MICHIGAN STATE UNIVERSITY

Report of

THE UNIVERSITY COMMITTEE ON CURRICULUM

to the Faculty Senate

Actions by UCC

October 23, 2025

The effective date for new programs subject to Statewide Academic Program review is implemented in accordance with the Statewide Academic Program Review calendar.

MICHIGAN STATE UNIVERSITY
University Committee on Curriculum

November 18, 2025

TO: Faculty Senate

This report is prepared and distributed for the following purposes:

1. To report new academic programs, changes in academic programs, discontinuations of academic programs, new courses, permanent changes in courses, and deletions of courses.
2. To notify the initiating colleges, schools, and departments of approval by the University Committee on Curriculum of their requests for new academic programs, changes in academic programs, discontinuations of academic programs, new courses, permanent changes in courses, and deletions of courses.
3. To provide information to members of the faculty in each department about academic programs and courses in all colleges, departments, and schools of the University.

Reports of the University Committee on Curriculum to the Faculty Senate are organized as follows:

PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES:

Organized by colleges in alphabetical order. For a given college, academic units are organized in alphabetical order. For a given academic unit, degrees, majors, and specializations are organized in alphabetical order.

PART II - NEW COURSES:[1]

Organized by academic units in alphabetical order; All-University courses appear last. For a given academic unit, courses are organized according to the names associated with course subject codes, in alphabetical order. Courses with the same subject code are in numerical order.

PART III - COURSE CHANGES:[1]

Organized by academic units in alphabetical order; All-University courses appear last. For a given academic unit, courses are organized according to the names associated with course subject codes, in alphabetical order. Courses with the same subject code are in numerical order.

Not all of the above categories, and not all of the colleges and academic units, will necessarily appear in any given Senate Report.

[1]One or more of the abbreviations that follow may be included in a course entry:
P: = Prerequisite monitored in SIS
C: = Corequisite
R: = Restriction
RB: = Recommended background
SA: = Semester Alias

MICHIGAN STATE UNIVERSITY

November 18, 2025

TO: Faculty Senate

FROM: University Committee on Curriculum

SUBJECT: New Academic Programs and Program Changes:
New Courses and Course Changes

PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Establish a **Bachelor of Science** degree in **Managerial Economics for the Bioeconomy** in the Department of Agricultural, Food, and Resource Economics. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 25, 2025 meeting.

   a. **Background Information**:

   The Department of Agricultural, Food, and Resource Economics is excited to offer a new major – Managerial Economics for the Bioeconomy (MEC). The MEC major will appeal to a broad range of students interested in a versatile business major that provides opportunities to interact closely with faculty and industry, while preparing for career opportunities in a wide range of industries and professions. AFRE has collected extensive feedback from industry stakeholders and students via a series of focus groups, and used the information collected to create this new major. The MEC major allows students more flexibility in terms of course choice, while still ensuring that students graduate with skills that are highly valued in the marketplace, including problem solving, data analytics, business communication, and an understanding of the role of various stakeholders (e.g., producers, consumers, and policymakers) in the marketplace. This major will help meet the high demand for business-related majors at MSU, as well as help meet the needs of industry stakeholders for a well-trained workforce.

   b. **Academic Programs Catalog Text**:

   The Bachelor of Science Degree in Managerial Economics for the Bioeconomy is rooted in the study of management and practical applications of economics. The degree affords students a high degree of flexibility and is well suited for students interested in developing strong analytical, strategic thinking, and problem-solving skills that are broadly applicable to a variety of diverse managerial and policymaking related careers. Internships, study abroad, research, and networking opportunities are encouraged to broaden learning and practical experience in the major.

   Requirements for the Bachelor of Science Degree in Managerial Economics for the Bioeconomy

   1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science Degree in Managerial Economics for the Bioeconomy.

      The University's Tier II writing requirement for the Managerial Economics for the Bioeconomy major is met by completing AFRE 445. That course is referenced in item 3. below.

      The completion of the Managerial Economics for the Bioeconomy mathematics requirement may also satisfy the College of Agriculture and Natural Resources and the University mathematics requirement.
   2. The requirements of the College of Agriculture and Natural Resources for the Bachelor of Science degree.

      Certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
   3. The following requirements for the major:

CREDITS

a. All of the following courses (26 credits):

AFRE	100	Economics and Management for the Bioeconomy	3
AFRE	203	Data Analysis for Managerial Decision Making	3
AFRE	206	World Food, Population and Poverty	3
AFRE	210	Professional Seminar in Agricultural, Food, and Resource Economics	1
AFRE	222	Sales for the Bioeconomy	3
AFRE	240	Product Marketing for the Bioeconomy	3
AFRE	410	Advanced Professional Seminar in Agricultural, Food, and Resource Economics	1
AFRE	445	Strategic Management for the Bioeconomy (W)	3
EC	201	Introduction to Microeconomics	3
EC	202	Introduction to Macroeconomics	3

b. Three of the following courses (9 credits):

AFRE	300	Public Policy Analysis	3
AFRE	315	Labor and Personnel Management	3
AFRE	322	Organizational Economics for the Bioeconomy	3
AFRE	327	International Agribusiness and Food Marketing	3
AFRE	330	Advanced Agribusiness Management	3
AFRE	340	Food Marketing Research and Analytics	3
AFRE	360	Environmental Economics	3
AFRE	435	Financial Management for the Bioeconomy	3
AFRE	440	Food Marketing Management	3
AFRE	460	Natural Resource Economics	3
AFRE	465	Corporate Environmental Management	3

A study abroad or independent study experience may also fulfill part of this requirement through enrollment in AFRE 490 with approval by the department.

An internship experience may also fulfill part of this requirement through enrollment in AFRE 493 with approval by the department.

c. Two of the following courses (5 or 6 credits):

AFRE	224	Information and Market Intelligence	3
AFRE	232	Commodity Marketing	3
AFRE	265	Ecological Economics	3
ADV	200	The World of Advertising	2
ADV	375	Consumer Behavior	3
COM	100	Human Communication	3
COM	225	Introduction to Interpersonal Communication	3
COM	240	Introduction to Organizational Communication	4
CSE	102	Algorithmic Thinking and Programming	3
CSUS	200	Introduction to Sustainability	3
CSUS	300	Theoretical Foundations of Sustainability	3
CSUS	473	Social Entrepreneurship and Community Sustainability	3
EC	330	Money, Banking, and Financial Markets	3
EC	340	Survey of International Economics	3
EC	360	Private Enterprise and Public Policy	3
EC	380	Labor Relations and Labor Market Policy	3
FI	320	Introduction to Finance	3
GBL	323	Introduction to Business Law	3
HRLR	201	Human Capital in Society	3
HRLR	211	Introduction to Organizational Leadership	3
MGT	325	Management Skills and Processes	3
MKT	327	Introduction to Marketing	3
PHL	345	Business Ethics	3
SCM	304	Survey of Supply Chain Management	3

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

ACC	230	Survey of Accounting Concepts	3
AFRE	130	Foundations of Agribusiness Management	3

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

STT	200	Statistical Methods	3
STT	201	Statistical Methods	4
STT	315	Introduction to Probability and Statistics for Business	3

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

AFRE	303	Managerial Economics	3
EC	301	Intermediate Microeconomics	3

Effective Fall 2026.

2. Delete the curriculum and degree requirements for the **Graduate Certificate** in **Conservation Law** in the Department of Fisheries and Wildlife. The University Committee on Graduate Studies (UCGS) provided consultative commentary to the Provost after considering this request. The Provost made the determination to discontinue the program after considering the consultative commentary from the University Committee on Graduate Studies.

No new students are to be admitted to the program effective Spring 2023. No students are to be readmitted to the program effective Spring 2023. Effective Spring 2023, coding for the program will be discontinued and the program will no longer be available in the Department of Fisheries and Wildlife. Students who have not met the requirements for the Graduate Certificate in Conservation Law through the Department of Fisheries and Wildlife prior to Spring 2023 will have to change their certificate.

Note: This program has been in moratorium since Spring 2023.

3. Change the requirements for the **Bachelor of Science** degree in **Dietetics** in the Department of Food Science and Human Nutrition.

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

(1) In item 3. b. (1), delete the following course:

ANTR	350	Human Gross Anatomy for Pre-Health Professionals	3

Add the following course:

ANTR	350	Human Gross Anatomy for Pre-Health Professionals	4

(2) In item 3. b. (1) change the total credits from ‘30’ to ‘31’.

(3) In item 3. b. change the total credits from ’36 to 39’ to ’37 to 40’.

Effective Spring 2026.

4. Change the requirements for the **Bachelor of Science** degree in **Food Science** in the Department of Food Science and Human Nutrition.

The concentrations in the Bachelor of Science degree in Food Science 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 Food Science** make the following changes:

(1) In item 3. a., make the following changes:

(a) Change the total credits from ‘51’ to ‘52’.

(b) Delete the following courses:

CEM	142	General and Inorganic Chemistry	3
MMG	301	Introductory Microbiology	3

Add the following courses:

CEM	142	General and Inorganic Chemistry	4
MGI	301	Introductory Microbiology	3

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

PHY	241	Physics for Cellular and Molecular Biologists I	4

(3) In item 3. f., make the following changes:

(a) In the **Basic Food Science** concentration, make the following changes:

(i) Change the total credits from '25' to '27'.

(ii) In item (1) change the total credits from '16' to '18'.

(iii) In item (1) delete the following courses:

CEM	251	Organic Chemistry I	3
CEM	252	Organic Chemistry II	3

Add the following courses:

CEM	251	Organic Chemistry I	4
CEM	252	Organic Chemistry II	4

(iv) In item (2) delete the following courses:

MMG	409	Eukaryotic Cell Biology	3
MMG	425	Microbial Ecology	3
MMG	431	Microbial Genetics	3
MMG	445	Microbial Biotechnology (W)	3
MMG	451	Immunology	3

Add the following courses:

MGI	409	Eukaryotic Cell Biology	3
MGI	425	Microbial Ecology	3
MGI	431	Microbial Genetics	3
MGI	451	Immunology	3

Effective Spring 2026.

5. Change the requirements for the **Minor in Beverage Science and Technology** in the Department of Food Science and Human Nutrition.

a. Under the heading **Minor in Beverage Science and Technology** in item 1. make the following change:

(1) Delete the following courses:

MMG	201	Fundamentals of Microbiology	3
MMG	301	Introductory Microbiology	3

Add the following courses:

MGI	201	Fundamentals of Microbiology	3
MGI	301	Introductory Microbiology	3

Effective Spring 2026.

6. Establish a **Bachelor of Science** degree in **Cropping Systems Science** in the Department of Plant, Soil and Microbial Sciences. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 4, 2025 meeting.

a. **Background Information**:

Michigan State University has had an academic major in Crop and Soil Sciences with three concentrations for over forty years. The concentrations are currently: Crop and Soil Sciences, Turfgrass Management, and Advanced Studies. The department completed a curriculum review in 2023-2024 and the curriculum committee recommended and received support from the faculty in a ballot vote to put the current Crop and Soil Sciences major into moratorium and create three new majors. The three new majors are Cropping Systems Science, Turfgrass Science and Management, and Environmental Soil and Water Science. There are no accrediting agencies or federal regulations related to this request.

