MICHIGAN STATE UNIVERSITY
University Committee on Curriculum

SUBCOMMITTEE A – AGENDA

**Via Teams**
**TUESDAY,** April 21, 2026
**1:30 p.m.**

# PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

## COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to change the requirements for the **Agricultural Technology Certificate** in **Agricultural Industries** in The Institute of Agricultural Technology.

*The concentrations in the Agricultural Technology Certificate in Agricultural Industries will be noted on the student's academic record when the requirements for the certificate have been completed.*

a. Under the heading **Requirements for Agricultural Industries** replace the entire entry with the following:

The student must complete 42 credits from the following:

1. All of the following courses (15 to 18 credits):

| | | | |
|---|---|---|---|
| AFRE | 100 | Economics and Management for the Bioeconomy | 3 |
| AT | 145 | Agricultural Communications | 2 |
| AT | 293 | Professional Internship in Agricultural Technology | 3 to 6 |
| CROP | 101 | Introduction to Crop Science | 3 |
| CROP | 101L | Introduction to Crop Science Laboratory | 1 |
| CROP | 192 | Professional Development Seminar I | 1 |
| CROP | 292 | Career Leadership in Agriculture | 2 |

2. One of the following courses (2 or 3 credits):

| | | | |
|---|---|---|---|
| SOIL | 203 | World of Soils | 2 |
| SOIL | 210 | Fundamentals of Soil Science | 3 |

3. Complete one of the following concentrations. The concentration will be noted on the student's transcript.

**Agronomy**

1. All of the following courses (10 credits):

| | | | |
|---|---|---|---|
| CROP | 110 | Computer Applications in Agronomy | 2 |
| CROP | 126 | Introduction to Weed Management | 2 |
| CROP | 135 | Crop Scouting and Investigation | 3 |
| CROP | 212 | Advanced Crop Production | 2 |
| CROP | 226L | Weed Science Laboratory | 1 |

2. Complete 4 credits from the following:

| | | | |
|---|---|---|---|
| CROP | 151 | Seed and Grain Quality | 2 |
| CROP | 201 | Forage Crops | 3 |
| ENT | 111 | Basics of Applied Entomology | 2 |
| PLP | 105 | Fundamentals of Applied Plant Pathology | 1 |
| PLP | 105L | Fundamentals of Applied Plant Pathology Lab | 1 |

3. Complete a minimum of 7 to 11 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

**Ag Business**

1. All of the following courses (12 credits):

| | | | |
|---|---|---|---|
| AFRE | 130 | Foundations of Agribusiness Management | 3 |
| AFRE | 203 | Data Analysis for Managerial Decision-Making | 3 |
| AFRE | 222 | Sales for the Bioeconomy | 3 |
| AFRE | 232 | Commodity Marketing | 3 |

2. Complete 3 credits from the following:

| | | | |
|---|---|---|---|
| AFRE | 206 | World Food, Population and Poverty | 3 |
| AFRE | 240 | Product Marketing for the Bioeconomy | 3 |

3. Complete a minimum of 6 to 10 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

**Ag Education**

1. All of the following courses (8 credits):

| | | | |
|---|---|---|---|
| CEP | 240 | Introduction to Exceptional Learners | 3 |
| CSUS | 200 | Introduction to Sustainability | 3 |
| CSUS | 222A | Seminar in Instructional Theory I - Agriculture, Food and Natural Resources Education | 3 |
| CSUS | 222B | Seminar in Instructional Theory II - Agriculture, Food and Natural Resources Education | 3 |

2. Complete 6 credits from the following:

| | | | |
|---|---|---|---|
| ANS | 110 | Introductory Animal Agriculture | 3 |
| FOR | 202 | Introduction to Forestry | 3 |
| HRT | 203 | Introduction to Horticulture | 3 |
| TE | 150 | Reflections on Learning | 3 |

3. Complete a minimum of 6 to 10 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

**Food Processing and Safety**

1. All of the following courses (16 credits):

| | | | |
|---|---|---|---|
| AE | 153 | Engine and Equipment Technology | 2 |
| FSC | 113 | Basic Commodity Overview of Food Processing and Technology | 3 |
| FSC | 114 | Food Processing and Technology Facilities Management | 3 |
| FSC | 125 | Food Processing and Technology Unit Operations | 2 |
| FSC | 211 | Principles of Food Science | 3 |
| PKG | 101 | Principles of Packaging | 3 |

2. Complete 3 credits from the following:

| | | | |
|---|---|---|---|
| AE | 151 | Fabrication Technology | 2 |
| AFRE | 203 | Data Analysis for Managerial Decision-Making | 3 |
| AFRE | 222 | Sales for the Bioeconomy | 3 |
| AFRE | 240 | Product Marketing for the Bioeconomy | 3 |
| FSC | 222 | Professional Development and Career Planning in Food Science | 1 |
| HNF | 150 | Introduction to Human Nutrition | 3 |

3. Complete a minimum of 2 to 6 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

Effective Fall 2026.

2. Request to change the requirements for the **Minor** in **Smart Agricultural Systems** in the Department of Biosystems and Agricultural Engineering.

   a. Under the heading **Requirements for the Minor in Smart Agricultural Systems** make the following changes:

      (1) In item 2., change the requirement to ‘Complete 6 to 7 credits from the following courses’.

      (2) In item 2., delete the following courses:

| | | | |
|---|---|---|---|
| CSS | 467 | Bioenergy Feedstock Production | 3 |
| ME | 451 | Control Systems | 4 |
| TNG | 335 | Computer Security Fundamentals | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| CROP | 467 | Bioenergy Feedstock Production | 3 |
| ME | 452 | Control Systems | 3 |
| ME | 452L | Vibrations and Controls Laboratory | 1 |
| TNG | 345 | Mechanical Machine Dynamics | 3 |
| TNG | 450 | Hardware Cybersecurity | 3 |

Effective Fall 2026.

3. Request to establish a **Graduate Certificate** in **Distilled Beverages** in the Department of Food Science and Human Nutrition. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its March 16, 2026 meeting.

a. **Background Information**:

The Department of Food Science and Human Nutrition (FSHN) and the Department of Chemical Engineering and Materials Science (ChEMS) at Michigan State University are developing an online Graduate Certificate in Distilled Beverages to expand access to distilling science education beyond Michigan and the United States. This interdisciplinary collaboration brings together expertise in fermentation science, process engineering, and distilled beverage innovation to meet the growing global demand for skilled professionals in the distilled spirits industry.

The Graduate Certificate in Distilled Beverages will provide academically rigorous and industry-relevant training for both students pursuing advanced education and professionals currently employed in distilleries. Offered fully online, the program enables participants to enhance their technical knowledge and credentials while maintaining full-time employment.

By delivering a high-quality, flexible learning experience, the program minimizes the need for on-campus resources while extending MSU's land-grant mission of global outreach and applied education. Participants will gain a science and engineering-based understanding of raw material selection, fermentation, distillation, maturation, sensory analysis, and regulatory compliance all within the context of sustainability and innovation in the distilled beverage industry.

By leveraging existing strengths and infrastructure, MSU already has a Beverage Science and Technology minor and expertise in fermentation, food science, and chemical engineering. This gives MSU a strong base to design rigorous, technically advanced course work without needing to build everything from scratch.

While many programs are centered in states with large distilling tradition (Kentucky, etc.), fewer institutions offer fully online programs that reach international learners or working distillers globally. MSU can capture demand from untapped geographies by providing quality remote education.

