

MICHIGAN STATE UNIVERSITY

**Report of
THE UNIVERSITY COMMITTEE ON CURRICULUM
to the Faculty Senate
October 13, 2020**

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

October 13, 2020

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. Any items not approved by the Faculty Senate will be reported to the appropriate college and department or school.
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.

¹One 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

October 13, 2020

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. Change the requirements for the **Minor in Agribusiness Management** in the Department of Agricultural, Food, and Resource Economics.

- a. Under the heading **Requirements for the Minor in Agribusiness Management** replace the entire entry with the following:

The student must complete 15 credits from the following:

1. Both of the following courses (6 credits):

AFRE 100	Decision-making in the Agri-Food System	3
AFRE 203	Data Analysis for the Agri-Food System	3
2. One of the following courses (3 credits):

AFRE 130	Farm Management I	3
AFRE 232	Commodity Marketing	3
3. Two of the following courses including at least one at the 300-level or above (6 credits):

AFRE 130	Farm Management I	3
AFRE 222	Agribusiness and Food Industry Sales	3
AFRE 232	Commodity Marketing	3
AFRE 300	Public Policy Issues in the Agri-Food System	3
AFRE 303	Managerial Economics	3
AFRE 322	Organization of the Agri-Food Systems	3
AFRE 327	Global Agri-Food Industries and Markets	3
AFRE 330	Farm Management II	3
AFRE 432	Commodity Marketing II	3
AFRE 435	Financial Management in the Agri-Food System	3
AFRE 490	Independent Study in Agricultural Food and Resource Economics	3

Agricultural Food and Resource Economics 130 or 232 may be used to fulfill requirement 3. if not used to fulfill requirement 2.

Effective Fall 2021.

2. Change the requirements for the **Bachelor of Science degree in Agribusiness Management** in the Department of Agricultural, Food, and Resource Economics.

- a. Under the heading **Requirements for the Bachelor of Science Degree in Agribusiness Management** replace the entire entry with the following:

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

The University's Tier II Writing Requirement for the Agribusiness Management major is met by completing Agricultural Food and Resource Economics 445 or 465. Those courses are referenced in item 3. below.

The completion of the Agribusiness Management 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.

Students must achieve a grade of at least 2.0 or higher in each AFRE course referenced in items 3. a. and in courses taken to fulfill requirements 3. b., 3. c. and 3.d.

3. The following requirements for the major:

				CREDITS
a.	All of the following courses (38 credits):			
	AFRE	100	Decision-making in the Agri-Food System	3
	AFRE	130	Farm Management I	3
	AFRE	203	Data Analysis for the Agri-Food System	3
	AFRE	206	World Food, Population and Poverty	3
	AFRE	210	Professional Seminar in Agricultural, Food, and Resource Economics	1
	AFRE	222	Agribusiness and Food Industry Sales (W)	3
	AFRE	232	Commodity Marketing I	3
	AFRE	240	Food Product Marketing	3
	AFRE	265	Ecological Economics	3
	AFRE	410	Advanced Professional Seminar in Agricultural Food and Resource Economics	1
	AFRE	435	Financial Management in the Agri-Food System	3
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
	MTH	124	Survey of Calculus I	3
b.	Three of the following courses (9 credits):			
	AFRE	224	Information and Market Intelligence in the Agri-Food Industry	3
	AFRE	300	Public Policy Issues in the Agri-Food System	3
	AFRE	315	Labor and Personnel Management in the Agri-Food System	3
	AFRE	322	Organization of the Agri-Food Systems	3
	AFRE	327	Global Agri-Food Industries and Markets	3
	AFRE	330	Farm Management II	3
	AFRE	432	Commodity Marketing II	3
	AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
	AFRE	465	Corporate Environmental Management (W)	3
	AFRE	490	Independent Study in Agricultural Food and Resource Economics	3
	AFRE	493	Professional Internship in Agricultural Food and Resource Economics	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.			
	Agricultural Food and Resource Economics 300, 330 or 432 may be used to fulfill requirement 3.b. if not used to fulfill requirement 3.d.			
c.	One of the following courses (3 credits):			
	AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
	AFRE	465	Corporate Environmental Management (W)	3

- d. One of the following courses (3 credits):
 - AFRE 300 Public Policy Issues in Agri-Food System 3
 - AFRE 330 Farm Management II 3
 - AFRE 432 Commodity Marketing ii 3
- e. One of the following courses (3 or 4 credits):
 - AFRE 303 Managerial Economics 3
 - EC 301 Intermediate Microeconomics 3
- f. 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
- g. One of the following courses (3 credits):
 - SCM 303 Introduction to Supply Chain Management 3
 - SCM 304 Survey of Supply Chain Management 3
- h. Complete 6 credits in sciences related to agricultural production and processing, as approved by the department. It is recommended that these credits be from the same discipline.

Effective Fall 2021.

- 3. Change the requirements for the **Minor in Environmental Economics** in the Department of Agricultural, Food, and Resource Economics.
 - a. Under the heading **Requirements for the Minor in Environmental Economics** replace the entire entry with the following:

The student must complete 15 credits from the following:

 - 1. All of the following courses (9 credits):
 - AFRE 203 Data Analysis for the Agri-Food System 3
 - AFRE 265 Ecological Economics 3
 - AFRE 360 Environmental Economics 3
 - 2. One of the following courses (3 credits):
 - AFRE 460 Natural Resource Economics 3
 - AFRE 465 Corporate Environmental Management (W) 3
 - 3. One of the following courses (3 or 4 credits):
 - AFRE 303 Managerial Economics 3
 - AFRE 460 Natural Resource Economics 3
 - AFRE 465 Corporate Environmental Management (W) 3
 - CSUS 354 Water Resources Management 3
 - CSUS 465 Environmental and Natural Resource Law 3
 - EC 450 Economics of Environmental Policy (W) 3
 - FOR 419 Applications of Geographic Information Systems 4

Agricultural Food and Resource Economics 460 or 465 may be used to fulfill requirement 3. if not used to satisfy requirement 2.

Effective Fall 2021.

- 4. Change the requirements for the **Bachelor of Science degree in Environmental Economics and Management** in the Department of Agricultural, Food, and Resource Economics.
 - a. Under the heading **Requirements for the Bachelor of Science Degree in Environmental Economics and Management** replace the entire entry with the following:
 - 1. The University requirements for bachelor's degrees as described in the Undergraduate Education section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Environmental Economics and Management.

The University's Tier II Writing Requirement for the Environmental Economics and Management major is met by completing Agricultural Food and Resource Economics 465. This course is referenced in item 3. below.

The completion of the Environmental Economics and Management 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.

Students must achieve a grade of at least 2.0 or higher in each AFRE course referenced in items 3. a. and in courses taken to fulfill requirements 3. b. and 3. c.

3. The following requirements for the major:

				CREDITS
a.	All of the following courses (38 credits):			
	AFRE	100	Decision-making in the Agri-Food System	3
	AFRE	203	Data Analysis for the Agri-Food System	3
	AFRE	206	World Food, Population and Poverty	3
	AFRE	210	Professional Seminar in Agricultural, Food, and Resource Economics	1
	AFRE	222	Agribusiness and Food Industry Sales (W)	3
	AFRE	240	Food Product Marketing	3
	AFRE	265	Ecological Economics	3
	AFRE	360	Environmental Economics	3
	AFRE	410	Advanced Professional Seminar in Agricultural Food and Resource Economics	1
	AFRE	460	Natural Resource Economics	3
	AFRE	465	Corporate Environmental Management (W)	3
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
	MTH	124	Survey of Calculus I	3
b.	Three of the following courses (9 credits):			
	AFRE	224	Information and Market Intelligence in the Agri-Food Industry	3
	AFRE	300	Public Policy Issues in the Agri-Food System	3
	AFRE	315	Labor and Personnel Management in the Agri-Food System	3
	AFRE	322	Organization of the Agri-Food Systems	3
	AFRE	327	Global Agri-Food Industries and Markets	3
	AFRE	435	Financial Management in the Agri-Food Systems	3
	AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
	AFRE	490	Independent Study in Agricultural Food and Resource Economics	3
	AFRE	493	Professional Internship in Agricultural Food and Resource Economics	3
	CSUS	354	Water Resources Management	3
	CSUS	465	Environmental and Natural Resource Law	3
	EC	450	Economics of Environmental Policy (W)	3
	FOR	419	Applications of Geographic Information Systems to Natural Resource Management	4

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

- Agricultural Food and Resource Economics 435 or 445 may be used to fulfill requirement 3.b. if not used to fulfill requirement 3.c.
- c. One of the following courses (3 credits):

AFRE	435	Financial Management in the Agri-Food Systems	3
AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
 - d. One of the following courses (3 credits):

ACC	201	Principles of financial Accounting	3
ACC	230	Survey of Accounting Concepts	3
AFRE	130	Farm Management I	3
FI	320	Introduction to Finance	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
 - g. One of the following courses (3 credits):

SCM	303	Introduction to Supply Chain Management	3
SCM	304	Survey of Supply Chain Management	3
 - h. Complete 6 credits in sciences related to sustainability and the environment, as approved by the department. It is recommended that these credits be from the same discipline.

Effective Fall 2021.

5. Change the requirements for the **Minor in Food Industry Management** in the Department of Agricultural, Food, and Resource Economics.

- a. Under the heading **Requirements for the Minor in Food Industry Management** replace the entire entry with the following:

The student must complete 15 credits from the following:

- 1. All of the following courses (9 credits):

AFRE	100	Decision-making in the Agri-Food System	3
AFRE	203	Data Analysis for the Agri-Food System	3
AFRE	240	Food Product Marketing	3
- 2. One of the following courses (3 credits):

AFRE	340	Food Marketing Research and Analytics	3
AFRE	440	Food Marketing Management	3
- 3. One of the following courses (3 credits):

AFRE	222	Agribusiness and Food Industry Sales	3
AFRE	300	Public Policy Issues in the Agri-Food System	3
AFRE	303	Managerial Economics	3
AFRE	322	Organization of the Agri-Food Systems	3
AFRE	327	Global Agri-Food Industries and Markets	3
AFRE	340	Food Marketing Research and Analytics	3
AFRE	440	Food Marketing Management	3
AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
AFRE	490	Independent study in Agricultural Food and Resource Economics	3

Agricultural Food and Resource Economics 340 and 440 may be used to fulfill requirement 3. if not used to fulfill requirement 2.

Effective Fall 2021.

6. Change the requirements for the **Bachelor of Science degree in Food Industry Management** in the Department of Agricultural, Food, and Resource Economics.

a. Under the heading **Requirements for the Bachelor of Science Degree in Food Industry Management** replace the entire entry with the following:

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

The University's Tier II Writing Requirement for the Food Industry Management major is met by completing Agricultural Food and Resource Economics 445. This course is referenced in item 3. below.

The completion of the Food Industry Management 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.

Students must achieve a grade of at least 2.0 or higher in each AFRE course referenced in items 3. a. and in courses taken to fulfill requirements 3. b. and 3. c.

3. The following requirements for the major:

				CREDITS
a.	All of the following courses (38 credits):			
	AFRE	100	Decision-making in the Agri-Food System	3
	AFRE	203	Data Analysis for the Agri-Food System	3
	AFRE	206	World Food, Population and Poverty	3
	AFRE	210	Professional Seminar in Agricultural, Food, and Resource Economics	1
	AFRE	222	Agribusiness and Food Industry Sales (W)	3
	AFRE	240	Food Product Marketing	3
	AFRE	265	Ecological Economics	3
	AFRE	340	Food Marketing Research and Analytics	3
	AFRE	410	Advanced Professional Seminar in Agricultural Food and Resource Economics	1
	AFRE	440	Food Marketing Management	3
	AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
	MTH	124	Survey of Calculus I	3
b.	Three of the following courses (9 credits):			
	AFRE	224	Information and Market Intelligence in the Agri-Food Industry	3
	AFRE	232	Commodity Marketing I	3
	AFRE	300	Public Policy Issues in the Agri-Food System	3
	AFRE	315	Labor and Personnel Management in the Agri-Food System	3
	AFRE	322	Organization of the Agri-Food Systems	3
	AFRE	327	Global Agri-Food industries and Markets	3
	AFRE	435	Financial Management in the Agri-Food Systems	3
	AFRE	465	Corporate Environmental Management (W)	3
	AFRE	490	Independent Study in Agricultural Food and Resource Economics	3

- AFRE 493 Professional Internship in Agricultural Food and Resource Economics 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.
- Agricultural Food and Resource Economics 435 or 465 may be used to fulfill requirement 3.b. if not used to fulfill requirement 3.c.
- c. One of the following courses (3 credits):
 - AFRE 435 Financial Management in the Agri-Food Systems 3
 - AFRE 465 Corporate Environmental Management (W) 3
- d. One of the following courses (3 credits):
 - ACC 201 Principles of financial Accounting 3
 - ACC 230 Survey of Accounting Concepts 3
 - AFRE 130 Farm Management I 3
 - FI 320 Introduction to Finance 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
- g. One of the following courses (3 credits):
 - SCM 303 Introduction to Supply Chain Management 3
 - SCM 304 Survey of Supply Chain Management 3
- h. Complete 6 credits in sciences related to food production and processing, as approved by the department. It is recommended that these credits be from the same discipline.

Effective Fall 2021.

7. Change the requirements for the **Agricultural Technology Certificate** in **Dairy Management** in the Institute of Agricultural Technology.

a. Under the heading **Requirements for Dairy Management** make the following changes:

(1) In item 1., change the total credits from '32' to '35'.

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

ANS	132	Dairy Farm Management Seminar	1
ANS	215	Growth, Health and Lactation in Dairy Cattle	2
ANS	230	Dairy Herd Management	3
ANS	232	Introductory Dairy Cattle Management	3

Add the following courses:

ANS	132	Dairy Farm Management Seminar	2
ANS	134	Dairy Production I	3
ANS	200C	Dairy Cattle Genetics and Evaluation	2
ANS	234	Dairy Production II	3
ANS	235L	Dairy Herd Reproduction Laboratory	2

(3) In item 2., change the total credits from '16' to '15' and delete the following course:

ANS	110	Introductory Animal Agriculture	4
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Add the following courses:

ANS	110	Introductory Animal Agriculture	3
CSS	101L	Introduction to Crop Science Laboratory	1

Effective Fall 2021.

8. Change the requirements for the **Bachelor of Science** degree in **Animal Science** in the Department of Animal Science.

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

- (1) In item 1., replace paragraph two with the following:

The University's Tier II writing requirement for the Animal Science major is met by completing one of the following courses: Animal Science 301, 313, 314, 409, or 435. Those courses are referenced in item 3. below.

- (2) In item 3. d. delete the following course:

ANS	232	Introductory Dairy Cattle Management	3
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Add the following course:

ANS	134	Dairy Production I	3
ANS	234	Dairy Production II	3

- (3) In item 3. f. delete the following course:

ANS	432	Advanced Dairy Cattle Management	3
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Add the following course:

ANS	334	Dairy Management I	3
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- (4) In item 3. h. make the following changes:

- (a) Change the total credits for concentrations from '23 to 33' to '20 to 40'.

- (b) Change the **Animal Industry** concentration to the following:

Animal Industry (20 to 24 credits):

1. The following course (3 credits):

ANS	201	Animal Products	3
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 ANS 201 may not be used to fulfill requirement 3. d. above.
2. One of the following courses (2 or 3 credits):

AFRE	203	Data Analysis for the Agri-Food System	3
CSS	110	Computer Applications in Agronomy	2
3. One of the following courses (3 credits):

AFRE	100	Decision-making in the Agri-Food System	3
AFRE	130	Farm Management I	3
4. One of the following advanced management courses (3 credits):

ANS	422	Advanced Beef Cattle Feedlot Management	3
ANS	434	Dairy Management II	3
ANS	442	Advanced Horse Management	3
ANS	472	Advanced Swine Management	3
ANS	482	Advanced Companion Animal Management	3
FSC	432	Food Processing: Dairy Foods	3
FSC	433	Food Processing: Muscle Foods	3

Courses used to fulfill this requirement may not be used to

- fulfill requirement 3. f. above.
5. A minimum of 9 credits from the following courses:
- | | | | |
|-----|------|--|---|
| ANS | 211 | Animal and Product Evaluation | 3 |
| ANS | 305 | Applied Animal Behavior | 3 |
| ANS | 305L | Applied Animal Behavior Laboratory | 1 |
| ANS | 307 | Animal Reproduction | 3 |
| ANS | 309 | Animal Health and Disease Management | 3 |
| ANS | 313 | Principles of Animal Feeding and Nutrition (W) | 4 |
| ANS | 314 | Genetic Improvement of Domestic Animals (W) | 4 |
| ANS | 315 | Anatomy and Physiology of Farm Animals | 4 |
| ANS | 404 | Introduction to Quantitative Genetics | 3 |
| ANS | 407 | Food and Animal Toxicology | 3 |
| ANS | 409 | Problems, Controversies and Advancements in Reproduction (W) | 4 |
| ANS | 413 | Non-Ruminant Nutrition | 4 |
| ANS | 418 | Animal Agriculture and the Environment | 3 |
| ANS | 425 | Animal Biotechnology | 3 |
| ANS | 427 | Environmental Toxicology and Society | 3 |
| ANS | 435 | Mammary Physiology (W) | 4 |
| ANS | 445 | Equine Exercise Physiology | 4 |
| ANS | 455 | Avian Physiology | 4 |
| ANS | 483 | Ruminant Nutrition | 3 |
- Courses used to fulfill this requirement may not be used to fulfill requirement 3. e. above.