Michigan State University began as Michigan Agricultural College (MAC) and has a long history of academic majors connected to agriculture and the environment. The Crop and Soil Sciences major has been housed for over 40 years in the Department of Crop and Soil Sciences, and more recently in the Department of Plant, Soil, and Microbial Sciences (a merger of the Departments of Crop and Soil Sciences and Plant Pathology). Michigan State University is the leading university in Michigan to offer a degree in crop and soil sciences.

In recent years, the Crop and Soil Sciences department merged with Plant Pathology and the new department was named Plant, Soil and Microbial Sciences. The Crop and Soil Sciences major with three concentrations, the Minor in Agronomy, the Minor in Turfgrass Management, and the Minor in Environmental Soil Science is housed in this department.

The major in Cropping Systems Science will teach students to: (1) characterize crop development and physiology; (2) explain abiotic and biotic stresses on crop plants and methods for alleviating these stresses; (3) describe weather and climate and the impact on crop production; (4) describe the components of precision agriculture and the impact on sustainable cropping systems; (5) demonstrate practical skills in identification of crop and weed plants and seeds, insects and plant diseases, soil texturing and diagnosis of problems in fields; (6) describe farming systems and practices for growing Michigan's key agronomic crops; (7) interpret soil texture, structure, fertility, and soil management and their impact on cropping systems; (8) describe the characteristics of and design economically, environmentally, and socially sustainable cropping systems; (9) describe and explain the importance of crop genetics and plant breeding in advancing crop production; and (10) be competent in oral and written communication, computer use, problem solving, and critical analysis.

b. **Academic Programs Catalog Text**:

The Bachelor of Science degree in Cropping Systems Science is designed to prepare students for career opportunities as agronomists and cropping system scientists, as farmers and consultants, in private and public businesses, and with government agencies. Cropping systems science involves the application of biological, chemical, and physical science principles to produce plants grown for human food, animal feed, biofuel, and fiber to meet global demand. The use of biotechnology, digital technologies and precision agriculture are important aspects of agricultural food systems today. Cropping systems scientists, agronomists, and farmers strive to improve soil health and develop cropping sequences and management techniques to improve the economic, environmental, and social sustainability of farms. Conserving soil and water and maintaining long-term farm field productivity and resilience depends largely on the management of cropping systems. This major provides students with the opportunity to understand the challenges and opportunities to integrate scientific innovations with the practice of crop production. Students take courses in crop production, physiology, genetics, precision agriculture, pest management, soil science, meteorology, and professional development courses to prepare for careers in cropping systems science.

Requirements for the Bachelor of Science Degree in Cropping Systems Science

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science Degree in Cropping Systems Science.

   The University's Tier II writing requirement for the Cropping Systems Science major is met by completing CROP 313 and CROP 492. Those courses are referenced in item 3. below.

   Students who are enrolled in the Cropping Systems Science major leading to the Bachelor of Science degree in the Department of Plant, Soil and Microbial Sciences, may complete an alternative track to Integrative Studies in Biological and Physical Sciences that consists of the following courses: Plant Biology 105 and 106 combined; and Chemistry 141, 143, and 161. The completion of Plant Biology 106 and Chemistry 161 satisfies the laboratory requirement. Plant Biology 105 and 106 combined and Chemistry 141, 143, and 161 may be counted toward both the alternative track and the requirements for the major referenced in item 3. below.

   The completion of the College of Agriculture and Natural Resources mathematics requirement may also satisfy the University mathematics requirement.
2. The requirements of the College of Agriculture and Natural Resources for the Bachelor of Science degree.

   Certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
3. The following requirements for the major:

				CREDITS
a.	One of the following courses (3 or 5 credits):			
	MTH	103	College Algebra	3
	MTH	116	College Algebra and Trigonometry	5
b.	One of the following courses (3 or 4 credits):			
	STT	200	Statistical Methods	3
	STT	201	Statistical Methods	4
	STT	224	Introduction to Probability and Statistics for Ecologists	3
	STT	421	Statistics I	3
c.	One of the following courses (4 credits):			
	CEM	143	Survey of Organic Chemistry	4
	CEM	251	Organic Chemistry I	4
d.	One of the following courses (3 credits):			
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
e.	All of the following courses (45 credits):			
	CEM	141	General Chemistry	4
	CEM	161	Chemistry Laboratory I	1
	CROP	101	Introduction to Crop Science	3
	CROP	101L	Introduction to Crop Science Laboratory	1
	CROP	110	Computer Applications in Agronomy	2
	CROP	192	Professional Development Seminar I	1
	CROP	212	Advanced Crop Production	2
	CROP	226L	Weed Science Laboratory	1
	CROP	313	Data Interpretation and Writing in the Agronomic Sciences (W)	2
	CROP	326	Weed Science	2
	CROP	350	Introduction to Plant Genetics	3
	CROP	488	Agricultural Cropping Systems: Integration and Problem Solving	3
	CROP	492	Professional Development Seminar II (W)	1
	ENT	404	Fundamentals of Entomology	4
	PLB	105	Plant Biology	3
	PLB	106	Plant Biology Laboratory	1
	PLP	405	Plant Pathology	4
	SOIL	210	Fundamentals of Soil Science	3

	SOIL	480	Soil Fertility and Management		4
f.	One of the following courses (3 credits):				
	HRT	361	Applied Plant Physiology		3
	PLB	301	Introductory Plant Physiology		3
g.	Complete 8 credits from the following courses: (8 credits):				
	SOIL	330	Soil Chemistry		2
	SOIL	340	Applied Soil Physics		2
	SOIL	360	Soil Biology		3
	SOIL	470	Soil Resources		3
h.	Two of the following courses: (4 to 6 credits):				
	AFRE	130	Farm Management I		3
	CROP	124	Introduction to Sustainable Agriculture and Food Systems		2
	CROP	135	Crop Scouting and Investigation		3
	CROP	151	Seed and Grain Quality		2
	CROP	201	Forage Crops		3
	CROP	292	Leadership Development in Agriculture		2
i.	One of the following courses (3 credits):				
	GEO	103	Introduction to Climate Change Studies		3
	GEO	203	Introduction to Meteorology		3
	GEO	402	Agricultural Climatology		3
j.	One of the following, either i. or ii. (3 or 4 credits):				
	(i) GEO	221	Introduction to Geographic Information		3
	(ii) BE	221	Introduction to Smart Agriculture		1
	BE	321	Principles of Precision Agriculture		3
k.	One of the following courses (3 credits):				
	CROP	420	Cover Crops in Agroecosystems		3
	CROP	431	International Agricultural Systems		3
	CROP	441	Plant Breeding and Biotechnology		3
	CROP	442	Agricultural Ecology		3
	CROP	451	Biotechnology Applications for Plant Breeding and Genetics		3
	CROP	460	Plant-Microbe Interactions		3
	CROP	467	Bioenergy Feedstock Production		3
	CROP	485	Physiology in Plant Nutrition		3
	GEO	409	Global Climate Change and Variability		3
	GEO	410	Geography of Food and Agriculture		3
l.	One of the following experiential courses (3 credits):				
	CROP	493	Professional Internship in Crop and Soil Sciences		3
	CROP	499	Undergraduate Research		3

Effective Fall 2026.

7. Establish a **Bachelor of Science** degree in **Environmental Soil and Water Science** in the Department of Plant, Soil and Microbial Sciences. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 4, 2025 meeting.

a. **Background Information**:

Michigan State University has had an academic major in Crop and Soil Sciences with three concentrations for over forty years. The concentrations are currently: Crop and Soil Sciences, Turfgrass Management, and Advanced Studies. The department completed a curriculum review in 2023-2024 and the curriculum committee recommended and received support from the faculty in a ballot vote to put the current Crop and Soil Sciences major into moratorium and create three new majors. The three new majors are Cropping Systems Science, Turfgrass Science and Management, and Environmental Soil and Water Science. There are no accrediting agencies or federal regulations related to this request.

Michigan State University began as Michigan Agricultural College (MAC) and has a long history of academic majors connected to agriculture and the environment. The Crop and Soil Sciences major has been housed for over 40 years in the Department of Crop and Soil Sciences, and more recently in the Department of Plant, Soil, and Microbial Sciences (a merger of the Departments of Crop and

Soil Sciences and Plant Pathology). Michigan State University is the leading university in Michigan to offer a degree in crop and soil sciences.

In recent years, the Crop and Soil Sciences department merged with Plant Pathology and the new department was named Plant, Soil and Microbial Sciences. The Crop and Soil Sciences major with three concentrations, the Minor in Agronomy, the Minor in Turfgrass Management, and the Minor in Environmental Soil Science is housed in this department.

The major in Environmental Soil and Water Science will teach students (1) the role that soils play as components of ecosystems; (2) the abiotic and biotic factors and processes that govern soil properties and functions; (3) to evaluate the impact of weather and climate on soil formation and properties.; (4) the role that water plays in soil and landscape development and management; (5) to demonstrate practical skills in the identification of plants and soil types, and in diagnosis of environmental issues; (6) major environmental issues facing modern society, and the role that land and water management play in addressing those issues; (7) to interpret soil texture, structure, fertility, and soil management and their impact on different environments; (8) to design economically, environmentally, and socially sustainable land and water uses;)9) to articulate the origin and purpose of environmental and natural resource policies; and (10) to demonstrate competence in oral and written communication, computer use, problem-solving, and critical analysis.

b. **Academic Programs Catalog Text**:

The Bachelor of Science degree in Environmental Soil and Water Science is designed to prepare students for career opportunities assoil scientists, ecosystem ecologists, environmental restorationists, watershed managers, and consultants, in private and public businesses, and with government agencies.

Soil and water science involves the application of biological, chemical, and physical science principles to protect soil and water quality as landscapes are used to meet human needs for recreation, waste disposal, food production and others. Protecting and restoring soil and water resources is necessary for building sustainable communities. The major provides students with the opportunity to recognize the challenges and opportunities to integrate scientific innovations in land management. Students take courses in soil science, water resource management, ecology, biology, geology, meteorology, and professional development to prepare for careers where expertise in soil and water science is required.

Requirements for the Bachelor of Science Degree in Environmental Soil and Water Science

CREDITS

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science Degree in Environmental Soil and Water Science.

   The University's Tier II writing requirement for the Cropping Systems Science major is met by completing CROP 313 and CROP 492. Those courses are referenced in item 3. below.

   Students who are enrolled in the Environmental Soil and Water Science major leading to the Bachelor of Science degree in the Department of Plant, Soil and Microbial Sciences, may complete an alternative track to Integrative Studies in Biological and Physical Sciences by completing items 3.a., 3.b., and 3.c. below. The completion of Biological Sciences 171 or 172 and Chemistry 161 satisfies the laboratory requirement. Completion of items 3.a., 3.b., and 3.c below will be counted toward both the alternative track and the requirements for the major.

   The completion of the College of Agriculture and Natural Resources mathematics requirement may also satisfy the University mathematics requirement.

2. The requirements of the College of Agriculture and Natural Resources for the Bachelor of Science degree.

   Certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.