MSU's program can avoid duplication and improve specialization rather than replicating what's already here (e.g. weekend/hybrid in-person certificates). It can complement them by focusing on process engineering, raw-material science, analytical methods, and rigorous assessment, making graduates technically strong rather than just operationally competent.

Having such a program positions MSU as a leader in beverage distilling education nationally, enhances its reputation in food science and engineering, attracts students globally, and supports Michigan's (and the U.S.'s) distilled beverage sector by advancing workforce capacity.

b. **Academic Programs Catalog Text**:

The Graduate Certificate in Distilled Beverages is an online, interdisciplinary program offered jointly by the Department of Food Science and Human Nutrition and the Department of Chemical Engineering and Materials Science. Designed for students and professionals seeking a strong foundation in the science and engineering of distilled spirits production, the program provides applied training in fermentation, distillation processes, and product development. Graduates will gain the technical expertise needed to advance in the rapidly growing distilled beverage industry through a flexible, fully online format.

**Requirements for the Graduate Certificate in Distilled Beverages**

| | | | CREDITS |
|---|---|---|---|
| Students must complete 12 credits from the following: | | | |
| CHE | 884 | Distillation Science and Technology I | 3 |
| CHE | 885 | Distillation Science and Technology II | 3 |
| FSC | 480 | Fundamentals of Chemistry and Microbiology for Distillers | 3 |
| FSC | 481 | Fermented Beverages | 3 |

Effective Fall 2026.

## COLLEGE OF ENGINEERING

1. Request to change the **Graduation Requirements for All Majors** statement in the **College of Engineering**. The University Committee on Undergraduate Education (UCUE) will consider this request at its April 9, 2026 meeting.

   a. Under the heading ***Graduation Requirements for All Majors*** make the following changes:

      (1) In item 1. a., replace ‘Microbiology and Molecular Genetics’ with ‘Microbiology, Genetics, and Immunology’.

      (2) In item 1. b., delete ‘Physics 183B’ and ‘Physics 184B’.

      (3) In item 2. b., delete ‘Biosystems Engineering’.

      (4) In item 2. c., delete ‘Physics 183B’ and ‘Physics 184B’.

      (5) In item 2. e., add ‘CMSE 201 (Materials Science and Engineering)’.

      (6) In item 3. c., delete ‘Physics 183B’ and ‘Physics 184B’.

   Effective Fall 2026.

2. Request to change the **Admission to the College** statement in the **College of Engineering**. The University Committee on Undergraduate Education (UCUE) will consider this request at its April 9, 2026 meeting.

   a. Under the heading **Admission to the College**, paragraph three, make the following changes:

      (1) In item 4., delete ‘Biosystems Engineering’.

      (2) In item 6., ‘Computational Mathematics, Science and Engineering 202’ and replace with ‘Computational Mathematics, Science and Engineering 201’.

   Effective Fall 2026.

3. Request to change the requirements for the **Bachelor of Science** degree in **Technology Engineering** in the College of Engineering.

*The concentrations in the Bachelor of Science degree in Technology Engineering are noted on the student's academic record when the requirements for the degree have been completed.*

a. Under the heading **Requirements for the Bachelor of Science Degree in Technology Engineering** replace the entire entry with the following:

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 128 credits, including general elective credits, are required for the Bachelor of Science degree in Technology Engineering.

The University's Tier II writing requirement for the Technology Engineering major is met by completing Technology Engineering 480. That course is referenced in item 3. b. below.

Students who are enrolled in the College of Engineering may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading *Graduation Requirements for All Majors* in the College statement. Certain courses referenced in requirement 3. Below may be used to satisfy the alternative track.

2. The requirements of the College of Engineering for the Bachelor of Science degree.

The credits earned in certain courses referenced in requirement 3.below may be counted toward College requirements as appropriate.

3. The following requirements for the major:

a. All of the following courses (45 credits):

| | | | |
|---|---|---|---|
| CEM | 161 | General Chemistry Laboratory I | 1 |
| CSE | 232 | Introduction to Programming II | 4 |
| ECE | 230 | Digital Logic Fundamentals | 3 |
| ME | 280 | Graphic Communications | 2 |
| MSE | 250 | Materials Science and Engineering | 3 |
| PHY | 251 | Introductory Physics Laboratory I | 1 |
| PHY | 252 | Introductory Physics Laboratory II | 1 |
| STT | 180 | Introduction to Data Science | 4 |
| STT | 201 | Statistical Methods | 4 |
| TNG | 210 | Manufacturing Processes and Prototyping | 2 |
| TNG | 220 | Electrical Circuits | 4 |
| TNG | 310 | Computer Aided Manufacturing and Simulation | 3 |
| TNG | 320 | Sensors and Signal Processing | 3 |
| TNG | 322 | Electronics and Embedded Systems Lab | 1 |
| TNG | 335 | Computer Security Fundamentals | 3 |
| TNG | 430 | Engineering Project Management | 3 |
| TNG | 480 | Technology Engineering Capstone (W) | 3 |

b. One of the following courses (3 credits):

| | | | |
|---|---|---|---|
| MGT | 325 | Management Skills and Processes | 3 |
| Or | | | |
| SCM | 304 | Survey of Supply Chain Management | 3 |

c. One of the following courses (3 or 4 credits):

| | | | |
|---|---|---|---|
| CSE | 260 | Discrete Structures in Computer Science | 4 |
| Or | | | |
| TNG | 330 | Quality and Continuous Improvement | 3 |
| Or | | | |

A basic math or science elective from an approved list of courses, approved by the student's academic advisor.

d. One of the following courses (3 or 4 credits):

| | | | |
|---|---|---|---|
| BS | 161 | Cell and Molecular Biology | 3 |
| CEM | 142 | General and Inorganic Chemistry | 3 |
| CEM | 144 | Organic Chemistry and Applications | 4 |
| CEM | 152 | Principles of Chemistry | 4 |
| ENT | 205 | Pests, Society and Environment | 3 |
| IBIO | 150 | Integrating Biology: From DNA to Populations | 3 |
| MGI | 141 | Introductory Human Genetics | 3 |
| MGI | 201 | Fundamentals of Microbiology | 3 |
| PLB | 105 | Plant Biology | 3 |
| PSL | 250 | Introductory Physiology | 4 |

| | | | | |
|---|---|---|---|---|
| | MTH | 133 | Calculus II | 4 |

Students cannot fulfill both the math/basic science elective and the University Bioscience requirement with the same course.

e. In consultation with their academic advisor, students must select one of the following: Embedded Cybersecurity concentration or Mechatronics concentration, or Semiconductors concentration or the Smart Agricultural Systems Minor. The concentration or minor will be noted on the student's academic record. (16 credits)

**Mechatronics**

| | | | |
|---|---|---|---|
| TNG | 340 | Engineering Statics and Mechanics of Materials | 3 |
| TNG | 345 | Mechanical Machine Dynamics | 3 |
| TNG | 440 | Robotics, Automation, and Controls | 3 |
| TNG | 445 | Troubleshooting Mechatronic Systems | 4 |
| TNG | 447 | Topics in Mechatronics | 3 |

**Embedded Cybersecurity**

| | | | |
|---|---|---|---|
| TNG | 350 | Operating System Fundamentals | 3 |
| TNG | 355 | Networks and Network Security | 3 |
| TNG | 450 | Hardware Cybersecurity | 3 |
| TNG | 455 | Engineering Secure Hardware and Software | 4 |
| TNG | 457 | Topics in Embedded Cybersecurity | 3 |

The concentration will be noted on the student's academic record.

