320—Exercise Physiology (3 cr)

Communication
Communication graduates find or create jobs in all sectors of the economy and in multiple levels of organizations. Graduates can expect to find or to create jobs in corporate e-learning, health management, general corporate management, marketing, public relations, sports information, or in fields requiring technical writing skills. Communication graduates also may hold jobs as corporate mediators and negotiators, editors, newsletter editors, political campaign leaders, public affairs officers, public information officers, speech writers, and Web site designers. According to the Minnesota Career Information System (2002), the major employers of graduates with communication degrees are management and public relations firms, colleges and universities, and state and local government agencies.

Communication B.S. Program Outcomes
• Demonstrate proficiencies in applying theory, listening, reading, speaking, and writing in the profession;
• Demonstrate technology proficiencies in computer applications, including graphic design and Web page development;
• 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.

Communication Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 45 credits required in the major, 9 credits required in communication electives, 9 credits required in a technology sequence and 12 open electives; 40 credits are required in upper division courses.

Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Spch 1101—Public Speaking (3 cr)
CA elective (2 cr)
Communication elective (3 cr)
Liberal education electives (6 cr)
Humanities electives (6 cr) (from at least two departments)
Math/science electives (12 cr) (at least 3 cr math and 3 cr lab science)
Social science electives (6 cr) (from at least two departments)

Program Requirements
Comm 3000—Communication Theory (3 cr)
Comm 3258—Research Methods in Communication (3 cr)
Comm 3900—Internship (3-6 cr)
Comp 3303—Writing in Your Profession (3 cr)
Spch 3001—Communication in Human Relationships (3 cr)
Spch 3431—Persuasion (3 cr)
Spch 3704—Business and Professional Speaking (3 cr)
Spch 4703—Communication Ethics (3 cr)
Spch 4704—Organizational Communication (3 cr)
Communication electives (9 cr)
Concentration area electives (18 cr)
Technology electives (9 cr)

Computer Software Technology

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 named 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.

Computer Software Technology B.S. Program Outcomes

Computer software technology 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.

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 42 credits are required in liberal education, 60 credits in the major, and 18 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Hum 3110—Culture and Technology (3 cr)
Math 1150—Elementary Statistics (3 cr)

Math 1271—Calculus I (4 cr)
Phil 1001—Introduction to Philosophy (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Psy 1001—General Psychology (3 cr)
Spch 1101—Public Speaking (3 cr)
Human Diversity electives (3 cr)
CA electives (2 cr)

Program Requirements

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)

Open electives 18 credits (suggested electives based on career interests)

Financial and E-Commerce Systems

Acct 2101—Principles of Accounting I (3 cr)
ITM 3215—Information Assurance and Systems Security (3 cr)
Mgmt 3100—Managerial Finance (3 cr)
Mgmt 3270—Fundamentals of E-Business (3 cr)

Network-Centric Systems

ITM 3120—Messaging Systems (3 cr)
ITM 3145—HTML/XML (3 cr)
ITM 3200—Internet Standards and Protocols-TCP/IP (3 cr)
ITM 3215—Information Assurance and Systems Security (3 cr)

Dietetic Technician

The dietetic technician 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.

Dietetic Technician A.A.S. Program Outcomes

The graduate 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 and will be able to

• 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 foodservice director in a health care or institutional setting;

Spch 1101—Public Speaking (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Phil 1001—Introduction to Philosophy (3 cr)
Liberal Education Requirements
• practice the clinical and communication skills
needed of a dietetic technician in a hospital,
nursing home, or in the community setting;
• demonstrate abilities in critical thinking, problem
solving and self-assessment needed to maintain
competency as a dietetic professional.

**Dietetic Technician Course Requirements**

(A.A.S.)

Degree Requirements: A total of 75 credits is
required for graduation. Of this total, 30 credits
are required in liberal education and 45 credits in
dietetics.

**Liberal Education Requirements**

Biol 1464—Human Anatomy and Physiology I (3 cr)
Biol 1474—Human Anatomy and Physiology II (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Psy 1001—General Psychology (3 cr)
CA electives (2 cr)
Chemistry electives (4 cr)
Math electives (3 cr)
Social science electives (3 cr)
Liberal education electives (2 cr)

**Program Requirements**

FScN 1123—Fundamentals of Nutrition (3 cr)
FScN 1273—Medical Nutrition Therapy (4 cr)
FScN 1313—Life Cycle Nutrition (3 cr)
FScN 1654—Nutrition Care: Principles and Practices (3 cr)
FScN 1999—Dietetic Practicum (6 cr)
FScN 3203—Community Nutrition (3 cr)
FScN 3211—Professional Issues in Dietetics (1 cr)
FScN 3310—Elements of Food Science (3 cr)
FScN 3900—Internship (2 cr)
HR1 1111—Introduction to Food Preparation (3 cr)
HR1 1112—Sanitation and Safety (2 cr)
HR1 2124—Quantity Foods Systems Management (4 cr)
HSM 1010—Medical Terminology (2 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
HR1 elective (3 cr)

**Early Childhood Education**

(A collaborative baccalaureate degree and teacher
licensure program with Bemidji State University;
policies for admission to this teacher education
program are available from the early childhood
education program manager.)

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 must
be competent to meet the developmental needs of
children and families and the programming needs of
a high-quality early childhood education program.

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. All majors must be
admitted into the teacher education program prior
to enrollment in the first education course (Ed 3100)
and they must maintain a 2.50 GPA to continue
enrollment in ECE and Ed courses. All majors will	take required courses in the four academic core
areas. These courses and their required clinical
teaching experiences will prepare graduates to
design, implement, and evaluate developmentally
appropriate learning experiences for young children
in early childhood settings, to collaborate with
families, to effectively manage resources (human,
fiscal, physical), and to communicate with the
community.

Students who wish to finish their teacher licensure
within their degree program, or who wish to teach
in public school classrooms with kindergarten
through third grade, will need to complete the
primary education emphasis. Students who wish to
increase their academic preparation for supervisory,
management, and/or leadership roles in the field may
choose the program management emphasis.

**Early Childhood Education B.S. Program**

Outcomes

Graduates of the program in early childhood
education will be able to

• describe how children differ in their development
and approach to learning; and apply this
knowledge to create environments that are
healthy, respectful, supportive, and challenging;

• build positive caregiving relationships, understand
the unique developmental milestones; describe a
wide array of effective strategies for developing an
appropriate learning environment; and use their
knowledge and critical thinking skills to design,
implement, and evaluate experiences that promote
positive development and learning for all infants
and toddlers;

• establish physically and psychologically safe and
healthy learning environments; devise a wide
array of effective approaches, strategies, and
tools to support young children’s development
and learning; understand the essential concepts,
inquiry tools, and structure of content areas; and
use critical thinking skills to design, implement,
and evaluate meaningful, challenging, and
comprehensive developmental and learning
outcomes for preprimary-aged children;

• plan, design, and implement developmentally
appropriate learning experiences; and use the
central concepts and tools of inquiry for teaching
language and literacy, mathematics, science,
social studies, visual and performing arts, health
and physical education;

• use communication skills to effectively establish
and maintain positive, respectful, collaborative
relationships that support, involve, and empower
families in their child’s development and learning;

• plan and individualize curriculum and teaching
practices and use critical thinking as they
interpret and plan for the use of assessment results
in a responsible manner;

• communicate their understanding of the
foundations of early childhood education and
the effects of societal conditions on children and
families, identify and use ethical guidelines and
other professional standards in their practice;
and engage in reflective practice and professional

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**Programs of Study**
development as informed advocates for sound educational practices and policies;
• articulate a philosophy and rationale for decisions, work effectively with others, carry out management tasks associated with planning, organizing, staffing, leading, monitoring and controlling for quality, and engage in reflective practice as they evaluate the effects of their choices and actions on others, as a basis for program planning and modification.

Early Childhood Education Course
Requirements (B.S.)

Degree Requirements: A total of 123 credits is required for graduation with the primary education emphasis and required for completion of teacher licensure; a total of 120 credits is required for graduation with the program management emphasis. Of these totals, 40 credits are required in liberal education, 3 credits in computer applications, 53 credits in the major program core, and 24–27 credits in the major emphasis; 40 credits are required in upper division courses.