- (c) In item 3. h. under the **Animal Biology and Preveterinary** add the following courses under item 4.:

ANS	305	Applied Animal Behavior	3
ANS	305L	Applied Animal Behavior Laboratory	1
ANS	307	Animal Reproduction	3
ANS	309	Animal Health and Disease Management	3
ANS	313	Principles of Animal Feeding and Nutrition (W)	4
ANS	314	Genetic Improvement of Domestic Animals (W)	4
ANS	315	Anatomy and Physiology of Farm Animals	4

Add the following note:

Courses used to fulfill this requirement may not be used to fulfill requirement 3. e. above.

- (d) In the **Companion and Exotic Animal Biology** concentration delete the note in item 1. and add the following course in item 3.:

IBIO	368	Zoo Animal Biology and Conservation	3
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- (e) Add the following concentration:

Dairy Industry (38 to 40 credits):

1. All of the following courses (24 credits):
- | | | | |
|------|-----|--|---|
| ANS | 134 | Dairy Production I | 3 |
| ANS | 234 | Dairy Production II | 3 |
| ANS | 334 | Dairy Management I | 3 |
| ANS | 434 | Dairy Management II | 3 |
| AFRE | 130 | Farm Management I | 3 |
| AFRE | 203 | Data Analysis for the Agri-Food System | 3 |
| AFRE | 430 | Farm Management II | 3 |
| ACC | 230 | Survey of Accounting Concepts | 3 |
- ANS 234 may not be used to fulfill requirement 3.d. above.
2. Choose a minimum of 8 credits from the following courses:
- | | | | |
|-----|------|--------------------------------------|---|
| ANS | 200C | Dairy Cattle Genetics and Evaluation | 2 |
|-----|------|--------------------------------------|---|

	ANS	233	Dairy Feed Management	3
	ANS	235	Dairy Herd Reproduction	2
	ANS	235L	Dairy Herd Reproduction Laboratory	2
	ANS	238	Dairy Cattle Health Management	3
3.	Choose a minimum of 6 credits from the following courses:			
	AFRE	232	Commodity Marketing I	3
	AFRE	315	Labor and Personnel Management in the Agri-Food System	3
	AFRE	435	Financial Management in the Agri-Food System	3
	ANS	409	Problems, Controversies, and Advancement in Reproduction (W)	4
	ANS	418	Animal Agriculture and the Environment	3
	ANS	435	Mammary Physiology (W)	3
	ANS	483	Ruminant Nutrition	3
	FSC	432	Food Processing: Dairy Foods	3
	FSC 432 may not be used to fulfill requirement 3.f. above.			

Effective Fall 2021.

9. Change the requirements for the **Master of Science** degree in **Animal Science** in the Department of Animal Science. The University Committee on Graduate Studies (UCGS) approved this request at its meeting on September 14, 2020.

- a. Under the heading **Admission** add the following statement:

Applicants will be evaluated for admission based on academic record, research and work experience, professional goals, and letters of reference. All applicants are required to submit scores from the General Test of the Graduate Record Examination.

- b. Under the heading **Requirements for the Master of Science Degree in Animal Science** replace the entire entry with the following:

The student may elect either Plan A (with thesis) or Plan B (without thesis). A minimum of 30 credits is required for the degree under either Plan A or Plan B. The student's major professor and guidance committee must approve the student's program of study, including thesis research for students under Plan A.

Requirements for Both Plan A and Plan B

1. Complete a set of courses related to one of the areas of specialization within the field of animal science, as approved by the major professor and guidance committee.

Additional Requirements for Plan A

1. Complete 6 to 10 credits in ANS 899 Master's Thesis Research.
2. Complete a written thesis and present it publicly at a departmental seminar prior to graduation.
3. Pass a final oral examination in defense of the thesis before the guidance committee that occurs immediately after the public seminar at which the thesis is presented.

Additional Requirements for Plan B

1. Complete no more than 6 credits in ANS 898 Master's Research.
2. Complete a project and present it publicly at a departmental seminar prior to graduation.
3. Pass a final examination or evaluation before the guidance committee that occurs immediately after the public seminar at which the project is presented.

Effective Fall 2021.

10. Change the requirements for **Bachelor of Science** degree in **Sustainable Parks, Recreation and Tourism** in the Department of Community Sustainability.

a. Under the heading **Requirements for the Bachelor of Science Degree in Sustainable Parks, Recreation and Tourism** make the following changes:

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

FOR	412	Wildland Fire	2
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Add the following course:

FOR	215	Introduction to Wildland Fire	2
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Effective Fall 2021.

11. Change the requirements for the **Master of Science** degree in **Forestry** in the Department of Forestry. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.

a. Under the heading **Master of Science** replace the entire entry with the following:

In addition to meeting the requirements of the university and of the College of Agriculture and Natural Resources, students must meet the requirements specified below.

Requirements for the Master of Science Degree in Forestry

The master's degree program in forestry is available under either Plan A (with thesis) or Plan B (without thesis). A total of 30 credits is required for the degree under Plan A or Plan B. The student's program of study must be approved by either their major professor or guidance committee.

Requirements for Plan A

1. Complete the following course (2 credits):
FOR 802 Forest Science Research 2
2. Complete a program of study approved by the major professor and guidance committee to meet the student's educational and career goals.
3. Complete at least 6 credits and no more than 10 credits in FOR 899 Master's Thesis Research.
4. Pass an oral examination, including a public presentation, in defense of the thesis, administered by the student's guidance committee. One re-examination may be scheduled at the discretion of the guidance committee. The final oral examination must be passed within five calendar years from the date of enrollment in the first course included for degree certification.

Requirements for Plan B

1. Complete a program of study approved by the major professor and guidance committee to meet the student's educational and career goals.
2. Complete a non-thesis capstone project, practicum or other professional development experience of at least 1 credit and no more than 6 credits through enrollment in FOR 898 Master's Professional Project. Upon completion of the project, a report must be completed and submitted to the student's guidance committee.
3. Pass a final oral examination, including a public presentation, in defense of the professional project, administered by the student's guidance committee. One re-examination may be scheduled at the discretion of the guidance committee. The final oral examination must be passed within five calendar years from the date of enrollment in the first course included for degree certification.

Effective Fall 2021.

12. Change the requirements for the **Doctor of Philosophy** degree in **Forestry** in the Department of Forestry. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.

- a. Under the heading **Doctor of Philosophy** replace the entire entry with the following:

The Doctor of Philosophy degree in Forestry provides advanced education to prepare future scholars and leaders who advance knowledge about forested ecosystems and help resolve issues that challenge the provision of forest ecosystem services at local, regional and global scales. The program is research-intensive and students will produce original applied or fundamental research of quality comparable to a two to four peer-reviewed publications in a scientific journal.

In addition to meeting the requirements of the university and of the College of Agriculture and Natural Resources, students must meet the requirements specified below.

Requirements for the Doctor of Philosophy Degree in Forestry

1. Complete the following course (2 credits):
FOR 802 Forest Science Research 2
2. Complete a program of study approved by the major professor and guidance committee to meet the student's educational and career goals.
3. Complete at least 24 credits and no more than 36 credits in FOR 999 Doctoral Dissertation Research.
4. No more than 1/4th of the program of study can be from transfer credits. Graduate credits may be transferred from other postsecondary accredited institutions of comparable academic quality if they are appropriate to a student's program and were completed within the time limits approved for the earning of the degree at MSU.
5. Comprehensive examinations must be completed within five years from the time when a student begins the first class at MSU that appears on the student's doctoral program of study.
6. Successfully pass the final oral examination in defense of the dissertation.

Effective Fall 2021.

13. Change the requirements for the **Doctor of Philosophy** degree in **Packaging** in the School of Packaging. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.

- a. Under the heading **Admission** in paragraph two, replace items 1. and 2. with the following:

1. Completed a master's degree program in packaging, or in a related science or engineering area, for which a thesis was required, or a completed bachelor's degree in packaging or related science or engineering area with significant intensive research experience such as having peer-reviewed journal publications as the main author, or conducting several semesters of research work.
2. A grade-point average of at least 3.40 for the bachelor's or master's degree program.

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

The student must:

1. One of the following courses (3 credits):
PKG 805 Advanced Packaging Dynamics 3
PKG 815 Permeability Shelf Life 3
2. Both of the following courses (7 credits):
PKG 825 Polymeric Packaging Materials 4
PKG 860 Research Methods 3
3. An additional 3 credits of 800-level Packaging courses excluding PKG 890.
4. Complete 24 to 36 credits in PKG 999 Doctoral Dissertation Research.
5. Pass both a written and an oral comprehensive examination.
6. Complete a dissertation in one of the following areas of packaging: material

7. science applications in packaging, food packaging, healthcare packaging, mass transport applications, or the dynamics and physical distribution aspects or human factors in packaging.
7. Successfully defend the dissertation.

Effective Fall 2021.

COLLEGE OF COMMUNICATION ARTS AND SCIENCES

1. Change the requirements for the **Bachelor of Arts** degree in **Journalism** in the School of Journalism.
- The concentrations in the Bachelor of Arts degree in Journalism 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 Arts Degree in Journalism** make the following changes:
- (1) Delete the **Journalism Education** concentration.
- (2) In the note following the concentrations, add the **Media Photography** minor to the list of minors available to choose from.
- (1) Replace item d. (2) with the following:
- | | | | |
|---|-----|-------------------------|---|
| Civics: One of the following courses (3 credits): | | | |
| PLS | 313 | American Public Policy | 3 |
| PLS | 320 | Judicial Politics | 3 |
| PLS | 324 | Congress | 3 |
| PLS | 325 | The Presidency | 3 |
| PLS | 334 | Campaigns and Elections | 3 |

Effective Fall 2021.

COLLEGE OF ENGINEERING

1. Change the requirements for the **Minor in Energy** in the College of Engineering.
- a. Under the heading **Requirements for the Minor in Energy** make the following changes:
- (1) In item 2., add the following course:
- | | | | |
|-----|-----|---|---|
| ECE | 320 | Energy Conversion and Power Electronics | 3 |
|-----|-----|---|---|
- (2) In item 3., delete the following course:
- | | | | |
|-----|-----|-------------------------|---|
| ECE | 202 | Circuits and Systems II | 3 |
|-----|-----|-------------------------|---|
- Add the following course:
- | | | | |
|-----|-----|---------------------|---|
| ECE | 302 | Electronic Circuits | 3 |
|-----|-----|---------------------|---|
- (3) In item 4., add the following courses:
- | | | | |
|-----|-----|---|---|
| CE | 473 | Smart and Sustainable Building Design
and Operations | 3 |
| ENE | 472 | Life Cycle Assessment of Energy | 3 |
- (4) In item 5., delete the following course:

EEP	255	Ecological Economics	3
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Add the following courses:

CE	371	Sustainable Civil and Environmental Engineering Systems	3
EEM	255	Ecological Economics	3

(5) In item 6., delete the following courses:

ECE	305	Electromagnetic Fields and Waves I	4
ECE	320	Energy Conversion and Power Electronics	3
EEP	255	Ecological Economics	3
ENE	481	Environmental Chemistry: Equilibrium Concepts	3
ISP	221	Earth Environment and Energy	3

Add the following courses:

CE	473	Smart and Sustainable Building Design and Operations	3
CEM	485	Modern Nuclear Chemistry	3
CSUS	259	Sustainable Energy and Society	3
EEM	255	Ecological Economics	3
ENE	472	Life Cycle Assessment of Energy	3
TSM	130	Energy Efficiency and Conservation in Agricultural Systems	3

Effective Fall 2021.

2. Change the requirements in the **Master of Science** degree in **Materials Science and Engineering** in the Department of Chemical Engineering and Materials Science. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.

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

Students entering the program with a bachelor degree in a field other than Materials Science and Engineering may be required to complete additional collateral courses to fulfill deficiencies in their academic background. Collateral course work does not count towards the requirements for the degree program.

b. Under the heading **Requirements for the Master of Science Degree in Materials Science and Engineering** replace the entire entry with the following:

The students must complete a total of 30 credits for the degree under Plan A (with thesis) or Plan B (without thesis), and meet the requirements specified below.

Requirements for Both Plan A and Plan B:

			CREDITS
1.	Core Courses. All of the following courses (12 credits):		
	MSE	851 Thermodynamics of Solids	3
	MSE	855 Advanced Rate Theory and Diffusion	3
	MSE	860 Advanced Theory of Solids	3
	MSE	870 Electron Microscopy in Materials Science	3
		Or	
	MSE	881 Advanced Spectroscopy and Diffraction Analysis of Materials	3

Additional Requirements for Plan A

1.	Complete the following course:		
	CHE	892 Seminar	2
2.	Complete 6 credits of MSE 899 Master's Thesis Research		

3. One course at the 400-level or above in mathematics or statistics as approved by the student's academic advisor.
4. Submit a written thesis and oral presentation, administered by the student's advisory committee.
5. A minimum of 16 credits must be at the 800-level or above as approved by the student's academic advisor.

Additional Requirements for Plan B

1. Complete the following course:
CHE 892 Seminar 2
2. One course at the 400-level or above in mathematics or statistics as approved by the student's academic advisor.
3. At least 6 to 9 credits completed in a coordinated technical minor as approved by the student's academic advisor.
4. Additional elective credits as approved by the student's academic advisor.
5. A minimum of 18 credits at the 800-level or above as approved by the student's academic advisor.
6. Pass a final examination or evaluation.

Effective Fall 2021.

3. Change the requirements in the **Master of Science** degree in **Civil Engineering** in the Department of Civil and Environmental Engineering. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.
 - a. Under the heading **Requirements for the Master of Science Degree in Civil Engineering** replace the entire entry with the following:

The student must complete a total of 30 credits for the degree under either Plan A (with thesis) or Plan B (without thesis).

A student under Plan A must complete at least 20 credits at the 800-level or above, including 4 credits of Civil Engineering 899, but not more than 6 credits. Up to 10 credits of 400-level course work may be counted toward the degree. The student's program must be approved by the guidance committee.

A student under Plan B must complete at least 18 credits at the 800-level or above, including the completion of a research or design project through enrollment of at least 1 credit, but no more than 4 credits in Civil Engineering 892. Up to 12 credits of 400-level course work may be counted toward the degree. The student's program must be approved by the guidance committee.

Effective Fall 2021.

4. Change the requirements in the **Master of Science** degree in **Environmental Engineering** in the Department of Civil and Environmental Engineering. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.
 - a. Under the heading **Requirements for the Master of Science Degree in Environmental Engineering** replace the entire entry with the following:

The student must complete a total of 30 credits for the degree under either Plan A (with thesis) or Plan B (without thesis).

A student under Plan A must complete at least 20 credits at the 800-level or above, including 4 credits of Environmental Engineering 899. Up to 10 credits of 400-level course work may be counted toward the degree. The student's program must be approved by the guidance committee.

A student under Plan B must complete at least 18 credits at the 800-level or above, including the completion of a research or design project through enrollment of at least 1 credit, but no more than 4 credits in Environmental Engineering 892. Up to 12 credits of 400-level course work may be counted toward the degree. The student's program must be approved by the guidance committee.

Effective Fall 2021.

