

MICHIGAN STATE UNIVERSITY

**Report of
THE UNIVERSITY COMMITTEE ON CURRICULUM
to the Faculty Senate
January 18, 2022**

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

January 18, 2022

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

January 18, 2022

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 **Disciplinary Teaching Minor in Agriculture, Food and Natural Resource Education** in the Department of Community Sustainability. The Teacher Education Council (TEC) approved this request at its November 8, 2021 meeting.

a. Under the heading **AGRICULTURE, FOOD AND NATURAL RESOURCE EDUCATION** replace the entire entry with the following:

Students must complete:

1. All of the following courses (14 credits):

ANS	110	Introductory Animal Agriculture	3
CSS	101	Introduction to Crop Science	3
CSUS	200	Introduction to Sustainability	3
CSUS	343	Community Food and Agricultural Systems	3
TE	409	Crafting Teaching Practices in the Secondary Teaching Minor	1
TE	503	Internship in Teaching Diverse Learners in Additional Endorsement Areas	1
2. One of the following courses (3 credits):

AFRE	100	Decision-making in the Agri-Food System	3
AFRE	130	Farm Management I	3
3. One of the following courses (2 or 3 credits):

CSS	143	Introduction to Soil Science	2
CSS	210	Fundamentals of Soil Science	3
4. One of the following groups (3 credits):
 - a.

HRT	242	Passive Solar Greenhouses for Protected Cultivation	1
HRT	243	Organic Transplant Production	1
HRT	253	Compost Production and Use	1
 - b.

HRT	203	Introduction to Horticulture	3
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5. One of the following groups (6 credits):
 - a.

CSUS	860	Youth Leadership: Theory and Practice	3
CSUS	861	Educational Theory and Application of Experiential Learning in AFNR	3
 - b.

CSUS	222A	Seminar in Instructional Theory I – Agriculture, Food and Natural Resources Education	1
CSUS	222B	Seminar in Instructional Theory II – Agriculture, Food and Natural Resources Education	1
CSUS	222C	Seminar in Instructional Theory III – Agriculture, Food and Natural Resources Education	1
CSUS	223A	Seminar in Leadership Theory I – Agriculture, Food and Natural Resources Education	1
CSUS	223B	Seminar in Leadership Theory II – Agriculture, Food and Natural Resources Education	1

CSUS 223C Seminar in Leadership Theory III –
 Agriculture, Food and Natural
 Resources Education

Effective Summer 2022.

2. Change the requirements for **Bachelor of Science** degree in **Environmental Studies and Sustainability** in the Department of Community Sustainability.

a. Under the heading **Requirements for the Bachelor of Science Degree in Environmental Studies and Sustainability** replace the item 3. with the following:

The following requirements for the major (64 to 66 credits):

- a. All of the following Science Foundations courses (15 credits):
- | | | | |
|------|-----|--|---|
| BS | 161 | Cell and Molecular Biology | 3 |
| BS | 162 | Organismal and Population Biology | 3 |
| BS | 172 | Organismal and Population Biology Laboratory | 2 |
| CEM | 141 | General Chemistry | 4 |
| IBIO | 355 | Ecology | 3 |
- b. One of the following Applied Earth Sciences courses (3 or 4 credits):
- | | | | |
|-----|-----|------------------------------|---|
| CSS | 210 | Fundamentals of Soil Science | 3 |
| GEO | 206 | Physical Geography | 3 |
| GLG | 201 | The Dynamic Earth | 4 |
- c. All of the following Community Sustainability Core courses (16 credits):
- | | | | |
|------|-----|---|---|
| CSUS | 200 | Introduction to Sustainability | 3 |
| CSUS | 221 | Seminar in Environmental and Sustainability Careers | 1 |
| CSUS | 300 | Theoretical Foundations of Sustainability | 3 |
| CSUS | 301 | Community Engagement for Sustainability (W) | 3 |
| CSUS | 310 | History of Environmental Thought and Sustainability | 3 |
| CSUS | 400 | Topics in Environmental Justice | 3 |
- d. One of the following Intermediate Energy, Water, Land courses (3 credits):
- | | | | |
|------|-----|---------------------------------------|---|
| CSUS | 259 | Sustainable Energy and Society | 3 |
| CSUS | 320 | Environmental Planning and Management | 3 |
| CSUS | 354 | Water Resources Management | 3 |
- e. One of the following Advanced Energy, Water, Land courses (3 credits):
- | | | | |
|------|-----|---|---|
| CSUS | 426 | Conservation Planning and Adaptive Management | 3 |
| CSUS | 453 | Watershed Planning and Management | 3 |
| CSUS | 459 | Clean Energy System Policy | 3 |
- f. Two of the following Community Sustainability Intermediate Electives (6 credits):
- | | | | |
|------|-----|--|---|
| CSUS | 215 | International Development and Sustainability | 3 |
| CSUS | 265 | Exploring Environmental and Sustainability Issues
and Policy Using Film | 3 |
| CSUS | 273 | Introduction to Travel and Tourism | 3 |
| CSUS | 276 | Sustaining our National Parks and Recreation Lands | 3 |
| GEO | 221 | Introduction to Geographic Information | 3 |
- g. Two of the following Community Sustainability Advanced Electives (6 or 7 credits):
- | | | | |
|------|-----|---|---|
| CSUS | 343 | Community Food and Agricultural Systems | 3 |
| CSUS | 431 | Interpretation and Visitor Information Systems | 3 |
| CSUS | 445 | Community-Based Environmental and Sustainability
Education | 3 |
| CSUS | 473 | Social Entrepreneurship for Community Sustainability | 3 |
| CSUS | 476 | Natural Resource Recreation Management | 4 |
- h. Two of the following Administration and Leadership courses (6 credits):
- | | | | |
|------|-----|--|---|
| CSUS | 322 | Leadership for Community Sustainability | 3 |
| CSUS | 429 | Program Evaluation for Community Sustainability | 3 |
| CSUS | 430 | Non-Profit Organizational Management for
Community Sustainability | 3 |
| CSUS | 433 | Grant Writing and Fund Development | 3 |
- i. One of the following Policy and Law courses: (3 credits)
- | | | | |
|------|-----|---|---|
| CSUS | 464 | Environmental and Natural Resource Policy in Michigan | 3 |
| CSUS | 465 | Environmental and Natural Resource Law | 3 |