Liberal Education Requirements
Art 2000—Elementary Art (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
ECE 2100—Child Development and Learning (3 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Communication electives (3 cr)
Liberal education electives (6 cr)
Math/natural science electives (12 cr) (at least 3 cr math and 3 cr lab science)
Social science electives (6 cr) (from at least two departments)

Program Requirements

Education Core (8 cr, both emphases)
Ed 3100—Introduction to the Foundations of Education (BSU) (3 cr)
Ed 3110—Educational Psychology (BSU) (3 cr)
EdHD 5009—Human Relations: Applied Skills for School and Society (UMTC) (1 cr)
PubH 5003—Fundamentals of Alcohol and Drug Abuse (UMTC) (1 cr)

Early Childhood and Family Core (15 cr, both emphases)
ECE 3500—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)

Infant and Toddler Education (13 cr, both emphases)
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 (17 cr, both emphases)
ECE 4700—Developmentally Appropriate Preprimary Education I (3 cr)
ECE 4902—Developmentally Appropriate Preprimary Education II (3 cr)
ECE 4811—Preprimary Student Teaching I (4 cr)
ECE 4812—Preprimary Student Teaching II (4 cr)
Ed 3677—Relations and Management in Early Childhood Education (BSU) (3 cr)

Primary Education Emphasis Requirements
(27 cr; completes course requirements for Board of Teaching licensure)
Ed 3201—Language Arts in the Primary Grades (3 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 Teachers (BSU) (3 cr)
Mus 3604—Music Methods and Materials for Children (3 cr)

Program Management Emphasis Requirements
(24 cr; without Board of Teaching licensure)
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)
Adviser approved electives (4 cr)
Open electives (5 cr)

Equine Industries Management

Equine industries management graduates will understand and be able to meet the daily care, nutrition, health care, and exercise/training needs of horses in their care. They will have the knowledge, experience, and skills necessary to succeed in equine or equine-related employment and will have the business and management competencies necessary to operate an equine or related business. Equine industries management career positions include managing boarding/breeding/training facilities; trainer/instructor; sales representative for feed, pharmaceutical, tack, or other equine-related support industries; and manager and marketer for breed associations, race tracks, or other venues and facilities.

While earning a degree, students can also be fulfilling the requirements for the newly designed pre-veterinary curriculum. Details on the pre-veterinary program curriculum requirements can be found on page 52 of this catalog under Health Sciences—Pre-Veterinary Medicine.
Equine Industries Management B.S. Program Outcomes

Equine industries management 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.

Equine Industries Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 61 credits in the major, and 14 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements
Biol 1009—General Biology (4 cr)
Biol 3022—Principles of Genetics (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
or Chem 1021—Chemical Principles I (4 cr)
Chem 1401—Elementary Biochemistry (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements
AgEc 3540—Farm Business Management (4 cr)
AgEc 4750—Agribusiness Marketing (3 cr)
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)
EqSc 1202—Equine Evaluation (2 cr)
Six credits required from the following:
EqSc 1000—Light Horse Driving (2 cr)
or EqSc 1100—Western Equitation (3 cr)
or EqSc 1200—Hunt Seat and Dressage Equitation (3 cr)
or EqSc 1300—Saddle Seat Equitation (3 cr)
or EqSc 3441—Topics in Advanced Western Equitation (1.5 cr)
or EqSc 3443—Topics in Advanced Equitation Over Fences (1.5 cr)
EqSc 2102—Horse Production (4 cr)
EqSc 3305—Equine Reproductive Techniques (3 cr)
EqSc 3403—Equine Exercise Physiology (3 cr)
EqSc 3413—Horse Training and Showing (3 cr)
EqSc 4102—Equine Management (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
GBus 3107—Legal Environment in Business (3 cr)
Agriculture elective (3 cr)
Open electives (9 cr)

Golf Facilities and Turf Systems

Professional golf course managers and turf specialists 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 beautiful and functional turfgrass environments. Extensive coursework in plant science, horticulture, and turf systems helps students develop technical skills. Complementary courses in recreation management and human relations skills provide background for managing employees and customers.

Student learning blends hands-on with high-tech in a practical, career-oriented environment. Internships may be completed at golf courses, business complexes and office parks, public recreation areas, or with industry suppliers.

Graduates will hold positions such as golf course manager or superintendent, landscape or grounds manager or supervisor, sales or marketing representative, scientist, and turf specialist.

Golf Facilities and Turf Systems B.S. Program Outcomes

Graduates of the golf facilities and turf systems program will
• demonstrate competencies in turfgrass systems management;
• understand the use of integrated pest management and resource preservation;
• demonstrate an awareness of the need for continuing professional development;
A total of 120 credits is required for graduation. Of this total, 48 credits are required in liberal education, 61 credits in the major, and 11 credits in electives; 45 credits are required in upper division courses.

**Liberal Education Requirements**

- **Biol 1009**—General Biology (4 cr)
- **Biol 2022**—General Botany (3 cr)
- **Biol 3131**—Plant Physiology (3 cr)
- **CA 1010**—Introduction to Computer Technology (1 cr)
- **Chem 1401**—Elementary Biochemistry (4 cr)
- **Comp 1011**—Composition I (3 cr)
- **Comp 1013**—Composition II (3 cr)
- **Econ 2101**—Microeconomics (3 cr)
- **Math 1031**—College Algebra (3 cr)
- **or Math 1150**—Elementary Statistics (3 cr)
- **Psy 1001**—General Psychology (3 cr)
- **Spch 1101**—Public Speaking (3 cr)
- **Spch 3431**—Persuasion (3 cr)
- **Comp 3008**—Business Writing (3 cr)
- **or Comp 3303**—Writing in Your Profession (3 cr)
- **CA electives (2 cr)
- **Humanities electives (6 cr) (from two different departments)**

**Program Requirements**

- **Agro 3640**—Weed Science (3 cr)
- **GFTS 3072**—Principles of Turf Management (3 cr)
- **GFTS 3074**—Turfgrass Management Systems (3 cr)
- **GFTS 3076**—Turfgrass Management Systems (3 cr)
- **GFTS 3077**—Turf and Landscape Irrigation Design and Installation (2 cr)
- **GnAg 2899/3899**—Pre-Internship Seminar (.5 cr)
- **GnAg 3900**—Internship (2 cr)
- **GnAg 3901**—Post-Internship Internship Seminar (.5 cr)
- **GnAg 4652**—Agricultural and Natural Resources Seminar (1 cr)
- **Hort 1010**—Introduction to Horticulture (3 cr)
- **Hort 1021**—Woody Plant Materials (4 cr)
- **Hort 3040**—Commercial Landscape Design and Grounds Maintenance (4 cr)
- **Mgmt 3210**—Supervision and Leadership (3 cr)
- **Mgmt 3220**—Principles of Management (3 cr)
- **Mgmt 3250**—Operations Management (3 cr)
- **NatR 3344**—Land Use Planning (3 cr)
- **NatR 3360**—Geographic Information Systems (4 cr)
- **Span 1204**—Beginning Spanish II (4 cr)
- **GFTS 3000**—Foundations of Sport and Recreation Management (3 cr)
- **SRM 3003**—Facilities and Equipment Management (3 cr)
- **SWM 3225**—Watershed Management (3 cr)
- **Open electives (11 cr)**

### Programs of Study

**Health Management**

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.

**Health Management B.S. Program Outcomes**

Health management 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.

**Health Management Course Requirements (B.S.)**

**Degree Requirements**: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 58 credits in the major, and 17 credits in electives; 40 credits are required in upper division courses.

**Liberal Education Requirements**

- **Biol 1464**—Human Anatomy and Physiology I (3 cr)
- **Biol 1474**—Human Anatomy and Physiology II (3 cr)
- **CA 1010**—Introduction to Computer Technology (1 cr)
- **Comp 1011**—Composition I (3 cr)
- **Comp 1013**—Composition II (3 cr)
- **Econ 2101**—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)  
or Math 1150—Elementary Statistics (3 cr)  
Psy 1001—General Psychology (3 cr)  
Spch 1101—Public Speaking (3 cr)  
CA electives (2 cr)  
Communication electives (3 cr)  
Liberal education electives (6 cr)  
Humanities electives (6 cr) (from two different departments)  
Math/natural science electives (3 cr)  

Program Requirements

Accounting I (3 cr)  
Accounting II (3 cr)  
Spreadsheet Applications (2 cr)  
Database Management Applications (2 cr)  
Medical Terminology (2 cr)  
Introduction to Health Services Organizations (2 cr)  
Quality Improvement and Risk Management (3 cr)  
Health Care and Medical Needs (2 cr)  
Essentials of Managed Care (3 cr)  
Health Management Information Systems (3 cr)  
Health Care Leadership and Planning (3 cr)  
Administration of Continuum Care Facilities (3 cr)  
Health Care Policy and Comparative Systems (3 cr)  
Internship (3 cr)  
Health Care Finance (3 cr)  
Health Care Law and Biomedical Ethics (3 cr)  
Health Care Leadership and Planning (3 cr)  
Regulatory Management (3 cr)  
Principles of Management (3 cr)  
Supervision and Leadership (3 cr)  
Human Resource Management (3 cr)  
Principles of Marketing (3 cr)  
Open electives (17 cr)  

Health Sciences

The B.S. in health sciences provides students with the prerequisite knowledge and skills required for admission to professional programs in chiropractic, dentistry, medicine, occupational therapy, pharmacy, physical therapy, and veterinary medicine. 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. Students who plan on applying to schools of veterinary medicine may wish to combine the pre-veterinary medical course requirements with either the animal industries management or equine industries management program.