COLLEGE OF HUMAN MEDICINE

1. Change the requirements for the **Master of Public Health** degree in **Public Health** in the College of Human Medicine. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.
 - a. Under the heading **Admission** make the following changes:
 - (1) Renumber items 1. and 2. to items 2. and 3. and add the following item 1.:
 1. submit an Application to Graduate Study at Michigan State University with application fee.
 - (2) Delete the original item 3.
 - (3) Replace items 4., 5., and 6. with the following:
 4. submit three letters of recommendation from professional or academic references.
 5. submit a personal statement describing interest in and understanding of public health, including professional career goals, and how their experiences, personal and professional, have influenced that interest;
 6. submit official transcripts from all post-secondary institutions attended;
 - (4) Add the following item 8.:
 8. submit official English language proficiency test scores to institution code 1465 (TOEFL, IELTS, MELAB) if applying as an international applicant.
 - (5) Replace the second paragraph with the following:

The MPH Admission Committee integrates the academic information, letters of recommendation, and personal statement to make the final admissions decision based on the following considerations:
 - (6) Delete paragraph three.
 - b. Under the heading **Requirements for the Master of Public Health Degree in Public Health** make the following changes:
 - (1) Delete item 5.

Effective Fall 2021.

JAMES MADISON COLLEGE

1. Change the requirements for the **Bachelor of Arts** degree in **James Madison College [Comparative Cultures and Politics Major]** in James Madison College. The Teacher Education Council (TEC) approved this request at its meeting in September, 2020.

- a. Under the heading **Comparative Cultures and Politics** replace item 1. d. with the following:

Complete 6 to 9 credits from two or three courses at the 300-level or above, selected in consultation with an academic advisor. All credits must focus on a particular region of the world or social group. Students may also propose their own thematically focused related area for advisor approval.

Effective Fall 2021.

COLLEGE OF NATURAL SCIENCE

1. Change the name of the **Bachelor of Science** degree in **Biological Science-Interdepartmental to Biological Science Secondary Education** in the College of Natural Science. The Teacher Education Council (TEC) approved this request at its September 2020 meeting.

Students admitted to the major prior to Fall 2021 will be awarded a Bachelor of Science Degree in Biological Science-Interdepartmental.

Students admitted to the major Fall 2021 and forward will be awarded a Bachelor of Science Degree in Biological Science Secondary Education.

Effective Fall 2021.

2. Change the name of the **Bachelor of Science** degree in **Physical Science-Interdepartmental to Physical Science Secondary Education** in the College of Natural Science. The Teacher Education Council (TEC) approved this request at its September 2020 meeting.

Students admitted to the major prior to Fall 2021 will be awarded a Bachelor of Science Degree in Physical Science-Interdepartmental.

Students admitted to the major Fall 2021 and forward will be awarded a Bachelor of Science Degree in Physical Science Secondary Education.

Effective Fall 2021.

3. Change the requirements for the **Bachelor of Science** degree in **Biomedical Laboratory Science** in the Biomedical Laboratory Diagnostics Program.

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

- (1) In item 3.c. under the **Clinical Chemistry** concentration, add the following course in item (2):

PHM	321	Common Drugs	3
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- (2) In item 3.c. under the **Immunology** concentration, change the total credits from '10 or 11' to '9 or 10' and replace item (1) with the following:

The following course (1 credit):			
BLD	452L	Immunodiagnostics Laboratory	1

- (3) In item 3.c. under the **Medical Microbiology** concentration, under item (2), delete the following courses:

EPI	290	History of Scientific Reasoning and Critical Thinking in Global Public Health and Epidemiology	3
IBIO	316	General Parasitology	3

- (4) In item 3.c. under the **Hematology and Hemostatis** concentration, change the total credits from '9 to 11' to '7 to 9' and delete the following courses from item (1):

BLD	435L	Immunoematology Laboratory	1
BLD	452L	Immunodiagnosics Laboratory	1

In item (3) delete the following course:

BLD	835	Hemostasis, Thrombosis and Effective Resource Management	3
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Add the following course:

IBIO	341	Fundamental Genetics	4
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Effective Fall 2021.

4. Change the requirements for the **Bachelor of Arts** degree in **Chemistry** in the Department of Chemistry. The Teacher Education Council (TEC) approved this request at its September 14, 2020 meeting.

- a. Under the heading **Requirements for the Bachelor of Arts Degree in Chemistry** make the following changes:

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

- (a) Change the total credits from '22 to 27' to '21 to 27'.

- (b) In item (1) delete the following course:

ZOL	141	Introductory Human Genetics	3
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Add the following courses:

IBIO	150	Integrating Biology: From DNA to Populations	3
MMG	141	Introductory Human Genetics	3

- (c) In item (4) add the following:

(d)	PHY	173	Studio Physics for Scientists and Engineers I	5
	PHY	174	Studio Physics for Scientists and Engineers II	5
(e)	PHY	221	Studio Physics for Life Scientists I	4
	PHY	222	Studio Physics for Life Scientists II	4

- (d) Replace item (5) with the following:

One of the following courses (3 or 4 credits):			
BMB	401	Comprehensive Biochemistry	4
BMB	461	Advanced Biochemistry I	3

Effective Fall 2021.

5. Change the requirements for the **Bachelor of Science** degree in **Chemistry** in the Department of Chemistry. The Teacher Education Council (TEC) approved this request at its September 14, 2020 meeting.

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

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

(a) Change the total credits from '29 to 36' to '28 to 33'.

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

BS	162	Organismal and Population Biology	3
BS	182H	Honors Organismal and Population Biology	3
ENT	205	Pests, Society and Environment	3
LB	144	Biology I: Organismal Biology	4
MMG	201	Fundamentals to Microbiology	3
PLB	105	Plant Biology	3
PSL	250	Introductory Physiology	4
ZOL	141	Introductory Human Genetics	3

(c) In item (5) delete the following course:

MTH	255H	Honors Differential Equations	3
-----	------	-------------------------------	---

(d) In item (6) add the following item (d):

PHY	173	Studio Physics for Scientists and Engineers I	5
PHY	174	Studio Physics for Scientists and Engineers II	5

(e) Replace item (7) with the following:

The following course (3 credits):			
BMB	461	Advanced Biochemistry I	3

(2) In item 3. b. change the total credits from '45 or 46' to '46 or 47'.

(3) In item 3. b. (3) change the total credits from '30' to '31' and add the following course:

CEM	444	Chemical Safety	1
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Effective Fall 2021.

6. Change the requirements for the **Bachelor of Science** degree in **Chemical Physics** in the Department of Chemistry.

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

(1) In item 3. a. change the total credits from '47 to 56' to '51 to 60' and make the following changes:

(a) In item (1) change the total credits from '3 or 4' to '3 to 5' and delete the following course:

ZOL	141	Introductory Human Genetics	3
-----	-----	-----------------------------	---

Add the following courses:

IBIO	150	Integrating Biology: From DNA to Populations	3
------	-----	--	---

- | | | | | |
|--|-----|-----|-----------------------------|---|
| | MMG | 141 | Introductory Human Genetics | 3 |
|--|-----|-----|-----------------------------|---|
- (b) Add a new item (2) and renumber items (2) through (10) respectively:
- The following course (4 credits):
- | | | | | |
|--|------|-----|--|---|
| | CMSE | 201 | Computational Modeling and Data Analysis I | 4 |
|--|------|-----|--|---|
- (c) In item (6) delete the following course:
- | | | | | |
|--|-----|------|-------------------------------|---|
| | MTH | 255H | Honors Differential Equations | 3 |
|--|-----|------|-------------------------------|---|
- (d) In item (8) delete the following courses:
- | | | | | |
|--|-----|------|---------------------------------------|---|
| | MTH | 428H | Honors Analysis I | 3 |
| | MTH | 443 | Boundary Value Problems for Engineers | 3 |
- Add the following course:
- | | | | | |
|--|-----|------|---------------------------------|---|
| | MTH | 327H | Honors Introduction to Analysis | 3 |
|--|-----|------|---------------------------------|---|
- (e) Add the following item (d):
- | | | | | |
|--|-----|-----|--|---|
| | PHY | 173 | Studio Physics for Scientists and Engineers I | 5 |
| | PHY | 174 | Studio Physics for Scientists and Engineers II | 5 |
- (f) In item (11) add the following course:
- | | | | | |
|--|-----|-----|---|---|
| | PHY | 493 | Introduction to Elementary Particle Physics | 3 |
|--|-----|-----|---|---|
- (2) In item b. change the total credits from '28 to 30' to '29 to 31' and make the following changes:
- (a) In item (4) change the credits of 'CEM 495' from '2' to '3'.
- (b) In item (5) change the credits from '6' to '7' and add the following course:
- | | | | | |
|--|-----|-----|-----------------|---|
| | CEM | 444 | Chemical Safety | 1 |
|--|-----|-----|-----------------|---|

Effective Fall 2021.

7. Establish a **Master of Science** degree in **Data Science** in the Department of Statistics and Probability. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its May 13, 2020 meeting.

a. **Background Information:**

Data science is an interdisciplinary field whose purpose is the extraction of actionable insights from data in its many forms. Data science employs theories and techniques drawn from various disciplines, including statistics, mathematics, computer science, and information science. It is a field, which is evolving rapidly, under the action of practitioners who are developing new methodologies for their data analysis needs, often with little heed to solid foundations. At the same time, academics are identifying and studying the fields expanding specificities, to the point that data science may already warrant being called a discipline in its own right.

The rationale for offering this program at MSU is three-fold. First, there is a tremendous need for data scientists, particularly at the MS level, in almost every industry. Most industries report the need for staggering numbers of such scientists over the next 10 years. For example, McKinsey Global Institute reports that data science is the #1 job in America with an average base salary in

excess of \$105,000. While there are data science programs at other universities, these cannot meet the vast need and demand for data scientists.

MSU has a unique collaboration of three departments: (1) statistics, (2) computer science and engineering, and (3) computational mathematics, science, and engineering – that offer three complementary perspectives on data science. This will ensure our students emerge from the program with a rigorous statistical and mathematical foundation of data science, the ability to develop and apply efficient data science algorithms to problems, and the ability to develop appropriate data science models for a wide variety of applications.

This master's in data science program will be coupled with an interdisciplinary research center in data science. By coupling this instructional program with a data science research center, MSU will become highly competitive for many federal and other research funding opportunities in data science without introducing any additional costs. The benefit to students comes from exposure to cutting-edge projects.

b. Academic Programs Catalog Text:

The Master of Science degree in Data Science is designed to provide students with an interdisciplinary blend of statistics, computer science, and computational science and mathematics which provides the necessary training to assimilate, process, analyze, and interpret data from diverse sources.

Admission

To be considered for admission to the master's degree, a student must:

1. Have a four-year bachelor's degree in a relevant quantitative discipline.
2. Demonstrate sufficient quantitative preparation through work or other relevant experiences.

In addition to meeting the requirements of the university and of the College of Natural Science, students must meet the requirements specified below.

Requirements for the Master of Science Degree in Data Science

A total of 30 credits is required for the degree under Plan B (without thesis). The student's program of study must be approved by the student's guidance committee and must meet the requirements specified below.

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

CMSE 830	Foundations of Data Science	3
CMSE 831	Computational Optimization	3
CSE 482	Big Data Analysis	3
CSE 881	Data Mining	3
STT 810	Mathematical Statistics for Data Scientists	3
STT 811	Applied Statistical Modeling for Data Scientists	3
 2. Complete 9 credits of elective courses from the following:

CMSE 402	Data Visualization Principles and Techniques	3
CMSE 822	Parallel Computing	3
CMSE 890	Selected Topics in Computational Mathematics, Science, and Engineering	1 to 4
CSE 802	Pattern Recognition and Analysis	3
CSE 830	Design and Theory of Algorithms	3
CSE 847	Machine Learning	3
STT 802	Statistical Computation	3
STT 812	Statistical Learning and Data Analysis	3
STT 873	Statistical Learning and Data Mining	3
STT 874	Introduction to Bayesian Analysis	3
STT 875	R Programming for Data Sciences	3
- CMSE 890 must be approved by the student's guidance committee.

- Other courses may be available to fulfill this requirement with advisor approval.
3. Completion of a 3-credit capstone course involving an applied, industrial, or governmental data science project. Students may complete this requirement by enrollment in Computer Science and Engineering 890, Computational Mathematics, Science, and Engineering 890, or Statistics and Probability 890. The student's topic area must be approved by the student's guidance committee.
 4. Completion of a final examination or evaluation.

Effective Fall 2021.

COLLEGE OF SOCIAL SCIENCE

1. Change the requirements for the **Master of Social Work** degree with majors in **Clinical Social Work, Clinical Social Work-Advanced Standing, Organization and Community Leadership**, and **Organization and Community Leadership-Advanced Standing** in the School of Social Work. The University Committee on Graduate Studies (UCGS) approved this request at September 14, 2020 meeting.

- a. Under the heading **Requirements for the Master of Social Work Degree Program** replace the entire entry with the following:

The student must complete 57 credits in specified instruction in social work. Required course work for both the Clinical Social Work major and the Organization and Community Leadership major are taken in the following areas: social work practice methods, human behavior and the social environment, social welfare policy, research methods, and field education. Additional information can be found at <http://socialwork.msu.edu>.

Clinical Social Work

1. All of the following courses (51 credits):

SW	810	Theories of Groups, Organizations, and Communities in Social Work	3
SW	811	Social Work Perspectives in Human Development	3
SW	820	Social Welfare Policy and Services	3
SW	822	Topics in Policy Practice and Advocacy	3
SW	829	Social Work Research Methods I	2
SW	830	Social Work Research Methods II	2
SW	832	Evaluating Social Work Programs and Practice	2
SW	840	Generalist Social Work Practice Methods I	3
SW	841	Generalist Social Work Practice Methods II	3
SW	843	Clinical Assessment and Diagnosis	2
SW	845	Administrative Skills in Social Work	3
SW	850	Clinical Social Work Practice I	3
SW	851	Clinical Social Work Practice II	3
SW	894A	Social Work Field Education: Graduate Generalist Practice I	4
SW	894B	Social Work Field Education: Graduate Generalist Practice II	4
SW	894D	Social Work Field Education: Clinical Practice I	4
SW	894E	Social Work Field Education: Clinical Practice II	4
2. Complete 6 credits of general electives at the 400-level or higher as approved by the student's academic advisor.

Organization and Community Leadership

1. All of the following courses (48 credits):

SW	810	Theories of Groups, Organizations, and Communities in Social Work	3
SW	811	Social Work Perspectives in Human Development	3
SW	820	Social Welfare Policy and Services	3
SW	822	Topics in Policy Practice and Advocacy	3
SW	829	Social Work Research Methods I	2
SW	830	Social Work Research Methods II	2
SW	832	Evaluating Social Work Programs and Practice	2
SW	840	Generalist Social Work Practice Methods I	3

	SW	841	Generalist Social Work Practice Methods II	3
	SW	844	Essential Theories in Organizations and Communities Social Work Practice	2
	SW	865	Social Work Leadership in Organizations and Communities I	3
	SW	866	Social Work Leadership in Organizations and Communities II	3
	SW	894A	Social Work Field Education: Graduate Generalist Practice I	4
	SW	894B	Social Work Field Education: Graduate Generalist Practice II	4
	SW	894G	Social Work Field Education: Organization and Community Leadership I	4
	SW	894I	Social Work Field Education: Organization and Community Leadership II	4
2.			Complete 6 credits of general electives at the 400-level or higher as approved by the student's academic advisor.	
3.			Complete 3 credits of general electives from the following approved list of courses. Many courses require permission for enrollment.	
	ADV	816	Fundraising and Philanthropy in Nonprofit Organizations	3
	CSUS	433	Grant Writing and Fund Development	3
	CSUS	858	Gender, Justice and Environmental Change: Issues and Concepts	3
	GEO	816	The World System of Cities	3
	HDFS	860	Youth Policy and Positive Youth Development	3
	HDFS	861	Community Youth Development	3
	HM	804	Public Health Policy and Administration	3
	HM	841	Public Health Policy	3
	HM	854	Health Equity Framework for Public Health Practice	3
	HM	828	Community Engagement in Public Health Practice	3
	HRLR	813	Organizational Behavior for Human Resources and Labor Relations	3
	HRLR	816	Organizational Development and Change	3
	HRLR	818	Leadership	3
	HRLR	822	Training and Development	3
	PDC	403	Introduction to Domicology: Sustainable Built Environment	3
	PPL	801	Quantitative Methods in Public Policy	3
	PPL	802	Quantitative Methods in Public Policy II	3
	PPL	806	Policy Evaluation	3
	PPL	807	Public Policy	3
	PPL	808	Policy Development and Administration	3
	PPL	890	Policy Workshop	3
	PPL	891	Issues in Public Policy	1 to 3
	PSY	873	Methods and Practice of Community Engagement I	3
	PSY	880	Foundations of Evaluation Practice	3
	PSY	881	Evaluation Design	3
	PSY	882	Evaluation Data Collection Methods	3
	PSY	883	Statistics for Evaluators I	3
	PSY	885	Communicating and Reporting	3
	PSY	887	Statistics for Evaluators II	3
	PSY	888	Evaluation Management	3
	SOC	881	Analysis of Social Data I	3
	SW	492	Seminar in Social Work	3
	SW	890	Independent Study	1 to 4
	SW	891	Special Topics in Graduate Social Work	1 to 4

- b. Under the heading **Requirements for the Advanced Standing Master of Social Work Program** replace the entire entry with the following:

The student must complete 38 credits in specified instruction in social work. Required course work for both the Clinical Social Work major and the Organization and Community Leadership major are taken in the following areas: social work practice methods, social welfare policy, research methods, and field education. Additional information can be found at <http://socialwork.msu.edu>.