- j. A minimum of 3 credits in one of the following courses:

CSUS	418	Community Sustainability Study Abroad	3 to 6
CSUS	419	International Studies in Community Sustainability	3 to 12
CSUS	493	Professional Internship in Community Sustainability	3 to 6

Students may substitute another appropriate course with approval of the department.

Effective Fall 2022.

3. Change the requirements for the **Bachelor of Science** degree in **Forestry** in the Department of Forestry.

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

- (1) Replace paragraph two with the following:

The University's Tier II writing requirement for the Forestry major is met by completing Forestry 330, 340L, 406L, 414, and 462. Those courses are referenced in item 3. a. below.

- (2) In item 3. a. change the total credits from '64' to '61'.

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

FOR	405	Forest Ecosystem Services	3
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- (4) In item 3. d. delete the following course:

FW	443	Restoration Ecology	3
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Add the following courses:

FW	417	Wetland Ecology and Management	3
PLB	443	Restoration Ecology	3

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

WRA	341	Nature and Environmental Writing	3
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Add the following course:

CSUS	433	Grant Writing and Fund Development	3
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Effective Fall 2022.

4. Change the requirements for the **Minor in Forestry** in the Department of Forestry.

- a. Under the heading **Requirements for the Minor in Forestry** make the following changes:

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

FOR	405	Forest Ecosystem Services	3
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- (2) In item 4., delete the following courses:

FOR	404	Forest Ecology	3
FOR	404L	Forest Ecology Laboratory	1
FOR	412	Wildland Fire	2

Add the following courses:

FOR	340	Forest Ecology	3
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FOR	340L	Forest Ecology Laboratory	1
FOR	413	Wildland Fire Ecology and Management	3

Effective Fall 2022.

5. Change the requirements for the **Minor in Urban and Community Forestry** in the Department of Forestry.

a. Under the heading **Requirements for the Minor in Urban and Community Forestry** make the following changes:

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

FOR	405	Forest Ecosystem Services	3
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(2) In item 4., delete the following course:

FOR	404	Forest Ecology	3
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Add the following course:

FOR	340	Forest Ecology	3
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Effective Summer 2022.

ELI BROAD COLLEGE BUSINESS

1. Change the requirements for the **Minor in Retail Management** in the Department of Management.

a. Under the heading **Requirements for the Minor in Retail Management** make the following changes:

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

MKT	351	Retail Management	3
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(2) In item 4., delete the following courses:

FIM	460	Retail Information Systems	3
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MGT	416	Labor Management Relations	3
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MKT	355	Entrepreneurship: Strategic Marketing Planning and Launch	3
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MKT	439	Strategic Management for Food and Agribusiness Firms (W)	3
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Add the following courses:

AFRE	340	Food Marketing Research and Analytics	3
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AFRE	445	Strategic Management for Food and Agribusiness Firms (W)	3
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Effective Spring 2022.

COLLEGE OF COMMUNICATION ARTS AND SCIENCES

1. Change the requirements for the **Master of Arts** degree in **Health and Risk Communication** in the College of Communication Arts and Sciences. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.

- a. Under the heading **Admission** delete item 4. and renumber items 5. and 6. respectively:

4. the Graduate Record Examination General Test scores.

- b. Under the heading **Requirements for the Master of Arts Degree in Health and Risk Communication** in item 3., delete the following course:

ADV	860	Media Relations	3
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Add the following course:

ADV	845	Advertising and Public Relations for Health, Science, and the Environment	3
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Effective Summer 2022.

2. Change the requirements for the **Graduate Specialization in Nonprofit Fundraising** in the Department of Communication. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.