Health Sciences—Pre-Professional Track

B.S. Program Outcomes

The primary goal for the pre-professional curriculum is to prepare graduates for successful admission to a professional program—usually medicine, and for working cooperatively with others as a member of the health care delivery team. Therefore, the graduate will demonstrate the following outcomes:

- communicate effectively—both orally and in writing in a variety of settings and media;  
- work cooperatively as a member of a team within the health care delivery system;  
- apply analytical and critical thinking skills to professional problems and issues;  
- demonstrate competence in scientific and mathematical skills;  
- use information technology appropriately in professional practice settings;  
- apply content related to diversity of groups (e.g., age, gender, race-ethnicity) to one’s study and practice in the health care delivery system;  
- apply knowledge from the social sciences, humanities, and health service management to their practice in the health care delivery system.

Health Sciences: Pre-Professional Track

Course Requirements (B.S.)

Degree Requirements: A total of 120 credits are required for graduation. Of this total, 45 credits are required in liberal education, 53 credits in the major, and 22 credits in electives, 5 of which must be upper division credits; 40 credits are required in upper division courses.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)  
Biol 3022—Genetics (3 cr)  
CA 1010—Introduction to Computer Technology (1 cr)  
Comp 1011—Composition I (3 cr)  
Comp 1013—Composition II (3 cr)  
Comp 3303—Writing in Your Profession (3 cr)  
Hum 3310—Culture and Technology (3 cr)  
Math 1271—Calculus I (4 cr)  
Phil 1001—Introduction to Philosophy (3 cr)  
Phys 1101—Introductory College Physics I (4 cr)  
Psy 1001—General Psychology (3 cr)  
Soc 1102—Cultural Anthropology (3 cr)  
Spc 1101—Public Speaking (3 cr)  
Computer application electives (2 cr)  
Mathematical/scientific thinking electives (3 cr)  

Program Requirements

Chem 1021—Chemical Principles I (4 cr)  
Chem 1022—Chemical Principles II (4 cr)  
HSci 3900—Internship (3 cr)  
HSM 2010—Introduction to Health Service Organizations (2 cr)  
HSM 3020—Quality Improvement and Risk Management (3 cr)  
HSM 3200—Health Care and Medical Needs (2 cr)  
HSM 3200—Health Care Leadership and Planning (3 cr)  
HSM 3240—Health Care Policy and Comparative Systems (3 cr)  
HSM 4212—Regulatory Management (3 cr)  
HSM 4212—Regulatory Management (3 cr)  
Human Resources Management (3 cr)  
Human Resources Management (3 cr)  
Principles of Business Administration (3 cr)  
Upper division electives (5 cr)  

Open electives (17 cr)
Health Sciences—Pre-Medicine Track

Course Requirements

The courses below reflect the prerequisite courses for the University of Minnesota Medical School. Applicants to the University of Minnesota Medical School program must have completed a baccalaureate degree prior to enrollment.

Other medical schools may have requirements that are somewhat different from the University of Minnesota’s. Students are advised to contact the medical school program(s) to which they are applying to identify any additional course requirements, test requirements such as the Medical College Aptitude Test (MCAT), interviews, or other prerequisites.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)
Biol 2012—General Zoology (3 cr)
Biol 3022—Genetics (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Hum 3310—Culture and Technology (3 cr)
Lit 3001—World Literature (3 cr) in lieu of Comp 3303—Writing in your Profession (3 cr)
Math 1271—Calculus I (4 cr)
Phys 1001—Introduction to Philosophy (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)
Soc 1102—Cultural Anthropology (3 cr)
Spch 1101—Public Speaking (3 cr)
Computer applications elective (3 cr)

Program Requirements

Biol 2032—General Microbiology (4 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
Chem 2301—Elementary Organic Chemistry I (3 cr)
Chem 2310—Elementary Organic Chemistry I Lab (2 cr)
Chem 2302—Elementary Organic Chemistry II (3 cr)
Chem 2311—Elementary Organic Chemistry II Lab (2 cr)
Chem 3021—Biochemistry (3 cr)
HSci 3900—Internship (3 cr)
HSM 2010—Introduction to Health Services Organizations (2 cr)
HSM 3030—Health Care and Medical Needs (2 cr)
HSM 3200—Health Care Leadership and Planning (3 cr)
HSM 3240—Health Care Policy and Comparative Systems (3 cr)
HSM 4212—Regulatory Management (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Math 1250—Precalculus (4 cr)
Phil 3003—Applied Ethics (3 cr)
Phys 1102—Introductory College Physics II (4 cr)
Psy 1093—Developmental Psychology (3 cr)
Psych 3001—Abnormal Psychology (3 cr)
Soc 1102—Cultural Anthropology (3 cr)
Soc 3937—Social Gerontology (3 cr)
Electives (14 cr)
Upper division electives (5 cr)

Health Sciences—Pre-Chiropractic Track

Course Requirements

The Council on Chiropractic Education (CCE) has specified prerequisite courses for admission to accredited programs in chiropractic medicine. (The January 2003 standards containing these prerequisites can be found on the CCE Web site at www.cce-usa.org.) The CCE requirements, along with suggested UMC courses that will fulfill these requirements, are shown below. Individual programs of chiropractic medicine may have additional requirements; students are advised to contact the program(s) to which they may be applying to identify the specific admission requirements for that program.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)
Biol 1464—Human Anatomy and Physiology I (3 cr)
Biol 3022—Genetics (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Hum 3310—Culture and Technology (3 cr)
Math 1271—Calculus I (4 cr)
Phil 1001—Introduction to Philosophy (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Psy 1001—General Psychology (3 cr)
Soc 1001—Introduction to Sociology (3 cr)
Soc 1102—Cultural Anthropology (3 cr)
Spch 1101—Public Speaking (3 cr)
Computer applications elective (2 cr)

Program Requirements

Biol 1474—Human Anatomy and Physiology II (3 cr)
Chem 1021—Chemical Principles I (4 cr)
Chem 1022—Chemical Principles II (4 cr)
HSci 3900—Internship (3 cr)
HSM 2010—Introduction to Health Services Organizations (2 cr)
HSM 3020—Quality Improvement and Risk Management (3 cr)
HSM 3030—Health Care and Medical Needs (2 cr)
HSM 3200—Health Care Leadership and Planning (3 cr)
HSM 3240—Health Care Policy and Comparative Systems (3 cr)
HSM 4212—Regulatory Management (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Math 1250—Precalculus (4 cr)
Phil 3003—Applied Ethics (3 cr)
Phys 1102—Introductory College Physics II (4 cr)
Psy 1093—Developmental Psychology (3 cr)
Psy 3604—Abnormal Psychology (3 cr)
Soc 1102—Cultural Anthropology (3 cr)
Soc 3937—Social Gerontology; Elders in American Society (3 cr)
Electives (14 cr)
Upper division electives (5 cr)

Health Sciences—Pre-Dentistry Track

Course Requirements

Listed below are courses often included as admission requirements for programs in dentistry. Because not all schools have the same admission requirements,
students are advised to contact the dental schools to which they plan to apply to determine specific course and admission requirements.