3. The following requirements for the major:

				CREDITS
a.	All of the following courses (38 credits):			
	BS	161	Cell and Molecular Biology	3
	BS	162	Organismal and Population Biology	3
	CEM	141	General Chemistry	4
	CEM	161	Chemistry Laboratory I	1
	CROP	110	Computer Applications in Agronomy	2
	CROP	192	Professional Development Seminar I	1
	CROP	313	Data Interpretation and Writing in the Agronomic Sciences (W)	2
	CROP	492	Professional Development Seminar II (W)	1
	GLG	201	Introduction to Earth and Planetary Sciences	4
	SOIL	210	Fundamentals of Soil Science	3
	SOIL	330	Soil Chemistry	2
	SOIL	340	Applied Soil Physics	2
	SOIL	360	Soil Biology	3
	SOIL	470	Soil Resources	3
	SOIL	480	Soil Fertility and Management	4
b.	One of the following biology laboratory courses (2 credits)			
	BS	171	Cell and Molecular Biology Laboratory	2
	BS	172	Organismal and Population Biology Laboratory	2
c.	One of the following organic chemistry courses (4 credits)			
	CEM	143	Survey of Organic Chemistry	4
	CEM	251	Organic Chemistry I	4
d.	One of the following plant courses (3 or 4 credits):			
	CROP	101	Introduction to Crop Science	3
	FOR	202	Introduction to Forestry	3
	FOR	204	Forest Vegetation	3
	GEO	201	Introduction to Plant Geography	3
	HRT	203	Introduction to Horticulture	3
	PLB	105	Plant Biology	3
	PLB	203	Biology of Plants	4
	PLB	218	Plants of Michigan	3
e.	One of the following ecology courses (3 credits):			
	CROP	326	Weed Science	2
	and			
	CROP	226L	Weed Science Laboratory	1
	FOR	340	Forest Ecology	3
	IBIO	355	Ecology	3
	PLB	441	Plant Ecology	3
f.	Two of the following water courses (6 or 7 credits)			
	CSUS	453	Watershed Planning and Management	3
	GEO	406	Geomorphology of River and Coastal Systems	3
	GLG	411	Hydrogeology	3
	GLG	421	Environmental Geochemistry	4
	SOIL	455	Environmental Pollutants in Soil and Water	3
g.	One of the following climate or weather courses (3 credits)			
	GEO	103	Introduction to Climate Change Studies	3
	GEO	203	Introduction to Meteorology	3
	GEO	402	Agricultural Climatology	3
	GEO	409	Global Climate Change and Variability	3
	IBIO	357	Global Change Biology (W)	3
h.	One of the following math courses (3 credits)			
	MTH	103	College Algebra	3
	MTH	124	Survey of Calculus I	3
	MTH	132	Calculus I	3
i.	One of the following statistics courses (3 or 4 credits):			
	STT	200	Statistical Methods	3
	STT	201	Statistical Methods	4
	STT	224	Introduction to Probability and Statistics for Ecologists	3

	STT	421	Statistics I	3
j.	One of the following policy courses (3 credits):			
	CSUS	320	Environmental Planning and Management	3
	CSUS	354	Water Resources Management	3
	CSUS	464	Environmental and Natural Resource Policy in Michigan	3
	FOR	466	Natural Resource Policy	3
	GEO	211	Environmental Policy and Practice	3
l.	One of the following specialization courses (3 or 4 credits):			
	CROP	460	Plant-Microbe Interactions	3
	GLG	422	Field Methods in Environmental Science	3
	GLG	435	Geomicrobiology (W)	4
	GLG	446	Sustainable Food Systems	3
	MGI	425	Microbial Ecology	3
	PLB	443	Restoration Ecology	3
m.	One of the following experiential courses (3 credits):			
	CROP	493	Professional Internship in Crop and Soil Sciences	3
	SOIL	499	Undergraduate Research	3
	Complete 3 credits in an Education Abroad, International Internship, International Research Experience, or Study Away with approval by the advisor for the major.			

Effective Fall 2026.

8. Establish a **Bachelor of Science** degree in **Turfgrass Science and Management** in the Department of Plant, Soil and Microbial Sciences. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 4, 2025 meeting.

a. **Background Information**:

Michigan State University has had an academic major in Crop and Soil Sciences with three concentrations for over forty years. The concentrations are currently: Crop and Soil Sciences, Turfgrass Management, and Advanced Studies. The department completed a curriculum review in 2023-2024 and the curriculum committee recommended and received support from the faculty in a ballot vote to put the current Crop and Soil Sciences major into moratorium and create three new majors. The three new majors are Cropping Systems Science, Turfgrass Science and Management, and Environmental Soil and Water Science. There are no accrediting agencies or federal regulations related to this request.

Michigan State University began as Michigan Agricultural College (MAC) and has a long history of academic majors connected to agriculture and the environment. The Crop and Soil Sciences major has been housed for over 40 years in the Department of Crop and Soil Sciences, and more recently in the Department of Plant, Soil, and Microbial Sciences (a merger of the Departments of Crop and Soil Sciences and Plant Pathology). Michigan State University is the leading university in Michigan to offer a degree in crop and soil sciences.

In recent years, the Crop and Soil Sciences department merged with Plant Pathology and the new department was named Plant, Soil and Microbial Sciences. The Crop and Soil Sciences major with three concentrations, the Minor in Agronomy, the Minor in Turfgrass Management, and the Minor in Environmental Soil Science is housed in this department.

The major in Turfgrass Science and Management will explain turfgrass development and physiology; characterize soil texture, structure, fertility, and soil management and their impact on turf systems and their surrounds; study practices for establishing and maintaining all species of turfgrasses; explain abiotic and biotic stresses on turfgrass plants and cultural methods for managing these stresses; demonstrate practical skills in identification of turfgrasses, weeds, ornamentals, plants, insects, pathogens, and diagnosis of abiotic problems in turf management; describe the characteristics and design of economic, environmental, and socially sustainable performance-turf systems; integrate turfgrass genetics and its potential use to advance turfgrass performance and functionality; study weather and climate and the impact on turfgrass growth, turf management, and usability; apply business management principles to turf operations; demonstrate oral and written

communication, computer use, problem solving, and critical analysis; and learn the impact of turfgrass science and management on society in both technical and everyday language.

b. **Academic Programs Catalog Text**:

The Bachelor of Science degree in Turfgrass Science and Management is designed to prepare students for career opportunities as golf course superintendents, sports turf managers, lawn care professionals, grounds managers for private and public businesses, green industry salespersons and managers, and positions within governmental and institutional entities.

Turfgrass Science and Management involves the application of biological, chemical, and physical science principles to establish and care for turfgrasses that are used to provide biological, structural, functional, and aesthetic benefits. This major provides students the opportunity to understand the challenges and opportunities to integrate scientific innovations with the science and art of turfgrass management.

Requirements for the Bachelor of Science Degree in Turfgrass Science and Management

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science Degree in Turfgrass Science and Management.

   The University's Tier II writing requirement for the Cropping Systems Science major is met by completing TURF 402. That course is referenced in item 3. below.

   Students who are enrolled in the Environmental Soil and Water Science major leading to the Bachelor of Science degree in the Department of Plant, Soil and Microbial Sciences, may complete an alternative track to Integrative Studies in Biological and Physical Sciences that consists of the following courses: Plant Biology 105 and 106 combined; and Chemistry 141, 143, and 161. The completion of Plant Biology 106 and Chemistry 161 satisfies the laboratory requirement. Plant Biology 105 and 106 combined and Chemistry 141, 143, and 161 may be counted toward both the alternative track and the requirements for the major referenced in item 3. below.

   The completion of the College of Agriculture and Natural Resources mathematics requirement may also satisfy the University mathematics requirement.
2. The requirements of the College of Agriculture and Natural Resources for the Bachelor of Science degree.

   Certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
3. The following requirements for the major:

				CREDITS
a.	One of the following courses (3 to 5 credits):			
	MTH	103	College Algebra	3
	MTH	116	College Algebra and Trigonometry	5
b.	One of the following courses (3 or 4 credits):			
	STT	200	Statistical Methods	3
	STT	201	Statistical Methods	4
	STT	224	Introduction to Probability and Statistics for Ecologists	3
	STT	421	Statistics I	3
c.	One of the following courses (4 credits):			
	CEM	143	Survey of Organic Chemistry	4
	CEM	251	Organic Chemistry I	4
d.	All of the following courses (58 credits):			
	CEM	141	General Chemistry	4
	CEM	161	Chemistry Laboratory I	1
	COM	100	Human Communication	3
	CROP	110	Computer Applications in Agronomy	2
	CROP	226L	Weed Science Lab	1
	CROP	326	Weed Science	2
	ENT	264	Turfgrass Entomology	3

	PLB	105	Plant Biology	3
	PLB	106	Plant Biology Lab	1
	PLP	266	Turf Pathology	3
	SOIL	210	Fundamentals of Soil Science	3
	TURF	178	Turf Irrigation	3
	TURF	181	Pesticide and Fertilizer Application Technology	3
	TURF	202	World of Turf	2
	TURF	212	Turfgrass Biology	3
	TURF	232	Turf Cultural Practices	2
	TURF	262	Turf Management Seminar I	1
	TURF	267	Performance Turf Design and Construction	2
	TURF	269	Turf Management Strategies	2
	TURF	272	Turf Soil Fertility	2
	TURF	282	Turfgrass Physiology	2
	TURF	402	Turf in the Environment and Society (W)	3
	TURF	462	Turf Management Seminar II	1
	TURF	469	Advanced Turf Management Strategies	1
	TURF	472	Advanced Turf Soil Fertility	1
	TURF	482	Advanced Turfgrass Physiology	1
	TURF	493	Professional Internship in Turfgrass Science and Management	3
e.	One of the following courses: (3 credits):			
	CROP	350	Introduction to Plant Genetics	3
	CROP	441	Plant Breeding and Biotechnology	3
f.	One of the following courses: (3 credits):			
	GEO	103	Introduction to Climate Change Studies	3
	GEO	203	Introduction to Meteorology	3
	GEO	402	Agricultural Climatology	3
g.	Two of the following courses: (5 or 6 credits):			
	ACC	230	Survey of Accounting Concepts	3
	HB	425	Golf Operations and Management	3
	MGT	325	Management Skills and Processes	3
	TURF	171	Operations Budgeting for Golf Course Managers	2
h.	A minimum of 3 credits from the following courses:			
	CROP	451	Biotechnology Applications in Plant Breeding and Genetics	3
	CROP	460	Plant-Microbe Interactions	3
	CROP	485	Physiology in Plant Nutrition	3
	CSUS	354	Water Resources Management	3
	ENT	404	Fundamentals of Entomology	4
	ENT	477	Pesticides in Pest Management	3
	GLG	411	Hydrogeology	3
	MGI	425	Microbial Ecology	3
	PLP	405	Plant Pathology	4
	PLP	407	Diseases and Insects of Forest and Shade Trees	4
	SOIL	330	Soil Chemistry	2
	SOIL	340	Applied Soil Physics	2
	SOIL	360	Soil Biology	3
	SOIL	455	Environmental Pollutants in Soil and Water	3
	SOIL	470	Soil Resources	3

Effective Fall 2026.