- a. Under the heading **Requirements for the Graduate Specialization in Nonprofit Fundraising**, in item 2., delete the following course:

ADV	823	Consumer Behavior Theories	3
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Add the following course:

ADV	800	Advertising and Public Relations Theory	3
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Effective Summer 2022.

3. Delete the curriculum and degree requirements for the **Disciplinary Teaching Minor in Journalism**, available for secondary certification, in the School of Journalism. The University Committee on Undergraduate Education (UCUE) provided consultative commentary to the Provost after considering this request. The Provost made the determination after considering the consultative commentary from the University Committee on Undergraduate Education to discontinue the program.

No new students are to be admitted to the program effective Fall 2021. No students are to be readmitted to the program effective Fall 2021. Effective Fall 2021, coding for the program will be discontinued and the program will no longer be available in the School of Journalism. Students who have not met the requirements for the Disciplinary Teaching Minor in Journalism through the School of Journalism prior to Fall 2021 will have to change their minor.

COLLEGE OF ENGINEERING

1. Change the requirements in the **Master of Science** degree in **Computer Science** in the Department of Computer Science and Engineering. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.
 - a. Under the heading **Requirements for the Master of Science Degree in Computer Science** make the following changes:
 - (1) Under the heading **Theory and Algorithms** add the following course:

CSE	814	Formal Methods in Software Development	3
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 - (3) Under the heading **Data Analysis and Applications** add the following courses:

CSE	840	Computational Foundations in Artificial Intelligence	3
CSE	849	Deep Learning	3

Effective Fall 2022.

2. Change the requirements in the **Doctor of Philosophy** degree in **Computer Science** in the Department of Computer Science and Engineering. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.
 - a. Under the heading **Requirements for the Doctor of Philosophy Degree in Computer Science** make the following changes:
 - (1) Replace item 1. with the following:

Students must complete a minimum of 30 credits beyond the research requirements in CSE 999. Students must maintain a cumulative grade-point average of at least 3.00 in all courses counted towards the 30 credits. The student's guidance committee reserves the right to require additional course work beyond the minimum. Students should contact the graduate director for approval of any courses outside the Department of Computer Science and Engineering.
 - (2) In item 3. under the heading **Theory and Algorithms** add the following course:

CSE	814	Formal Methods in Software Development	3
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 - (3) In item 3. under the heading **Data Analysis and Applications** add the following courses:

CSE	840	Computational Foundations in Artificial Intelligence	3
CSE	849	Deep Learning	3

Effective Fall 2022.

JAMES MADISON COLLEGE

1. Change the requirements for the **Bachelor of Arts** degree in **James Madison College [Social Relations and Policy]**. The Teacher Education Council (TEC) approved this request at its November 8, 2021 meeting.
 - a. Under the heading **Requirements for the Bachelor of Arts Degree in James Madison College** make the following changes:
 - (1) Under the heading **Social Relations and Policy** make the following change:
 - (a) In item 1. c. add the following course:
MC 338 Environmental Justice and Global Change 4

Effective Summer 2022.

COLLEGE OF NATURAL SCIENCE

1. Change the requirements for the **Bachelor of Science** degree in **Biochemistry and Molecular Biology** in the Department of Biochemistry and Molecular Biology.
 - a. Under the heading **Requirements for the Bachelor of Science Degree in Biochemistry and Molecular Biology** make the following changes:
 - (1) In item 3. a. change the total credits from '61 to 69' to '58 to 64'.
 - (2) In item 3. a. (1) change the total credits from '11' to '8' and delete the following course:
CEM 262 Quantitative Analysis 3
 - (3) Change item 3. a. (4) to the following:
One of the following groups of courses (2 credits):
 - (a) CEM 161 Chemistry Laboratory I 1
CEM 162 Chemistry Laboratory II 1
 - (b) LB 171L Introductory Chemistry Laboratory I 1
LB 172L Principles of Chemistry II - Reactivity Laboratory 1
 - (c) CEM 185H Honors Chemistry Laboratory I 2
 - (4) In item 3. a. (5) (a) add the following course:
LB 271 Organic Chemistry 3
 - (5) Change item 3. a. (8) (b) to the following and reletter (b), (c), and (d) respectively:
PHY 221 Studio Physics for Life Sciences I 4
PHY 222 Studio Physics for Life Sciences II 4
 - (6) In item 3. b. change the total credits from '13' to '18' and delete the following courses:
BMB 470 Advanced Molecular Biology Laboratory 3
BMB 471 Advanced Biochemistry Laboratory 3
Add the following courses:
BMB 370 Introductory Biochemistry Laboratory 3
BMB 470 Advanced Molecular Biology Laboratory 4
BMB 471 Advanced Biochemistry Laboratory 4

Effective Summer 2022.