**Required Courses**

- Biol 1009—General Biology (4 cr)
- Biol 1022—General Zoology (3 cr)
- Chem 1021—Chemical Principles I (4 cr)
- Chem 1022—Chemical Principles II (4 cr)
- Chem 2301—Elementary Organic Chemistry I (3 cr)
- Chem 2310—Elementary Organic Chemistry I Lab (2 cr)
- Chem 2302—Elementary Organic Chemistry II (3 cr)
- Chem 2311—Elementary Organic Chemistry II Lab (2 cr)
- Comp 1011—Composition I (3 cr)
- Comp 1013—Composition II (3 cr)
- Math 1031—College Algebra (3 cr)
  or Math 1150—Elementary Statistics (3 cr)
  or Math 1250—Precalculus (4 cr)
- Phys 1101—Introductory College Physics I (4 cr)
- Phys 1102—Introductory College Physics II (4 cr)
- Psy 1001—General Psychology (3 cr)
- Spch 1101—Public Speaking (3 cr)

**Electives**

*The following elective credits are recommended*

- Biol 1464—Human Anatomy and Physiology I (3 cr)
- Biol 1474—Human Anatomy and Physiology II (3 cr)
- Biol 2032—General Microbiology (4 cr)
- Biol 3022—Genetics (3 cr)
- Chem 1021—Chemical Principles I (3 cr)
- Chem 2301—Elementary Organic Chemistry I (3 cr)
- Chem 2310—Elementary Organic Chemistry I Lab (2 cr)
- Chem 2311—Elementary Organic Chemistry II (3 cr)
- Chem 2312—Elementary Organic Chemistry II Lab (2 cr)
- Comp 1011—Composition I (2 cr)
- Comp 1013—Composition II (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Math 1031—College Algebra and Analytic Geometry (3 cr)
- Math 1250—Precalculus (4 cr)
- Math 1271—Calculus I (4 cr)
- Phys 1101—Introductory College Physics I (4 cr)
- Phys 1102—Introductory College Physics II (4 cr)
- Psy 1001—General Psychology (3 cr)
  or Psy 1093—Developmental Psychology (3 cr)
- Soc 1001—Introduction to Sociology (3 cr)
  or Soc 1002—Sociology (3 cr)
- Soc 1102—Cultural Anthropology (3 cr)
- Soc 3937—Social Gerontology (3 cr)
- Art elective (3) (Studio lab course)
- Communications elective (3 cr)
- Computer applications elective(s) (2 cr)

**Health Sciences—Pre-Occupational Therapy Track Course Requirements**

Students who want to apply for a program in occupational therapy can complete the prerequisite courses as a part of several UMC degree programs. The courses listed below are required for admission to many occupational therapy programs. Students should check with those schools to be sure they have completed the appropriate prerequisite coursework and any remaining admission requirements. Some programs in occupational therapy allow a student to transfer without having completed a baccalaureate degree.

**Required Courses**

- PMed 1003—Orientation to Occupational Therapy (1 cr) (Offered IDL via UMTC)
- Art 1152—Drawing and Design (3 cr) (Must take as 3 credit studio course)
  or Art 1252—Color and Design (3 cr) (Must take as 3 credit studio course)
  or Art 1352—Art Design and Techniques (3 cr) (Must take as 3 credit studio course)
- Biol 1464—Human Anatomy and Physiology I (3 cr)
- Biol 1474—Human Anatomy and Physiology II (3 cr)
- HSM 1001—Medical Terminology (2 cr)
- Math 1150—Elementary Statistics (3 cr)
- Psy 1001—General Psychology (3 cr)

**Health Sciences—Pre-Pharmacy Track Course Requirements**

The following courses reflect the prerequisites for the University of Minnesota College of Pharmacy. Students are advised to contact the College of Pharmacy regarding other admission requirements. Students who plan on applying to other programs in pharmacy are advised to consult the program(s) for the specific requirements. Students who wish to complete a baccalaureate degree at UMC will need to complete the 45 credits of liberal education in addition to the remaining requirements for the degree they are seeking.

**Required Courses**

- Biol 1009—General Biology (4 cr)
- Biol 1464—Human Anatomy and Physiology I (3 cr)
- Biol 1474—Human Anatomy and Physiology II (3 cr)
- Biol 2032—General Microbiology (4 cr)
- Chem 1021—Chemical Principles I (4 cr)
- Chem 1022—Chemical Principles II (4 cr)
- Chem 2301—Elementary Organic Chemistry I (3 cr)
- Chem 2310—Elementary Organic Chemistry I Lab (2 cr)
- Chem 2311—Elementary Organic Chemistry II (3 cr)
- Chem 2312—Elementary Organic Chemistry II Lab (2 cr)
- Comp 1011—Composition I (2 cr)
- Comp 1013—Composition II (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Math 1031—College Algebra and Analytic Geometry (3 cr)
- Math 1250—Precalculus (4 cr)
- Math 1271—Calculus I (4 cr)
- Phys 1101—Introductory College Physics I (4 cr)
- Phys 1102—Introductory College Physics II (4 cr)
- Psy 1001—General Psychology (3 cr)
  or Psy 1093—Developmental Psychology (3 cr)
- Soc 1001—Introduction to Sociology (3 cr)
  or Soc 1102—Cultural Anthropology (3 cr)
- Soc 3937—Social Gerontology (3 cr)
- Spch 1101—Public Speaking (3 cr)
- Liberal education electives (non-science, non-mathematics, non-professional) (12 cr)

**Health Sciences—Pre-Veterinary Medicine Track Course Requirements**

The pre-veterinary medicine track at UMC reflects the prerequisite courses for the University of Minnesota College of Veterinary Medicine. Students are advised to contact the College of Veterinary Medicine Admissions Office for any other admission requirements. Students who plan on applying to other programs in veterinary medicine are advised to consult the program(s) for the specific prerequisite courses and other admission requirements. Because of the competitive nature of programs in veterinary medicine, students are advised to enroll in a degree program in a related field, such as animal industries management or equine industries management and to consult with one of their advisers. Students who wish to complete a baccalaureate degree at UMC need to complete the 45 credits of liberal education in addition to the remaining requirements for the degree they are seeking.

**Required Courses**

- Biol 1009—General Biology (4 cr)
- Biol 1464—Human Anatomy and Physiology I (3 cr)
- Biol 1474—Human Anatomy and Physiology II (3 cr)
- Biol 2032—General Microbiology (4 cr)
- Chem 1021—Chemical Principles I (4 cr)
- Chem 1022—Chemical Principles II (4 cr)
- Chem 2301—Elementary Organic Chemistry I (3 cr)
- Chem 2310—Elementary Organic Chemistry I Lab (2 cr)
- Chem 2311—Elementary Organic Chemistry II (3 cr)
- Chem 2312—Elementary Organic Chemistry II Lab (2 cr)
- Comp 1011—Composition I (2 cr)
- Comp 1013—Composition II (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Math 1031—College Algebra and Analytic Geometry (3 cr)
- Math 1250—Precalculus (4 cr)
- Math 1271—Calculus I (4 cr)
- Phys 1101—Introductory College Physics I (4 cr)
- Phys 1102—Introductory College Physics II (4 cr)
- Psy 1001—General Psychology (3 cr)
  or Psy 1093—Developmental Psychology (3 cr)
- Soc 1001—Introduction to Sociology (3 cr)
  or Soc 1102—Cultural Anthropology (3 cr)
- Soc 3937—Social Gerontology (3 cr)
- Spch 1101—Public Speaking (3 cr)
- Liberal education electives (non-science, non-mathematics, non-professional) (12 cr)
Horticulture

See Plant Industries Management.

Hotel, Restaurant, and Institutional Management

The hotel, restaurant, and institutional management program prepares students to be managers in hotels, restaurants, resorts, institutional settings, and selected hospitality businesses. In addition to the hotel, restaurant, and institutional management and application coursework, the curriculum provides a solid foundation in marketing, management, computer technology, accounting, finance, business law, economics, ethics, and communication. As part of the program requirements, students participate in a national hospitality conference, which provides an excellent learning opportunity and a chance to meet potential employers. The Hospitality Association Club subsidizes conference attendance.

Hotel/restaurant management emphasis—This flexible emphasis provides both depth and breadth in the hospitality industry. Students are prepared for both front- and back-of-the-house positions in hotels, restaurants, resorts, and motels as well as for many other hospitality-related positions.

Food service administration emphasis—For students with a desire to specialize in the institutional segment of the industry, this emphasis helps prepare them for food service management positions in hospitals, colleges, nursing homes, airlines, and other food service systems management firms.

Resort/spa management emphasis—Every day people face stress, pollution, and the strains of contemporary living. Spas and resorts promote well-being by creating relaxing, natural, and exclusive environments where people can feel pampered and reenergized. Depending on the focus of the spa or resort, a program or regimen can encompass food and nutrition, fitness, meditation and relaxation, or various health-related treatments.

Hotel, Restaurant, and Institutional Management B.S. Program Outcomes

Graduates of the hotel, restaurant, and institutional management 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 hospitality systems;
- demonstrate collaboration within team settings;
- demonstrate appropriate use of technology as used in the hospitality industry.

Hotel, Restaurant, and Institutional Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 59-63 credits in the major, and 12-16 credits in electives based on emphasis; 40 credits are required in upper division courses.