**Semiconductors**

| | | | |
|---|---|---|---|
| MSE | 260 | Electronic, Magnetic, Thermal, and Optical Properties of Materials | 3 |
| MSE | 460 | Electronic Structure and Bonding in Materials and Devices | 3 |
| TNG | 345 | Mechanical Machine Dynamics | 3 |
| TNG | 462 | Automation in Semiconductor Fabrication | 3 |
| TNG | 465 | Electronic Failure Analysis | 4 |

**Smart Agricultural Systems Minor**

Students must complete a minimum of 16 credits from the following:

1. All of the following courses (10 credits):

| | | | |
|---|---|---|---|
| BE | 221 | Introduction to Smart Agriculture | 1 |
| BE | 321 | Principles of Precision Agriculture | 3 |
| BE | 421 | Sensors and Robotics for Agricultural Systems | 3 |
| BE | 422 | Crop Modeling and Optimization | 3 |

2. Complete 6 to 7 credits from the following courses:

| | | | |
|---|---|---|---|
| BE | 449 | Human Health Risk Analysis for Engineering Controls | 3 |
| BE | 456 | Electric Power and Control 3 | |
| BE | 481 | Water Resources Systems Analysis and Modeling | 3 |
| BE | 482 | Engineering Ecological Treatment Systems | 3 |
| CROP | 467 | Bioenergy Feedstock Production | 3 |
| CSE | 404 | Introduction to Machine Learning | 3 |
| CSE | 440 | Introduction to Artificial Intelligence | 3 |
| CSE | 480 | Database Systems | 3 |
| CSE | 482 | Big Data Analysis | 3 |
| ECE | 416 | Digital Control | 3 |
| ECE | 417 | Robotics | 3 |
| ECE | 431 | Smart Sensor Systems | 3 |
| ECE | 434 | Autonomous Vehicles | 3 |
| ECE | 477 | Microelectronic Fabrication | 3 |
| FOR | 419 | Applications of Geographic Information Systems to Natural Resources Management | 4 |
| ME | 417 | Design of Alternative Energy Systems | 3 |
| ME | 452 | Control Systems | 3 |
| ME | 452L | Vibrations and Controls Laboratory | 1 |

| | | | |
|---|---|---|---|
| ME | 456 | Mechatronic System Design | 3 |
| TNG | 345 | Mechanical Machine Dynamics | 3 |
| TNG | 355 | Networks and Network Security | 3 |
| TNG | 440 | Robotics Automation and Controls | 3 |
| TNG | 450 | Hardware Cybersecurity | 3 |

Effective Fall 2026.

4. Request to change the requirements for the **Bachelor of Science** degree in **Biosystems Engineering** in the Department of Biosystems and Agricultural Engineering.

*The concentrations in the Bachelor of Science degree in Biosystems Engineering are noted on the student's academic record when the requirements for the degree have been completed.*

a. Under the heading **Requirements for the Bachelor of Science Degree in Biosystems Engineering** make the following changes:

(1) In item 3. a. delete the following courses:

| | | | |
|---|---|---|---|
| CEM | 143 | Survey of Organic Chemistry | 4 |
| CEM | 151 | General and Descriptive Chemistry | 4 |

Add the following courses:

| | | | |
|---|---|---|---|
| CEM | 144 | Organic Chemistry Survey and Applications | 4 |
| CEM | 145L | Basic Organic Chemistry Laboratory | 1 |

(2) In item 3. c. change 'MMG 301' to 'MGI 301'.

(3) In item 3. d. delete the following courses:

| | | | |
|---|---|---|---|
| CSS | 442 | Agricultural Ecology | 3 |
| CSS | 451 | Biotechnology Applications for Plant Breeding and Genetics | 3 |
| MMG | 365 | Medical Microbiology | 3 |
| MMG | 404 | Human Genetics | 3 |
| MMG | 425 | Microbial Ecology | 3 |
| MMG | 445 | Microbial Biotechnology (W) | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| CROP | 442 | Agricultural Ecology | 3 |
| CROP | 451 | Biotechnology Applications for Plant Breeding and Genetics | 3 |
| MGI | 365 | Medical Microbiology | 3 |
| MGI | 404 | Human Genetics | 3 |
| MGI | 425 | Microbial Ecology | 3 |
| MGI | 445 | Microbial Biotechnology (W) | 3 |

b. Under the heading **Concentration ins Biosystems Engineering** make the following changes:

(1) In the **Bioenergy and Bioproduct Engineering** concentration make the following changes:

(a) In item 1., change 'CSS 467' to 'CROP 467'.

(b) In item 2., delete the following courses:

| | | | |
|---|---|---|---|
| CSS | 442 | Agricultural Ecology | 3 |
| CSS | 451 | Biotechnology Applications for Plant Breeding and Genetics | 3 |

| | | | |
|---|---|---|---|
| MMG | 425 | Microbial Ecology | 3 |
| MMG | 445 | Microbial Biotechnology (W) | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| CROP | 442 | Agricultural Ecology | 3 |
| CROP | 451 | Biotechnology Applications for Plant Breeding and Genetics | 3 |
| MGI | 425 | Microbial Ecology | 3 |

(2) In the **Biomedical Engineering** concentration make the following changes:

(a) In item 2., delete the following courses:

| | | | |
|---|---|---|---|
| MMG | 365 | Medical Microbiology | 3 |
| MMG | 404 | Human Genetics | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| MGI | 365 | Medical Microbiology | 3 |
| MGI | 404 | Human Genetics | 3 |

(b) In item 3., delete the following courses:

| | | | |
|---|---|---|---|
| MMG | 365 | Medical Microbiology | 3 |
| MMG | 404 | Human Genetics | 3 |
| PLB | 400 | Introduction to Bioinformatics | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| MGI | 365 | Medical Microbiology | 3 |
| MGI | 404 | Human Genetics | 3 |

(3) In the **Ecosystems Engineering** concentration make the following changes:

(a) In item 2., delete the following courses:

| | | | |
|---|---|---|---|
| CSS | 442 | Agricultural Ecology | 3 |
| MMG | 425 | Microbial Ecology | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| CROP | 442 | Agricultural Ecology | 3 |
| MGI | 425 | Microbial Ecology | 3 |

(b) In item 3., delete the following courses:

| | | | |
|---|---|---|---|
| CSS | 210 | Fundamentals of Soil Science | 3 |
| CSS | 330 | Soil Chemistry | 2 |
| CSS | 360 | Soil Biology | 3 |
| CSS | 442 | Agricultural Ecology | 3 |
| CSS | 455 | Environmental Pollutants in Soil and Water | 3 |
| MMG | 425 | Microbial Ecology | 3 |

Add the following courses:

| | | | |
|---|---|---|---|
| SOIL | 210 | Fundamentals of Soil Science | 3 |
| SOIL | 330 | Soil Chemistry | 2 |
| SOIL | 360 | Soil Biology | 3 |
| CROP | 442 | Agricultural Ecology | 3 |
| SOIL | 455 | Environmental Pollutants in Soil and Water | 3 |
| MGI | 425 | Microbial Ecology | 3 |

Effective Fall 2026.

5. Request to establish a **Minor** in **Artificial Intelligence** in the Department of Computer Science and Engineering. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its March 12, 2026 meeting.

a. **Background Information**:

Artificial Intelligence (AI) is a transformative technology and is impacting nearly every aspect of modern society. As a technological enabler, it is growing at double-digit annual rates and is expected to contribute over $13 trillion to the global economy by 2030. *https://www.statista.com/outlook/tmo/artificial-intelligence/worldwide#market-size.* The impact of AI is being felt in a wide range of industries ranging from health care and finance to manufacturing and business services. As AI becomes more prevalent and widely accepted, there is a strong demand for graduates with AI skills in a wide range of majors.