Clinical Social Work-Advanced Standing

1. All of the following courses (32 credits):

SW	812B	Integration of Theory, Policy, and Evaluation in Social Work	2
SW	822	Topics in Policy Practice and Advocacy	3

	SW	830	Social Work Research Methods II	2
	SW	832	Evaluating Social Work Programs and Practice	2
	SW	842B	Advanced Generalist Social Work Practice Methods	2
	SW	843	Clinical Assessment and Diagnosis	2
	SW	845	Administrative Skills in Social Work	3
	SW	850	Clinical Social Work Practice I	3
	SW	851	Clinical Social Work Practice II	3
	SW	893B	Social Work Field Education: Graduate Advanced Generalist Practice	2
	SW	894D	Social Work Field Education: Clinical Practice I	4
	SW	894E	Social Work Field Education: Clinical Practice II	4
2.	Complete 6 credits of general electives at the 400-level or higher as approved by the student's academic advisor.			

Organization and Community Leadership-Advanced Standing

1.	All of the following courses (29 credits):			
	SW	812B	Integration of Theory, Policy, and Evaluation in Social Work	2
	SW	822	Topics in Policy Practice and Advocacy	3
	SW	830	Social Work Research Methods II	2
	SW	832	Evaluating Social Work Programs and Practice	2
	SW	842B	Advanced Generalist Social Work Practice Methods	2
	SW	844	Essential Theories in Organizations and Communities Social Work Practice	2
	SW	865	Social Work Leadership in Organizations and Communities I	3
	SW	866	Social Work Leadership in Organizations and Communities II	3
	SW	893B	Social Work Field Education: Graduate Advanced Generalist Practice	2
	SW	894G	Social Work Field Education: Organization and Community Leadership I	4
	SW	894I	Social Work Field Education: Organization and Community Leadership II	4
2.	Complete 6 credits of general electives at the 400-level or higher as approved by the student's academic advisor.			
3.	Complete 3 credits of general electives from the following approved list of courses. Many courses require permission for enrollment.			
	ADV	816	Fundraising and Philanthropy in Nonprofit Organizations	3
	CSUS	433	Grant Writing and Fund Development	3
	CSUS	858	Gender, Justice and Environmental Change: Issues and Concepts	3
	GEO	816	The World System of Cities	3
	HDFS	860	Youth Policy and Positive Youth Development	3
	HDFS	861	Community Youth Development	3
	HM	804	Public Health Policy and Administration	3
	HM	841	Public Health Policy	3
	HM	854	Health Equity Framework for Public Health Practice	3
	HM	828	Community Engagement in Public Health Practice	3
	HRLR	813	Organizational Behavior for Human Resources and Labor Relations	3
	HRLR	816	Organizational Development and Change	3
	HRLR	818	Leadership	3
	HRLR	822	Training and Development	3
	PDC	403	Introduction to Domicology: Sustainable Built Environment	3
	PPL	801	Quantitative Methods in Public Policy	3
	PPL	802	Quantitative Methods in Public Policy II	3
	PPL	806	Policy Evaluation	3
	PPL	807	Public Policy	3
	PPL	808	Policy Development and Administration	3
	PPL	890	Policy Workshop	3
	PPL	891	Issues in Public Policy	1 to 3
	PSY	873	Methods and Practice of Community Engagement I	3
	PSY	880	Foundations of Evaluation Practice	3
	PSY	881	Evaluation Design	3
	PSY	882	Evaluation Data Collection Methods	3
	PSY	883	Statistics for Evaluators I	3

PSY	885	Communicating and Reporting	3
PSY	887	Statistics for Evaluators II	3
PSY	888	Evaluation Management	3
SOC	881	Analysis of Social Data I	3
SW	492	Seminar in Social Work	3
SW	890	Independent Study	1 to 4
SW	891	Special Topics in Graduate Social Work	1 to 4

- c. Under the heading **Residence** replace the entry with the following:

One year of residence consisting of two consecutive semesters and involving at least 7 credits of graduate course work each semester is required.

- d. Under the heading **Part–Time Students** replace the entry with the following:

Both the Master of Social Work program and the Advanced Standing Master of Social Work program are available on a part–time basis.

At the time of admission, students must apply for either part–time or full–time study. Students may transfer between part–time and full–time study with approval of the School.

Part–time students must progress through a plan of study as specified by the school. All students must meet their residence requirements during the year in which they are enrolled in the advanced practice and field education courses.

Effective Fall 2021.

2. Change the requirements for the **Doctor of Philosophy** degree in **Social Work**. The University Committee on Graduate Studies (UCGS) approved this request at its September 14, 2020 meeting.

- a. Under the heading **Admission** replace the entire entry with the following:

The doctoral program in social work invites applications from experienced social workers who hold a Master of Social Work (MSW) degree from a Council on Social Work Education (CSWE) accredited graduate program. Applicants must provide evidence of academic performance via transcripts and standardized test scores, and a capacity to develop concepts and articulate issues related to the social work profession via two writing samples. Students are asked to provide a personal essay that articulates their interest in advanced social work research, education, and practice. Applicants with outstanding academic records may be admitted to the program provisionally and permitted to make up deficiencies on a collateral basis.

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

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

SW	900	Doctoral Proseminar in Social Work	2
SW		901 Knowledge Construction in Social Work	3
SW	905	Historical and Current Analysis of Social Work and Social Problems	3
SW	911	Research Sequence Practicum I	2
SW	912	Research Sequence Practicum II	2
SW	920	Evaluation of Social Work Services and Practice	3
SW	930	Social Work Research Using Quantitative and Qualitative Methods	3
2. Complete a minimum of 6 credits in statistics at the 800 or 900 level as approved by the student’s guidance committee.
3. Complete 15 additional graduate-level credits in a focused cognate or social science discipline, of which 3 credits can be in social work.
4. Pass a comprehensive examination administered by the student’s guidance committee.
5. Complete 24 credits of SW 999 Doctoral Dissertation Research.

6. Successfully defend the doctoral dissertation.

Effective Fall 2021.

PART II - NEW COURSES

DEPARTMENT OF ANIMAL SCIENCE

- ANS 134 Dairy Production I
Fall of every year. 3(2-2)
Introduction to dairy production and the dairy industry.
SA: ANS 232
Effective Fall 2020
- ANS 234 Dairy Production II
Fall of every year. 3(2-2) P: ANS 134
Introduction to biology and management practices related to growth, lactation, and health of dairy animals.
SA: ANS 215
Effective Fall 2020
- ANS 235L Dairy Herd Reproduction Laboratory
Fall of every year. Spring of every year. 2(0-4) P: ANS 235 or concurrently
Reproductive anatomy and physiology, semen handling, artificial insemination in dairy cattle, palpation of female reproductive tract, ultrasound, embryo transfer, and in-vitro fertilization.
Effective Spring 2021
- ANS 334 Dairy Management I
Fall of every year. 3(2-2) P: ANS 234 RB: ANS 313
Analysis of dairy farm production practices, procedures, and decision-making. Financial analysis of biological and management practices. Field trips required.
SA: ANS 230, ANS 432
Effective Fall 2020
- ANS 434 Dairy Management II
Spring of every year. 3(2-2) P: ANS 334
Integration, analysis, and problem solving related to dairy production. Field trips required.
SA: ANS 430, ANS 432
Effective Fall 2020

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY

- BMB 479 Special Topics in Biochemistry II
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: BMB 461 R: Open to undergraduate students in the Biochemistry and Molecular Biology/Biotechnology Major or in the Biochemistry and Molecular Biology major or in the Lyman Briggs Biochemistry and Molecular Biology Coordinate Major or in the Lyman Briggs-Biochemistry/Biotechnology Coordinate Major or approval of department.
Special topics in biochemistry and molecular biology.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall 2020

THE ELI BROAD COLLEGE OF BUSINESS

- BUS 292 Special Topics In Business Abroad
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to undergraduate students in the The Eli Broad College of Business or in the Accounting major or in the Business - Admitted major or in the Business-Preference major or in the Finance Major or in the Human Resource Management Major or in the Management Major or in the Marketing Major or in the Supply Chain Management Major or in the Hospitality Business Major or approval of college.
Education abroad emphasizing an introduction to the functional fields in business abroad and their interrelationships. Review of fundamental concepts and principles of business abroad.
Effective Spring 2021
- BUS 393 Business Service Learning Abroad
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to undergraduate students in the The Eli Broad College of Business or in the Accounting major or in the Business - Admitted major or in the Finance Major or in the Hospitality Business Major or in the Human Resource Management Major or in the Management Major or in the Marketing Major or in the Supply Chain Management Major or in the Business-Preference major or approval of college.
Civil engagement practices and theories. Impact of non-profit organizations, practices of engaged citizenship. Volunteer placements at civic organizations.
Effective Spring 2021
- BUS 492 Advanced Topics Abroad
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to undergraduate students in the The Eli Broad College of Business or in the Accounting major or in the Finance Major or in the Human Resource Management Major or in the Management Major or in the Marketing Major or in the Supply Chain Management Major or in the Hospitality Business Major or approval of college.
Education abroad emphasizing an advanced study of interrelatedness of business functions abroad not typically found in business academic departments.
Effective Spring 2021
- BUS 493 Business Internship
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Open to undergraduate students in the The Eli Broad College of Business or in the Accounting major or in the Business - Admitted major or in the Finance Major or in the Hospitality Business Major or in the Human Resource Management Major or in the Management Major or in the Marketing Major or in the Supply Chain Management Major or approval of college.
Supervised professional or internship experience in agencies or businesses related to the student's major field of study.
Request the use of the Pass-No Grade (P-N) system.
Effective Spring 2021

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

- CE 275 GIS for Civil and Environmental Engineers
Fall of every year. Spring of every year. 1(1-3) P: (EGR 100 and EGR 102) and (CE 274 or concurrently)
Basic operations in GIS software with applications to civil and environmental engineering
Effective Fall 2021
- CE 473 Smart and Sustainable Building Design and Operations
Spring of odd years. 3(3-0) Interdepartmental with Environmental Engineering. P: CE 371 or approval of department
Elements of the design and operation of smart and sustainable buildings. Current and future energy-related challenges of existing buildings.
Effective Spring 2021

- CE 496 Review for the CE and ENE Fundamentals of Engineering Exams
Fall of every year. Spring of every year. 1(1-0) P: CE 495 or concurrently
Review of general, civil, and environmental engineering topics in preparation for sitting the
NCEES Fundamentals of Engineering Exam
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2021
- ENE 472 Life Cycle Assessment of Energy Technologies
Spring of every year. 3(2-2) Interdepartmental with Civil Engineering. P: CE 371 or approval of
department R: Open to students in the College of Engineering.
Use of life-cycle assessment (LCA) for energy technologies to evaluate trade-offs between
various energy options and guide energy choices.
Effective Spring 2021

DEPARTMENT OF COMPUTATIONAL MATHEMATICS, SCIENCE, AND ENGINEERING

- CMSE 830 Foundations of Data Science
Fall of every year. 3(3-0) RB: (CMSE 201 or CSE 231 or CMSE 801) and (MTH 235 or MTH 340 or
MTH 347H) and ((MTH 309 or MTH 314 or MTH 317H) and STT 810) R: Not open to doctoral
students in the Computational Mathematics, Science and Engineering.
Core mathematical principles that underlie the algorithms and methods used in data
science. Applications to problems in data analysis.
Effective Spring 2020
- CMSE 831 Computational Optimization
Spring of every year. 3(3-0) RB: (CMSE 201 or CMSE 801 or CSE 231) and (MTH 235 or MTH 340
or MTH 347H) and ((MTH 309 or MTH 314 or MTH 317H) and STT 810)
Applications and algorithms for finite-dimensional linear and non-linear optimization
problems.
Effective Spring 2020

SCHOOL OF CRIMINAL JUSTICE

- CJ 493 Undergraduate Research in Criminal Justice
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a
maximum of 6 credits in all enrollments for this course. RB: CJ 292 R: Open to undergraduate
students in the School of Criminal Justice. A student may earn a maximum of 12 credits in all
enrollments for any or all of these courses: CJ 490 and CJ 493.
Faculty-guided undergraduate research in criminal justice.
Effective Fall 2020

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

- ECE 817 Advanced Electrical Drives
Fall of every year. 3(3-0) RB: ECE 313 and ECE 320 Not open to students with credit in ECE 424.
Modeling and control of AC motors
Effective Fall 2021
- ECE 827 Power Electronic Systems for Renewable Energy, Transportation, and Utility Applications
Spring of odd years. 3(3-0) P: ECE 821
Converter/inverter system analysis, control, and design. Renewable energy power
conversion systems. Power/energy conversion systems for hybrid and electric vehicles.
FACTS (flexible ac transmission system) devices for utility applications.
SA: ECE 924
Effective Spring 2022

- ECE 830 Embedded Cyber-Physical Systems
Fall of every year. 3(3-0) RB: Undergraduate degree in Electrical Engineering, Computer Engineering, or related major. R: Open to students in the Department of Electrical and Computer Engineering. Not open to students with credit in ECE 430.
Modeling continuous and discrete dynamics of embedded cyber-physical systems (CPS). Hybrid systems. Composition of state machines. Concurrent models of computation. Design and implementation of CPS including sensors and actuators, embedded processors, Internet of Things (IoT), cloud IoT, multitasking, and scheduling. Analysis and verification of CPS. Emerging topics in CPS.
Effective Fall 2020

DEPARTMENT OF EMERGENCY MEDICINE

- EM 634 Special Topics in Emergency Medicine
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
Knowledge and skills to manage acute medical emergencies in adult and pediatric patients.
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 Spring 2020

DEPARTMENT OF EPIDEMIOLOGY AND BIostatISTICS

- EPI 919 COVID-19 Epidemiology and Public Health
Fall of every year. Spring of every year. Summer of every year. 3(3-0) R: Open to graduate students in the Department of Epidemiology and Biostatistics or approval of department.
Application of epidemiologic and public health principles to COVID-19.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer 2020

DEPARTMENT OF FAMILY MEDICINE

- FM 614 Breastfeeding and Lactation
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
Skills and knowledge necessary to advise and assist breastfeeding infants and their mothers including management of common difficulties.
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 Spring 2020

DEPARTMENT OF FINANCE

- FI 460 Estate and Income Tax Planning
Fall of every year. 3(3-0) R: Open to juniors or seniors in the Eli Broad College of Business and The Eli Broad Graduate School of Management. C: FI 370 concurrently.
Estate planning and income tax planning issues for the financial planner and wealth management advisor.
Effective Spring 2021

DEPARTMENT OF HORTICULTURE

- HRT 841 Foundation in Computational and Plant Sciences
Fall of every year. 3(3-0) Interdepartmental with Biochemistry and Molecular Biology and Computational Mathematics, Science, & Engineering and Crop and Soil Sciences and Plant Biology.
Computational modeling applied to plant biology. Data analysis, algorithmic thinking, model building, bioinformatics, and molecular biology using coding and computational resources.
Effective Fall 2020