Liberal Education Requirements

- CA 1010—Introduction to Computer Technology (1 cr)
- Comp 1011—Composition I (3 cr)
- Comp 1013—Composition II (3 cr)
- Comp 3303—Writing in Your Profession (3 cr)
- HRI 2231—Menu Design and Analysis (3 cr)
- HRI 3241—Hospitality Selection and Procurement (3 cr)
- HRI 1111—Introduction to Food Preparation (3 cr)
- FScN 1123—Fundamentals of Nutrition (3 cr)
- HRI 1111—Introduction to Food Preparation (3 cr)
- HRI 1112—Sanitation and Safety (2 cr)
- HRI 2214—Quantity Foods Systems Management (4 cr)
- HRI 2231—Menu Design and Analysis (3 cr)
- HRI 3241—Hospitality Selection and Procurement (3 cr)
- HRI 3900—Internship (I) (1-3 cr)
- HRI 3900—Internship (II) (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 3300—Principles of Management (3 cr)
- Mktg 3304—Principles of Marketing (3 cr)
- FScN 1654—Nutrition Care: Principles and Practices (3 cr)
- FScN 3211—Professional Issues in Dietetics (1 cr)
- FScN 3310—Elements of Food Science (3 cr)
- HRI 3311—Restaurant Operational Management (3 cr)
- HRI 3411—Facility Layout and Design (3 cr)
- Open electives (16 cr)

Program Requirements

- Acct 2101—Principles of Accounting I (3 cr)
- Acct 2102—Principles of Accounting II (3 cr)
- FScN 1123—Fundamentals of Nutrition (3 cr)
- HRI 1111—Introduction to Food Preparation (3 cr)
- HRI 1112—Sanitation and Safety (2 cr)
- HRI 2214—Quantity Foods Systems Management (4 cr)
- HRI 2231—Menu Design and Analysis (3 cr)
- HRI 3241—Hospitality Selection and Procurement (3 cr)
- HRI 3900—Internship (I) (1-3 cr)
- HRI 3900—Internship (II) (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 3300—Principles of Management (3 cr)
- Mktg 3304—Principles of Marketing (3 cr)

Food Service Administration Emphasis Requirements

- FScN 1273—Medical Nutrition Therapy (4 cr)
- FScN 1654—Nutrition Care: Principles and Practices (3 cr)
- FScN 3211—Professional Issues in Dietetics (1 cr)
- FScN 3310—Elements of Food Science (3 cr)
- HRI 3311—Restaurant Operational Management (3 cr)
- HRI 3411—Facility Layout and Design (3 cr)
- Open electives (16 cr)
Programs of Study

Hotel/Restaurant Management Emphasis
Requirements
HRI 2211—Rooms Division Management (3 cr)
HRI 3311—Restaurant Operational Management (3 cr)
HRI 3331—Global Tourism (3 cr)
HRI 3341—Hospitality Marketing and Sales (3 cr)
HRI 3411—Facility Layout and Design (3 cr)
HRI 4431—Beverage Technology (3 cr)
HRI 4441—Catering On and Off Premise (3 cr)
Open electives (12 cr)

Resort/Spa Management Emphasis Requirements
HRI 2211—Rooms Division Management (3 cr)
HRI 3341—Hospitality Marketing and Sales (3 cr)
15 credits from the following:
FScN 1273—Medical Nutrition Therapy (4 cr)
Hlth 1062—First Aid and CPR (2 cr)
Hlth 1072—Wellness (3 cr)
HRI 3311—Restaurant Operational Management (3 cr)
HRI 3331—Global Tourism (3 cr)
HRI 3411—Facility Layout and Design (3 cr)
HRI 4431—Beverage Technology (3 cr)
HRI 4441—Catering On and Off Premise (3 cr)
HSM 2010—Introduction to Health Services Organization (2 cr)
HSM 3030—Health Care and Medical Needs (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 Exercise (1 cr)
SRM 3001—Sports Nutrition (3 cr)
SRM 3003—Facility and Equipment Management (3 cr)
SRM 3320—Exercise Physiology (3 cr)
Open electives (12 cr)

Hotel, Restaurant, and Institutional Management A.A.S. Program Outcomes
Students completing the A.A.S. degree in hotel, restaurant, and institutional management will be prepared to assume supervisory or entry-level management positions in the hospitality industry. Graduates of the hotel, restaurant, and institutional management 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 hospitality systems;
• demonstrate collaboration within team settings;
• demonstrate appropriate use of technology as used in the hospitality industry.

Hotel, Restaurant, and Institutional Management Course Requirements (A.A.S.)

Degree Requirements: A total of 64 credits is required for graduation. Of this total, 21 credits are required in liberal education, 32 credits in the major, and 11 credits in electives.

Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
CA electives (2 cr)
Liberal education electives (6 cr)
Humanities/fine arts electives (3 cr)
Mathematics/science electives (3 cr)
Social science electives (3 cr)

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 3341—Hospitality Marketing and Sales (3 cr)
HRI 3900—Internship (3 cr)
HRI 4421—Hospitality Law (3 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
Select 9 credits from the following:
HRI 2124—Quantity Foods Systems Management (4 cr)
HRI 2211—Rooms Division Management (3 cr)
HRI 2231—Menu Design and Analysis (3 cr)
HRI 3331—Global Tourism (3 cr)
HRI 3411—Facility Layout and Design (3 cr)
HRI 4321—Food, Beverage, and Labor Control (3 cr)
HRI or adviser-approved electives (11 cr)

Hotel, Restaurant, and Institutional Management Certificate Program Outcomes
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 bachelors 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 hospitality systems.

Hotel, Restaurant, and Institutional Management Certificate Requirements
A total 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 3331—Global Tourism (3 cr)
HRI 3341—Hospitality Marketing and Sales (3 cr)
HRI 3421—Hospitality Law (3 cr)
Information Management

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, network, and computer skills.

Information Management A.A.S. Program Outcomes

Information management 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.

Information Management Course Requirements (A.A.S.*)

Degree Requirements: A total of 64 credits is required for graduation. Of this total, 30 credits are required in liberal education and 34 credits in the major.

Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
CA 1011—Introduction to Computer Systems Architecture (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Psy 1001—General Psychology (3 cr)
Spch 1101—Public Speaking (3 cr)
Library education electives (3 cr)
Humanities electives (3 cr)
Lab science electives (3 cr)

Program Requirements
Acc 2101—Principles of Accounting I (3 cr)
Acc 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 2060—Microcomputer Operating Systems (3 cr)
ITM 3120—Networking and Telecommunications (3 cr)
Mgmt 3200—Principles of Management (3 cr)
Business/technology electives (8 cr)

Information Technology Management

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. Students choose an area that matches their career interest.

Information Technology Management B.S. Program Outcomes

Information technology management 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.

Information Technology Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits are required for graduation. Of this total, 40 credits are required in liberal education, 54 credits in the major, and 26 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements
Biol 1009—General Biology (4 cr)
CA 1010—Introduction to Computer Technology (1 cr)
CA 1011—Introduction to Computer Systems Architecture (2 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Hum 3310—Culture and Technology (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Phil 1001—Introduction to Philosophy (3 cr)
Phys 1101—Introductory College Physics I (4 cr)
Psy 1001—General Psychology (3 cr)
Spch 1101—Public Speaking (3 cr)
Human Diversity electives (3 cr)

Program Requirements
Acc 2101—Principles of Accounting I (3 cr)
Acc 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 (3 cr)
ITM 4020—Analysis and Design of Information Systems (3 cr)
ITM 4000—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)
Open electives 26 credits (of which 12 credits must be taken in a specialization)

Application Development Specialization (12 credits)
CA 2090—Data Structures and Algorithms (3 cr)
CA 2200—Introduction to Software Engineering (3 cr)
CA 3200—Software Design and Architecture (3 cr)
ITM 3145—HTML/XML (3 cr)

Networking and Telecommunications Specialization (12 credits)
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)

Computer Applications Specialization (12 credits)
CA 1012—Application Suite Software (2 cr)
CA 1015—Word Processing Applications (2 cr)
CA 1020—Spreadsheet Applications (2 cr)
CA 1055—Animation Software Application With Flash MX (2 cr)
CA 1070—Desktop Publishing (2 cr)
CA 1080—Audio-Video Production Applications (2 cr)

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

Information Technology Management Minor Program Outcomes
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.

Information Technology Management Minor Course Requirements
A total of 18 credits is required for this minor.

Liberal Education Requirements
Courses required by the student’s major program of study.

Minor Requirements
ITM 2070—Introduction to Programming I (3 cr)
ITM 2060—Database Management Systems (3 cr)
ITM 3110—Microcomputer Operating Systems (3 cr)
Select 9 credits from the following:
ITM 2070—Introduction to Programming II (3 cr)
ITM 3120—Networking and Telecommunications (3 cr)
ITM 3130—Message 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
ITM 3215—Applied Hacking and Systems Security (3 cr)
ITM 4020—Analysis and Design of Information Systems (3 cr)

Manufacturing Management
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. Program graduates will be able to supervise a manufacturing process and manage human and mechanical resources within budgetary constraints. Graduates will also be able to set and monitor product quality.