AI has long been a major research focus area of the Department of Computer Science and Engineering and we offer a range of courses in AI technologies at the undergraduate and graduate levels. The Bachelor of Science degree in Computer Science has also recently added a concentration in Artificial Intelligence. The existing Minor in Computer Science is very popular. There are currently 58 students in that program from 27 different majors in 8 colleges. Many of those students take AI-related courses as part of the minor.

The most closely related program at MSU would be the Minor in Cognitive Science. This introduces students to the nature of the mind and how biological systems process complex information to produce thought and adaptive behavior, and how artificial systems can be endowed with the same capabilities. Three CSE courses currently serve as electives for that minor. However, the prerequisites for those courses limit students who choose to take those courses to students in computing majors such as Computer Science and Computer Engineering.

Many peer institutions offer a Minor in Artificial Intelligence including Northwestern University, UCLA, Purdue, USC, Carnegie Mellon University, Cornell, and Georgia Tech.

Curriculum guidelines for computer science and related programs are published by the Association for Computer Machinery (ACM). The most recent curriculum recommendations are Computer Science Curricula 2023, *https://dl.acm.org/doi/book/10.1145/3664191*.

The accrediting agency for computer science and related programs is ABET, *www.abet.org*. The Computer Science (B.S.) program is accredited by the Computing Accreditation Commission of ABET, under the General Criteria and the Program Criteria for Computer Science and Similarly Named Computing Programs. Criteria for accreditation can be found at *https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-computing-programs-2024-2025/.*

b. **Academic Programs Catalog Text**:

The Minor in Artificial Intelligence is administered by the Department of Computer Science and Engineering. The minor provides students with a foundation in artificial intelligence that applies to many disciplines and also provides opportunities for students in industry or government, as well as prepare students for graduate-level study in artificial intelligence.

The minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University other than the Bachelor of Science Degree in Computer Science or the Bachelor of Science Degree in Computer Engineering or the Bachelor of Science Degree in Computational Data Science, or the Bachelor of Science Degree in Data Science. The minor is not available to students with a Minor in Computer Science. With the approval of the department and college that administers the student's degree program, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree.

Students who plan to complete the requirements for the minor must apply to the Department of Computer Science and Engineering. The minimum criteria for acceptance are the completion of Computer Science and Engineering 231 and 260 with a minimum grade in each of those two courses of 3.0. Enrollment may be limited. Calculus I is an implied component of the Artificial Intelligence Minor, since the course is a prerequisite for a required course in the Minor.

**Requirements for the Minor in Artificial Intelligence**

CREDITS

Complete a minimum of 22 credits from the following:

1. All of the following courses (19 credits):

| | | | |
|---|---|---|---|
| CSE | 231 | Introduction to Programming I | 4 |
| CSE | 232 | Introduction to Programming II | 4 |
| CSE | 260 | Discrete Structures in Computer Science | 4 |
| CSE | 300 | Social, Ethical, and Professional Issues in Computing | 1 |
| CSE | 331 | Algorithms and Data Structures | 3 |
| CSE | 345 | Fundamentals of Artificial Intelligence | 3 |

2. One of the following courses (3 credits):

| | | | |
|---|---|---|---|
| CSE | 402 | Biometrics and Pattern Recognition | 3 |
| CSE | 404 | Introduction to Machine Learning | 3 |
| CSE | 434 | Autonomous Vehicles | 3 |
| CSE | 440 | Artificial Intelligence | 3 |
| CSE | 446 | AI Agents | 3 |
| MTH | 483 | Mathematical Machine Learning | 3 |

Effective Fall 2026.

## COLLEGE OF NATURAL SCIENCE

1. Request to change the requirements for the **Bachelor of Science** degree in **Physiology** in the Department of Physiology.

   a. Under the heading **Requirements for the Bachelor of Science Degree in Physiology** make the following changes in item 3.:

      (1) In item a. (1) (b), delete the following courses:

| | | | |
|---|---|---|---|
| STT | 200 | Statistical Methods | 3 |
| STT | 231 | Statistics for Scientists | 3 |
| STT | 421 | Statistics I | 3 |
| STT | 464 | Statistics for Biologists | 3 |

      Add the following courses:

| | | | |
|---|---|---|---|
| STT | 200 | Statistical Methods | 4 |
| STT | 231 | Statistics for Scientists | 4 |

      (2) In item a., change the total credits from ’62 to 71’ to ’66 to 73’.

      (3) In item a. (2) (a), change the credits of ‘CEM 142’ from ‘3’ to ‘4’.

      (4) In item a. (2) (b), change the credits of ‘CEM 152’ from ‘3’ to ‘4’.

      (5) In item a. (5), change the credits of ‘CEM 251 and CEM 255’ from ‘3’ to ‘4’.

      (6) In item a. (7), change the credits of ‘ANTR 350’ from ‘3’ to ‘4’.

Effective Fall 2026.

## COLLEGE OF NURSING

1. Request to change the requirements for the **Master of Science in Nursing** degree in **Nursing**. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

   *The concentrations in the Doctor of Nursing Practice degree in Nursing Practice are noted on the student's academic record when the requirements for the degree have been completed.*

   a. Under the heading **Admission** replace item 9. with the following:

      If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

   b. Under the heading **Requirements for the Master of Science Degree in Nursing in Nursing** make the following changes:

      (1) Replace the entry text with the following:

      A total of 54 or 56 credits is required for the degree under Plan B (without thesis) depending on the student's area of concentration. Students must meet the requirements specified below:

      (2) In item 1., change the total credits from '24' to '24 or 27' and add the following course and note:

| | | | |
|---|---|---|---|
| NUR | 914 | Biostatistics for the APRN | 3 |

      NUR 906 is **not** required for the Nurse Practitioner-Family and Nurse Practitioner-Adult-Gerontological Primary Care concentrations.

      (3) In item 2., under the **Nurse Practitioner-Family** concentration, change the total credits from '30' to '32' and replace the entry with the following:

| | | | |
|---|---|---|---|
| NUR | 912 | Health Promotion and Population Health for the Primary Care NP | 3 |
| NUR | 915 | Clinical Diagnosis and Management I - Family | 6 |
| NUR | 916 | Diagnosis and Management for the Primary Care Nurse Practitioner | 6 |
| NUR | 917 | Diagnosis and Management for the Family Nurse Practitioner II | 6 |
| NUR | 918 | Diagnosis and Management for the Family Nurse Practitioner III | 6 |
| NUR | 941 | Introduction to Diagnostic Reasoning for the Family Nurse Practitioner | 3 |
| NUR | 943 | Pediatric and Perinatal Concepts for the Family Nurse Practitioner (FNP) | 2 |

      (4) In item 2., under the **Nurse Practitioner-Adult-Gerontological Primary Care** concentration, change the total credits from '30' to '32' and replace the entire entry with the following:

| | | | |
|---|---|---|---|
| NUR | 912 | Health Promotion and Population Health for the Primary Care NP | 3 |
| NUR | 916 | Diagnosis and Management for the Primary Care Nurse Practitioner | 6 |
| NUR | 925 | Diagnosis and Management for the Adult Gerontology Primary Care Nurse Practitioner I | 6 |
| NUR | 927 | Diagnosis and Management for the Adult Gerontology Primary Care Nurse Practitioner II | 6 |
| NUR | 928 | Diagnosis and Management for the Adult Gerontology Primary Care Nurse Practitioner III | 6 |

| | | | |
|---|---|---|---|
| NUR | 942 | Introduction to Diagnostic Reasoning for the Family Nurse Practitioner | 3 |
| NUR | 944 | Gerontologic Concepts for the Adult Gerontology Primary Care Nurse Practitioner | 2 |