2. Change the requirements for the **Bachelor of Science** degree in **Biochemistry and Molecular Biology/Biotechnology** in the Department of Biochemistry and Molecular Biology.
- a. Under the heading **Requirements for the Bachelor of Science Degree in Biochemistry and Molecular Biology/Biotechnology** make the following changes:
- (1) In item 3. a. change the total credits from '66 to 73' to '63 to 71'.
 - (2) In item 3. a. (1) change the total credits from '11' to '8' and delete the following course:

CEM	262	Quantitative Analysis	3
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 - (3) Change item 3. a. (4) to the following:
One of the following groups of courses (2 credits):
 - (a)

CEM	161	Chemistry Laboratory I	1
CEM	162	Chemistry Laboratory II	1
 - (b)

LB	171L	Introductory Chemistry Laboratory I	1
LB	172L	Principles of Chemistry II - Reactivity Laboratory	1
 - (c)

CEM	185H	Honors Chemistry Laboratory I	2
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 - (4) In item 3. a. (5) (a) add the following course:

LB	271	Organic Chemistry	3
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 - (5) Change item 3. a. (8) (b) to the following and reletter item (b), (c), and (d) respectively:

PHY	221	Studio Physics for Life Sciences I	4
PHY	222	Studio Physics for Life Sciences II	4
 - (6) In item 3. a. (9) change the total credits from '3' to '3 or 4' and change the credits for BMB 470 from '3' to '4'.
 - (7) In item 3. b. change the total credits from '10' to '14' and delete the following course:

BMB	471	Advanced Biochemistry Laboratory	3
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Add the following courses:

BMB	370	Introductory Biochemistry Laboratory	3
BMB	471	Advanced Biochemistry Laboratory	4

Effective Summer 2022.

3. Change the requirements for the **Graduate Certificate in Neuroscience and the Law** in the Program in Neuroscience. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.
- a. Under the heading **Requirements for the Graduate Certificate in Neuroscience and the Law** replace the entire entry with the following:
- Students must complete a minimum of 12 credits from the following courses:
1. Both of the following courses (3 credits):

NEU	840	Introduction to Brain and Behavioral Disorders	2
NEU	892	Special Topics in Neuroscience and the Law	1

2.	Complete 9 credits from the following courses (9 credits):		
	NEU 842	Neuroethics	3
	NEU 843	Methods for Assessing the Nervous System	3
	NEU 844	The Science and Ethics of Brain Interventions	3
	NEU 845	Neuroscience of Drug Use and Human Disorders	3

Effective Summer 2022.

4. Establish a **Master of Science** degree in **Accelerator Science and Engineering** in the Department of Physics and Astronomy. The University Committee on Graduate Studies (UCGS) recommended approval of this request at its September 20, 2021 meeting.

a. **Background Information:**

Recent Department of Energy (DOE) and National Science Foundation (NSF) studies detailed issues with producing a sufficient number of highly trained Accelerator Science and Engineering (AS&E) specialists to meet needs in both DOE laboratory facilities, discovery science, and technology/industry. Fulfilling these needs is critical to maintaining U.S. leadership in accelerator technology and enhancing economic growth. In 2017 the DOE issued a Funding Opportunity Announcement for Traineeship in AS&E. MSU's proposal was the sole recipient of a DOE grant to address critical workforce needs in AS&E. Historically, MSU has produced a highly technical workforce in AS&E due to the presence of the National Superconducting Cyclotron Laboratory (NSCL). For decades, many graduate students have been trained at the NSCL under NSF-sponsored cooperative agreements and other federal funding. Currently MSU offers master's and doctoral degrees in physics and in engineering. MSU now has the opportunity to offer an exciting training opportunity in accelerator science and engineering. The AS&E Traineeship (ASET) program at MSU is supported by the DOE and leverages the unique campus-based equipment, systems, and experts at the Facility for Rare Isotope Beams (FRIB) and NSCL. It also makes use of the many MSU faculty involved with the ASET program across several MSU academic programs and couples them with resources at U.S. DOE national laboratories. Partnering academic programs at MSU include the Departments of Physics and Astronomy, and Chemistry in the College of Natural Science in addition to the Department of Electrical and Computer Engineering in the College of Engineering. MSU has established a novel AS&E graduate student program to address all the major need areas stressed in the recent DOE and NSF studies: (1) Physics and engineering of large accelerators; (2) Superconducting RF (SRF) accelerator physics and engineering; (3) RF power engineering; (4) Large-scale cryogenic systems.

Students completing the curriculum will be certified, well trained, and ready for productive careers in AS&E where there are critical workforce needs nationally. The AS&E master's program leverages the unique campus-based equipment, systems, and experts at the Facility for Rare Isotope Beams and NSCL. The department currently administers a Graduate Certificate in Accelerator Science and Engineering.