9. Change the requirements for the **Minor in Agronomy** in the Department of Plant, Soil and Microbial Sciences.

a. Under the heading **Minor in Agronomy** replace the entire entry with the following:

Complete a minimum of 16 credits from the following:

1. All of the following courses (7 credits):

CROP	101	Introduction to Crop Science	3
CROP	101L	Introduction to Crop Science Laboratory	1
SOIL	210	Fundamentals of Soil Science	3

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

CROP	420	Cover Crops Agroecosystems	3
CROP	488	Agricultural Cropping Systems: Integration and Problem Solving	3

3. Complete 6 credits from the following:

CROP	135	Crop Scouting and Investigation	3
CROP	151	Seed and Grain Quality	2
CROP	201	Forage Crops	3
CROP	212	Advanced Crop Production	2
CROP	326	Weed Science	2
and			
CROP	226L	Weed Science Laboratory	1
CROP	350	Introduction to Plant Genetics	3
CROP	441	Plant Breeding and Biotechnology	3
CROP	442	Agroecology Ecology	3
CROP	467	Bioenergy Feedstock Production	3
HRT	251	Organic Farming Principles and Practices	3
SOIL	330	Soil Chemistry	2
SOIL	340	Applied Soil Physics	2
SOIL	360	Soil Biology	3
SOIL	470	Soil Resources	3

Effective Fall 2026.

10. Change the requirements for the **Minor** in **Environmental Soil Science** in the Department of Plant, Soil and Microbial Sciences.

a. Under the heading **Requirements for the Minor in Environmental Soil Science** make the following changes:

(1) In item 1., delete the following course:

CSS	210	Fundamentals of Soil Science	3

Add the following course:

SOIL	210	Fundamentals of Soil Science	3

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

CSS	203	World of Soils	2
CSS	330	Soil Chemistry	2
CSS	340	Applied Soil Physics	2
CSS	360	Soil Biology	2
CSS	470	Soil Resources	3
CSS	480	Soil Fertility and Management	3

Add the following courses:

SOIL	203	World of Soils	2
SOIL	330	Soil Chemistry	2

SOIL	340	Applied Soil Physics	2
SOIL	360	Soil Biology	2
SOIL	470	Soil Resources	3
SOIL	480	Soil Fertility and Management	3

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

CSS	411	Fire and Environmental Quality	3
CSS	420	Cover Crops in Agroecosystems	3
CSS	442	Agricultural Ecology	3
CSS	460	Plant-Microbe Interactions	3
CSS	488	Agricultural Cropping Systems: Integration and Problem Solving	3

Add the following courses:

CROP	411	Fire and Environmental Quality	3
CROP	420	Cover Crops in Agroecosystems	3
CROP	442	Agricultural Ecology	3
CROP	460	Plant-Microbe Interactions	3
CROP	488	Agricultural Cropping Systems: Integration and Problem Solving	3

Effective Fall 2026.

11. Establish a **Minor** in **Plant Pathology** in the Department of Plant, Soil and Microbial Sciences. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 4, 2025 meeting.

a. **Background Information**:

Plant pathology is an interdisciplinary field involving agronomy, biology, chemistry, environmental sciences, forestry, and horticulture. Emphasis areas in plant pathology include bacteriology, epidemiology, host-parasite interactions, mycology, molecular biology, soil microbiology, and virology. Plant pathologists are hired by colleges/universities, government agencies, and private industry to monitor plant diseases and improve plant health.

MSU is a nationally recognized university offering several undergraduate degree programs in the plant sciences. The diverse array of students interested in plant science careers would benefit from a minor in plant pathology.

Students will develop a view of phytopathogens as dynamic components of managed and natural environments; recognize applications, requirements, and limitations of principles and methods in plant pathology; and demonstrate the relationship of cross-disciplinary fields and approaches in plant pathology.

b. **Academic Programs Catalog Text**:

The Minor in Plant Pathology provides the principles and methods in plant pathology.

The minor is available as an elective to all students who are enrolled in bachelor's degree programs at Michigan State University. The minor is administered by the Department of Plant, Soil and Microbial Sciences.

At least 9 credits counted towards the requirements for this minor must be unique. Unique credits must not be used to fulfill another university, college, or major requirement in the student's program.

Students who plan to complete the program should consult the undergraduate advisor in the Department of Plant, Soil and Microbial Sciences.

Requirements for the Minor in Plant Pathology

Students must complete 15 credits from the following:

					CREDITS
1.	One of the following courses (3 or 4 credits):				
	CROP	101	Introduction to Crop Science		3
	HRT	203	Introduction to Horticulture		3
	FOR	202	Introduction to Forestry		3
	FOR	204	Forest Vegetation		3
	PLB	203	Biology of Plants		4
2.	One of the following options (4 or 5 credits):				
	a. PLP	405	Plant Pathology		4
	b. MGI	301	Introductory Microbiology		3
	PLP	481	Plant Pathogen Omics and Evolution		2
	c. MGI	301	Introductory Microbiology		3
	PLP	482	Methods in Plant Pathology		2
3.	Complete 5 to 7 credits from the following courses:				
	CROP	460	Plant-Microbe Interactions		3
	PLB	402	Biology of Fungi		4
	PLP	266	Turf Pathology		3
	PLP	407	Diseases and Insects of Forest and Shade Trees		4
	PLP	481	Plant Pathogen Omics and Evolution		2
	PLP	482	Methods in Plant Pathology		2
	PLP	492	Seminar		2
	PLP	498	Undergraduate Research		1 to 4
	Courses may not be used to fulfill requirement 2. and 3.				
4.	Additional courses to complete 15 credits:				
	CROP	135	Crop Scouting and Investigation		3
	ENT	477	Pesticides in Pest Management		3
	ENT	478	Integrated Pest Management (W)		3
	ENT	479	Organic Pest Management (W)		3
	MGI	302	Introductory Laboratory for General and Allied Health Microbiology		1
	MGI	425	Microbial Ecology		3
	MGI	461	Molecular Pathogenesis		3
	MGI	499	Undergraduate Research		1 to 3

Effective Fall 2026.

COLLEGE OF EDUCATION

1. Establish a **Master of Arts** degree in **Educational Statistics and AI** in the Department of Counseling, Educational Psychology and Special Education. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its September 15, 2025 meeting.

   a. **Background Information**:

   The Master of Arts in Educational Statistics and AI addresses the critical need for professionals skilled in leveraging artificial intelligence (AI) and advanced statistical methodologies to tackle complex challenges in educational research, policy, and practice. Modern educational systems generate vast amounts of data through assessments such as the National Assessment of Educational Progress (NAEP), Programme for International Student Assessment (PISA), and Trends in International Mathematics and Science Study (TIMSS). These datasets hold transformative potential for improving instructional strategies, resource allocation, and equity initiatives but require sophisticated analytical frameworks to unlock actionable insights. While Michigan State University (MSU) offers robust programs in statistics and computer science, none explicitly bridge these disciplines with applied educational research. This program fills this gap by integrating AI tools—such as natural language processing (NLP) and predictive analytics—with statistical rigor, enabling students to interpret and ethically apply data-driven solutions to real-world educational challenges. Unlike similar programs at peer institutions (e.g., University of Michigan, Purdue University), which

prioritize theoretical or technical domains, this curriculum emphasizes interdisciplinary applications tailored to educational contexts, aligning with MSU's 2030 Strategic Plan ("Data-Driven Education") and the College of Education's focus on technology-enhanced learning and equitable outcomes.

The program is strategically positioned to advance MSU's commitment to interdisciplinary innovation by uniting expertise from education, statistics, and computer science. Existing MSU programs in quantitative methods lack dedicated training in applying AI and statistical tools to educational datasets, creating a disconnect between technical skills and sector-specific needs. Market analyses, including findings from the Online MA/MS Futures Task Force report, underscore growing demand for professionals who can translate data into policy and practice within K-12, higher education, and government agencies. State and district leaders increasingly seek evidence-based strategies to address disparities in student achievement, teacher retention, and resource distribution, yet lack personnel trained to harness AI-driven analytics. By equipping graduates to ethically design, evaluate, and communicate data-informed solutions, this program directly responds to these unmet needs while reinforcing MSU's leadership in educational research and technological integration.

b. **Academic Programs Catalog Text**:

The Master of Arts Degree in Educational Statistics and AI prepares professionals to tackle pressing challenges in education through a rigorous integration of advanced statistical methodologies and artificial intelligence (AI). Students gain expertise in analyzing diverse educational datasets—including state-level assessments (e.g., Michigan's Michigan Student Test of Educational Progress [M-STEP]), national benchmarks (National Assessment of Educational Progress[NAEP]), and international surveys (Programme for International Student Assessment [PISA], Trends in International Mathematics and Science Study [TIMSS])—to generate insights that directly inform policy reform, instructional innovation, and equitable resource allocation.

Admission

Applicants to the Master of Arts Degree in Educational Statistics and AI must meet the following criteria:

1. Academic Performance: A minimum cumulative grade-point average of 3.00 (on a 4.00 scale) in the final two years of undergraduate coursework and in any prior graduate-level study.
2. Statement of Purpose: A two-page statement articulating the applicant's professional goals, research interests, and alignment with the program's focus on applying statistical and AI methodologies to educational challenges.
3. Graduate Record Examination (GRE): Submission of GRE General Test scores is optional but encouraged. Scores may strengthen applications, particularly for candidates seeking to demonstrate quantitative aptitude or compensate for gaps in academic records (e.g., lower GPAs in quantitative course work).
4. English Language Proficiency: Non-native English speakers must submit scores from an approved English proficiency test (e.g., TOEFL, IELTS) meeting Michigan State University's minimum requirements.

Admission decisions are based on a holistic review of academic preparation, professional goals, and potential for success. Admission is competitive, with priority given to applicants whose goals align with the program's mission to advance equitable educational outcomes through AI and statistics. Meeting minimum criteria does not guarantee admission.

Requirements for the Master of Arts Degree in Educational Statistics and AI

A minimum of 30 credits is required for the degree under Plan B (without thesis). The student's program of study must be approved by the Program Director of the Master of Arts Degree in Educational Statistics and AI. This program is available only online.

Students must complete the following:

			CREDITS
1.	All of the following courses (9 credits):		
	CEP 808	Introduction to Educational Measurement	3
	CEP 834	Inference in Educational Statistics	3
	CEP 835	Artificial Intelligence (AI) and Data Science in Education	3

2. Complete six courses totaling 18 credits from the following:

CEP	819	Experimental Design and Causal Inference	3
CEP	821	Sampling within Educational Contexts: Multi-level Analyses	3
CEP	823	AI for Data Collection and Analysis in Education	3
CEP	826	Linear Statistical Models in Education	3
CEP	863	Path Analytic Models in Education	3
CEP	867	Ethics of AI in Education	3
STT	810	Mathematical Statistics for Data Scientists	3
STT	811	Applied Statistical Modeling for Data Scientists	3
A relevant course approved by the academic advisor			

3. Complete the following capstone course (3 credits):

CEP	898	Educational Statistics and AI Capstone	3

4. Completion of a final evaluation.

Effective Fall 2026.

2. Establish a **Graduate Certificate** in **Sport Performance Training** in the Department of Kinesiology. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its September 15, 2025 meeting.

a. **Background Information**:

The Department of Kinesiology has offered a graduate concentration in Strength and Conditioning since 2006 and has developed widespread recognition for preparation of strength and conditioning and sport performance training practitioners. To strategically grow this field of study, the department has shifted this concentration to an online degree program, the Master of Science in Applied Sport Sciences, and proposes this Type 2 graduate certificate program entitled Sport Performance Training (an analogous term) to parallel this offering. Approximately 125 higher education institutions sponsor a graduate education program in Kinesiology or Exercise Science, the parent discipline(s) for strength and conditioning and sport performance training. We receive 15-20 applicants per year and the online strategy will allow us to grow this applicant pool while maintaining program quality. Furthermore, MSU's nationwide brand recognition as a Big Ten Division One NCAA institution gives our program added visibility, which is an important asset in the promotion of online graduate programs.