(4) In item 2., under the **Nurse Practitioner-Psychiatric Mental Health** concentration, change the total credits from '30' to '27' and delete the following course:

| | | | |
|---|---|---|---|
| EPI | 840 | Clinical Epidemiology for Healthcare Practice | 3 |

(5) In item 2., under the **Adult-Gerontology-Clinical Nurse Specialist** concentration, change the total credits from '30' to '27' and delete the following course:

| | | | |
|---|---|---|---|
| EPI | 840 | Clinical Epidemiology for Healthcare Practice | 3 |

2. Request to change the requirements for the **Doctor of Nursing Practice** degree in **Nursing Practice**. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

*The concentrations in the Doctor of Nursing Practice degree in Nursing Practice are noted on the student's academic record when the requirements for the degree have been completed.*

a. Under the heading **Admission** replace item 10. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

b. Under the heading **Requirements for the Doctor of Nursing Practice Degree in Nursing Practice** make the following changes:

(1) In item 2., under the **Nurse Practitioner-Family** concentration, add the following courses and change the total credits from '42' to '47':

| | | | |
|---|---|---|---|
| NUR | 941 | Introduction to Diagnostic Reasoning for the Family Nurse Practitioner | 3 |
| NUR | 943 | Pediatric and Perinatal Concepts for the Family Nurse Practitioner (FNP) | 2 |

(2) In item 2., under the **Nurse Practitioner-Adult-Gerontological Primary Care** concentration, delete the following courses and change the total credits from '42' to '47':

| | | | |
|---|---|---|---|
| NUR | 913 | Health Promotion – Adult Gerontology | 3 |
| NUR | 926 | Clinical Diagnosis and Management I – Adult-Gerontology | 6 |
| NUR | 929 | Clinical Diagnosis and Management V – Clinical Immersion – Adult Gerontology | 6 |

Add the following courses:

| | | | |
|---|---|---|---|
| NUR | 912 | Health Promotion – Family | 3 |
| NUR | 916 | Clinical Diagnosis and Management II – Family | 6 |
| NUR | 919 | Clinical Diagnosis and Management V- Clinical Immersion – Family | 6 |
| NUR | 942 | Introduction to Diagnostic Reasoning for the Adult-Gerontology Primary Care Nurse Practitioner | 3 |
| NUR | 944 | Gerontologic Concepts for the Adult Gerontology Primary Care Nurse Practitioner | 2 |

(3) In item 3. **Admission to the Post-Master's Degree** replace item 10. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

Effective Fall 2026.

3. Request to change the requirements for the **Graduate Certificate** in **Adult-Gerontology – Clinical Nurse Specialist** in the College of Nursing. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

*The Graduate Certificate in Adult-Gerontology – Clinical Nurse Specialist is a Type 2 graduate certificate and will appear on the transcript as "Graduate Certificate Program in Adult-Gerontology - - Clinical Nurse Specialist".*

a. Under the heading **Admission** replace item 9. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

Effective Fall 2026.

4. Request to change the requirements for the **Graduate Certificate** in **Nurse Practitioner – Adult - Gerontological Primary Care** in the College of Nursing. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

*The Graduate Certificate in Nurse Practitioner – Adult-Gerontological Primary Care is a Type 2 graduate certificate and will appear on the transcript as "Graduate Certificate Program in Nurse Practitioner – Adult-Gerontological Primary Care".*

a. Under the heading **Admission** replace item 9. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

b. Under the heading **Requirements for the Graduate Certificate in Nurse Practitioner – Adult-Gerontological Primary Care** make the following changes:

(1) Delete the following courses:

| | | | |
|---|---|---|---|
| NUR | 913 | Health Promotion – Adult Gerontology | 3 |
| NUR | 926 | Clinical Diagnosis and Management II – Adult Gerontology | 6 |

Add the following courses:

| | | | |
|---|---|---|---|
| NUR | 912 | Health Promotion – Family | 3 |
| NUR | 916 | Clinical Diagnosis and Management II – Family | 6 |
| NUR | 942 | Introduction to Diagnostic Reasoning for Adult-Gerontology Primary Care Nurse Practitioner | 3 |
| NUR | 944 | Gerontologic Concepts for the Adult Gerontology Primary Care Nurse Practitioner | 2 |

(2) Change the total credits from '27 to '35'.

Effective Fall 2026.

5. Request to change the requirements for the **Graduate Certificate** in **Nurse Practitioner - Family** in the College of Nursing. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

*The Graduate Certificate in Nurse Practitioner - Family is a Type 2 graduate certificate and will appear on the transcript as "Graduate Certificate Program in Nurse Practitioner - Family".*

a. Under the heading **Admission** replace item 9. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

b. Under the heading **Requirements for the Graduate Certificate in Nurse Practitioner – Family** make the following change:

(1) Add the following course:

| | | | |
|---|---|---|---|
| NUR | 941 | Introduction to Diagnostic Reasoning for the Family Nurse Practitioner | 3 |
| NUR | 943 | Pediatric and Perinatal Concepts for the Family Nurse Practitioner (FNP) | 2 |

(2) Change the total credits from ’27 to ‘32’.

Effective Fall 2026.

6. Request to change the requirements for the **Graduate Certificate** in **Nurse Practitioner - Psychiatric Mental Health** in the College of Nursing. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

*The Graduate Certificate in Nurse Practitioner - Psychiatric Mental Health is a Type 2 graduate certificate and will appear on the transcript as "Graduate Certificate Program in Nurse Practitioner - Psychiatric Mental Health".*

a. Under the heading **Admission** replace item 9. with the following:

If the applicant's native language is not English, the applicant must complete an English Language Proficiency Exam, in accordance with the Gradate School's English Language Competency policy. (*https://grad.msu.edu/english-language-competency*).

Effective Fall 2026.

## COLLEGE OF OSTEOPATHIC MEDICINE

1. Request to change the requirements for the **Professional Program in Osteopathic Medicine** leading to the Doctor of Osteopathic Medicine degree the College of Osteopathic Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

    a. Under the heading **Requirements for the Doctor of Osteopathic Medicine Degree** make the following changes:

        (1) Under ***PreClerkship Curriculum*** make the following changes:

            (a) Change the total credits from '91' to '92'.

            (b) Add the following course:

            OST 501 Introduction to Medical School 1

    Effective Summer 2026.

2. Request to change the requirements for the **Master of Science** degree in **Basic Medical Science** in the College of Osteopathic Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its April 20, 2026 meeting.

    a. Under the heading **Admission** add the following paragraph:

    Students must begin the application process within one year (three semesters) of the end date of their most recent DO course that fulfills the degree requirements. Applications initiated after this one-year window will not be eligible for review, even if the six-year academic completion limit has not been reached.

    b. Under the heading **Requirements for the Master of Science Degree in Basic Medical Science** make the following changes:

        (1) Change the total credits from '91' to '92'.

        (2) In item 1., under *Semester 1* add the following course:

        OST 501 Introduction to Medical School 1

        (3) Under the heading ***Additional Requirements for Plan A*** add the following sentence to the note in item 1.:

        Students qualifying for an incomplete grade must complete the thesis no later than the middle of the next semester, consistent with University policy.

        (4) Under the heading ***Additional Requirements for Plan B*** replace the entry with the following:

            1. Complete the following course:

            OST 890 Independent Study 4

            2. Completion of a final examination or evaluation.

    Effective Summer 2026.