With the recent development of FRIB at MSU, the opportunities for graduate student training in AS&E at MSU have multiplied. Presently, MSU is building FRIB, a new ~\$1B national-user facility for nuclear science funded by the DOE, MSU, and the state of Michigan. FRIB provides numerous training opportunities in the areas one through four listed above in a large facility. The large increase in scale constituted by FRIB (~ 5x larger) relative to the NSCL results in national-lab-scale facilities that can be exploited to do much more in AS&E training at MSU relative to historic levels to help address critical needs in the field. FRIB's location on campus provides unique opportunities for AS&E student training at a world-class accelerator facility while the students are enrolled in Physics and Engineering courses.

b. **Academic Programs Catalog Text:**

The Master of Science degree in Accelerator Science and Engineering provides graduate students the opportunity to further their understanding of accelerator science and technology. Graduates will be certified, well trained, and ready for productive careers in Accelerator Science and Engineering. Research is supported by the Accelerator Science and Engineering Traineeship (ASET) Program. Students will gain a broad understanding of physics and engineering of large accelerators; superconducting radio frequency accelerator physics and engineering; radio frequency power engineering; and large-scale cryogenic systems, and their role in accelerator science and

engineering. Upon completion of the program, students are able to contribute to the research and development of accelerator systems and associated technologies and support operations of accelerator systems, primarily, but not limited to accelerator systems at National Laboratories and industries.

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

Admission

For admission to the master's degree program in accelerator science and engineering on regular status, the student must have:

1. Completed mathematics and physics courses equivalent to those that are required for an undergraduate major in physics.
2. A satisfactory grade–point average, normally at least 3.00, in the courses referenced in item 1. above.
3. General GRE and Physics GRE examinations are required for admission to the program. Scores should be sent electronically, directly to Michigan State University.
4. For international students, except those with a 4-year degree from a U.S. institution, TOEFL examination scores must be submitted with a total average score of 100 or higher on the iBT.

Students who do not meet the requirements for admission to the program on regular status may be admitted on a provisional basis to remove deficiencies. Collateral course work will not count towards the requirements for the degree.

Requirements for the Master of Science Degree in Accelerator Science and Engineering

CREDITS

The student must complete a total of 30 credits for the degree with a grade-point average of 3.00 under Plan A (with thesis). A minimum of 16 credits must be at the 800-level or above.

Requirements for Plan A:

1. The following course (3 credits):

	PHY 862	Accelerator Systems	3
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2. At least two courses from the following or any other 800 or 900-level accelerator science-focused courses as approved by the Physics and Astronomy Graduate Program Director (6 credits):

	ECE 837	Computational Methods in Electromagnetics	3
	ECE 850	Electrodynamics of Plasmas	3
	ECE 989	Advanced Topics in Plasmas	3
	PHY 861	Beam Physics	3
	PHY 864	Accelerator Technology	3
	PHY 905	Special Problems	3
	PHY 961	Nonlinear Beam Dynamics	3
	PHY 962	Particle Accelerators	3
	PHY 963	U.S. Particle Accelerator School	3
	PHY 964	Seminar in Beam Physics Research	3

Additional courses may be used to fulfill this requirement if approved by the Director of Graduate Studies. Up to 14 credits of undergraduate senior-level courses that have not been used towards any other degree may be used to fulfill this requirement with the exception of PHY 405 and PHY 490.

Additional Requirements for Plan A

1. Complete 5 to 10 credits of PHY 899 Master's Thesis Research.
2. Pass a final oral examination in defense of the thesis.

5. Change the name of the **Master of Science** degree in **Physiology to Molecular, Cellular, and Integrative Physiology** in the Department of Physiology in the Colleges of Human Medicine, Natural Science, Osteopathic Medicine, and Veterinary Medicine. The College of Natural Science is the primary administrative unit. The University Committee on Graduate Studies (UCGS) approved this request at its November 15, 2021 meeting.

Students admitted to the major prior to Summer 2022 will be awarded a Master of Science Degree in Physiology.

Students admitted to the major Summer 2022 and forward will be awarded a Master of Science Degree in Molecular, Cellular, and Integrative Physiology.

Effective Summer 2022.

COLLEGE OF SOCIAL SCIENCE

1. Change the requirements for the **Minor in Anthropology** in the Department of Anthropology.
- a. Under the heading **Requirements for the Minor in Anthropology** replace the entire entry with the following:

Complete a minimum of 18 credits from the following:

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

ANP 201	Introduction to Cultural Anthropology	3
ANP 203	Introduction to Archaeology	3
ANP 206	Introduction to Physical Anthropology	3
2. One of the following area courses (3 credits):

ANP 410	Anthropology of Latin America	3
ANP 411	North American Indian Ethnography	3
ANP 415	China: Culture and Society	3
ANP 417	Introduction to Islam in Africa	3
ANP 419	Anthropology of the Middle East	3
ANP 432	American Indian Women	3
ANP 433	Contemporary American Indian Communities	3
ANP 437	Asian Emigrant Communities: A Global Perspective	3
ANP 452	North American Archaeology	3
ANP 455	Archaeology of Ancient Egypt	3
3. Two of the following topical/analytical/methods courses (6 to 8 credits):