Accreditation for strength and conditioning degree programs is handled by the Council on Accreditation of Strength and Conditioning Education (CASCE). Although not currently mandated, by 2030, CASCE accreditation will be required for graduates to sit for the Certified Strength and Conditioning Specialist (CSCS) credential examination, which carries widespread industry recognition as an entry-level certification.

b. **Academic Programs Catalog Text**:

The Graduate Certificate in Sport Performance Training provides opportunities for students to develop expertise in the planning, implementation, and evaluation of strength and conditioning and performance training for athletes at the professional, intercollegiate, interscholastic, and community sports levels. The certificate is available only online.

Admission

To be considered for admission to the Graduate Certificate in Sport Performance Training, students must:
1. have completed a bachelor's degree.
2. complete the Intent to Enroll form if you are currently enrolled in a graduate degree program at Michigan State University.

Students who are not enrolled at Michigan State University must:
1. submit a university application and application fee.
2. provide transcripts from all previous institutions of higher education.

3. submit an academic statement of 750 words that clearly describe the applicant's reasons for pursuing the certificate and the goals that the certificate will help them attain.
4. submit a current resume of no more than two pages.
5. submit two letters of recommendation, one from a professional source (colleague, supervisor), and one from an academic source (instructor, advisor).
6. take a test of English language proficiency for students for whom English is not a first language.

Applications are reviewed by faculty who look for indications of high probability of success. Factors that are significant in determining admission are:
1. a grade-point average of 3.0 or higher in the last two years of all undergraduate and graduate course work.
2. professional goals that are consistent with the objectives of the graduate certificate.
3. evidence of an understanding of the roles that sport performance and strength and conditioning practitioners serve within competitive sports.
4. relevant career experiences, including employment, internships, or field experiences.

Requirements for the Graduate Certificate in Sport Performance Training

Students must complete 13 credits from the following:

				CREDITS
1.	All of the following courses (10 credits):			
	KIN	815	Essentials of Strength and Conditioning	3
	KIN	815B	Essentials of Strength and Conditioning II	3
	KIN	819	Advanced Sport Nutrition	3
	KIN	852	Ethics for the Sport Practitioner	1
2.	One additional 3-credit Kinesiology course approved by the student's academic advisor.			

Effective Spring 2026.

JAMES MADISON COLLEGE

1. Establish a **Bachelor of Arts** degree in **Public Affairs for Secondary Education** in James Madison College. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its September 4, 2025 meeting. The Teacher Education Council (TEC) approved this request by email vote on October 28, 2025.

a. **Background Information**:

The new major is being created to meet updated standards for secondary teacher certification in the State of Michigan. These adjustments will enable James Madison students to graduate in four years, as requested by the Provost. Having one of the best teacher education programs in the United States here at MSU allows James Madison students the unique opportunity to combine their interests in public and international affairs with courses required for secondary social studies certification.

Former teacher certification pathways through James Madison College were not achievable in the new model of teacher education requirements at MSU, and field-specific requirement eliminations would result in a weakening of that specific major.

The major will provide the theoretical and practical foundations necessary for students to become certified to teach social studies courses in the State of Michigan. It will provide clarity around requirements for students' James Madison College major and teacher certifications.

b. **Academic Programs Catalog Text**:

The Bachelor of Arts Degree in Public Affairs for Secondary Education will provide the theoretical and practical foundations necessary for students to become certified to teach social studies courses in the State of Michigan.

Requirements for the Bachelor of Arts Degree in Public Affairs for Secondary Education

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits are required for the Bachelor of Arts Degree in Public Affairs for Secondary Education.

   The University's Tier II writing requirement for the Public Affairs for Secondary Education major is met by completing MC 492, MC 493, MC 497, or MC 498. Those courses are referenced in item 3. below.
2. The requirements of James Madison College for the Bachelor of Arts degree.
3. The following requirements for the major:

					CREDITS
a.	All of the following Social Studies courses (31 credits):				
	GEO	204	World Regional Geography		3
	GEO	221	Introduction to Geographic Information		3
	GEO	330	Geography of the United States		3
	HST	140	World History to 1500		4
	HST	150	World History since 1500		4
	HST	201	Historical Methods and Skills		3
	HST	202	U.S. History to 1876		4
	HST	203	U.S. History since 1876		4
	HST	320	History of Michigan		3
b.	One of the following course sequences (8 credits):				
	(1)	MC	220	International Relations I: World Politics and International Security	4
		MC	221	International Relations II: The Politics of International Economic Relations	4
	(2)	MC	230	Cultures and Politics in Comparative Perspective	4
		MC	231	Cultures and Politics in Transnational Perspective	4
	(3)	MC	270	Classical Republicanism	4
		MC	271	Constitutionalism and Democracy	4
	(4)	MC	280	Social Theory and Social Relations	4
		MC	281	Immigrants, Minorities, and American Pluralism	4
c.	One 300 or 400-level MC elective course				4
d.	One of the following courses (5 credits):				
	MC	492	Senior Seminar in International Relations (W)		5
	MC	493	Senior Seminar in Comparative Cultures and Politics (W)		5
	MC	497	Senior Seminar in Social Relations and Policy (W)		5
	MC	498	Senior Seminar in Political Theory and Constitutional Democracy (W)		5
e.	Completion of the requirements for *Teacher Certification* in the Department of Teacher Education, which includes all of the following courses (36 credits):				
	CEP	240	Introduction to Exceptional Learners		3
	TE	101	Social Foundations of Justice and Equity in Education		3
	TE	102	Pedagogy and Politics of Justice and Equity in Education		3
	TE	150	Reflections on Learning		3
	TE	302	Literacy and Adolescent Learners in School and Community Contexts		3
	TE	325	Clinical Experience in Social Studies Education I		3
	TE	341	Teaching and Learning of (Bi)Multilingual Learners		3

TE	425	Clinical Experience in Social Studies Education II	3
TE	426	Seminar in Social Studies Education I	3
TE	427	Seminar in Social Studies Education II	3
TE	428	Student Teaching Internship in Social Studies Education	6

Effective Spring 2026.

COLLEGE OF SOCIAL SCIENCE

1. Change the requirements for the **Dual Major** in **Environmental Science and Policy** in the College of Social Science. The University Committee on Graduate Studies (UCGS) approved this request at its September 15, 2025 meeting.

   a. Under the heading Requirements for the Dual Major in Environmental Science and Policy in item 1. c. make the following changes:

      (1) Delete the following course:

SOC	869	Community and Conservation	3

      Add the following courses:

AFRE	923	Advanced Environmental Economics	3
AFRE	925	Advanced Natural Resource Economics	3

Effective Spring 2026.

2. Change the requirements for the **Master of Science** degree in **Geography** in the Department of Geography, Environment, and Spatial Sciences. The University Committee on Graduate Studies (UCGS) approved this request at its October 13, 2025 meeting.

   a. Under the heading **Admission**, replace the first paragraph with the following:

      All Plan A (with thesis) students seeking the master's degree in geography are expected to have completed courses in physical, human, and regional geography; in quantitative methods; and in geographic information science. Applicants who have not completed all of these requirements must work with their guidance committee to determine which, if any, deficiencies need to be remedied. Any course work completed to correct course deficiencies must be approved by the guidance committee and may not be counted toward the 30-credit requirement for the degree.

   b. Under the heading **Admission**, **Regular Status**, delete the following:

      3. Satisfactory scores on the Graduate Record Examination General Test for students seeking Plan A (with thesis).

   c. Under the heading **Requirements for the Master of Science Degree in Geography** replace the entire entry with the following:

      The Master of Science in Geography is available under Plan A (with thesis) or Plan B (without thesis). The student must complete a minimum of 30 credits distributed as follows:

      Requirements for Both Plan A and Plan B (3 credits):

      1. One of the following seminar courses:

			CREDITS
GEO	813	Seminar in Urban and Economic Geography	3
GEO	816	The World System of Cities	3
GEO	871	Seminar in Physical Geography	3
GEO	872	Seminar in Human Geography	3
GEO	873	Seminar in Human-Environment Geography	3
GEO	874	Seminar in Geographic Information Science	3

Complete an advisor/guidance committee approved seminar substitution 3

2. Complete an additional minimum of 9 credits from GEO courses at the 400-level or 800-level as approved by the student's Plan A guidance committee or Plan B advisor.
3. Complete an additional minimum of 9 credits from 800-level or above courses taken inside or outside of the Department of Geography, Environment and Spatial Sciences as approved by the student's Plan A guidance committee or Plan B advisor.

Additional Requirements for Plan A

1. The following course (3 credits):
   GEO 886 Research Design in Geography 3
2. Completion of 6 credits of GEO 899 Master's Thesis Research.
3. Completion of a research paper or poster at a professional meeting.
4. Pass a final oral examination in defense of the thesis as approved by the student's guidance committee.

Additional Requirements for Plan B

1. Complete an additional minimum of 9 credits from GEO courses at the 800-level or above as approved by the student's advisor.
2. Pass a final written examination or evaluation as approved by the student's advisor.

Effective Fall 2026.

3. Change the requirements for the **Doctor of Philosophy** degree in **Geography** in the Department of Geography, Environment, and Spatial Sciences. The University Committee on Graduate Studies (UCGS) approved this request at its October 13, 2025 meeting.

a. Under the heading **Admission**, replace the paragraph with the following:

Admission to the doctoral program is based upon an evaluation of the student's academic records related to both the bachelor's and master's degrees, letters of recommendation, written statements, and other pertinent information such as professional experience and related achievements. Typical entrants to the doctoral program present a grade–point average of 3.60 or higher in a recognized master's degree program, which usually includes a thesis.

b. Under the heading **Requirements for the Doctor of Philosophy Degree in Geography** replace the entire entry with the following:

The student must:

1. Complete at least 56 credits while enrolled in the doctoral program including the following courses:
   a. The following courses (30 credits):
      GEO 886 Theories and Philosophies in Geography 3
      GEO 986 Theory and Methods in Geography 3
      GEO 999 Doctoral Dissertation Research 24
   b. At least two of the following seminars (6 credits):
      GEO 813 Seminar in Urban and Economic Geography 3
      GEO 816 The World System of Cities 3
      GEO 871 Seminar in Physical Geography 3
      GEO 872 Seminar in Human Geography 3
      GEO 873 Seminar in Human-Environment Geography 3
      GEO 874 Seminar in Geographic Information Science 3
      Complete an advisor/guidance committee approved seminar Substitution 3
   c. One advanced-level tool course (3 credits):
      Tool courses may be in such areas as computer science, foreign language, statistics or mathematics, cartography, remote sensing, geographic information science and social science or physical science research methods. The courses may be administered by the Department

of Geography, Environment, and Spatial Sciences or by another department or school.

d. Courses that focus on a specialized area of geography and related course work (17 credits)

2. In consultation with the student's guidance committee, submit a manuscript to a refereed journal.
3. Successfully defend the doctoral dissertation.