COLLEGE OF HUMAN MEDICINE

- HM 625 Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual+ Health Care
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
LGBTQIA+ history and culture, identification of own biases, and skills in engaging the LGBTQIA+ community in a clinical setting.
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 Spring 2020
- HM 626 Special Topics in Neurologic Conditions
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: HM 556 R: Open to graduate-professional students in the College of Human Medicine.
Case-based overview of common neurologic conditions, diagnosis, treatment.
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 Spring 2020
- HM 825 Transition to Graduate Academic Writing
Fall of every year. Spring of every year. Summer of every year. 1(1-0) RB: completion of Tier 2 writing assignment or undergraduate degree R: Approval of college.
Identify and analyze scholarly articles and published research studies to develop effective writing skills within the genre of academic writing and scholarship.
Request the use of the Pass-No Grade (P-N) system.
Effective Summer 2020
- HM 862 Global Pandemics and Public Health Systems, Law, and Community Impacts
Fall of every year. Spring of every year. 3(3-0) P: HM 101 R: Open to students in the Public Health Major and open to juniors or seniors and open to graduate students. Approval of college.
Public health systems and response to pandemics including public health law and ethics, disease transmission, testing and treatment, and social and community context.
Effective Summer 2020

CENTER FOR INTEGRATIVE STUDIES IN GENERAL SCIENCE

- ISB 210L Science and Society: Impacts of Daily Decisions Lab
Fall of every year. Spring of every year. Summer of every year. 2(1-2) P: MTH 101 or MTH 103 or MTH 103B
Investigating and analyzing the environmental and personal impacts of daily decisions (fuels, energy, food, water, consumer goods).
Effective Fall 2020

MSU COLLEGE OF LAW

- LAW 533Y Trademark Counterfeiting: Legal Approaches to Protecting the Brand
On Demand. 0 to 6 credits. P: (LAW 533N or LAW 535D) and completion of Tier I writing requirement R: Open to Law students in the MSU College of Law.
Reactive and proactive legal approaches to combating trademark counterfeiting and brand protection in the U.S. and various global legal frameworks.
Effective Spring 2020
- LAW 535R Rethinking Intellectual Property in a Technological Age
Spring of every year. 0 to 6 credits. R: Open to Law students in the MSU College of Law.
Seminar on selected topics in intellectual property.
Effective Spring 2021
- LAW 541Y The Law of American Chattel Slavery: Origins and Development
On Demand. 0 to 6 credits. R: Open to Law students in the MSU College of Law.
Origins, development, and legacy of the laws that built and sustained a slave society.
Effective Spring 2021
- LAW 811D A Survey of Hemp: Uses, Issues, and Perceptions
Summer of every year. 0 to 6 credits. R: Open to law advanced students in the MSU College of Law or in the Global Food Law Major.
Overview of the laws and regulations related to hemp at the state and federal levels.
Effective Summer 2020
- LAW 811E Drafting, Amending, and Updating Food Laws: Government, Industry, and Consumer Inputs
Summer of every year. 0 to 6 credits. R: Open to law advanced students in the MSU College of Law or in the Global Food Law Major.
Analysis of the steps required to draft, amend and update food laws and regulations from a global perspective.
Effective Summer 2020

DEPARTMENT OF MANAGEMENT

- MGT 225 Women Leadership in Business
Fall of every year. Spring of every year. 1 to 2 credits. R: Open to sophomores or juniors or seniors in the Accounting major or in the Finance Major or in the Hospitality Business Major or in the Marketing Major or in the Supply Chain Management Major or in the Business - Admitted major or in the Human Resource Management Major or in the Management Major or approval of department.
Investigation of the status of women in business today and the importance of diversity in building innovative companies.
Effective Fall 2021
- MGT 852 Entrepreneurship: Recognizing New Venture Opportunities
Spring of every year. 1 to 3 credits. P: MBA 824 or MGT 824 R: Open to graduate students in the Eli Broad College of Business and The Eli Broad Graduate School of Management or approval of department.
- REINSTATEMENT Appropriate techniques required to recognize new venture opportunities. Develop and evaluate ideas to determine whether they could become a viable new venture.
Effective Spring 2021

COLLEGE OF OSTEOPATHIC MEDICINE

- OST 620 Patient Safety and Quality Improvement
Fall of every year. Spring of every year. Summer of every year. 2 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open to students in the College of Osteopathic Medicine.
Foundations of patient safety and quality improvement incorporating Institute for Healthcare Improvement's (IHI) certification.
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 2020
- OST 621 Leadership in Healthcare
Fall of every year. Spring of every year. Summer of every year. 3(2-2) R: Open to students in the College of Osteopathic Medicine.
Develop healthcare-focused leadership skills through review of theory and interactive discussions with experts.
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 2020

DEPARTMENT OF PLANT BIOLOGY

- PLB 814 Advanced Principles and Applications of Epigenetics
Spring of odd years. 3(3-0) Interdepartmental with Integrative Biology. P: IBIO 341 or CSS 350 or approval of college R: Not open to undergraduate students or approval of college. Not open to students with credit in PLB 480.
Epigenetics and epigenomics including the molecular mechanisms of epigenetic modifications of eukaryotic genomes.
Effective Spring 2021

DEPARTMENT OF RELIGIOUS STUDIES

- REL 232 Islam in America
Fall of every year. Spring of every year. 3(3-0)
Introduction to the history and evolution of Islam in America.
Effective Spring 2021
- REL 285 Introduction to Social Entrepreneurship and Religion
Summer of every year. 3(3-0)
Social entrepreneurship, nonprofits and religious organizations in the U.S. Role of religion and religious organizations in social innovation and entrepreneurship. Social change in civil society. Business plan creation.
Effective Fall 2020

DEPARTMENT OF WRITING, RHETORIC AND AMERICAN CULTURES

- WRA 810 Writing, Composing, Designing, Making
Fall of every year. 3 credits. R: Open to graduate-professional students in the Department of Writing, Rhetoric and American Cultures.
Practices of writing, composing, designing, and making primarily digital texts. Practice informed by current topics in and theories of professional and technical writing, cultural rhetorics, including critical making and multimodal composing.
Effective Fall 2021

PART III – COURSE CHANGES

DEPARTMENT OF AGRICULTURAL, FOOD, AND RESOURCE ECONOMICS

- ABM 437 Agribusiness Strategic Management (W)
Spring of every year. 3(4-0) P: (FIM 220) and ((ABM 435 or FI 320) and completion of Tier I writing requirement) RB: (ABM 303) or (ABM 203 and EC 301) R: Open to seniors.
Analysis of strategic management issues for agribusiness. Formulation of business strategy and solutions to strategic problems. Integration of operations, marketing, finance, and human resource management.
SA: FSM 429
~~DELETED COURSE~~
Effective Fall 2020
- ~~ABM 100~~
AFRE 100 Decision-making in the Agri-Food System
Fall of every year. Spring of every year. 3(3-0) ~~Interdepartmental with Food Industry Management~~
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.
~~SA: FSM 200 SA: FSM 200, ABM 100~~
~~Effective Fall 2014~~ Effective Fall 2021
- ~~ABM 130~~
AFRE 130 Farm Management I
Fall of every year. Spring of every year. Summer of every year. 3(3-0) ~~RB: ABM 100 and ABM 203~~
RB: AFRE 100 and AFRE 203
General farm management including record keeping, income tax management, farm finance, and operational management of agricultural resources.
~~SA: AEC 050 SA: AEC 050, ABM 130~~
~~Effective Fall 2018~~ Effective Fall 2021
- ~~ABM 203~~
AFRE 203 Data Analysis for the Agri-Food System
Fall of every year. Spring of every year. Summer of every year. 3(3-0) ~~Interdepartmental with Environmental Economics and Management and Food Industry Management P: (ABM 100) and (EC 201 or concurrently) P: (AFRE 100 or concurrently) or (EC 201 or concurrently)~~ RB: STT 200 or STT 201 or STT 315 ~~R: Open to undergraduate students in the Agribusiness Management Major or in the Agribusiness Management Minor or in the Environmental Economics Minor or in the Environmental Economics and Management major or in the Food Industry Management Major or in the Food Industry Management Minor.~~
Introduction to data analysis tools used in the management of food systems.
SA: ABM 203
~~Effective Fall 2018~~ Effective Fall 2021
- ~~EEM 260~~
AFRE 206 World Food, Population and Poverty
Fall of every year. Spring of every year. 3(3-0) ~~Interdepartmental with Agribusiness Management and Food Industry Management P: ABM 100 or EC 201 or EEM 255 P: AFRE 100 or AFRE 265 or EC 201~~
Description and analysis of world food, population and poverty problems. Interrelationships between developed and developing countries.
~~SA: EEP 260 SA: EEP 260, EEM 260~~
~~Effective Summer 2018~~ Effective Fall 2021

ABM 210
AFRE 210

~~Professional Seminar in Agribusiness Management~~
Professional Seminar in Agricultural, Food, and Resource Economics
Spring of every year. 1(1-0) ~~R: Open to students in the Agribusiness Management Minor and open to students in the Animal Science Major or in the Horticulture Major or in the Agribusiness Management Major.~~ 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.
SA: ABM 210
~~Effective Fall 2015~~ Effective Fall 2021

ABM 222
AFRE 222

Agribusiness and Food Industry Sales
Fall of every year. Spring of every year. Summer of every year. 3(3-0) ~~Interdepartmental with Food Industry Management P: ABM 100 or EC 201 or EC 202~~ P: AFRE 100 or EC 201 ~~RB: AFRE 240~~ R: AFRE 240
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.
~~SA: FSM 320~~ SA: FSM 320, ABM 222
~~Effective Fall 2018~~ Effective Fall 2021

FIM 224
AFRE 224

Information and Market Intelligence in the Agri-Food Industry
Summer of every year. 3(3-0) ~~Interdepartmental with Agribusiness Management P: (ABM 100 or concurrently) or (EC 201 or concurrently)~~
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.
~~SA: FIM 424~~ SA: FIM 424, FIM 224
~~Effective Fall 2014~~ Effective Fall 2021

ABM 225
AFRE 232

Commodity Marketing I
Fall of every year. 3(3-0) ~~P: ABM 100 or EC 201~~ 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.
SA: ABM 225
~~Effective Fall 2014~~ Effective Fall 2021

FIM 220
AFRE 240

Food Product Marketing
Fall of every year. Spring of every year. 3(3-0) ~~P: ABM 100 or concurrently~~ 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.
SA: FIM 220
~~Effective Fall 2014~~ Effective Fall 2021

EEM 255
AFRE 265

Ecological Economics
Fall of every year. Spring of every year. 3(3-0) ~~P: EC 201 or concurrently~~ P: (EC 201 or concurrently) or (EC 202 or concurrently) ~~RB: ABM 203~~ RB: AFRE 203
Relationship between the economy and the natural environment. Economic organization and sustainability. Economic concepts applied to natural resources and agriculture.
~~SA: PRM 255, EEP 255~~ SA: EEP 255, PRM 255, EEM 255
~~Effective Summer 2018~~ Effective Fall 2021

~~ABM 400~~
AFRE 300

Public Policy Issues in the Agri-Food System
Spring of every year. 3(3-0) ~~Interdepartmental with Food Industry Management P: EC 201 and EC 202 P: (AFRE 100) and (EC 201 or EC 202) RB: (ABM 303) or (ABM 203 and EC 301) 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.
~~SA: FSM 421~~ SA: FSM 421, ABM 400
~~Effective Fall 2018~~ Effective Fall 2021

~~ABM 303~~
AFRE 303

~~Economics of Decision Making in the Agri-Food System~~
Managerial Economics
Fall of every year. Spring of every year. 3(3-0) ~~Interdepartmental with Environmental Economics and Management and Food Industry Management P: (MTH 124 and EC 201 and EC 202 and ABM 203) and (STT 200 or STT 201 or STT 315) P: (MTH 124) and AFRE 203 and EC 201 and (STT 200 or STT 201 or STT 315)~~
Managerial economics with applications focusing on agriculture, food, and resources issues.
SA: ABM 303
~~Effective Fall 2018~~ Effective Fall 2021

~~ABM 337~~
AFRE 315

Labor and Personnel Management in the Agri-Food System
Fall of every year. Summer of every year. 3(3-0) ~~P: ABM 100 or ABM 130 or HRT 404 P: AFRE 100 or AFRE 130 RB: EC 201 R: Open to juniors or seniors. Not open to students with credit in FIM 415.~~
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.
SA: ~~FSM 325~~ SA: FSM 325, ABM 337, FIM 415
~~Effective Fall 2016~~ Effective Fall 2021

~~ABM 422~~
AFRE 322

~~Vertical Coordination in the Agri-Food System~~
Organization of the Agri-Food Systems
~~Fall of every year.~~ Spring of every year. 3(3-0) Interdepartmental with Food Industry Management.
~~P: ABM 100 and ABM 203 and EC 201 P: AFRE 100 and EC 201 RB: (ABM 303) or EC 301 RB: (AFRE 303) or (AFRE 203 and EC 301)~~ 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.
SA: FSM 443
~~Effective Fall 2018~~ Effective Fall 2021

~~ABM 427~~
AFRE 327

Global Agri-Food Industries and Markets
Fall of every year. 3(3-0) ~~Interdepartmental with Food Industry Management P: (FIM 220 or ABM 225) and (EC 201 and EC 202) and ABM 203 P: (AFRE 100) and (AFRE 232 or AFRE 240) and EC 201 and EC 202 RB: (ABM 303) or EC 301 RB: (AFRE 303) or (AFRE 203 and EC 301)~~ 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.
SA: ABM 427
~~Effective Fall 2018~~ Effective Fall 2021

~~ABM 430~~
~~AFRE 330~~

~~Farm Management II~~
~~Fall of every year. 3(3-0) P: (ABM 130 and EC 201) and ABM 203 P: (AFRE 130) and AFRE 203~~
~~RB: (ABM 303) or EC 301 RB: (AFRE 303) or (AFRE 203 and EC 301) R: Open to juniors or~~
~~seniors.~~
~~Advanced management, planning, and control of farm production, marketing, financial~~
~~activities, economic principles, budgeting and financial statements.~~
~~SA: FSM 330 SA: FSM 330, ABM 430~~
~~Effective Fall 2018 Effective Fall 2021~~

~~FIM 460~~
~~AFRE 340~~

~~Retail Information Systems~~
~~Food Marketing Research and Analytics~~
~~Fall of every year. Spring of every year. 3(3-0) P: (FIM 220) and (MKT 327 or MKT 300) and ABM~~
~~203 P: AFRE 203 and AFRE 240 RB: (ABM 303 or EC 301) and (FIM 335 or concurrently) RB:~~
~~(AFRE 303) or (AFRE 203 and EC 301); and AFRE 440 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.~~
~~SA: HED 460, RET 460 SA: HED 460, RET 460, FIM 460~~
~~Effective Fall 2018 Effective Fall 2021~~

~~EEM 320~~
~~AFRE 360~~

~~Environmental Economics~~
~~Spring of every year. 3(3-0) P: (EEM 255 and EC 201) and (ABM 203 or approval of department)~~
~~P: (AFRE 265) and AFRE 203 RB: (ABM 303) or (EC 301 or concurrently) 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 SA: EEP 320, EEM 320~~
~~Effective Summer 2018 Effective Fall 2021~~

~~ABM 410~~
~~AFRE 410~~

~~Advanced Professional Seminar in Agribusiness Management~~
~~Advanced Professional Seminar in Agricultural Food and Resource Economics~~
~~Fall of every year. 1(1-0) P: ABM 210 P: AFRE 210 R: Open to juniors or seniors in the~~
~~Agribusiness Management Minor and open to juniors or seniors in the Animal Science Major or in~~
~~the Horticulture Major or in the Agribusiness Management Major. 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.~~
~~Effective Fall 2015 Effective Fall 2021~~

~~ABM 425~~
~~AFRE 432~~

~~Commodity Marketing II~~
~~Fall of every year. 3(3-0) P: (ANS 314 or STT 200 or STT 201 or STT 315 or approval of~~
~~department) and ABM 225 P: (AFRE 232) and (ANS 314 or STT 200 or STT 201 or STT 315 or~~
~~approval of department) RB: (ABM 303) or (ABM 203 and EC 301) RB: (AFRE 303) or (AFRE 203~~
~~and EC 301) R: Open to juniors or seniors.~~
~~Advanced application of supply, space demand, and prices in commodity markets.~~
~~Futures and options and their role in forward pricing. Risk management. Agricultural and~~
~~food markets.~~
~~SA: FSM 441 SA: FSM 441, ABM 425~~
~~Effective Fall 2015 Effective Fall 2021~~

~~ABM 435~~
AFRE 435

Financial Management in the Agri-Food System
~~Fall of every year. Spring of every year. 3(3-0) P: (ABM 130 or ACC 201 or ACC 230) and (ABM 303 or EC 301 or approval of department) P: (AFRE 203) and (AFRE 130 or FI 320 or ACC 201 or ACC 230) and (AFRE 303 or EC 301) 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.
~~SA: FSM 412~~ SA: FSM 412, ABM 435
~~Effective Fall 2018~~ Effective Fall 2021