ANP 310	Archaeology of Human Migrations	3
ANP 320	Social and Cultural Theory	3
ANP 321	Anthropology of Social Movements	3
ANP 325	Anthropology of the Environment and Development	3
ANP 330	Race, Ethnicity, and Nation: Anthropological Approaches to Collective Identity	3
ANP 362	Archaeology of Foragers to Farmers	3
ANP 363	Rise of Civilization	3
ANP 364	Fake Archaeology: Pseudoscience and the Past	3
ANP 370	Culture, Health, and Illness	3
ANP 412	Method and Practice in Digital Heritage	3
ANP 420	Language and Culture	3
ANP 422	Religion and Culture	3
ANP 425	Issues in Medical Anthropology	3
ANP 426	Urban Anthropology	3
ANP 429	Ethnographic Field Methods	4
ANP 436	Globalization and Justice: Issues in Political and Legal Anthropology	3

ANP	439	Human Rights: Anthropological Perspectives	3
ANP	440	Hominid Fossils	3
ANP	441	Osteology and Forensic Anthropology	4
ANP	443	Human Adaptability	3
ANP	461	Method and Theory in Historical Archaeology	3
ANP	463	Laboratory Methods in Archaeology	3
ANP	486	Environmental Archaeology	3

Effective Summer 2022.

2. Delete the curriculum and degree requirements for the **Master of Arts degree in Professional Applications in Anthropology** in the Department of Anthropology. The University Committee on Graduate Studies (UCGS) provided consultative commentary to the Provost after considering this request. The Provost made the determination to discontinue the program after considering the consultative commentary from the University Committee on Graduate Studies.

No new students are to be admitted to the program effective Fall 2020. No students are to be readmitted to the program effective Fall 2020. Effective Fall 2021, coding for the program will be discontinued and the program will no longer be available in the Department of Anthropology. Students who have not met the requirements for the Master of Arts degree in Professional Applications in Anthropology through the Department of Anthropology prior to Fall 2021 will have to change their major.

3. Change the requirements for the **Bachelor of Arts degree in Economics** in the Department of Economics.

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

- (1) In item 1., paragraph three, delete Economics 406 and 412 from the Tier II writing requirement.

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

EC	306	Comparative Economics Systems	3
EC	406	Economic Analysis of Russia and the Commonwealth of Independent States (W)	3
EC	412	Economic Analysis of Latin America (W)	3

- (3) In item 3. c. delete the following courses:

EC	406	Economic Analysis of Russia and the Commonwealth of Independent States (W)	3
EC	412	Economic Analysis of Latin America (W)	3

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

STT	351	Probability and Statistics for Engineering	3
STT	430	Introduction to Probability and Statistics	3
STT	442	Probability and Statistics II: Statistics	3

- (5) Delete the optional cognate in business.

Effective Summer 2022.

4. Change the requirements for the **Bachelor of Science** degree in **Economics** in the Department of Economics.
- a. Under the heading **Requirements for the Bachelor of Science Degree in Economics** make the following changes:
- (1) In item 1., paragraph three, delete Economics 406 and 412 from the Tier II writing requirement.
 - (2) In item 3. b. delete the following courses:

EC	306	Comparative Economics Systems	3
EC	406	Economic Analysis of Russia and the Commonwealth of Independent States (W)	3
EC	412	Economic Analysis of Latin America (W)	3
 - (3) In item 3. c. delete the following courses:

EC	406	Economic Analysis of Russia and the Commonwealth of Independent States (W)	3
EC	412	Economic Analysis of Latin America (W)	3
 - (4) In item 3. i. add the following course:

STT	380	Probability and Statistics for Data Science	4
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 - (5) Delete the optional cognate in business.

Effective Summer 2022.

5. Establish a **Graduate Certificate** in **Animal Studies: Social Science and Humanities Perspectives** in the Department of Sociology. The University Committee on Graduate Studies (UCGS) approved this request at its September 13, 2021 meeting.

a. **Background Information:**

The proposed Graduate Certificate in Animal Studies: Social Science and Humanities Perspectives will address one of the most challenging questions of our time: how can humans and other animals coexist in altruistic ways so that all beings thrive within our global ecosystem? The “animal question” is increasingly vital within law, public policy, ethics, and health. The growth in the critical evaluation of human-animal relationships is due to the widespread recognition of: (1) the commodification of animals in a wide variety of human contexts, such as the use of animals as food, labor, and objects of spectacle; (2) the degradation of the natural world, a staggering loss of animal habitat, and species extinction; and (3) the increasing need to coexist with other animals in urban, rural, and natural contexts.

Animal studies, sometimes known as human-animal studies and anthrozoology, is the scholarly investigation of the relationships between humans (as individuals, within communities, and in societies) and non-human animals (as individuals, in groups, and as species). The term “animal studies” refers to the social science/humanities-focused complement to the traditional bio-scientific study of animal behavior in disciplines such as animal science, zoology, and veterinary medicine. Animal studies extends scholarly examination to the cultural conditions of the relationship between humans and other animals. “Animal Studies” is the programmatic name for the field used by a dozen scholarly programs at U.S. colleges and universities, numerous academic book series, and a major reference work The Oxford Handbook of Animal Studies.