The program is technology-focused and offers seamless progression between coursework completed at a two-year institution and coursework presented by UMC while working in industry. Students will be prepared to enter their technological field with a specific set of technical skills and will make an immediate contribution in the manufacturing industry. While working, students complete management and technological coursework to fulfill degree requirements.

The program is for two-year graduates, incoming freshmen, and working graduates in industrial and business fields who have experience in manufacturing or other business settings. Graduates with A.S. and A.A.S. qualifications are also eligible for admission.

Manufacturing Management B.M.M. Program Outcomes
Bachelor of manufacturing management graduates will be able to
• play a growing supervisory and management role in their workplace;
• 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;
• accurately and efficiently control the movement of materials;
• do a safety audit using a comprehensive approach to safety problems in the workplace, including OSHA standards, developing safety awareness, and hazard analysis.
Manufacturing Management Course Requirements (B.M.)

Degree Requirements: A total of 120 credits is required for graduation; 40 credits are required in upper division courses.

Liberal Education Requirements

- Comp 1011—Composition I (3 cr)
- Comp 1013—Composition II (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- or Math 1150—Elementary Statistics (3 cr)
- Phys 1012—Introductory Physics (4 cr)
- Spch 1101—Public Speaking (3 cr)

Program Requirements

- Accr 2101—Principles of Accounting I (3 cr)
- BM 3012—Applied Engineering Principles (3 cr)
- BM 4034—Quality Standards (3 cr)
- Comp 3303—Writing in Your Profession (3 cr)
- Mgmt 3100—Managerial Finance (3 cr)
- Mgmt 3200—Principles of Management (3 cr)
- Mgmt 3210—Supervision and Leadership (3 cr)
- Mgmt 3250—Operations Management (3 cr)
- Mktg 3300—Principles of Marketing (3 cr)
- Spch 3431—Persuasion (3 cr)

Select 13 upper division business/technology electives (13 cr)

(Recommended electives: BM 3011, BM 3804, GBus 3107, Mgmt 3100, Mgmt 3250)

Transfer credits or open electives (58 cr)

Bachelor of Manufacturing—Quality Management

The bachelor of manufacturing management degree with an emphasis in quality management prepares students for employment in the private sector as well as state and federal regulatory agencies. Quality management provides assurance to consumers that products are free of defects and will function in expected ways. It is an increasingly important priority for people, industry, and government. By ensuring that product failures are corrected at the internal level, product recalls can be avoided leading to increased profitability of the manufacturing enterprise. Taking the next step to total quality management has been proven to be a sure way to increase sales, staff morale, and profitability.

International marketing of goods produced locally is regulated by voluntary regulatory standards such as American National Standards Institute (ANSI) and International Organization for Standardization (ISO). These standards have gone beyond product performance to also address environmental issues regarding pollution caused by production in the country of origin as well as pollution caused by packaging in the country of destination.

Quality management focuses on line and middle management groups that need to track down the cause of the problem wherever it originates within production, processing, packaging, distribution, and warehousing operations. Opportunities for quality management professionals with hands-on experience of the processes that they manage are numerous and expected to grow at a faster rate than the supply of graduates.

Degree Requirements: A total of 120 credits is required for graduation; 40 credits are required in upper division courses.

Liberal Education Requirements

- Comp 1011—Composition I (3 cr)
- Comp 1013—Composition II (3 cr)
- Comm 4800—Crisis Communication (3 cr)
- or Spch 3431—Persuasion (3 cr)
- Econ 2101—Microeconomics (3 cr)
- Math 1031—College Algebra and Analytical Geometry (3 cr)
- Phys 1012—Introductory Physics (4 cr)
- Spch 1101—Public Speaking (3 cr)

Program Requirements

- Accr 2101—Principles of Accounting I (3 cr)
- 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 3012—Applied Engineering Principles (3 cr)
- BM 3034—Quality Management Systems (3 cr)
- BM 3053—Product Development Management (3 cr)
- Mgmt 3200—Principles of Management (3 cr)
- Mgmt 3210—Supervision and Leadership (3 cr)
- Mktg 3300—Principles of Marketing (3 cr)

Upper Division Electives (10 cr)

(Recommended electives: BM 3011, BM 3804, GBus 3107, Mgmt 3100, Mgmt 3250)

Transfer credits or open electives (57 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 non-credit based on the students’ background. The courses taken for the certificate program will transfer into the bachelor of manufacturing program.

Required Courses

- BM 3005—Facilities Planning and Selection (3 cr)
- BM 3011—Manufacturing Operations and Logistics (3 cr)
- BM 4034—Quality Standards (3 cr)
- Mgmt 3210—Supervision and Leadership (3 cr)

Electives (courses from two areas are strongly recommended)

- BM 3020—Industrial Safety (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)

Marketing and Management

Marketing and management prepares students for supervisory or entry-level management positions in business organizations. Marketing and management career options include retail store manager, assistant general manager, physical distribution manager, sales representative, purchasing agent, warehouse manager, and consumer service manager.
Programs of Study

Marketing and Management A.A.S. Program Outcomes
Marketing and management 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.

Marketing and Management Course Requirements (A.A.S.)
Degree Requirements: A total of 64 credits is required for graduation. Of this total, 21 credits are required in liberal education and 43 credits in the major.

Liberal Education Requirements
CA 1010—Introduction to Computer Technology (1 cr)
CA 1020—Spreadsheet Applications (2 cr)
Comp 1011—Composition I (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr) or Math 1150—Elementary Statistics (3 cr)
Psy 1001—General Psychology (3 cr)
Liberal education electives (3 cr)
Humanities/fine arts electives (3 cr)

Program Requirements
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 (3 cr)
Mktg 3250—Promotional Strategies (3 cr)
Mktg 3300—Principles of Marketing (3 cr)
Business/technology electives (16 cr)

Music Minor Outcomes
On completion of the program, students have
- developed musical interests through gaining a broader knowledge of music;
- developed vocal and/or instrumental skills for performance;
- developed an enhanced appreciation of the performing arts;
- experienced the study of music with other students interested in music;
- enhanced their ability to gain part time employment in the field of music.

Music Minor Requirements
A total of 18 credits is required.
Mus 1021—Introduction to Music (3 cr)
Mus 1111—Music Theory One (3 cr)
Mus 1121—Music Theory Two (3 cr)

Music minor electives (3 cr) chosen from the following:
Mus 1011—Choir (lower division) (1 cr)
Mus 1041—Private Instruction (1 cr)
Mus 1042—Class Piano (1 cr)
Mus 1051—Band/Pep Band (lower division) (1 cr)
Mus 1071—Musical Theater (1 cr)

Upper division course requirements (6 cr) chosen from the following:
Mus 3011—University Singers (1 cr)
Mus 3029—Music of the Twentieth Century (3 cr)
Mus 3041—Private Instruction (1 cr)
Mus 3051—Band/Pep Band (1 cr)
Mus 3091—Choral and Instrumental Conducting (2 cr)
Mus 3604—Elementary Music Methods for Children (3 cr)

Natural Resources
Degree options include a bachelor of science (B.S.) in natural resources with emphases in
- natural resources management;
- wildlife management;
- park management;
- water resource management;
- natural resources law enforcement.

Natural Resources B.S. Program Outcomes
Natural resource graduates will
- apply an integrated approach to resource management that incorporates environmental, economic, and social considerations;
- demonstrate appropriate technical knowledge base 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 in order to be successful in a changing natural resources workplace.
Natural Resources—Natural Resource Management

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.

Career opportunities include resource managers with county, state, and federal agencies as well as private conservation organizations; environmental and land use planner; land reclamation manager; and natural area manager.