Effective Fall 2026.

COLLEGE OF VETERINARY MEDICINE

1. Change the requirements for the **Graduate Certificate** in **Food Safety** in the Department of Large Animal Clinical Sciences. The University Committee on Graduate Studies (UCGS) approved this request at its September 15, 2025 meeting.

The Graduate Certificate in Food Safety is a Type 2 graduate certificate and will appear on the transcript as "Graduate Certificate Program in Food Safety".

a. Under the heading **Requirements for the Graduate Certificate in Food Safety** make the following changes:

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

VM	817	Livestock Pre-Harvest Food Safety	3
VM	824	Global Food Safety	3
VM	835	Food Safety for Produce	3

Add the following courses:

VM	826	Creating a Food Safety Culture	3
VM	827	Food Safety Modernization Act and Hazard Analysis and Critical Control Point Systems	3

Effective Spring 2026.

PART II - NEW COURSES

DEPARTMENT OF COUNSELING, EDUCATIONAL PSYCHOLOGY, AND SPECIAL EDUCATION

CEP 808 Introduction to Educational Measurement
Fall of every year. Spring of every year. 3(3-0)
Introduction to concepts and methods needed for the development and evaluation of educational tests. Topics include test development, item analysis, classical test theory, reliability, validity, generalizability theory, factor analysis, and item response theory.
Effective Fall Semester 2026

CEP 819 Experimental Design and Causal Inference
Fall of every year. 3(3-0) P: CEP 834 and CEP 835
Design and analysis of educational experiments. Covers randomization, validity threats, ANOVA, regression, multilevel models, and causal inference frameworks. Prepares students to evaluate interventions and policy impacts in educational settings.
Effective Fall Semester 2026

CEP 821 Sampling within Educational Contexts – Multi-level Analyses
Spring of every year. 3(3-0) P: CEP 834 and CEP 835 RB: Introductory statistics, regression analysis
Design and analysis of hierarchical linear models for nested educational data. Topics include variance components, growth modeling, cross-classified designs, and meta-analytic applications to prepare students for advanced research in educational policy and evaluation.
Effective Fall Semester 2026

CEP 823 AI for Data Collection and Analysis in Education
Fall of every year. 3(3-0) P: CEP 834 and CEP 835 RB: Builds on the concepts covered in the pre-requisite and is for those who are eager to code, manipulate, and perform analyses in Python and R for educational data. Statistical concepts.
Equips educators and researchers with coding skills to apply AI tools to educational data. Trains students to implement AI solutions for advanced data analysis in educational research.
Effective Fall Semester 2026

CEP 826 Linear Statistical Models in Education
Fall of every year. 3(3-0) P: CEP 834 and CEP 835 RB: Knowledge of basic algebra, an understanding of the fundamental principles of descriptive statistics and hypothesis testing.
Introduction to techniques of data analysis and statistical inference commonly used in educational, sociological, economic, and psychological research: the general linear model (i.e., regression, analysis of variance) and extensions to multivariate outcomes, emphasizing graphical representations to build intuition and interpretation.
Effective Fall Semester 2026

CEP 834 Inference in Educational Statistics
Fall of every year. Spring of every year. 3(3-0) RB: Basic understanding of mathematics and research concepts in education or social sciences.
Concepts of statistical inference in educational contexts. Introduction to measures, variables, data analysis, estimation, and tests of hypotheses. Application of descriptive statistical techniques to data. Graphical and tabular representation of data.
Effective Fall Semester 2026

CEP 835 Artificial Intelligence (AI) and Data Science in Education
Fall of every year. Spring of every year. 3(3-0) RB: For educators and professionals without a technical background in AI or data science, focusing on practical applications and ethical considerations in educational contexts. No prior experience in AI or data science is required.
Introduction to foundational concepts, artificial intelligence (AI) applications, and ethical use of educational data, designed to prepare educators to evaluate AI appropriateness in analytical workflows.
Effective Fall Semester 2026

CEP 863 Path Analytic Models in Education
Spring of every year. 3(3-0) P: CEP 834 and CEP 835 RB: Introductory statistics, regression analysis
Introduction to path analysis and structural equation modeling for observed variables. Covers model construction, parameter estimation, hypothesis testing, and software applications (e.g., Mplus) with emphasis on educational research.
Effective Fall Semester 2026

CEP 867 Ethics of AI in Education
Spring of every year. 3(3-0) P: CEP 834 and CEP 835 RB: A basic understanding of educational systems and policies, familiarity with ethical principles, and an interest in the application of AI in education.
Ethical considerations in the application of artificial intelligence (AI) within educational settings. Topics include data privacy, algorithmic bias, fairness, transparency, accountability, and the impact of AI on student learning and equity.
Effective Fall Semester 2026

CEP 898 Educational Statistics and AI Capstone
Fall of every year. Spring of every year. 3(3-0) RB: Knowledge of basic algebra, an understanding of the fundamental principles of descriptive statistics and hypothesis testing. R: Approval of department.
Integration of advanced Artificial Intelligence (AI) and statistical methods to address real-world educational challenges. Design, implement, and present an original research or applied project focused on educational data.
Effective Fall Semester 2026

DEPARTMENT OF ENTOMOLOGY

ENT 848 Biological Control of Insects and Weeds
Spring of odd years. 3(2-2) RB: (ENT 404) or Ecology
REINSTATEMENT Principles and practices in the application of natural enemies to control arthropod and weed pests. Identification and biology of beneficial species (parasitoids, predators, pathogens) and the ecological basis for their use in pest management systems.
Effective Spring Semester 2026

DEPARTMENT OF FAMILY MEDICINE

FM 623 Street Medicine: Go to the People
Fall of every year. Spring of every year. Summer of every year. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: HM 549 or HM 556 RB: Able to communicate in English. Interest in care of the underserved. R: Open to graduate-professional students in the College of Human Medicine.
Immersive hands-on street medicine elective in the care of the unhoused. Work with multi-disciplinary teams to provide clinical care to people experiencing homelessness.
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 2 semesters after the end of the semester of enrollment.
Effective Fall Semester 2025

DEPARTMENT OF FISHERIES AND WILDLIFE

FW 854 Uncertainty in Natural Resource Management
Spring of odd years. 3(2-2) RB: IBIO 355
REINSTATEMENT Methods and challenges associated with accounting for uncertainty in natural resource decision making. Decision analysis, structured decision making, and adaptive management.
Effective Fall Semester 2026

COLLEGE OF OSTEOPATHIC MEDICINE

OST 584 Health Disparities and Health Equity
Summer of every year. 1(1-0) A student may earn a maximum of 2 credits in all enrollments for this course. R: Open to graduate-professional students in the College of Osteopathic Medicine or approval of department.
Recognize healthcare disparities across populations. Develop skills and intervention strategies to promote health equity.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer Semester 2026

OST 596 Voices and Values in Medicine
Spring of every year. 1(1-0) A student may earn a maximum of 2 credits in all enrollments for this course. R: Open to graduate-professional students in the College of Osteopathic Medicine or approval of department.
Student-led exploration of health equity, systemic bias, and social determinants of health relating to access to care, substance use, underserved populations, and shame in medicine.
Request the use of the Pass-No Grade (P-N) system.
Effective Spring Semester 2026

DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY

PHM 843 Introduction to Medical Device Toxicology
Summer of every year. 2(2-0) A student may earn a maximum of 2 credits in all enrollments for this course. RB: Science / Biology / Chemistry / Physiology R: Open to graduate students in the Integrative Pharmacology Major or in the Pharmacology and Toxicology Major.
Foundations of medical device biocompatibility and toxicology, including a review of the regulatory expectations and standards, endpoint assessment, and the data needed for toxicological risk assessment (TRA) to assess safety of medical devices.
Effective Summer Semester 2026

DEPARTMENT OF PLANT BIOLOGY

PLB 480 Epigenetics
Spring of even years. 3(3-0) Interdepartmental with Integrative Biology ~~P: IBIO 341 or CSS 350~~ P: IBIO 341 or CROP 350 R: Approval of college.
REINSTATEMENT Molecular mechanisms of epigenetic modifications of eukaryotic genomes and their roles in biological processes, human diseases and cancer, plant development, and production.
Effective Fall Semester 2026

DEPARTMENT OF PLANT, SOIL AND MICROBIAL SCIENCES

PLP 481 Plant Pathogen Omics and Evolution
Fall of every year. 2(2-0) P: MGI 301 or SOIL 360 or approval of department RB: A general knowledge of eukaryotic and prokaryotic cell structure and function, plant pathology, plant physiology, basic concepts and techniques of molecular biology and biochemistry.
Omics techniques in the study of plant pathogen evolution. Experimental design and dataset analyses.
Effective Fall Semester 2026

PLP 482 Methods in Plant Pathology
Fall of every year. 2(2-0) P: MGI 301 or SOIL 360 or approval of department
Advanced microbiological and molecular genetic techniques to study, manipulate, and identify plant pathogens.
Effective Fall Semester 2026

PART III – COURSE CHANGES

DEPARTMENT OF AGRICULTURAL, FOOD, AND RESOURCE ECONOMICS

AFRE 100 ~~Decision-making in the Agri-Food System~~ Economics and Management for the Bioeconomy
~~Fall of every year. Spring of every year.~~ Fall of every year. Spring of every year. Summer of every year. 3(3-0)

~~Organization and operation of the agri-food system. Economic analysis of agri-food firms and consumers. Management functions and decision-making of agri-food firms.~~ Organization and operation of firms, value chains, and markets. Economic analysis of business and consumers. Management functions and decision-making processes. Applications to agriculture, food, and natural resources.

~~SA: FSM 200, ABM 100~~ SA: ABM 100, FSM 200

Effective Fall Semester 2026

AFRE 130 ~~Farm Management I~~ Foundations of Agribusiness Management
Fall of every year. Spring of every year. Summer of every year. 3(3-0) RB: AFRE 100 and AFRE 203

~~General farm management including record keeping, income tax management, farm finance, and operational management of agricultural resources.~~ Agribusiness management practices including record keeping, income tax management, finance, and operational and resource management.

~~SA: AEC 050, ABM 130~~ SA: ABM 130, AEC 050

Effective Fall Semester 2026

AFRE 203 ~~Data Analysis for the Agri-Food System~~ Data Analysis for Managerial Decision-Making
Fall of every year. Spring of every year. Summer of every year. 3(3-0) ~~P: (AFRE 100 or concurrently) or (EC 201 or concurrently) RB: STT 200 or STT 201 or STT 315~~ RB: ((AFRE 100 or concurrently) or (EC 201 or concurrently)) and ((STT 200 or concurrently) or (STT 201 or concurrently) or (STT 315 or concurrently))

~~Introduction to data analysis tools used in the management of food systems.~~ Data analysis concepts and tools used in management. Applications to agriculture, food, and natural resources.

SA: ABM 203

Effective Fall Semester 2026

AFRE 206 World Food, Population and Poverty
Fall of every year. Spring of every year. 3(3-0) ~~P: AFRE 100 or AFRE 265 or EC 201~~ P: (AFRE 100 or concurrently) or (EC 201 or concurrently) or (EC 202 or concurrently)

Description and analysis of world food, population and poverty problems. Interrelationships between developed and developing countries.