# PART II - NEW COURSES AND CHANGES

## COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

ANS 442 Advanced Horse Management
Spring of every year. 3(2-2) ~~P: ANS 242 and ANS 313~~ P: ANS 242 RB: ANS 313 R: Not open to freshmen or sophomores.
Scientific application of biological and biotechnological principles in the disciplines of horse production and management.
SA: ANS 498
Effective Fall Semester 2026

ANS 485 Companion Animal Health
Spring of every year. 3(2-2) P: ANS 282 and ANS 309 R: Open to seniors in the Animal Science Major or in the Lyman Briggs Animal Science Coordinate Major.
NEW Strategies to maintain and improve the health of cats and dogs.
Effective Spring Semester 2026

ENT 805 Effective Science Presentations
Fall of every year. 1(1-0) R: Open to graduate students in the Department of Entomology or approval of department.
NEW Designing and delivering effective science presentations and public speaking performances. Offered first ten weeks of semester.
Effective Fall Semester 2027

FW 293 Undergraduate Seminar in Fisheries and Wildlife
Fall of every year. Spring of every year. 1(0-2) ~~P: FW 101 or concurrently~~ P: (FW 101 or concurrently) and FW 102 R: Open to undergraduate students in the Lyman Briggs College or in the Department of Fisheries and Wildlife.
Professional development and discussion of current case studies to prepare students for a career in Fisheries and Wildlife.
Effective Fall Semester 2026

FW 417 Wetland Ecology and Management
Fall of every year. 3(3-0) P: (BS 162 or BS 182H or LB 144 or FOR 340) and Completion of Tier I Writing Requirement RB: IBIO 355 R: Open to juniors or seniors or approval of department.
Biological, physical, and chemical processes controlling wetland structure and function. Utilization, mitigation, and conservation of wetlands on a sustainable basis.
SA: FW 412
Effective Fall Semester 2026

HRT 363 Managing Weeds in Horticulture
Spring of even years. 3(3-0) P: HRT 203 or CROP 101 or TURF 242
NEW Mechanical, cultural, chemical, and precision weed control in horticultural systems. Challenges related to economics, environmental impact, and resistance.
Effective Spring Semester 2027

HRT 482 Root Biology
Fall of odd years. 3(3-0) P: PLB 105 or PLB 201 R: Open to juniors or seniors or graduate students in the Department of Horticulture.
NEW Principles of root biology including evolution, ecology, physiology, development, architecture, and environmental interactions.
Effective Fall Semester 2027

CSS 801 Evolution of Resistance to Pesticides
Spring of even years. 2(2-0) RB: Undergraduate degree in related field
NEW Pesticide resistance evolution in bacteria, fungi, insects, and plants. Mechanisms of pesticide resistance: genetic and molecular processes.
Effective Spring Semester 2028

SOIL 210 Fundamentals of Soil Science
Fall of every year. Spring of every year. ~~3(2-3)~~ 3(3-0) RB: CEM 141 R: Open to undergraduate students or agricultural technology students.
Agricultural and natural resource ecosystems: soil, vegetation, and ground water components. Energy, water, and nutrient cycles. Soil classification and mapping. Land management and use issues.
SA: CSS 210
Effective Fall Semester 2026

## COLLEGE OF ENGINEERING

CHE 483 Brewing and Distilled Beverage Technology
Spring of every year. 3(2-3) Interdepartmental with Food Science ~~P: CHE 311 or (ME 410 or concurrently) or BE 350 or (BE 429 or concurrently) or (FSC 325 or concurrently)~~ P: CHE 311 or (ME 410 or concurrently) or BE 350 or (FSC 325 or concurrently) or MSE 310 RB: Major in Chemical Engineering, Biosystems Engineering or Food Science. Must be at least 21 years of age. R: Approval of department.
Raw materials for fermentation and basics of alcohol fermentation, beer and cider production; basics of distillation; brandy and eau de vie production; whiskey production; vodka, gin and flavored spirits production; flavor chemistry
Effective Fall Semester 2026

CHE 484 Distillation Science and Technology I
Spring of every year. 3(3-0) P: FSC 481
Raw material selection including fruits and types of cereal grains for distilled spirit production, malting of cereal grains, milling science, water chemistry and mashing theory.
DELETE COURSE
Effective Summer Semester 2026

CHE 485 Distillation Science and Technology II
Summer of every year. 3(3-0) P: FSC 481 and CHE 484
Distillation methods, equipment design and technology, stabilizing, filtration and bottling of distilled spirits, barrel aging, laboratory control, regulatory aspects, and safety.
DELETE COURSE
Effective Summer Semester 2026

CHE 884 Distillation Science and Technology I
Spring of every year. 3(3-0) P: (FSC 480 or approval of department) and FSC 481 RB: Undergraduate-level coursework in chemical engineering, food science, chemistry, or a related field is preferred. Familiarity with material and energy balances, basic thermodynamics, and laboratory safety practices is recommended. Or students have professional experiences in a related industry of beverage production, fermentation, and distillation. Prior exposure to fermentation or beverage processing is beneficial but not required. R: Approval of department.

NEW
Advanced study of raw material selection for distilled spirit production, including fruits and cereal grains. Emphasis on malting chemistry, milling mechanics, water chemistry, and mashing theory with quantitative analysis, process optimization, and critical evaluation of industrial practices
SA: CHE 484
Effective Fall Semester 2026

CHE 885 Distillation Science and Technology II: Equipment, Design, & Maturation
Summer of every year. 3(3-0) P: CHE 884 RB: Undergraduate-level coursework in chemical engineering, food science, chemistry, or a related field is preferred. Familiarity with material and energy balances, basic thermodynamics, and laboratory safety practices is recommended. Or students have professional experiences in a related industry of beverage production, fermentation, and distillation. Prior exposure to fermentation or beverage processing is beneficial but not required. R: Approval of department.

NEW Advanced study of distillation methods and equipment design for distilled spirits, including batch and continuous systems. Topics include separation theory, heating strategies, spirit stabilization and filtration, barrel aging chemistry, laboratory quality control, regulatory compliance, and distillery safety. Students complete a capstone-style project involving the design and technical justification of a distilled spirit process.
SA: CHE 485
Effective Fall Semester 2026

TNG 310 ~~Advanced Graphic Communications~~ Computer Aided Manufacturing & Simulation
Fall of every year. Spring of every year. 3(1-4) P: TNG 210 and ME 280 R: Open to students in the Technology Engineering Major. Not open to students with credit in ME 385.
~~Continuation of graphic communications including electrical schematics, geometric design and tolerancing, electrical and mechanical system design, and the integration of computer aided design, computer aided manufacturing, and computer numerical control.~~ Applications of computer aided design (CAD), computer aided manufacturing (CAM), and computer numerical control (CNC). Integration of manufacturing robotics.
Effective Fall Semester 2026

TNG 320 Sensors and Signal Processing
Fall of every year. Spring of every year. 3(2-2) ~~P: TNG 220 and STT 180~~ P: TNG 220 R: Open to students in the Technology Engineering Major. Not open to students with credit in ECE 366.
Conceptualizing of real-world phenomena in terms of electrical output and the implementation of devices for transduction and measurement.
Effective Fall Semester 2026

TNG 330 Quality and Continuous Improvement
Fall of every year. Spring of every year. 3(3-0) ~~P: STT 201 and TNG 310~~ P: STT 201 R: Open to students in the Technology Engineering Major.
Methods of quality control and improvement that are used in the manufacturing and service industries.
Effective Fall Semester 2026