Currently, there are 28 undergraduate major and minor programs in animal studies at universities and colleges in North America, including:

- Animal Studies Major at Eastern Kentucky University;
- Animal Studies Major at Eckerd College;
- Animal Studies Major and Minor at Southwestern University;
- Animal Studies Minor at Appalachian State University;
- Animal Studies Minor at Drury University;
- Animal Studies Minor and MA Degree at New York University;
- Animal Studies Minor at St. Joseph's University;
- Animal Studies Cluster at Wesleyan University;
- Animal Studies Constellation at University of Wisconsin-Madison; and
- Animal Studies Project at Harvard University.

Many of these programs would be potential feeder schools for the proposed Graduate Certificate in Animal Studies: Social Sciences and Humanities Perspectives. There are also 30 graduate programs in animal studies in the U.S. (including MSU's Graduate Specialization in Animal Studies: Social Sciences and Humanities Perspectives), as well as a substantial number of undergraduate, graduate, and professional programs in related fields such as animal-assisted therapy and animal law. Furthermore, many institutions that do not offer programs in animal studies nonetheless offer animal studies courses and courses on related topics including animal ethics and animal law. However, unlike most of these programs, our proposal is for an online-only program that would not require enrollment in a degree program nor presence on campus and would attract a much broader audience. This online program replaces MSU's Graduate Specialization in Animal Studies: Social Sciences and Humanities Perspectives, which is the only animal studies doctoral-level program in North America.

b. **Academic Programs Catalog Text:**

The Graduate Certificate in Animal Studies: Social Science and Humanities Perspectives, which is administered by the Department of Sociology, is an online program available to any individual with a bachelor's degree. The certificate addresses society's changing needs in providing individuals with a basic understanding of human relationships with other animals, including domestic and companion animals, liminal animals, and wildlife. The certificate is valuable as a complementary learning opportunity for individuals with, or who are planning careers in animal-related fields, including animal-assisted therapy, marine ecosystems, conservation criminology, animal shelters, sanctuaries, refuges, rehabilitation centers, and zoo management and education.

Requirements for the Graduate Certificate in Animal Studies: Social Science and Humanities Perspectives

			CREDITS
Students must complete 9 credits from the following:			
SOC	830	Animals and Environmental Sustainability	3
SOC	840	Animals and Social Transformations	3
SOC	850	Special Topics in Animal Studies	3

Effective Summer 2022.

PART II - NEW COURSES

DEPARTMENT OF COMMUNITY SUSTAINABILITY

- CSUS 477 Nature-based Tourism
Spring of every year. 3(3-0) P: CSUS 273 or CSUS 276 R: Open to juniors or seniors or graduate students.
Nature-based tourism types and differentiations from other forms of tourism.
Environmental, social/cultural, and managerial impacts. Examination of applied research in the nature-based tourism field.
Effective Spring 2023

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

- CSE 840 Computational Foundations in Artificial Intelligence
Fall of every year. 3(3-0) RB: MTH 314 and STT 441 or equivalent R: Open to graduate students in the Department of Computer Science and Engineering or approval of department.
Conduct research in machine learning, artificial intelligence, deep learning, data mining, and other related fields.
Effective Fall 2022
- CSE 849 Deep Learning
Spring of every year. 3(3-0) RB: MTH 314 and STT 441 or equivalent
CSE 841 or 842 or 847 R: Open to graduate students in the Department of Computer Science and Engineering or approval of department.
Overview of both the foundational ideas and the recent advances in deep neural network algorithms and applications.
Effective Fall 2022
- CSE 892 Exploration of Research in Computer Science and Engineering
On Demand. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course.
R: Approval of department.
Exploring research in computer science under faculty supervision, including but not limited to attending research group meetings, assisting faculty with a specific research project, and/or reading research literature.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2022

DEPARTMENT OF ENTOMOLOGY

- ENT 804 Scientific Communication
Fall of every year. 2(2-0)
Topics in scientific communication, the publication process, publication ethics and the development of scientific manuscript writing skills.
Effective Fall 2020

DEPARTMENT OF FORESTRY

- FOR 111 Field Explorations of Urban and Community Forestry
Summer of every year. 1 credit. R: Open to agricultural technology students.
Introduction to urban and community forestry, including networking, equipment operations, and tree identification. One week summer course.
Effective Summer 2022
- FOR 112 Career Development in Urban and Community Forestry
Spring of every year. 1(1-0) P: FOR 111 R: Open to agricultural technology students.
Preparation for academic success and professional careers in urban and community forestry. Effective communication, problem solving, and time management.
Effective Fall 2022