Natural Resources—Natural Resource Management B.S. Program Outcomes

In addition to the natural resources program outcomes, natural resource management graduates will

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

Natural Resources—Natural Resource Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

All emphases except natural resources law enforcement.
Biol 1009—General Biology (4 cr)
Biol 2022—General Botany (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
or Chem 1021—General Principles of Chemistry I (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Phys 1012—Introductory Physics (4 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements (all emphases)

GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Iternship (2 cr)
GnAg 3901—Post-Internship Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
Mgmt 3210—Supervision and Leadership (3 cr)
NatR 1233—Introduction to Natural Resources (3 cr)
NatR 1244—Elements of Forestry (4 cr)
NatR 3344—Land Use Planning (3 cr)
NatR 3364—Plant Taxonomy (3 cr)
NatR 3374—Ecology (4 cr)
NatR 3650—Prairie Ecosystem Management (2 cr)
NatR 3660—Wildlife Ecology and Management (4 cr)
NatR 3672—Wildlife Management (3 cr)
NatR 3699—Integrated Resource Management (3 cr)
SWM 3224—Soil and Water Conservation (4 cr)
Swch 1101—Introduction to Horticulture (3 cr)

Natural Resource Management Emphasis Requirements

Agro 1183—Field Crops: Production Principles (3 cr)
or Hort 1010—Introduction to Horticulture (3 cr)
ASM 3009—Surveying (4 cr)
NatR 3203—Park and Recreational Area 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)
Open electives (12 cr)

Natural Resources—Wildlife Management

This program is for students wishing a greater concentration on wildlife in relationship to habitat requirements and land management. The major focuses on terrestrial and wetland habitats and their mammal, bird, reptile, and amphibian associates with limited emphasis on fisheries management. Graduates of the emphasis fulfill the educational requirements for certification as an associate wildlife biologist by the Wildlife Society, the professional wildlife organization. Professional relationships and student development are enhanced by a student chapter of the Wildlife Society. Because of the competitive nature of wildlife-related positions, there is a minimum 3.00 GPA graduation requirement for this emphasis.

Career opportunities for wildlife management graduates are primarily with local, state, and federal agencies and private conservation organizations. Graduates may also pursue advanced graduate studies in wildlife research and management.

Natural Resources—Wildlife Management B.S. Program Outcomes

In addition to the natural resources program outcomes, wildlife management 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.

Natural Resources—Wildlife Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 69 credits in the major, and 6 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

See Natural Resources—Natural Resource Management Liberal education Requirements.

Program Requirements

See Natural Resources—Natural Resource Management Program Requirements.

Wildlife Management Emphasis Requirements

AnSc 3203—Animal Anatomy and Physiology (3 cr)
ASM 1034—Facilities Maintenance and Safety (3 cr)
ASM 3009—Surveying (4 cr)
Biol 2012—General Zoology (4 cr)
Econ 1150—Elementary Statistics (3 cr)
NatR 3464—Mammalogy (3 cr)
NatR 3466—Ornithology (3 cr)


Natural Resources—Park Management

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, and city recreation agencies. A series of wilderness management coursework is delivered collaboratively from the School of Forestry at the University of Montana. Flexibility in the choice of major course electives allows students to build a customized program that meets their specific career goals. Career opportunities include park manager, assistant park manager, visitor use assistant, interpreter, city or county park maintenance supervisor or technician, backcountry/wilderness ranger, and recreation technician or aide.

Natural Resources—Park Management B.S. Program Outcomes

In addition to the natural resources program outcomes, park management graduates will:

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

Natural Resources—Park Management Course Requirements (B.S.)

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

**Liberal Education Requirements**

See Natural Resources—Natural Resource Management Liberal Education Requirements on page 59.

**Program Requirements**

See Natural Resources—Natural Resource Management Program Requirements on page 59.

**Park Management Emphasis Requirements**

NatR 3203—Park and Recreational Area Management (3 cr)
NatR 3609—Integrated Resource Management (3 cr)

Agriculture/natural resources electives (15 cr).

Suggested electives include:

- ASM 1034—Facilities Maintenance and Safety (3 cr)
- GFTS 3072—Principles of Turf Management (3 cr)
- NatR 3495—Special Topics in Wilderness Management (1-3 cr)

Horticulture electives (7 cr)

Suggested electives include:

- Hort 1021—Woody Plant Materials (4 cr)
- Hort 1031—Herbaceous Perennial Plant Materials (2 cr)
- Hort 3040—Commercial Landscape Design and Ground Maintenance (4 cr)

Management electives (3 cr)

Open electives (13 cr)

Natural Resources—Water Resource Management

This emphasis blends general 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 are examined by land cover characteristics and computerized mapping technologies in relationship to field monitoring of lakes and streams.

Career opportunities include water planner; county wetlands coordinator; fisheries technician; environmental planner; watershed district manager; and conservationist with a county Soil and Water Conservation District, state Board of Water and Soil Resources, or federal Natural Resources Conservation Service. Students also receive a background appropriate for pursuing graduate work in a soil and water related field.

Natural Resources—Water Resource Management B.S. Program Outcomes

In addition to the natural resources program outcomes, water resource management 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 and water management practices to achieve soil conservation and water quality goals.

Natural Resources—Water Resource Management Course Requirements (B.S.)

**Degree Requirements:** A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 63 credits in the major, and 12 credits in electives; 40 credits are required in upper division courses.

**Liberal Education Requirements**

See Natural Resources—Natural Resource Management Liberal Education Requirements on page 59.

**Program Requirements**

See Natural Resources—Natural Resource Management Program Requirements on page 59.

**Water Resource Management Emphasis Requirements**

Agro 1183—Field Crops: Production Principles (3 cr)
ASM 3009—Surveying (4 cr)
Biol 3722—Limnology (3 cr)
Geol 1001—Introductory Geology (3 cr)
NatR 1663—Principles of Fisheries Management (3 cr)
NatR 3376—Wetland and Riparian Ecology and Management (2 cr)
NatR 3609—Integrated Resource Management (3 cr)
SWM 3209—Hydrology and Water Quality (4 cr)
SWM 3224—Soil and Water Conservation (4 cr)
SWM 3225—Watershed Management (3 cr)
Open electives (12 cr)
Natural Resources—Natural Resources Law Enforcement
(A collaborative program with Bemidji State University)

This emphasis provides integrated instruction in the field of 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 the completion of coursework and training in first aid and traffic law, students may attend a skills session and take the Minnesota Peace Officer Standards and Training (P.O.S.T.) certification examination.

Career opportunities include the following: conservation officer or game warden with state conservation agencies, U.S. Fish and Wildlife Service, U.S. Forest Service; ranger with county, state, or national parks; officer with local or state law enforcement agencies.

Natural Resources—Natural Resources Law Enforcement B.S. Program Outcomes

In addition to the natural resources program outcomes, natural resource law enforcement graduates will

• understand the role of education/law enforcement in natural resource management;
• be prepared to attend the peace officer’s skills training academy.

Natural Resources—Natural Resources Law Enforcement Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 66 credits in the major, and 8-9 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)
Biol 2022—General Botany (3 cr)
or Biol 2012—General Zoology (4 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
or Chem 1021—General Principles of Chemistry I (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3303—Writing in Your Profession (3 cr)
CrJs 3305—Judicial Process (BSU) (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
or Math 1150—Elementary Statistics (3 cr)
Phys 1012—Introductory Physics (4 cr)
Spch 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements

See Natural Resources—Natural Resource Management Program Requirements on page 59.

Natural Resources Law Enforcement Emphasis Requirements

CrJs 1120—Criminal Justice and Society (BSU) (4 cr)
CrJs 3304—Police Process (BSU) (3 cr)
CrJs 3320—Juvenile Delinquency and Justice (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)
Open electives (8-9 cr)

Plant Industries Management—Agronomy and Horticulture

The B.S. in plant industries management is a career-oriented program that combines science-based agricultural training and education with a strong liberal arts background to produce graduates skilled in the highly technical fields of agronomy, soils, and horticulture.

The flexibility of the agronomy emphasis enables students to build a thorough understanding of crop science with a concentration in areas such as crop production, diversified agriculture, agricultural chemicals, fertilizers, integrated pest management, seed conditioning and technology, and other areas related to production and quality in the food and fiber industry.

Career opportunities in agronomy include agricultural chemicals salesperson, crop product salesperson, crop research technician, elevator manager, fertilizer salesperson, laboratory technician, seed and grain inspector, soil testing technician, seed analyst, seed company field representative, crop consultant, seed conditioning plant manager, crop improvement field representative, and crop production.

The horticulture emphasis exposes students to various disciplines within horticulture, such as plant propagation, woody and herbaceous plant materials, turf, residential and commercial landscaping, greenhouse and nursery production, and floral design/flower shop management. Faculty work with students to develop a plan of study tailored to the individual.

Career opportunities in horticulture include floral designer, garden center manager, greenhouse operator, horticulture supplies salesperson, nursery manager, golf course grounds manager, landscape contractor, landscape designer, and public grounds supervisor.