TNG 345 Mechanical Machine Dynamics
Spring of every year. 3(2-2) ~~P: TNG 340~~ P: (MTH 132 and PHY 231) or PHY 183 R: Open to students in the Technology Engineering Major. Not open to students with credit in ME 361.
Analysis and application of the kinematics and kinetics of mechanical machines and systems.
Effective Fall Semester 2026

TNG 430 Engineering Project Management
Fall of every year. Spring of every year. 3(3-0) ~~P: TNG 330 or concurrently~~ P: MTH 132 ~~R: Open to students in the Technology Engineering Major.~~ R: Open to undergraduate students in the Technology Engineering Major.
Managing an engineering project, including scope, schedule, budget, and communications. How design considerations such as public health and safety, engineering standards, customer diversity, and ethical responsibilities affect the project outcome. Engineering economics.
Effective Fall Semester 2026

TNG 440 Robotics, Automation, and Controls
Fall of every year. 3(2-2) ~~P: TNG 320 and (TNG 322 or concurrently) and TNG 345~~ P: TNG 310 and TNG 320 and TNG 345 R: Open to students in the Technology Engineering Major.
Hardware, software, sensors, and human resources required to implement effective control systems. Interfacing and controlling a variety of electromechanical devices such as motors and pneumatic actuators. Industrial safety practices and procedures.
Effective Fall Semester 2026

TNG 462 Automation in Semiconductor Fabrication
Spring of every year. 3(1-2) P: TNG 322 and TNG 345 and MSE 460 R: Open to undergraduate students in the Technology Engineering Major. Not open to students with credit in ECE 477.
NEW Applications of automation, control systems, and robotics in semiconductor fabrication processes
Effective Fall Semester 2026

TNG 465 Electronic Failure Analysis
Fall of every year. 4(2-2) Interdepartmental with Electrical and Computer Engineering P: (TNG 322 and MSE 460) or ECE 302 R: Open to undergraduate students in the Computer Engineering Major or in the Electrical Engineering Major or in the Technology Engineering Major.
NEW Analytical and physical evaluation of microelectronics and printed circuit board assemblies
Effective Fall Semester 2026

TNG 480 Technology Engineering Capstone (W)
Fall of every year. Spring of every year. 3(1-4) P: (TNG 430) and completion of Tier I writing requirement ~~R: Open to students in the Technology Engineering Major.~~ R: Open to students in the Technology Engineering Major. Approval of department; application required.
Planning and execution of a team project involving the development of an engineered product or system, utilizing knowledge and skills acquired in prior engineering coursework. Project considerations include engineering standards, system constraints, design for customer needs, ethical issues, budget, timing, and safety.
Effective Fall Semester 2026

CMSE 991 Special Topics in Data Science, Machine Learning, and Artificial Intelligence
On Demand. 3(3-0) P: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 or approval of department RB: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 R: Open to master's students or doctoral students in the College of Engineering or in the Department of Computational Mathematics, Science, and Engineering or approval of department.
NEW Advanced topics in data science, machine learning, and artificial intelligence.
Effective Fall Semester 2026

CMSE 992 Special Topics in High Performance Computing
On Demand. 3(3-0) P: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 or approval of department RB: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 R: Open to master's students or doctoral students in the College of Engineering or in the Department of Computational Mathematics, Science, and Engineering or approval of department.
NEW Advanced topics in high performance computing.
Effective Fall Semester 2026

CMSE 993 Special Topics in Computational Modeling and Numerical Methods
On Demand. 3(3-0) P: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 or approval of department RB: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 R: Open to master's students or doctoral students in the College of Engineering or in the Department of Computational Mathematics, Science, and Engineering or approval of department.
NEW Advanced topics in computational modeling and numerical methods.
Effective Fall Semester 2026

CMSE 994 Special Topics in Emerging Technologies
On Demand. 3(3-0) P: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 or approval of department RB: CMSE 820 or CMSE 821 or CMSE 822 or CMSE 823 R: Open to master's students or doctoral students in the College of Engineering or in the Department of Computational Mathematics, Science, and Engineering or approval of department.

NEW
Advanced topics in emerging technologies.
Effective Fall Semester 2026

## COLLEGE OF NATURAL SCIENCE

ISE 420 Integrated Science Research
~~Fall of every year. Spring of every year.~~ Spring of every year. 3(2-2) Interdepartmental with Teacher Education ~~R: Open to seniors in the General Science Secondary Teaching Major and open to seniors in the Integrated Science Elementary Teaching Major.~~ R: Open to students in the College of Natural Science or in the Integrated Science-Secondary Education Major.

Research design and data analysis of individual research projects relevant to the K-12 science curriculum, integrating topics in life, earth, and physical science.
SA: SME 420
Effective Fall Semester 2026

PSL 475L Capstone Laboratory in Physiology
Fall of every year. Spring of every year. Summer of every year. ~~2(1-3)~~ 2(0-4) ~~P: (PSL 431 and PSL 432) and completion of Tier I writing requirement~~ P: (PSL 431 and PSL 432) and completion of Tier I writing requirement RB: anatomy and statistics R: Open to seniors in the Physiology Major or in the Lyman Briggs Physiology Coordinate Major.

Laboratory exercises in human and animal physiology, including cardiovascular, respiratory, neural, muscle, sensory, and hormonal function, as well as systems physiology studies in exercise and systemic reflexes.
Effective Spring Semester 2026

## COLLEGE OF NURSING

NUR 912 ~~Health Promotion – Family~~ Health Promotion and Population Health for the Primary Care NP
Spring of every year. Summer of every year. 3(3-0) ~~P: NUR 902 and NUR 907~~ P: NUR 902 and NUR 907 and NUR 914 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major. ~~C: EPI 840 concurrently~~

~~Integration of concepts, theories and principles of population health, health promotion and disease prevention at the advanced practice level across the lifespan.~~ Integration of concepts, theories and principles of population health, health promotion and disease prevention.
Effective Spring Semester 2026

NUR 913 Health Promotion – Adult-Gerontology
Spring of every year. Summer of every year. 3(3-0) P: NUR 902 and NUR 907 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major. ~~C: EPI 840 concurrently~~ C: EPI 840 concurrently

Integration of concepts, theories and principles of population health, health promotion and disease prevention at the advanced practice level for adults and older adults.
DELETE COURSE
Effective Spring Semester 2028

NUR 915 Clinical Diagnosis and Management I - Family
Fall of every year. 6(3-9) P: NUR 912 and NUR 907 and NUR 908 and NUR 909 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.