~~SA: EEP 260, EEM 260~~ SA: EEM 260, EEP 260

Effective Fall Semester 2026

AFRE 210 Professional Seminar in Agricultural, Food, and Resource Economics
Spring of every year. 1(1-0) R: Open to students in the Department of Agricultural, Food, and Resource Economics.

~~Industry trends in agribusiness management. Verbal, written, and visual communication techniques applied to professional situations, including professional development and career planning.~~ Industry and management trends. Verbal, written, and visual communication techniques applied to professional situations. Professional development, networking, and career planning.

SA: ABM 210

Effective Fall Semester 2026

AFRE 222 ~~Agribusiness and Food Industry Sales~~ Sales for the Bioeconomy
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: AFRE 100 or EC 201 RB: AFRE 240 R: Open to sophomores or juniors or seniors.
~~Selling processes and activities within agribusiness and food firms. Principles and techniques of sales. Operation of sales organizations.~~ Selling processes and activities. Principles and techniques of sales. Operation of sales organizations. Applications to agriculture, food, and natural resources.
SA: FSM 320, ABM 222
Effective Fall Semester 2026

AFRE 224 ~~Information and Market Intelligence in the Agri-Food Industry~~ Information and Market Intelligence
Summer of every year. 3(3-0)
~~Researching agri-food issues, food industry business environments, and agri-food industry trends. Information gathering. Electronic library reference sources. Synthesis of data and information into market intelligence.~~ Information gathering and data interpretation. Synthesis of data and information from multiple sources into market intelligence. Use of technology and innovation.
SA: FIM 424, FIM 224
Effective Fall Semester 2026

AFRE 232 ~~Commodity Marketing I~~ Commodity Marketing
Fall of every year. 3(3-0) P: AFRE 100 or EC 201
~~Commodity markets in the agri-food system. Analysis of supply, demand, and pricing alternatives. Agri-food marketing processes, including marketing cooperatives.~~ Structure and function of global commodity markets. Dynamics of price determination and pricing alternatives. Commodity marketing and procurement processes. Forecasting and risk management strategies. Applications to agriculture, food, and natural resources.
SA: ABM 225
Effective Fall Semester 2026

AFRE 240 ~~Food Product Marketing~~ Product Marketing for the Bioeconomy
Fall of every year. Spring of every year. 3(3-0) P: AFRE 100 or concurrently RB: EC 201
~~Structure of the food marketing system including food processors, manufacturers, retailers and food service. Impact of consumer behavior and buying patterns. International food product marketing. Strategic planning in food marketing.~~ Structure of the marketing system including relationships between processors, manufacturers, retailers and service providers. Impact of consumer trends, behavior and buying patterns. International product marketing. Strategic planning in marketing. Applications to agriculture, food, and natural resources.
SA: FIM 220
Effective Fall Semester 2026

AFRE 265 Ecological Economics
Fall of every year. Spring of every year. 3(3-0) ~~P: (EC 201 or concurrently) or (EC 202 or concurrently)~~ P: (AFRE 100 or concurrently) or (EC 201 or concurrently) or (EC 202 or concurrently) RB: AFRE 203
Relationship between the economy and the natural environment. Economic organization and sustainability. Economic concepts applied to natural resources and agriculture.
~~SA: EEP 255, PRM 255, EEM 255~~ SA: EEM 255, EEP 255, PRM 255
Effective Fall Semester 2026

AFRE 300 ~~Public Policy Issues in the Agri-Food System~~ Public Policy Analysis
Spring of every year. 3(3-0) P: (AFRE 100) and (EC 201 or EC 202) RB: (AFRE 203) and AFRE 240 and (AFRE 303 or EC 301) R: Open to juniors or seniors.
~~Objectives, alternatives and consequences of public policy in the agri-food system. Analysis of economic implications for food and agribusiness firms, farmers, consumers and society.~~ Objectives, alternatives, and consequences of public policy decisions. Analysis of economic implications for stakeholders including firms, consumers, and society. Applications to agriculture, food and natural resources.
SA: FSM 421, ABM 400
Effective Fall Semester 2026

AFRE 303 Managerial Economics
Fall of every year. Spring of every year. 3(3-0) ~~P: {(AFRE 203) and EC 201} and (STT 200 or STT 201 or STT 315)~~ P: AFRE 100 and AFRE 203 and EC 201 RB: STT 200 or STT 201 or STT 315
~~Managerial economics with applications focusing on agriculture, food, and resources issues.~~ Application of intermediate microeconomic concepts to management decision-making. Models of price formation, consumption and production decisions, and market structure. Applications to agriculture, food, and natural resources.
SA: ABM 303
Effective Fall Semester 2026

AFRE 315 ~~Labor and Personnel Management in the Agri-Food System~~ Labor and Personnel Management
Fall of every year. Summer of every year. 3(3-0) P: AFRE 100 or AFRE 130 RB: EC 201 R: Open to juniors or seniors.
~~Human resource management practices and techniques for farms, and agri-food firms: planning, recruiting, training, motivating, and evaluating. Labor regulations, compensation incentive plans, and employee benefits.~~ Human resource management practices and techniques: planning, recruiting, training, motivating, and evaluating. Labor regulations, compensation incentive plans, and employee benefits. Applications to agriculture, food, and natural resources.
SA: FSM 325, ABM 337, FIM 415
Effective Fall Semester 2026

AFRE 322 ~~Organization of the Agri-Food Systems~~ Organizational Economics for the Bioeconomy
Spring of every year. 3(3-0) ~~Interdepartmental with Food Industry Management~~ P: AFRE 100 and EC 201 ~~RB: (AFRE 303) or (AFRE 203 and EC 301)~~ RB: (AFRE 303 or concurrently) or (EC 301 or concurrently) R: Open to juniors or seniors.
~~Analysis of vertical coordination in the industrialized agri-food system. Agricultural cooperatives, contracts, marketing orders, and trade associations. Analysis of imperfect competition and methods of conducting business. Interaction with legal systems and government.~~ Market coordination, institutions, and mechanisms of governance. Analysis of cooperatives, alliances, contracts, marketing orders, and trade associations. Interaction with legal systems and government. Applications to agriculture, food, and natural resources.
SA: FSM 443
Effective Fall Semester 2026

AFRE 327 ~~Global Agri-Food Industries and Markets~~ International Agribusiness and Food Marketing
Fall of every year. 3(3-0) ~~P: (AFRE 100) and (AFRE 232 or AFRE 240) and EC 201 and EC 202~~ P: (AFRE 100) and (AFRE 232 or AFRE 240) ~~RB: (AFRE 303) or (AFRE 203 and EC 301)~~ RB: (AFRE 303 or concurrently) or (EC 301 or concurrently) R: Open to juniors or seniors.
~~Strategic understanding of the international agri-food system. Analysis of global production, marketing, and consumption. Knowledge of changing conditions in international industries and markets. Global trends and opportunities.~~ Understanding of the global agri-food system. Analysis of global production, marketing, and supply chain decisions. Knowledge of changing conditions in international industries and markets. Global trends and opportunities.
SA: ABM 427
Effective Fall Semester 2026

AFRE 330 ~~Farm Management II~~ Advanced Agribusiness Management
Fall of every year. 3(3-0) P: (AFRE 130) and AFRE 203 ~~RB: (AFRE 303) or (AFRE 203 and EC 301)~~ RB: (AFRE 303 or concurrently) or (EC 301 or concurrently) R: Open to juniors or seniors.
~~Advanced management, planning, and control of farm production, marketing, financial activities, economic principles, budgeting and financial statements.~~ Advanced planning and decision making in agribusiness firms. Management of production, marketing, finance, budgeting, and business planning.
SA: FSM 330, ABM 430
Effective Fall Semester 2026

AFRE 340 Food Marketing Research and Analytics
Fall of every year. Spring of every year. 3(3-0) P: AFRE 203 and AFRE 240 ~~RB: (AFRE 303) or (AFRE 203 and EC 301)} and AFRE 440~~ RB: (AFRE 303 or concurrently) or (EC 301 or concurrently) R: Open to juniors or seniors.
~~Information needed to make effective retail decisions. Use of technology in collecting, analyzing, and interpreting retail systems data and in writing and presenting reports.~~ Principles and tools for conducting market research and data analysis. Emerging market trends and new product development. Evidence-based decisions and communication for the food industry.
SA: HED 460, RET 460, FIM 460
Effective Fall Semester 2026

AFRE 360 Environmental Economics
Spring of every year. 3(3-0) P: (AFRE 265) and AFRE 203 RB: (AFRE 303 or concurrently) or (EC 301 or concurrently)
Analytical methods for evaluating economic impacts of environmental policies and understanding the economic causes of environmental problems.
SA: EEP 320, EEM 320
Effective Fall Semester 2026

AFRE 410 Advanced Professional Seminar in Agricultural Food and Resource Economics
Fall of every year. 1(1-0) P: AFRE 210 R: Open to juniors or seniors in the Department of Agricultural, Food, and Resource Economics.
~~Advanced professional problems and reestablishment of career planning in the agri-food system. Industry trends, career alternatives, and job search strategies. Enhanced verbal, written, and visual communication techniques.~~ Advanced professional development and career planning in agriculture, food and natural resources. Industry trends, career alternatives, and job search strategies. Professional networking. Enhanced verbal, written, and visual communication techniques.
Effective Fall Semester 2026

AFRE 435 ~~Financial Management in the Agri-Food System~~ Financial Management for the Bioeconomy
Fall of every year. Spring of every year. 3(3-0) ~~P: (AFRE 203) and (AFRE 130 or FI 320 or ACC 201 or ACC 230) and (AFRE 303 or EC 301)~~ P: (AFRE 203) and (AFRE 130 or FI 320 or ACC 230) and (AFRE 303 or EC 301 or approval of department) R: Open to juniors or seniors.
~~Analysis of agri-food business performance using financial statements. Capital budgeting of durable investments. Risk. Alternative methods to control capital asset services. Financial markets and credit institutions affecting agriculture and food.~~ Analysis of small business performance using financial statements. Capital budgeting of durable investments. Risk management. Alternative methods to control capital asset services. Financial markets and credit institutions. Applications to firms in agriculture, food, and natural resources. Capstone project.
~~SA: FSM 412, ABM 435~~ SA: ABM 435, FSM 412
Effective Fall Semester 2026

AFRE 440 Food Marketing Management
Fall of every year. Spring of every year. 3(3-0) P: AFRE 203 and AFRE 240 RB: (AFRE 340) and ((AFRE 303 or concurrently) or (EC 301 or concurrently))
~~Management decision-making in food industry organizations (processors, wholesalers, retailers). Marketing and sales in response to customer and consumer needs. Distribution and merchandising systems in domestic and international contexts.~~ Coordination of marketing activities in food industry organizations. Marketing analysis and development of marketing strategies. Product, branding, promotion and advertising, pricing, and distribution decisions. Domestic and international markets.
SA: FIM 335
Effective Fall Semester 2026