Plant Industries Management B.S. Program Outcomes

Plant industries management graduates will

• demonstrate appropriate skills necessary for employment in plant industry management (agronomy and/or horticulture);
• demonstrate skills in liberal education and management that provide a foundation for the applied curriculum;
• develop and demonstrate an attitude of continued inquiry and lifelong learning.
Programs of Study

Plant Industries Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 48 credits are required in liberal education, 63 credits in the major, and 9 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements (both emphases)

Biol 1009—General Biology (4 cr)
Biol 2022—General Botany (3 cr)
Biol 3022—Principles of Genetics (3 cr)
Biol 3131—Plant Physiology (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
Chem 1401—Elementary Biochemistry (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
or Math 1150—Elementary Statistics (3 cr)
Spc 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements (both emphases)

Agro 3640—Weed Science (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
PIM 2573—Entomology (3 cr)
PIM 3023—Plant Breeding (3 cr)
PIM 3030—Research Techniques (3 cr)
PIM 3230—Plant Pathology (3 cr)
Soil 1293—Soil Science (3 cr)
Soil 3414—Soil Fertility (4 cr)
AgEc, AFSM, or Mgmt electives (6 cr)

Agronomy Emphasis Requirements

Agro 1183—Field Crops: Production Principles (3 cr)
PIM 3630—Integrated Crop Management (3 cr)
18 credits from the following:
Agro 1030—Crop and Weed Identification (3 cr)
Agro 1540—Seed Conditioning and Techniques (4 cr)
Agro 2840—Grain and Seed Evaluation (4 cr)
Agro 3130—Forages (3 cr)
Agro 3444—Crop Production (4 cr)
SWM 3009—Hydrology and Water Quality (3 cr)
SWM 3224—Soil and Water Conservation (4 cr)
Agronomy/agriculture electives (7 cr)
Open electives (9 cr)

Horticulture Emphasis Requirements

Hort 1010—Introduction to Horticulture (3 cr)
Hort 1021—Woody Plant Materials (4 cr)
Hort 3034—Commercial Floriculture Crops: Spring (4 cr)
Hort 3036—Plant Propagation (4 cr)
10 credits from the following:
GFTS 3072—Turf Management (3 cr)
Hort 1030—Residential Landscape Design (3 cr)
Hort 1031—Perennials (2 cr)
Hort 1091—Indoor Ornamental Plants (2 cr)
Hort 1092—Floral Design (2 cr)
Hort 1093—Advanced Floral Design and Florist Operations (2 cr)
Hort 3033—Commercial Floriculture Crops, Fall (4 cr)

Hort 3040—Commercial Landscape Design and Ground
Maintenance (4 cr)
Agriculture electives (6 cr)
Open electives (9 cr)

Sport and Recreation Management

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.

Sport and Recreation Management B.S.

Program Outcomes

Sport and recreation management graduates will be able to 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;
• knowledge of human anatomy, physiology, health and wellness;
• team building skills and the ability to work in groups.

Sport and Recreation Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 45 credits are required in liberal education, 62 credits in the major, and 13 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

CA 1010—Introduction to Computer Technology (1 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Comp 3008—Business Writing (3 cr)
or Comp 3303—Writing in Your Profession (3 cr)
Econ 2101—Microeconomics—(3 cr)
or Econ 2102—Macroeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
Math 1150—Elementary Statistics (3 cr)
Spc 1101—Public Speaking (3 cr)
Liberal education electives (6 cr)
Humanities electives (6 cr) (from at least two departments)
Math/science electives (6 cr) (at least 3 must be in a lab science)
Social science electives (3 cr)

Sport and Recreation Management Course Requirements (B.S.)

Degree Requirements: A total of 120 credits is required for graduation. Of this total, 48 credits are required in liberal education, 63 credits in the major, and 9 credits in electives; 40 credits are required in upper division courses.

Liberal Education Requirements

Biol 1009—General Biology (4 cr)
Biol 2022—General Botany (3 cr)
Biol 3022—Principles of Genetics (3 cr)
Biol 3131—Plant Physiology (3 cr)
CA 1010—Introduction to Computer Technology (1 cr)
Chem 1001—Introductory Chemistry (4 cr)
Chem 1401—Elementary Biochemistry (4 cr)
Comp 1011—Composition I (3 cr)
Comp 1013—Composition II (3 cr)
Econ 2101—Microeconomics (3 cr)
Math 1031—College Algebra and Analytical Geometry (3 cr)
or Math 1150—Elementary Statistics (3 cr)
Spc 1101—Public Speaking (3 cr)
CA electives (2 cr)
Humanities electives (6 cr) (from at least two departments)
Social science electives (3 cr)

Program Requirements (both emphases)

Agro 3640—Weed Science (3 cr)
GnAg 2899/3899—Pre-Internship Seminar (.5 cr)
GnAg 3900—Internship (2 cr)
GnAg 3901—Post-Internship Seminar (.5 cr)
GnAg 4652—Agriculture and Natural Resources Seminar (1 cr)
PIM 2573—Entomology (3 cr)
PIM 3023—Plant Breeding (3 cr)
PIM 3030—Research Techniques (3 cr)
PIM 3230—Plant Pathology (3 cr)
Soil 1293—Soil Science (3 cr)
Soil 3414—Soil Fertility (4 cr)
AgEc, AFSM, or Mgmt electives (6 cr)

Agronomy Emphasis Requirements

Agro 1183—Field Crops: Production Principles (3 cr)
PIM 3630—Integrated Crop Management (3 cr)
18 credits from the following:
Agro 1030—Crop and Weed Identification (3 cr)
Agro 1540—Seed Conditioning and Techniques (4 cr)
Agro 2840—Grain and Seed Evaluation (4 cr)
Agro 3130—Forages (3 cr)
Agro 3444—Crop Production (4 cr)
SWM 3009—Hydrology and Water Quality (3 cr)
SWM 3224—Soil and Water Conservation (4 cr)
Agronomy/agriculture electives (7 cr)
Open electives (9 cr)

Horticulture Emphasis Requirements

Hort 1010—Introduction to Horticulture (3 cr)
Hort 1021—Woody Plant Materials (4 cr)
Hort 3034—Commercial Floriculture Crops: Spring (4 cr)
Hort 3036—Plant Propagation (4 cr)
10 credits from the following:
GFTS 3072—Turf Management (3 cr)
Hort 1030—Residential Landscape Design (3 cr)
Hort 1031—Perennials (2 cr)
Hort 1091—Indoor Ornamental Plants (2 cr)
Hort 1092—Floral Design (2 cr)
Hort 1093—Advanced Floral Design and Florist Operations (2 cr)
Hort 3033—Commercial Floriculture Crops, Fall (4 cr)

Hort 3040—Commercial Landscape Design and Ground
Maintenance (4 cr)
Agriculture electives (6 cr)
Open electives (9 cr)
Select 2 credits from the following:
- CA 1020—Spreadsheet Applications (2 cr)
- CA 1060—Database Management Applications (2 cr)
- CA 1070—Desktop Publishing (2 cr)

Program Requirements

- 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 (2 cr)
- Hlth 1072—Wellness (3 cr)
- Mgmt 3100—Managerial Finance (3 cr)
- Mgmt 3200—Principles of Management (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)
- Mktg 3250—Promotional Strategies (3 cr)
- Mktg 3300—Principles of Marketing (3 cr)
- PER 1151-1791—Physical education activities (4 cr)
- SRM 2100—Psychology of Sport (3 cr)
- SRM 3000—Foundations of Sport and Recreation Management (3 cr)
- SRM 3001—Sports Nutrition (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 (select from basketball, baseball, football, hockey, soccer, softball, volleyball) (2 cr)
- SRM 3900—Internship (3 cr)
- SRM 4099—Seminar in Sport and Recreation Management (1 cr)
- CA/ITM/Mgmt/Mktg electives (2 cr)
- Open electives (13 cr)

Technical Communication Minor

The technical communication minor program prepares students to communicate on multiple levels through writing and speech, within and between organizations. The minor complements all UMC major degree programs.

The technical communication minor provides
- the opportunity to demonstrate, in writing samples, the latest theory and practice in technical writing, including the ability to use word processing/desktop publishing/graphics software and industry standards of style and documentation;
- an understanding of how to organize and present written material clearly, coherently and concisely;
- the processes used to write and produce final documents following a logical methodology;
- critical thinking processes used to analyze documentation design, processes, and communication technology to facilitate communication and collaboration within and between organizations for growth and efficiency;
- processes used to adapt, direct, write, edit, and produce information for particular audiences.

Course Requirements (19 cr)

- CA 1040—Web Site Development (1 cr)
- CA 1050—Web Site Graphics (1 cr)
- CA 1070—Desktop Publishing (2 cr)
- Comm 3258—Research Methods in Communication (3 cr)
- Comp 2334—Technical Writing (3 cr)
- Comp 3313—Advanced Technical Writing: Software Documentation (3 cr)
- Spch 3001—Communication in Human Relationships (3 cr)
- STC 3701—Rhetorical Theory: Persuasion and the Literature of Science (3 cr)