~~FIM 335~~
AFRE 440

Food Marketing Management
Fall of every year. Spring of every year. 3(3-0) ~~P: (FIM 220) and (MKT 327 or MKT 300) and ABM 203~~ P: AFRE 203 and AFRE 240
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.
SA: FIM 335
~~Effective Fall 2018~~ Effective Fall 2021

~~FIM 439~~
AFRE 445

Strategic Management for Food and Agribusiness Firms (W)
Fall of every year. Spring of every year. 3(4-0) Interdepartmental with Marketing. ~~P: (FIM 220) and (ABM 130 or ABM 435 or FI 320 or ABM 303 or EC 301 or approval of department) 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) 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.
SA: FIM 439
~~Effective Summer 2018~~ Effective Fall 2021

~~EEM 460~~
AFRE 460

Natural Resource Economics
~~Fall of every year. Spring of every year. 3(3-0) P: (EC 201 and EEM 255) and ABM 203 P: (AFRE 265) and AFRE 203 RB: (ABM 303 or (EC 301 or concurrently)) and (EEM 320 or concurrently) 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~~ SA: EEP 460, EEM 460
~~Effective Summer 2018~~ Effective Fall 2021

~~EEM 405~~
AFRE 465

Corporate Environmental Management (W)
Spring of every year. 3(3-0) ~~Interdepartmental with Agribusiness Management and Food Industry Management P: (EEM 255) and (ACC 201 or ACC 230 or ABM 130) and ABM 203 and (((ABM 303 or EC 301) or approval of department) and completion of Tier I writing requirement) P: (AFRE 203) and AFRE 265 and (ACC 201 or ACC 230 or AFRE 130 or FI 320) and (AFRE 303 or EC 301) R: Open to juniors or seniors.~~
Integration of environmental protection and pollution prevention with business management. Economic and strategic analysis of environmental protection.
~~SA: PRM 405~~ SA: PRM 405, EEM 405
~~Effective Spring 2019~~ Effective Fall 2021

~~ABM 400~~
~~AFRE 490~~

~~Independent Study in Agribusiness Management~~
~~Independent Study in Agricultural Food and Resource Economics~~
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~P: ABM 100 P: AFRE 100 R: Not open to freshmen. Approval of department; application required.~~ R: Not open to freshmen. Approval of department; application required. Students are limited to a combined total of 6 credits in AFRE 490 and AFRE 493.
~~Independent supervised study of topics in agribusiness management. Independent supervised study of topics in agricultural food and resource economics.~~
~~SA: FSM 400 SA: FSM 490, ABM 490~~
~~Effective Fall 2014~~ Effective Fall 2021

~~ABM 403~~
~~AFRE 493~~

~~Professional Internship in Agribusiness Management~~
~~Professional Internship in Agricultural Food and Resource Economics~~
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~P: ABM 100 P: AFRE 100 R: Open to juniors or seniors in the Agribusiness Management major. Approval of department; application required.~~ R: Not open to freshmen. Approval of department; application required. A student may earn a maximum of 6 credits Limited to a total of 6 credits in AFRE 490 and AFRE 493.
Supervised professional experience in agribusiness management.
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.
SA: ABM 493
~~Effective Fall 2014~~ Effective Fall 2021

EEM 404

Public Sector Budgeting and Program Evaluation
Spring of every year. 3(3-0) P: (EC 201 or EEM 255) and EC 202 and Completion of Tier I Writing Requirement RB: (ABM 303) or (ABM 203 and EC 301) R: Not open to freshmen or sophomores.
Structure and finance of government. Approaches to public sector budgeting. Evaluation of output of programs and community services. Impact and multiple outcome analysis.
SA: PRM 404, EEP 404
DELETE COURSE
Effective Fall 2020

FIM 415

Human Resource Management: Changes and Challenges
Spring of every year. 3(3-0) P: ABM 100 or EC 201 or EC 202 R: Open to juniors or seniors. Not open to students with credit in ABM 337.
Human resource management strategies used in food industries. Changing demographics and labor force issues. Diversity, labor markets, regulations, employer policies, job analysis and staffing, compensation and benefits, motivation, performance appraisal, food labor unions, and cases.
DELETE COURSE
Effective Fall 2020

DEPARTMENT OF ANIMAL SCIENCE

ANS 132

Dairy Farm Management Seminar
Fall of every year. ~~1(1-0)~~ 2(2-0) R: Open to students in the Institute of Agricultural Technology. Challenges and opportunities in the dairy industry.
SA: ANS 054
~~Effective Fall 2013~~ Effective Fall 2021

- ANS 200C ~~Introductory Judging of Dairy Cattle~~
Dairy Cattle Genetics and Evaluation
Spring of every year. ~~4 to 2 credits, 2(2-0)~~ A student may earn a maximum of 3 credits in all enrollments for this course. P: ANS 134 R: A student may earn a maximum of 8 credits from the following courses: ANS 200A, ANS 200C, ANS 200D, ANS 200E, ANS 300A, ANS 300C, ANS 300D, ANS 300E, and ANS 300F.
~~Evaluation of functional conformation of dairy cattle. Preparation for intercollegiate competition. Genetics, breeding and evaluation of functional conformation of dairy cattle. Field trip required.~~
SA: ANS 200B
~~Effective Fall 2013~~ Effective Fall 2021
- ANS 200F Dairy Farm Evaluation
Fall of every year. 1(0-2) P: ANS 232 or concurrently R: A student may earn a maximum of 8 credits from the following courses: ANS 200A, ANS 200C, ANS 200D, ANS 200E, ANS 200F, ANS 300A, ANS 300C, ANS 300D, ANS 300E, and ANS 300F.
Evaluation of dairy farm management. Preparation for collegiate competition. Field trip required.
DELETE COURSE
Effective Fall 2020
- ANS 215 Growth, Health and Lactation in Dairy Cattle
Fall of every year. 2(2-0) RB: ANS 295 and ANS 232 R: Open to students in the Institute of Agricultural Technology.
Mammary anatomy and growth. Immunization and biosecurity. Lactation and mastitis. Transition into lactation.
DELETE COURSE
Effective Fall 2020
- ANS 230 Dairy Herd Management
Fall of every year. 3(2-2) P: ANS 232 RB: ANS 132 and ANS 295 and ANS 215 R: Open to students in the Institute of Agricultural Technology.
Analysis of dairy farm management. Investigation and problem solving. Collecting data and formulating conclusions and recommendations. Oral presentation. Field trip required.
SA: ANS 032
DELETE COURSE
Effective Fall 2020
- ANS 232 Introductory Dairy Cattle Management
Fall of every year. 3(2-2) Not open to students with credit in ANS 432.
Principles and techniques of dairy herd management including calf and heifer care plus lactating and dry cow management.
DELETE COURSE
Effective Fall 2020
- ANS 233 Dairy Feed Management
Fall of every year. 3(2-2) ~~P: ANS 203~~ P: ANS 134 RB: ANS 203 R: Open to students in the Institute of Agricultural Technology.
Feeding management of dairy cattle with emphasis on milking cows and replacements. Cost considerations of nutrient sources and supplies. Use of homegrown feeds. By-product utilization. Field trip required.
SA: ANS 051
~~Effective Fall 2013~~ Effective Fall 2020
- ANS 235 Dairy Herd Reproduction
Spring of every year. 2(2-0) ~~P: ANS 205~~ P: ANS 134 RB: ANS 232 or concurrently RB: ANS 295 R: Open to students in the Institute of Agricultural Technology.
Application of reproductive principles to dairy production. Field trip required.
~~Effective Summer 2014~~ Effective Fall 2020

- ANS 238 ~~Dairy Health Management~~
Dairy Cattle Health Management
Spring of every year. ~~3(2-2) P: ANS 232 or concurrently~~ P: ANS 134 R: Open to students in the Institute of Agricultural Technology.
Detection of dairy cattle disease. Infections and metabolic problems.
~~Effective Fall 2013~~ Effective Fall 2021
- ANS 300C ~~Advanced Dairy Cattle Judging~~
Dairy Cattle Judging Team
Fall of every year. ~~2 credits, 2(0-4) P: ANS 200C R: Not open to freshmen.~~ R: A student may earn a maximum of 8 credits from the following courses: ANS 200A, ANS 200C, ANS 200D, ANS 200E, ANS 300A, ANS 300C, ANS 300D, ANS 300E, and ANS 300F.
~~Evaluation of conformation of various breeds of dairy cattle. Represent MSU in intercollegiate competition. Field trips required.~~ Evaluation of conformation of various breeds of dairy cattle. Represent MSU in intercollegiate competition. Field trip required.
~~Effective Fall 2013~~ Effective Fall 2021
- ANS 300E Animal Welfare Judging
Fall of every year. ~~1(0-2)~~ 2(0-4) A student may earn a maximum of 6 credits in all enrollments for this course. ~~P: ANS 200E~~ P: ANS 200E or concurrently ~~RB: (ANS 110) and (ANS 305 or IBIO 313)~~ R: Not open to freshmen. R: A student may earn a maximum of 8 credits from the following courses: ANS 200A, ANS 200C, ANS 200D, ANS 200E, ANS 200F, ANS 300A, ANS 300C, ANS 300D, ANS 300E, and ANS 300F.
~~Enhanced understanding of the physiological and behavioral indicators of animal welfare. Ethical values in the assessment of welfare status. Intercollegiate competition. Field trip required.~~ Enhanced understanding of the physiological and behavioral indicators of animal welfare. Ethical values in the assessment of welfare status. Intercollegiate competition. Field trips required.
~~Effective Summer 2017~~ Effective Fall 2021
- ANS 300F ~~Advanced Dairy Farm Evaluation~~
Dairy Challenge Experiences
Spring of every year. ~~2(0-4) P: (ANS 200F and ANS 432) and (ANS 430 or concurrently) P: ANS 434 or concurrently~~ RB: ANS 313 RB: ANS 434 R: Not open to freshmen or sophomores. Approval of department. R: Approval of department. A student may earn a maximum of 8 credits from the following courses: ANS 200A, ANS 200C, ANS 200D, ANS 200E, ANS 300A, ANS 300C, ANS 300D, ANS 300E, and ANS 300F.
~~Evaluation of factors important in successful management of a dairy farm business. Represent Michigan State University in intercollegiate competition. Field trips required.~~ Evaluation of factors important in successful management of a dairy farm business. Intercollegiate competition as part of Dairy Challenge Team. Field trips required.
~~Effective Fall 2013~~ Effective Fall 2021
- ANS 430 Dairy Systems Management
Spring of every year. 3(2-3) P: ANS 313 and ANS 432 R: Not open to freshmen or sophomores.
Decision-making strategies for dairy farms. Emphasis on herd replacements, personnel, health, facilities, nutrient management and other issues associated with dynamic markets and business environments. Field trips required.
DELETE COURSE
Effective Fall 2020
- ANS 432 Advanced Dairy Cattle Management
Fall of every year. 3(2-2) P: ANS 232 RB: ANS 313 R: Not open to freshmen or sophomores.
Management techniques for operating a dairy herd. Mastitis control, reproductive and nutrition management, records, and general herd health. Field trips required.
DELETE COURSE
Effective Fall 2020

DEPARTMENT OF ART, ART HISTORY, AND DESIGN

- GD 460 Graphic Design II: Visual Communication
Fall of every year. Spring of every year. 3(0-6) ~~P: (GD 360 or STA 360) and (GD 365 or STA 365)~~
P: (GD 360) and GD 365 RB: Understanding of how to use a personal computer and web browsers.
Advance from the analysis of form to the meaning of form. Synthesis of form and content will progress towards cohesive communication systems.
SA: STA 460
~~Effective Summer 2018~~ Effective Fall 2020

DEPARTMENT OF BIOSYSTEMS AND AGRICULTURAL ENGINEERING

- BE 469 Sustainable Bioenergy Systems
Spring of every year. 3(3-0) Interdepartmental with Chemical Engineering. ~~P: BE 230 or CHE 204~~
P: {(BE 230 or CHE 201) and (BE 351 or CHE 321)} or (ME 201 and ENE 481) RB: CSS 467 and CHE 468 R: Open to juniors or seniors in the College of Engineering.
Biorefinery analysis and system design. Life cycle assessment to evaluate sustainability of bioenergy systems. Current policy regulating the bioeconomy and system economics. Product commercialization.
~~Effective Fall 2013~~ Effective Fall 2020

THE ELI BROAD COLLEGE OF BUSINESS

- EMB 801 Business Unit Strategy
Fall of every year. Summer of every year. 1 to 2 credits. R: Open to Executive MBA students.
Positioning the firm for competitive advantage. Institutional and corporate control. Organizational design.
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.
DELETE COURSE
Effective Spring 2020
- EMB 802 Financial Accounting Concepts
Fall of every year. Summer of every year. 2(2-0) R: Open to Executive MBA students.
Financial statement relationships and analysis. Role of accounting in capital markets. Contemporary financial reporting issues.
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.
SA: ACC 802
DELETE COURSE
Effective Spring 2020
- EMB 812 Accounting for Decision Making and Control
Fall of every year. 2(2-0) P: EMB 802 or concurrently R: Open to Executive MBA students.
Use of financial and non-financial data for decision making, planning, performance evaluation, control, and strategy implementation.
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.
SA: ACC 812
DELETE COURSE
Effective Spring 2020

- EMB 820 Marketing Operations and Innovation
Spring of every year. Summer of every year. 2(2-0) R: Open to Executive MBA students.
Concepts, methods, and applications of decision-making to address marketing issues such as market segmentation and positioning, new product development, promotional and distribution strategies. Techniques to model and analyze marketing decision problems to ensure optimal performance results.
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.
DELETE COURSE
Effective Spring 2020
- EMB 821 Corporate Finance
Fall of every year. Spring of every year. 3(3-0) R: Open to Executive MBA students.
Managerial finance covering short-, intermediate- and long-term problems. Financial planning and control using financial theory and management techniques. Applications in domestic and international settings.
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.
SA: FI 821
DELETE COURSE
Effective Spring 2020
- EMB 822 Managing Supply Chains and Lean Operations
Fall of every year. Spring of every year. 2 to 3 credits. R: Open to Executive MBA students.
Integrative approach to product design, development, and delivery. Flow of products from concept development through delivery to the final user. Product and process development, managing information and product flows. Total quality management. Resource and capacity management.
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.
DELETE COURSE
Effective Spring 2020
- EMB 828 Strategic and International Marketing
Fall of every year. Summer of every year. 1 to 2 credits. R: Open to Executive MBA students.
Models and methods of business planning. Relationship of strategic intent, business missions and planning hierarchies. Linking marketing, financial, and human resource strategic plans.
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.
DELETE COURSE
Effective Spring 2020
- EMB 831 Law and Business
Spring of every year. Summer of every year. 1(1-0) R: Open to Executive MBA students.
Critical analysis of government regulation of business from legal, political, and social perspectives. Moral concepts and social policy underlying government regulation.
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.
SA: GBL 859
DELETE COURSE
Effective Spring 2020

- EMB 845 Entrepreneurship
Fall of every year. Summer of every year. 1(1-0) R: Open to Executive MBA students.
Process of planning, starting, and positioning new businesses which link directly to customer requirements. Understanding unmet market opportunity due to competitive gaps or customer needs for both consumer and industrial products and services.
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.
SA: MSC 832
DELETE COURSE
Effective Spring 2020
- EMB 847 Business Decision Making and Marginal Analysis
Fall of every year. Summer of every year. 2 to 3 credits. R: Open to Executive MBA students.
Application and interpretation of analytical models to support decision making. Topics include understanding the selection of appropriate analytical tools for a given problem, the interpretation of statistical results, and decision analysis.
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.
DELETE COURSE
Effective Spring 2020
- EMB 856 Human Resources and Critical Organizational Transitions
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. R: Open to Executive MBA students.
Managing human resources to support significant changes in business configuration and strategy, including mergers and acquisitions, outsourcing and workforce reductions, and globalization. Evaluation of the effectiveness of the human resource management function.
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.
DELETE COURSE
Effective Spring 2020
- EMB 861 Strategic Management of Information Technology
Spring of every year. 2(2-0) R: Open to Executive MBA students.
Role of Information Technology (IT) in creating organizational efficiency, competitive differentiation and advantage. Examines various IT investment types and effective strategies for leveraging IT value.
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.
DELETE COURSE
Effective Spring 2020
- EMB 863 Strategy Process: Generation and Implementation
Spring of every year. Summer of every year. 2(2-0) R: Open to Executive MBA students.
Managing strategic processes in the firm. Integration of environmental factors, industry dynamics, organizational resources, and management functions in the analysis and solution of strategic issues.
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.
DELETE COURSE
Effective Spring 2020