AFRE 445 ~~Strategic Management for Food and Agribusiness Firms (W)~~
Strategic Management for the Bioeconomy (W)
Fall of every year. Spring of every year. ~~3(4-0)~~ 3(3-0) Interdepartmental with Marketing ~~P: (AFRE 203) and AFRE 240 and (ACC 201 or ACC 230 or AFRE 130 or AFRE 435 or FI 320) and (AFRE 303 or EC 301)~~ P: (AFRE 203) and AFRE 240 and (ACC 230 or AFRE 130 or FI 320) and (AFRE 303 or EC 301) RB: AFRE 435 R: Open to seniors.
~~Principles and techniques for analyzing and implementing business and strategy. Approaches to identify and manage strategic problems. Application to firms in the food and agribusiness industries. Capstone project.~~ Principles and techniques for analyzing business strategies. Approaches to identify and manage strategic problems. Formulation and implementation of business models for competitive advantage and value creation. Applications to firms in agriculture, food and natural resources. Capstone project.
SA: FIM 439
Effective Fall Semester 2026

AFRE 460 Natural Resource Economics
Fall of every year. 3(3-0) ~~P: (AFRE 265) and AFRE 203~~ P: AFRE 265 and AFRE 203 or approval of department RB: (AFRE 360) and ((AFRE 303 or concurrently) or (EC 301 or concurrently)) R: Open to juniors or seniors.
Economic framework for analyzing natural resource management decisions. Spatial and inter-temporal allocation of renewable and nonrenewable resources. Special emphasis on institutions, externalities, and public interests in resource management.
~~SA: EEP 460, EEM 460~~ SA: EEM 460, EEP 460
Effective Fall Semester 2026

AFRE 465 Corporate Environmental Management (W)
Spring of every year. 3(3-0) ~~P: (AFRE 203) and AFRE 265 and (ACC 201 or ACC 230 or AFRE 130 or FI 320) and (AFRE 303 or EC 301)~~ P: (AFRE 203 and AFRE 265) and (ACC 230 or AFRE 130) and (AFRE 303 or EC 301 or approval of department) R: Open to juniors or seniors.
~~Integration of environmental protection and pollution prevention with business management. Economic and strategic analysis of environmental protection.~~ Integration of environmental sustainability with business management. Economic and strategic analysis of environmental protection and pollution prevention. Capstone project.
SA: PRM 405, EEM 405
Effective Fall Semester 2026

AFRE 829 Economics of Environmental Resources
Fall of every year. 3(3-0) ~~Interdepartmental with Community Sustainability, Economics, Fisheries and Wildlife, Forestry~~ Interdepartmental with Community Sustainability, Fisheries and Wildlife, Forestry RB: Undergraduate intermediate microeconomics, calculus, and statistics
Economic principles, theoretical models, and empirical methods related to environmental problems and policy interventions. Applications to air, land, water, forests, energy, fish and wildlife, and climate change, including in developing countries.
SA: AEC 829
Effective Fall Semester 2026

SCHOOL OF CRIMINAL JUSTICE

CJ 429 Interdisciplinary Topics in Cybercrime and Cybersecurity
Spring of every year. 3(3-0) Interdepartmental with Computer Science and Engineering ~~P: CSE 102 or CSE 231~~ P: CJ 345 R: Open to juniors or seniors or graduate students.
Technical, legal, criminal, medical business, and communication aspects of CyberSecurity.
Effective Spring Semester 2026

COLLEGE OF ENGINEERING

EGR 440 Science and Engineering Entrepreneurship
Fall of every year. 3(3-0) R: Open to juniors or seniors in the College of Engineering or in the College of Natural Science or approval of college. Not open to students with credit in EGR 840.
~~Technical skills to enable and engage in science and engineering related entrepreneurship at all levels. Discovery, evaluation, and engagement of entrepreneurial opportunities starting with technology development to solve a problem, bring about desired change that is scalable, and the application of science and engineering principles in business related endeavors.~~ Technical skills to enable and engage in science and engineering related entrepreneurship at all levels with the application of science and engineering principles in business related endeavors.
Effective Fall Semester 2026

EGR 840 Science and Engineering Entrepreneurship
Fall of every year. 3(3-0) R: Open to graduate students in the College of Engineering or in the College of Natural Science. Not open to students with credit in EGR 440.
~~Technical skills to enable and engage in engineering related entrepreneurship at all levels. Discovery, evaluation, and engagement of entrepreneurial opportunities starting with technology development to solve a problem, bring about desired change that is scalable, and the application of engineering principles in business related endeavors.~~ Technical skills to enable and engage in science and engineering related entrepreneurship at all levels with the application of science and engineering principles in business related endeavors.
Effective Fall Semester 2026

DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION

FSC 423 Functional Foods and Human Health
Spring of even years. 3(3-0) ~~P: {(FSC 211) or HNF 150} and (MMG 201 or MMG 301 or FSC 342) and ((BMB 200 or concurrently) or (BMB 401 or concurrently))~~ P: {(FSC 211) or HNF 150} and (MGI 201 or MGI 301 or FSC 342) and ((BMB 200 or concurrently) or (BMB 401 or concurrently))
Concept, nature and classification of functional foods. Spectrum of biological activity. Positive and negative impacts on health, and regulatory aspects.
Effective Spring Semester 2026

FSC 440 Food Microbiology
Fall of every year. 3(3-0) ~~Interdepartmental with Microbiology and Molecular Genetics~~ Interdepartmental with Microbiology, Genetics, and Immunology ~~P: (MMG 201 or MMG 301) and completion of Tier I writing requirement.~~ P: (MGI 201 or MGI 301) or completion of Tier I writing requirement R: Not open to freshmen.
Major groups of microorganisms of importance to the food industry. Ecological, physiological, and public health aspects.
Effective Spring Semester 2026

FSC 442 Hazard Analysis Critical Control Point Training and Certification
Fall of every year. 1(1-0) ~~P: (FSC 325) and (MMG 301 or concurrently)~~ P: (FSC 325) and (MGI 301 or concurrently) RB: FSC 440 R: Open to juniors or seniors.
Design and implementation of Hazard Analysis Critical Control Point (HACCP) programs for the food industry. Offered second half of semester.
Effective Spring Semester 2026

HNF 453 Nutrition and Human Development
Spring of every year. 3(3-0) ~~P: (HNF 375 or HNF 377) and (PSL 250 or PSL 310 or PSL 431)~~ P: (HNF 377) and (PSL 250 or PSL 310 or PSL 431) R: Open to juniors or seniors in the Dietetics Major or in the Nutritional Sciences Major or in the Lyman Briggs Nutritional Sciences Coordinate Major.
Role of nutrients in anatomical, physiological, and biochemical processes as related to human growth and development. Nutrition throughout the life cycle. Nutritional assessment integrating the nutrition care process and age specific programs.
SA: HNF 376
Effective Spring Semester 2025

SCHOOL OF HOSPITALITY BUSINESS

HB 486 Advanced Hospitality Marketing
Fall of every year. 3(3-0) ~~P: HB 375 or MKT 300 or MKT 327~~ P: MKT 300 or MKT 327 R: Open to juniors or seniors in the Hospitality Business Major.
Application of advanced marketing principles in the hospitality industry. Identifying, influencing and servicing demand for hospitality products, services, and experiences.
SA: HB 475, HB 476
Effective Spring Semester 2026

DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

HDFS 481 Research and Quantitative Methods in Human Development and Family Studies
Fall of every year. Spring of every year. 3(3-0) ~~P: (HDFS 270) and ((MTH 103 or MTH 116 or MTH 124 or MTH 132 or MTH 101 or MTH 102 or STT 200 or STT 201) or designated score on Mathematics Placement test)~~ P: (HDFS 270) and ((MTH 103 or MTH 116 or MTH 124 or MTH 132 or MTH 101 or MTH 102 or STT 200 or STT 201 or MTH 103B) or designated score on Mathematics Placement test) R: Open to juniors or seniors or graduate students in the Department of Human Development and Family Studies.
Survey of qualitative and quantitative research methods. Evaluate, conceptualize and plan research. Validity and ethics explored for consumers of research in community agencies.
Effective Fall Semester 2026

DEPARTMENT OF OSTEOPATHIC MANIPULATIVE MEDICINE

OMM 602 Osteopathic Principles and Practice Clerkship
Fall of every year. Spring of every year. Summer of every year. 2 credits. R: Open to graduate-professional students in the College of Osteopathic Medicine.
Integration of osteopathic manipulative medicine and osteopathic principles and practice during clerkship rotations.
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 2 semesters after the end of the semester of enrollment.~~ Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 6 semesters after the end of the semester of enrollment.
Effective Spring Semester 2026

COLLEGE OF OSTEOPATHIC MEDICINE

OST 604 Essential Clinical Skills for the Senior Medical Student
Fall of every year. Spring of every year. Summer of every year. 2(1-2) Interdepartmental with Osteopathic Manipulative Medicine R: Open to seniors in the College of Osteopathic Medicine.
Longitudinal experience addressing essential skills for senior osteopathic medical students.
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.~~ Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 6 semesters after the end of the semester of enrollment.
Effective Spring Semester 2026

DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY

PHM 809 Drug Discovery and Medicinal Chemistry
Spring of odd years. 2(2-0) ~~Interdepartmental with Chemistry~~ Interdepartmental with Biochemistry and Molecular Biology, Chemistry A student may earn a maximum of 4 credits in all enrollments for this course. RB: BS in Biomedical science discipline (including, but not limited to chemistry, biochemistry, pharmacology, chemical engineering, molecular biology, biology, pharmacy, human biology, physiology.) R: Open to doctoral students in the Department of Chemistry or in the Department of Biochemistry and Molecular Biology or in the Pharmacology and Toxicology Major or approval of department.
Fundamentals of pharmaceutical drug discovery including basic chemistry, drug-design principles, high throughput screening, computational modeling, and drug metabolic pathways.
Effective Spring Semester 2026

PHM 851 Intellectual Property and Patent Law for Biomedical Sciences
~~Fall of every year.~~ Fall of odd years. 2(2-0) RB: Strong reading and writing skills helpful.
Fundamentals of intellectual property and patent law encountered by biomedical scientists, including issues of prevention, patent prosecution, and enforcement of patents in a litigation setting.
Effective Fall Semester 2026

DEPARTMENT OF PLANT, SOIL AND MICROBIAL SCIENCES

~~CSS 292~~
CROP 292 Career Leadership in Agriculture
Spring of every year. 2(2-0) Interdepartmental with Agricultural, Food, and Resource Economics, Animal Science, Horticulture Not open to students with credit in AT 214.
Leadership development, styles, and evaluations within agriculture.
~~SA: AEE 110, AEE 111~~ SA: AEE 110, AEE 111, CSS 292
Effective Fall Semester 2026

~~CSS 171~~
TURF 171 Operations Budgeting for Golf Course Managers
Spring of every year. ~~2(3-0)~~ 2(2-0) ~~RB: CSS 232 and CSS 210~~ RB: TURF 232 and SOIL 210
Budgeting. Financial analysis. Purchasing and materials management for golf course operations. Offered first ten weeks of semester.
~~SA: CSS 071~~ SA: CSS 071, CSS 171
Effective Fall Semester 2026

DEPARTMENT OF STATISTICS AND PROBABILITY

STT 467 Insurance Operations
~~Spring of every year.~~ Fall of every year. 3(3-0) Interdepartmental with Mathematics P: (ACC 230 and FI 321 and MTH 360) and completion of Tier I writing requirement RB: STT 441
Regulation, marketing and distribution, underwriting, risk control, premium auditing, the claim function, actuarial operations, and reinsurance.
Effective Spring Semester 2026