Integration of health assessment and diagnostic testing to formulate differential diagnoses for common health conditions/problems across the lifespan.
Effective Spring Semester 2028

NUR 916 ~~Clinical Diagnosis and Management II – Family~~
Diagnosis and Management for the Primary Care Nurse practitioner
Spring of every year. 6(3-9) P: NUR 915 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Integration of assessment and intervention strategies for health promotion and common problems in the clinical setting across the lifespan.~~ Integration of preventative and management strategies for populations in the primary care setting across adolescence, adult, and older adulthood.
Effective Spring Semester 2028

NUR 917 ~~Clinical Diagnosis and Management III – Family~~
Diagnosis and Management for the Family Nurse Practitioner II
Summer of every year. 6(3-9) P: NUR 916 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Principles and management strategies used to construct personalized care plans for individuals including diverse and at risk populations across the lifespan.~~ Integration of preventative and management strategies within the interprofessional team to deliver comprehensive care for populations across the age continuum.
Effective Spring Semester 2028

NUR 918 ~~Clinical Diagnosis and Management IV – Family~~
Diagnosis and Management for the Family Nurse Practitioner III
Fall of every year. 6(2-12) P: NUR 917 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Integrates evidence-based strategies to deliver collaborative primary care practice across the wellness/illness continuum with patients across the lifespan.~~ Integration of preventative and management strategies within the interprofessional team for populations across the age continuum.
Effective Spring Semester 2028

NUR 919 ~~Clinical Diagnosis and Management V- Clinical Immersion – Family~~
DNP Role Development in Clinical and Community Settings for the Nurse Practitioner
Spring of every year. 6(2-12) P: NUR 918 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Evidence-based management of chronic stable and complex problems within collaborative practice in complex health systems across the lifespan.~~ Prepares nurse practitioners to lead in clinical and community settings through evidence-based practice, collaborative strategies, with a focus on health equity.
Effective Spring Semester 2028

NUR 925 ~~Clinical Diagnosis and Management I – Adult-Gerontology~~
Diagnosis and Management for the Adult Gerontology Primary Care Nurse practitioner I
Fall of every year. 6(3-9) P: NUR 908 and NUR 909 and NUR 913 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Integration of health assessment and diagnostic testing to formulate differential diagnoses for common health conditions/problems in adults and older adults~~ Integration of health assessment, and diagnostic testing to formulate differential diagnoses and management plans for common health conditions and problems across adolescence, adult, and older adulthood.
Effective Spring Semester 2028

NUR 926 Clinical Diagnosis and Management II – Adult-Gerontology
Spring of every year. 6(3-9) P: NUR 925 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
Integration of assessment and intervention strategies for health promotion and common problems in the clinical setting for adults and older adults.
DELETE COURSE
Effective Spring Semester 2029

NUR 927 ~~Clinical Diagnosis and Management III – Adult-Gerontology~~
Diagnosis and Management for the Adult Gerontology Primary Care Nurse practitioner II
Summer of every year. 6(3-9) P: NUR 926 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Principles and management strategies used to construct personalized care plans for individuals including diverse and at risk populations with adults and older adults~~ Integration of preventative and management strategies within the interprofessional team to deliver comprehensive care for populations across adolescence, adult, and older adulthood.
Effective Spring Semester 2028

NUR 928 ~~Clinical Diagnosis and Management IV – Adult-Gerontology~~
Diagnosis and Management for the Adult Gerontology Primary Care Nurse practitioner III
Fall of every year. 6(2-12) P: NUR 927 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
~~Integrates evidence-based strategies to deliver collaborative primary care practice across the wellness/illness continuum for adults and older adults.~~ Integration of preventative and management strategies within the interprofessional team for populations across adolescence, adult, and older adulthood.
Effective Spring Semester 2028

NUR 929 Clinical Diagnosis and Management V - Clinical Immersion – Adult-Gerontology
Spring of every year. 6(2-12) P: NUR 928 R: Open to graduate students in the College of Nursing or in the Master of Science in Nursing or in the Nursing Practice Major.
Evidence-based management of chronic stable and complex problems within collaborative practice in complex health systems with adults and older adults
DELETE COURSE
Effective Fall Semester 2029

NUR 941 Introduction to Diagnostic Reasoning for the Family Nurse Practitioner
Summer of every year. 3(2-1) P: NUR 909 and NUR 912 C: NUR 908 concurrently
NEW Introduction of the family nurse practitioner role including diagnostic reasoning and differential diagnosis for common health conditions and problems across the lifespan.
Effective Summer Semester 2028

NUR 942 Introduction to Diagnostic Reasoning for the Adult-Gerontology Primary Care Nurse Practitioner
Summer of every year. 3(2-1) P: NUR 909 and NUR 912 C: NUR 908 concurrently
NEW Introduction of the adult gerontology nurse practitioner role including diagnostic reasoning and differential diagnosis for common health conditions and problems across adolescence, adult, and older adult
Effective Summer Semester 2028

NUR 943 Pediatric and Perinatal Concepts for the Family Nurse Practitioner (FNP)
Summer of every year. 2(2-0) P: NUR 915 C: NUR 916 concurrently
NEW Integration of preventative and management strategies to deliver comprehensive care for pediatric, prenatal, and postnatal populations
Effective Spring Semester 2029

NUR 944 Gerontologic concepts for the Adult Gerontology Primary Care Nurse practitioner
Spring of every year. 2(2-0) P: NUR 925 C: NUR 916 concurrently
NEW Integration of preventative and management strategies to deliver comprehensive care to older adults
Effective Spring Semester 2029

NUR 995 Doctor of Nursing Practice Project I
Spring of every year. Summer of every year. 4(2-2) ~~P: (NUR 902 and NUR 903 and NUR 905) and (NUR 916 or NUR 926 or NUR 934 or NUR 976)~~ P: (NUR 902 and NUR 903 and NUR 905) and (NUR 916 or NUR 926 or NUR 934 or NUR 976 or NUR 954) R: Open to doctoral students in the College of Nursing.
Introduction of the scholarly practice project for the advanced practice nurse.
Request the use of the Pass-No Grade (P-N) system.
Effective Spring Semester 2026

## COLLEGE OF OSTEOPATHIC MEDICINE

OST 501 Introduction to Medical School
Summer of every year. 1(1-0) R: Open to graduate-professional students in the College of Osteopathic Medicine.

NEW This course prepares students to enter medical school with confidence by building essential academic and professional foundations. It nurtures curiosity and lifelong learning, strengthens a commitment to serving patients and the profession, and sets the stage for developing physician leaders who can meaningfully advance the health of diverse communities.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer Semester 2026

OST 521 Musculoskeletal System
Fall of every year. 4(8-2) ~~P: OST 520~~ R: Open to graduate-professional students in the College of Osteopathic Medicine.
Structure, function, and conditions of the musculoskeletal system as applied to osteopathic medicine.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2026

OST 522 ~~Hematology, Oncology and Infectious Diseases~~ Hematologic System
~~Fall of every year.~~ Summer of every year. 3(3-0) P: OST 520 R: Open to graduate-professional students in the College of Osteopathic Medicine.
~~Systems biology approach to principles of hematology, oncology, and response to infection.~~ Systems biology approach to principles of hematology.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2026

OST 532 Integumentary System
~~Summer of every year.~~ Fall of every year. 2(2-0) R: Open to graduate-professional students in the College of Osteopathic Medicine.
Systems biology approach to the integumentary system, to include the skin and its epidermal derivatives. Normal structure and function and pathologies. Integration of basic science and clinical information.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2026

OST 549 Special Topics in Clinical Skills
On Demand. 1 to 6 credits. A student may earn a maximum of 30 credits in all enrollments for this course. R: Open to graduate-professional students in the College of Osteopathic Medicine or approval of college.
This course is an elective course to be taken in years 1 or 2 to provide students with an additional opportunity to work on clinical skills.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2026

OST 890 Independent Study
Fall of every year. Spring of every year. Summer of every year. ~~3(3-0)~~ 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. ~~RB: Enrolled in the Master of Arts in Health Professions Education~~ R: Approval of college; application required.
Supervised individual study in an area of osteopathic medicine.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer Semester 2026

## COLLEGE OF VETERINARY MEDICINE

LCS 635 ~~Swine Production Medicine Clerkship~~ Swine Health and Preventive Medicine
~~Fall of every year.~~ Spring of every year. 3 credits. ~~RB: Completion of year 2 of the graduate professional program in the College of Veterinary Medicine.~~ RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.
~~Swine production medicine and herd problem solving topics. Participation in the swine medicine clinical course at Iowa State University. Field trips required.~~ Swine health management and preventive medicine across diverse production systems.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall Semester 2026