- EMB 865 Business Ethics and Professional Responsibility
Spring of every year. 2(2-0) R: Open only to students in the Executive M.B.A Program.
Alternative ethical prescriptions for business and for enterprise managers and their evolution with globalization of the markets. Societal expectations of what constitutes responsible and irresponsible business behavior. Government regulation and changes in corporate governance as alternatives to conformity to ethical prescriptions. Negotiation and reconciliation of conflicting ethical prescriptions, governance procedures, and the regulatory environment.
DELETE COURSE
Effective Spring 2020
- EMB 866 Managing Teams and Negotiations
Fall of every year. Summer of every year. 1 to 2 credits. R: Open to Executive MBA students.
Development of team management and negotiation capabilities. Group decision making, conflict management, and resolution.
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.
DELETE COURSE
Effective Spring 2020
- EMB 877 Leadership Development
Fall of every year. Summer of every year. 1(1-0) R: Open to Executive MBA students.
Identification of underlying competencies important for leadership success. Assessment of student's current leadership competencies and development of an improvement plan. Disclosure of how the student's leadership behaviors are perceived by multiple sources in the organization and use of this knowledge to further enhance leadership effectiveness.
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.
DELETE COURSE
Effective Spring 2020
- EMB 887 Business Assessment and Operational Excellence
Fall of every year. Spring of every year. Summer of every year. 2(2-0) A student may earn a maximum of 4 credits in all enrollments for this course. R: Open to graduate students in the Master of Business Administration in Business Administration. Approval of department.
Strategically assess the capabilities of an organization or business unit. Identify gaps in organizational capabilities and constraints to realizing value. Develop a solution and implementation plan to remove an existing constraint (s).
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.
DELETE COURSE
Effective Spring 2020
- EMB 891 Special Topics in Executive Management
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to students in the Executive M.B.A. program.
Faculty-supervised study in special topics relevant to business executives.
DELETE COURSE
Effective Spring 2020

DEPARTMENT OF CHEMISTRY

- CEM 383 Introductory Physical Chemistry I
Fall of every year. 3(4-0) P: (CEM 142 or CEM 152 or CEM 182H or LB 172) and (MTH 133 or MTH 153H or MTH 126 or LB 119) ~~RB: PHY 184 or PHY 232 or PHY 232C or PHY 294H or LB 274~~
RB: PHY 184 or PHY 232 or PHY 232C or PHY 294H or LB 274 or PHY 174 or PHY 222 or PHY 242
Physical chemistry of macroscopic systems: thermodynamics, kinetics, electrochemistry.
SA: CEM 391
~~Effective Spring 2013~~ Effective Fall 2020
- CEM 384 Introductory Physical Chemistry II
Spring of every year. 3(4-0) P: ~~(CEM 142 or CEM 152 or CEM 182H or LB 172) and (MTH 133 or MTH 153H or MTH 126 or LB 110) and (PHY 184 or PHY 232 or PHY 232C or PHY 294H or LB 274)~~ P: (CEM 142 or CEM 152 or CEM 182H or LB 172) and (MTH 133 or MTH 153H or MTH 126 or LB 119) and (PHY 184 or PHY 232 or PHY 232C or PHY 294H or LB 274 or PHY 174 or PHY 222 or PHY 242) RB: CEM 383
Physical chemistry of microscopic systems: quantum mechanics, spectroscopy.
~~Effective Spring 2013~~ Effective Fall 2020
- CEM 483 Quantum Chemistry
Fall of every year. 3(4-0) P: ~~(MTH 235 or MTH 347H or MTH 340) and (PHY 184 or PHY 294H or LB 274 or PHY 184B) and (CEM 142 or CEM 152 or CEM 181H or LB 172)~~ P: (MTH 235 or MTH 347H or MTH 340) and (PHY 184 or PHY 294H or LB 274 or PHY 184B or PHY 174) and (CEM 142 or CEM 152 or CEM 181H or LB 172)
Postulates of quantum mechanics and the application to model systems, atoms and molecules. Introduction to molecular spectroscopy.
SA: CEM 362, CEM 461
~~Effective Fall 2016~~ Effective Fall 2020

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

- CE 341 Transportation Engineering
Fall of every year. Spring of every year. 3(3-0) P: ~~((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) and (((CE 273 or concurrently) and (CE 274 or concurrently)) and completion of Tier I writing requirement)~~ P: ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) and (((CE 273 or concurrently) and (CE 274 or concurrently)) and completion of Tier I writing requirement) and ((CE 372 or concurrently) or (STT 200 or concurrently) or (STT 201 or concurrently)) R: Open to juniors or seniors in the Department of Civil and Environmental Engineering or in the Urban and Regional Planning Major.
~~Overview of transportation system issues and problems. Fundamentals of highway design and operations. Planning and evaluation of transportation system alternatives.~~
Fundamentals of transportation planning, traffic flow and level-of-service, traffic signal design, geometric design of highways, and highway safety.
SA: CE 346
~~Effective Fall 2016~~ Effective Fall 2021
- CE 371 Sustainable Civil and Environmental Engineering Systems
Fall of every year. Spring of every year. 3(3-0) Interdepartmental with Environmental Engineering.
P: ~~((MTH 234 or concurrently) or (LB 220 or concurrently) or (MTH 254H or concurrently)) and ENE 280~~ P: (MTH 234 or concurrently) or (LB 220 or concurrently) or (MTH 254H or concurrently) R: ~~Open to juniors or seniors in the Civil Engineering Major or in the Environmental Engineering Major.~~
R: Open to juniors or seniors in the Applied Engineering Sciences Major or in the Energy Minor or in the Civil Engineering Major or in the Environmental Engineering Major.
Principles and tools of sustainable design and engineering economics in Civil and Environmental Engineering.
SA: CE 272
~~Effective Fall 2017~~ Effective Fall 2021

- CE 372 Risk Analysis in Civil and Environmental Engineering
Fall of every year. Spring of every year. ~~2(2-0)~~ 3(2-2) P: (MTH 234 or concurrently) or (LB 220 or concurrently) or (MTH 254H or concurrently) ~~R: Open to juniors in the Civil Engineering Major or in the Environmental Engineering Major and open to seniors in the Civil Engineering Major or in the Environmental Engineering Major.~~ R: Open to juniors in the Civil Engineering Major or in the Environmental Engineering Major and open to seniors or juniors in the Civil Engineering Major or in the Environmental Engineering Major.
Applications of probability, statistics, uncertainty and risk analysis to topics in civil and environmental engineering, characterization of system safety, and comparison tests for engineering quality control and environmental analyses.
SA: CE 272
~~Effective Fall 2017~~ Effective Fall 2021
- CE 485 Landfill Design
Spring of every year. 3(3-0) Interdepartmental with Environmental Engineering. ~~P: ENE 280 and CE 312~~ P: ENE 280 and CE 321 ~~RB: CE 312~~
Geotechnical and environmental design of solid waste landfills.
~~Effective Spring 2020~~ Effective Fall 2020
- ENE 280 Principles of Environmental Engineering and Science
Fall of every year. Spring of every year. 3(3-0) Interdepartmental with Civil Engineering. ~~P: (CEM 141 or CEM 151 or LB 171) and ((MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 148 or concurrently))~~ P: (CEM 141 or CEM 151 or LB 171) and (MTH 133 or MTH 153H or LB 119)
~~Physical, chemical and biological processes related to environmental science and engineering. Environmental systems analysis with application to air, water and soil. Analysis of environmental problems and development of engineering solutions.~~ Analysis of environmental problems and development of engineering solutions based on physical, chemical, and biological processes. Mass balance modeling of contaminant fate, transport and removal in environmental media.
~~Effective Fall 2013~~ Effective Fall 2021
- ENE 480 Environmental Measurements Laboratory
Fall of every year. ~~1(0-3)~~ 2(1-3) Interdepartmental with Civil Engineering. P: (CEM 161 or CEM 185H or LB 171L) and ENE 280 and (CEM 142 or CEM 152 or CEM 182H or LB 172) and ((ENE 481 or concurrently) or (ENE 483 or concurrently)) and Completion of Tier I Writing Requirement R: Open to juniors or seniors or graduate students in the College of Engineering.
~~Basic chemical and microbiological methods used in the analysis of environmental media. Laboratory safety, quality assurance, quality control, and statistics used in laboratory analysis. Related technical communication, laboratory report writing.~~ Basic chemical and microbiological methods used in the analysis of environmental media. Laboratory safety, quality assurance, quality control, and statistics used in laboratory analysis.
~~Effective Fall 2018~~ Effective Fall 2021
- ENE 481 Environmental Chemistry: Equilibrium Concepts
Fall of every year. 3(3-0) Interdepartmental with Civil Engineering. ~~P: ((CEM 141 and CEM 142) or (CEM 151 and CEM 152) or (CEM 181H and CEM 182H) or (LB 171 and LB 172)) and (ENE 280 or BE 230 or GLG 201 or GLG 301 or approval of department)~~ P: ((CEM 141 and CEM 142) or (CEM 151 and CEM 152) or (CEM 181H and CEM 182H) or (LB 171 and LB 172)) and (ENE 280 or BE 230 or GLG 201 or GLG 301 or approval of department) and ((CHE 201 or concurrently) or (CEM 251 or concurrently)) ~~R: Open to sophomores or juniors or seniors or graduate students in the Department of Biosystems and Agricultural Engineering or in the Department of Chemical Engineering and Materials Science or in the Department of Civil and Environmental Engineering or in the Department of Earth and Environmental Sciences.~~
Chemistry of natural environmental systems and pollutants. Equilibrium concepts and calculations for acid-base, solubility, complexation, redox and phase partitioning reactions and processes. Applications to ecosystem analysis, pollutant fate and transport, and environmental protection. Chemistry of environmental systems and air, water, and soil pollutants as applied to environmental engineering.
~~Effective Fall 2013~~ Effective Fall 2021

ENE 489 Air Pollution: Science and Engineering
Spring of every year. 3(3-0) Interdepartmental with Civil Engineering. ~~P: (CEM 141 or CEM 151 or LB 171) and (MTH 133 or MTH 153H or LB 119) and (ENE 280 or BE 230) and (CE 321 or CHE 344)~~ P: (CEM 141 or CEM 151 or LB 171) and (MTH 133 or MTH 153H or LB 119) and (ENE 280 or BE 230) and (CE 321 or CHE 311) and (CE 372 or CHE 316) and ((ME 201 or concurrently) or (BE 351 or concurrently) or (CHE 321 or concurrently)) R: Open to juniors or seniors or graduate students in the College of Engineering.
~~Basic physical and chemical principles governing indoor and atmospheric air pollution. Elements of air pollution meteorology, climate change, atmospheric transformations and transport. Air pollution sources and methods for their control. The role of local, state and federal government in air pollution control.~~ Basic physical and chemical principles governing indoor and atmospheric air pollutant fate, transport and control technologies.
~~Effective Fall 2013~~ Effective Fall 2021

COLLEGE OF COMMUNICATION ARTS AND SCIENCES

CAS 214 Social Media and the Start-up
Spring of every year. Summer of every year. 3(3-0) Interdepartmental with Writing, Rhetoric and American Cultures. ~~P: BUS 100 and CAS 144~~ P: CAS 114 R: Open to undergraduate students in the Entrepreneurship and Innovation Minor.
Introduction to using digital spaces and social media to propel entrepreneurship ideas forward. Survey of how businesses and organizations' websites, videos, podcasts, and social media presence brand products and organizations. Website, mobile and social media presence to promote entrepreneurial idea.
~~Effective Spring 2017~~ Effective Summer 2021

DEPARTMENT OF COMMUNITY SUSTAINABILITY

CSUS 447 Community Economic Development
Spring of every year. 3(3-0) Interdepartmental with Environmental Economics and Policy and Sociology. P: EC 201 or EC 202
Theories, frameworks, policies, concepts, principles, models, and skills for community economic development. Community participation in local development initiatives.
SA: ESA 470, RD 470
DELETE COURSE
Effective Fall 2020

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CSE 404 Introduction to Machine Learning
Fall of every year. 3(3-0) Interdepartmental with Computational Mathematics, Science, and Engineering and Statistics and Probability. ~~P: (CSE 331) and (STT 351 or STT 380 or STT 430 or STT 441)~~ P: (CSE 331) and (STT 351 or STT 380 or STT 430 or STT 441) and MTH 314 RB: Basic linear algebra ~~R: Open to juniors or seniors in the College of Engineering or in the Computer Science Minor or in the Lyman Briggs Computer Science Coordinate Major or in the Lyman Briggs Computer Science Major.~~ R: Open to juniors or seniors in the College of Engineering or in the Computer Science Minor or in the Lyman Briggs Computer Science Coordinate Major or in the Lyman Briggs Computer Science Major or in the Data Science Major.
~~Core principles and techniques of all machine learning including model design and programming algorithms.~~ Core principles and techniques for machine learning including algorithms, model design, and programming.
~~Effective Fall 2019~~ Effective Fall 2021

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

- ECE 818 Robotics
Spring of every year. 3(3-0) RB: ECE 313 or ME 451 ~~R: Open only to graduate students in the College of Engineering.~~ R: Open to graduate students in the College of Engineering. Not open to students with credit in ECE 417.
~~Robot modeling, kinematics, dynamics, trajectory planning, programming, sensors, controller design.~~ Robot modeling, kinematics, dynamics, trajectory planning, sensors, controller design, motion planning.
~~Effective Summer 2002~~ Effective Fall 2020
- ECE 821 Advanced Power Electronics and Applications
Fall of every year. 3(3-0) RB: Power and computer engineering areas. Not open to students with credit in ECE 425.
Power semiconductor devices, circuits, control, and applications. Converter and inverter analysis and design, DSP (Digital Signal Processor) control and implementation. Automotive and utility applications.
~~Effective Fall 2007~~ Effective Fall 2021
- ECE 825 Alternating Current Electrical Machines and Drives
Spring of even years. 3(3-0) P: ECE 817 RB: ECE 320
Analysis, modeling and design of synchronous, induction, and switched reluctance machines. Design drives for motion control and power system applications.
SA: EE 825
~~Effective Summer 1999~~ Effective Fall 2021
- ECE 924 Power Electronic Systems for Renewable Energy, Transportation, and Utility Applications
Spring of even years. 3(3-0) P: ECE 821
Converter/inverter system analysis, control, and design. Power loss estimation and thermal design. EMI/EMC Issues of Power Electronic Systems. Renewable Energy Power Conversion Systems. Power/Energy Conversion Systems for hybrid and electric vehicles. FACTS devices for utility applications.
DELETE COURSE
Effective Fall 2021

DEPARTMENT OF ENTOMOLOGY

- ENT 404 Fundamentals of Entomology
Fall of every year. ~~3(2-4)~~ 4(2-4) P: BS 162 or PLB 105 or LB 144
Insect classification, identification, diversity, physiology and ecology. Importance of insects to humans and the environment. Insect collection required.
~~Effective Fall 2013~~ Effective Fall 2021

DEPARTMENT OF FINANCE

- FI 321 Theory of Investments
Fall of every year. Spring of every year. 3(3-0) ~~P: FI 314~~ P: FI 311 or FI 320 R: Open to juniors or seniors in the Actuarial Science Major or in the Actuarial Science Minor or in the Economics Major. Not open to students with credit in FI 312.
Theoretical analysis of common stocks, bonds, options and futures. Tradeoff between risk and return, market efficiency, efficient portfolios and CAPM. Cash flow evaluation and option evaluation.
~~Effective Spring 2018~~ Effective Spring 2021

DEPARTMENT OF FOOD SCIENCE AND HUMAN NUTRITION

FSC 422 Advanced Professional Seminar in Food Science
Spring of every year. 1(1-0) P: FSC 222 RB: Advanced course work in food science R: Open to students in the Food Science Major.
Preparation for success in food science careers, marketing tools, business communication skills, and contemporary topics in food science.
DELETE COURSE
Effective Summer 2019

FSC 843 ~~Exposure Science and Environmental Epidemiology~~
Exposure Science and Epidemiology
~~Fall of even years. Spring of odd years.~~ 3(3-0) RB: Statistics, basic biological and chemical science
~~Human exposure to chemicals in food and the environment and its relationship to health and illness. Applied concepts in toxicology, exposure assessment, environmental epidemiology, and risk assessment. Human exposure to contaminants in food, water, products, and the environment - and how those exposures can affect human health. Applied concepts in exposure science and environmental epidemiology.~~
Applied concepts in exposure science and environmental epidemiology.
~~Effective Fall 2019~~ Effective Fall 2021

DEPARTMENT OF GEOGRAPHY, ENVIRONMENT, AND SPATIAL SCIENCES

GEO 869 Agent-Based Modeling
Spring of every year. 3(3-0) Interdepartmental with Environmental Science and Policy. RB: Basic understanding of data structures and algorithms covered in an introductory course of any programming language. R: Approval of department.
Theoretical concepts related to simulating dynamic geographic phenomena in the intersection between human and natural systems. Innovative agent-based methodology applied to complex social-environmental systems. Hands-on experience of agent-based modeling, with special emphasis on modeling human decision-making and its impact on the natural environment.
~~Effective Summer 2019~~ Effective Spring 2021

COLLEGE OF HUMAN MEDICINE

HM 847 ~~Public Health in Ghana: Methods for Community Practice~~
Public Health in Ghana: A One Health Perspective
~~Summer of every year. 4(4-0) 5(5-0) Interdepartmental with Osteopathic Medicine. P: HM 848 RB:~~
Academic or professional background in public health and/or public health related discipline; undergraduate level health-related discipline ~~R: Open to students in the Public Health Major and open to juniors or seniors. Approval of college; application required. R: Approval of college; application required.~~
Overview of major public health issues and the health care system, both Western and traditional, in Ghana. Health status indicators and determinants; major programs/strategies; organization of the health care system, access to and payment for care; role, image and status of health care providers; interface between Western and traditional medicine; basic qualitative and quantitative field research methods for community health. Major public health issues in Ghana from a One Health perspective; interface between Western and traditional health care beliefs and practices in Ghana; community engagement experience employing participatory research methods with emphasis on social justice and ethical conduct of research.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
~~Effective Summer 2015~~ Effective Summer 2021

SCHOOL OF JOURNALISM

~~JRN 375~~
JRN 265

International Journalism and Media
Fall of every year. 3(3-0)

Survey of media and journalism news systems around the world. Contemporary issues in international journalism. Press theory and effects on press freedom and media independence. Foreign correspondence reporting.

~~SA: JRN 335~~ SA: JRN 335, JRN 375

~~Effective Fall 2015~~ Effective Fall 2021

~~JRN 475~~
JRN 365

International News and Government Dynamics

Spring of every year. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. R: Not open to freshmen.

Comparative features of global media and coverage within regional contexts that rotate each year: Latin America and the Caribbean; Africa and the Middle East; Europe; or Asia and the Pacific. Historical influences and impact of state-press relations and communications technologies.

SA: JRN 475

~~Effective Summer 2016~~ Effective Fall 2021

MSU COLLEGE OF LAW

LAW 508B

Corporate Finance

Fall of every year. 2 to 4 credits. ~~P: LAW 500M~~ P: LAW 500M or concurrently R: Open to students in the MSU College of Law.

~~This course focuses on the principles of accounting, valuation, and the basic financial environment of close corporations and public companies.~~ Principles of accounting, valuation, and the basic financial environment of close corporations and public companies.

SA: DCL 380

~~Effective Spring 2006~~ Effective Fall 2020

LAW 524B

Securities Regulation I

Spring of every year. 2 to 4 credits. ~~P: LAW 500M~~ P: LAW 500M or concurrently R: Open to students in the MSU College of Law.

~~This course explores the regulation requirements applied to public offers of securities. Emphasis will be placed on the Security Act of 1933 and the Michigan Blue Sky law.~~ Regulatory requirements applied to public offers of securities and publicly held companies.

SA: DCL 428

~~Effective Spring 2006~~ Effective Fall 2020

LAW 810F

~~Codex Alimentarius: The World Food Code~~
International Food Standards – FAO and WHO

Fall of every year. Spring of every year. Summer of every year. 0 to 6 credits. ~~R: Open to master's of law students.~~ R: Open to law advanced students. Not open to students with credit in ANR 490 or FSC 816.

~~Development and workings of Codex Alimentarius.~~ History, development and workings of the Codex Alimentarius Commission in formulating and harmonizing food standards and ensuring their global implementation; content and legal application of Codex Alimentarius.

~~Effective Fall 2012~~ Effective Fall 2020

DEPARTMENT OF LINGUISTICS AND GERMANIC, SLAVIC, ASIAN AND AFRICAN LANGUAGES

GRM 201

Second-Year German I

Fall of every year. Spring of every year. 3(3-0) P: (GRM 102) or designated score on German Placement test ~~R: Approval of department.~~

Intermediate-level development of all language skills. Reading, viewing, and discussion of a broad range of cultural materials from the German-speaking world.

~~Effective Summer 2020~~ Effective Summer 2021

- LIN 225 Language and Gender
Fall of every year. ~~Spring of every year. Summer of every year.~~ 3(3-0) Interdepartmental with Women's Studies.
Gender and language in societies around the world. Issues such as status, power and politeness in monolingual and multilingual societies. The role of gender in language development, language variation and language change.
~~Effective Fall 2015~~ Effective Fall 2020
- LIN 824 Phonological Theory I
~~Fall of every year. Spring of every year.~~ 3(3-0) RB: LIN 424
Major phonological theories, argumentation, and advanced skills of phonological analysis.
~~Effective Fall 2000~~ Effective Fall 2020
- LIN 825 Phonological Theory II
~~Fall of every year. Spring of every year.~~ 3(3-0) RB: LIN 824
Issues in phonology. Current controversies and trends of research in phonology.
~~Effective Fall 2000~~ Effective Spring 2021

DEPARTMENT OF MATHEMATICS

- MTH 201 Elementary Mathematics for Teachers I
Fall of every year. Spring of every year. ~~Summer of every year.~~ 3(3-0) ~~P: (MTH 103 or MTH 116 or MTH 124 or MTH 132 or MTH 152H or LB 118 or MTH 101 or MTH 102) or designated score on Mathematics Placement test~~ P: (MTH 103 or MTH 116 or MTH 124 or MTH 132 or MTH 152H or LB 118 or MTH 101 or MTH 102 or MTH 103B) or designated score on Mathematics Placement test R: Open to students in the Child Development major or in the Education Major or in the Special Education-Learning Disabilities Major or in the Teacher Certification Internship Year Studies Program.
~~Mathematics needed for K-8 teaching. Place value and models for arithmetic, mental math, word problems, and algorithms. Factors, primes, proofs, and prealgebra. Fractions, ratios, rates, and percentages. Negative, rational, and real numbers. Special emphasis on the appropriate sequential order for teaching. Mathematics needed for teaching grades PreK - 6. Place value, algorithms for whole numbers, decimals, and fractions with an emphasis on children's mathematical thinking.~~
~~Effective Spring 2019~~ Effective Fall 2019
- MTH 202 Elementary Mathematics for Teachers II
Fall of every year. Spring of every year. ~~Summer of every year.~~ 3(3-0) P: MTH 201 R: Open to students in the Education Major or in the Special Education-Learning Disabilities Major or in the Child Development major or in the Teacher Certification Internship Year Studies Program.
~~A continuation of MTH 201. Geometry, measurement, and elementary data analysis. A continuation of MTH 201. Measurement, elementary geometry, and elementary number theory with an emphasis on children's mathematical thinking.~~
~~Effective Fall 2013~~ Effective Fall 2020

DEPARTMENT OF MEDICINE

- MED 492 Basics and Methods in Biomedical Research
Fall of every year. Spring of every year. 2 to 4 credits. ~~P: ((BS 161 or BS 181H) and (BS 171 or BS 191H)) or LB 145 and ((MTH 103 or MTH 110 or MTH 116) or designated score on Mathematics Placement test) and (CEM 252 or CEM 352)~~ P: ((BS 161 or BS 181H) and (BS 171 or BS 191H)) or LB 145 and ((MTH 103 or MTH 116) or designated score on Mathematics Placement test) and (CEM 252 or CEM 352) R: Approval of department.
Introduction to research concepts, strategies, methods and laboratory techniques in biomedical research. Laboratory safety, regulations, quality control and quality assurance. Online presentations and hands-on experience.
~~Effective Spring 2015~~ Effective Summer 2020

DEPARTMENT OF MICROBIOLOGY AND MOLECULAR GENETICS

- MMG 999 Doctoral Dissertation Research
Fall of every year. Spring of every year. Summer of every year. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to graduate students in the Genetics Major or in the Microbiology and Molecular Genetics Major.
Doctoral dissertation research.
Request the use of the Pass-No Grade (P-N) system.
~~Effective Summer 2014~~ Effective Spring 2019

COLLEGE OF MUSIC

- MUS 465 Music in Early Childhood
Fall of every year. 2(2-0) R: Not open to freshmen or sophomores and open to students in the Music Education Major.
~~Music learning activities and teaching strategies for children ages three to six. Music learning activities and teaching strategies for children ages birth to 5.~~
~~Effective Fall 2016~~ Effective Fall 2020
- MUS 830 Research Methods and Materials in Music
Fall of every year. ~~Spring of every year. 4 to 3 credits.~~ 3(3-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Open to graduate students in the College of Music.
Organization, presentation, and documentation of research. Encyclopedias, indices, databases, and other aids.
~~Effective Fall 2007~~ Effective Fall 2021
- MUS 883 Advanced Computer Music Projects
Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. ~~P: MUS 882 or MUS 441 or approval of college~~ P: MUS 441 or approval of college R: Open to graduate students in the College of Music or in the Computer Science Major.
Techniques and principles of composition and research with computers. Use of computer hardware and software.
~~Effective Fall 2007~~ Effective Fall 2021

SCHOOL OF PLANNING, DESIGN AND CONSTRUCTION

- PDC 120 ~~Planning and Design-Digital Graphics~~
Introductory Digital Graphic Communications
Spring of every year. ~~Summer of every year.~~ 2(1-2) ~~R: Open to undergraduate students in the School of Planning, Design and Construction.~~
~~Planning and design graphic software applications. Basic and fundamental communications to present digital renderings in various forms using digital software.~~
~~Effective Fall 2013~~ Effective Fall 2021

DEPARTMENT OF PLANT BIOLOGY

- PLB 416L Plant Physiology Laboratory
Spring of every year. 2(1-3) ~~P: (CEM 143 or CEM 351 or CEM 251) and (BS 161 or LB 145 or BS 181H) and (PLB 415 or concurrently) and (BS 171 or BS 191H or approval of department)~~ P: (CEM 143 or CEM 351 or CEM 251) and (BS 161 or LB 145 or BS 181H) and (PLB 415 or concurrently) and (BS 171 or BS 191H or LB 145 or approval of department)
Experimental methods and experiment design in plant physiology and molecular biology, with emphasis in photosynthesis, water relations, plant growth, plant development, genetics and gene regulation. Communication of scientific information in written and graphical format.
~~Effective Fall 2017~~ Effective Spring 2021

PLB 495 ~~Botanical Garden Internship~~
Internship in Plant Biology
Fall of every year. Spring of every year. Summer of every year. ~~2 to 8 credits. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.~~ R: Approval of department; application required.
~~Activities, functions and organization of botanical gardens. Principles of live plant curation. Supervised professional experience related to plant biology in industry, government, or non-profit settings.~~
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 3 semesters after the end of the semester of enrollment.
~~SA: BOT 495~~
Effective Fall 2014 Effective Fall 2020

DEPARTMENT OF POLITICAL SCIENCE

~~PLS 481H~~
PLS 481 Undergraduate Research Seminar
Fall of every year. Spring of every year. ~~4(4-0) 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: PLS 200 or concurrently or approval of department P: PLS 200 or concurrently RB: PLS 201 or concurrently R: Approval of department.~~
Advanced research seminar for students in the political science program.
~~SA: PLS 481H~~
Effective Fall 2016 Effective Fall 2021

~~PLS 490H~~
PLS 490 ~~Honors Internship~~
Guided Research
Fall of every year. Spring of every year. ~~Summer of every year. 3 to 6 credits. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: (PLS 200 or concurrently) or (PLS 201 or concurrently) or approval of department RB: PLS 200 and PLS 201 R: Approval of department.~~
~~Supervised participation in research or teaching. Guided research on selected topics for students in the political science program.~~
~~SA: PLS 490H~~
Effective Fall 2014 Effective Fall 2021

DEPARTMENT OF RELIGIOUS STUDIES

REL 215 ~~The Sound Of World Religions: Music, Chant, and Dance~~
Music and Religion
Fall of even years. 3(3-0)
Introduction to the lived experience of world religions through investigation of their sacred songs.
~~Effective Spring 2015~~ Effective Fall 2021

DEPARTMENT OF ROMANCE AND CLASSICAL STUDIES

FRN 201 Second-Year French I
Fall of every year. Spring of every year. 4(4-0) ~~P: (FRN 102 or FRN 150) or designated score on French Placement test~~ P: (FRN 102) or designated score on French Placement test
Intermediate-level review and development of aural comprehension, speaking, reading, and writing skills. Topics in the cultures of the French-speaking world.
~~Effective Spring 2014~~ Effective Fall 2020

DEPARTMENT OF STATISTICS AND PROBABILITY

STT 380 Probability and Statistics for Data Science
Fall of every year. Spring of every year. 4(4-0) P: ~~((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) and (MTH 314 or concurrently)~~ P: ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) and (MTH 314 or concurrently) and STT 180
Fundamental concepts and methods in probability and statistics from a data science perspective.
~~Effective Fall 2019~~ Effective Fall 2020

DEPARTMENT OF SUPPLY CHAIN MANAGEMENT

SCM 372 ~~Manufacturing Planning and Control~~
Manufacturing and Service Operations Management
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: SCM 303 and MKT 317
R: Open to juniors or seniors in the Supply Chain Management Major or in the Applied Engineering Sciences Major or approval of department.
Production planning, demand management, master scheduling, materials requirements, and capacity planning. Shop floor control, computer-integrated manufacturing, and just-in-time systems.
SA: MGT 402, MSC 402, MSC 372
~~Effective Spring 2018~~ Effective Fall 2021

SCM 462 ~~End to End Supply Chain Management Simulation~~
End-to-End Supply Chain Analytics Using Simulation
~~Fall of every year.~~ Spring of every year. 1(1-0) R: Open to seniors in the Department of Supply Chain Management or approval of department.
Simulation exercise and competition in the design and operation of global supply chains
~~Effective Fall 2017~~ Effective Fall 2021

SCM 463 ~~Supply Chain Enterprise Resource Planning Applications~~
Supply Chain Enterprise Resource Planning Technology Applications
On Demand. 1 to 3 credits. R: Open to seniors in the Department of Supply Chain Management or approval of department.
Workshop with hands-on experience in enterprise resource planning applications.
~~Effective Spring 2019~~ Effective Fall 2021

SCM 470 ~~Supply Chain Application and Policy (W)~~
Integrated Supply Chain Management Capstone (W)
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: (SCM 371 and SCM 372 and SCM 373) and completion of Tier I writing requirement R: Open to seniors in the Supply Chain Management Major.
Analysis and problem solving of supply chain management cases, specifically purchasing, operations, and logistics problems.
SA: MSC 470
~~Effective Fall 2019~~ Effective Fall 2021

SCM 472 ~~Supply Chain Industry Applications~~
Experiential Learning with Industry Problems in Supply Chain (W)
Spring of every year. 3(3-0) P: (SCM 371 and SCM 372 and SCM 373) and completion of Tier I writing requirement R: Open to seniors in the Department of Supply Chain Management. Not open to students with credit in SCM 470.
Integrated analysis and problem solving of supply chain management applications in collaboration with Engineering. Purchasing, manufacturing, logistics, and transportation as an integrated supply chain.
~~Effective Fall 2017~~ Effective Fall 2021

SCM 479

~~Supply Chain Cost Management~~

Supply Chain Cost Analysis and Application

Fall of every year. Spring of every year. 2(2-0) P: SCM 371 R: Open to juniors or seniors in the Supply Chain Management Major.

Pricing and cost management basics, cost models, parametric cost modeling, process mapping for cost management, total cost of ownership, target costing for purchased materials, value analysis and value engineering, using cost analysis to support purchase negotiations, current trends in cost management.

SA: MSC 479

~~Effective Fall 2016~~ Effective Fall 2021