- FOR 113 Urban Tree Care Equipment and Worker Safety
Fall of every year. 2(0-4) R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Equipment use, maintenance, and safety standards in the tree care industry.
Effective Fall 2022
- FOR 114 Introduction to Climbing and Aerial Tree Work
Spring of every year. 1(0-3) P: FOR 113 R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Practices and techniques of tree climbing and aerial tree work.
Effective Fall 2022
- FOR 120 Survey of Urban and Community Forestry
Spring of every year. 2(2-0) R: Open to agricultural technology students.
Introduction to core concepts related to urban and community forests.
Effective Fall 2022
- FOR 125 Methods of Engagement in Urban and Community Forestry
Fall of every year. 2(2-0) P: FOR 120 or approval of department R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Engaging with community members, stakeholders, and partners to share in decision making processes that benefit the urban community landscape.
Effective Fall 2022
- FOR 225 Urban Forestry Information Technology
Spring of every year. 3(1-4) P: FOR 222 R: Open to agricultural technology students.
Urban and community forestry data acquisition, data management and spatial analysis through a series of hands-on projects.
Effective Fall 2022
- FOR 235 Urban Tree Care Practicum
Fall of every year. 3(1-4) P: HRT 213 and FOR 113 and FOR 114 R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Practice of skills associated with urban tree care work.
Effective Fall 2022
- FOR 240 Crew Leadership and Management in Arboriculture
Spring of every year. 2(1-3) P: FOR 235 RB: Completion of a majority of the IAT Urban Forest Management courses or established background with working in the urban and community forestry industry. R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Aspects of crew leadership and communication in arboriculture.
Effective Fall 2022
- FOR 245 Capstone Experience in Urban and Community Forestry
Spring of every year. 2(1-3) P: FOR 125 and (FOR 225 or concurrently) and FOR 235 R: Open to agricultural technology students and open to undergraduate students in the Forestry Major.
Applications of urban forestry to improve green infrastructure for cities, towns and communities. Tree selection, risk assessment, cost-benefit analysis, landscape planning, values and perceptions.
Effective Fall 2022
- FOR 471 Consulting Forestry
Spring of every year. 3(3-0) P: FOR 419 or concurrently
Basics of running a consulting forestry business. Ethics, business establishment, marketing, and taxes. Field trip required.
Effective Spring 2022

PROGRAM IN NEUROSCIENCE

NEU 845 Neuroscience of Drug Use and Human Disorders
Spring of every year. 3(3-0) RB: NEU 840 or concurrently
REINSTATEMENT Introduction to the neurochemical basis of human disorders and how drugs are used to
treat these disorders.
Effective Spring 2022

DEPARTMENT OF SOCIOLOGY

SOC 830 Animals and Environmental Sustainability
Fall of every year. Spring of every year. Summer of every year. 3(3-0)
Study of sustainable relationships among humans, animals, and the natural world.
Effective Fall 2021

SOC 850 Special Topics in Animal Studies
Fall of every year. Spring of every year. Summer of every year. 3(3-0)
Special topics and emerging issues in animal studies, including animal subjectivity and
agency and intersecting race-gender-animal forms of oppression.
Effective Fall 2021

DEPARTMENT OF STATISTICS AND PROBABILITY

STT 810 Mathematical Statistics for Data Scientists
Fall of every year. Summer of every year. 3(3-0) RB: STT 442 R: Open to seniors in the
Department of Statistics and Probability and not open to graduate students in the Department of
Statistics and Probability.
Random variables. Probability distributions. Transformation of variables. Maximum
likelihood estimation. Interval estimation. Hypothesis testing.
Effective Summer 2022

STT 811 Applied Statistical Modeling for Data Scientists
Spring of every year. Summer of every year. 3(3-0) RB: STT 442 R: Open to seniors in the
Department of Statistics and Probability and not open to graduate students in the Department of
Statistics and Probability.
Data Visualization. Linear regression. Analysis of variance. Logistic regression.
Generalized linear models. Variable selection. Categorical data analysis. Models for
design of experiments. Models for time series data.
Effective Summer 2022

STT 812 Statistical Learning and Data Analysis
Spring of every year. Summer of every year. 3(3-0) P: (STT 441 and STT 442) or (STT 810 and
STT 811) or (STT 863 and STT 864) R: Open to seniors in the Department of Statistics and
Probability and not open to graduate students in the Department of Statistics and Probability.
Low dimensional data visualization. Linear Regression. Binary Regression. Linear
discriminant analysis. Probabilistic classification. Model selection via regularization.
LASSO. Non-parametric smoothing. CART. MART. Support vector machine. Neural
network. Clustering. Random forest.
Effective Summer 2022

PART III – COURSE CHANGES

SCHOOL OF CRIMINAL JUSTICE

- CJ 220 Criminology
Fall of every year. Spring of every year. 3(3-0) ~~R: Open to students in the Peace and Justice Studies Minor or in the Sociology Major or in the Youth and Society Minor or in the Criminal Justice Major or in the Law, Justice, and Public Policy Minor or in the Conservation and Environmental Law Enforcement Minor or approval of school.~~ R: Open to students in the Peace and Justice Studies Minor or in the Law, Justice, and Public Policy Minor or in the Youth and Society Minor or in the Criminal Justice Major or in the Conservation and Environmental Law Enforcement Minor or approval of school.
Introduction to the socio-legal foundation of crime. Crime typology and measurement procedures. Theory and public policy. Societal responses to crime and criminals.
~~Effective Fall 2020~~ Effective Summer 2022
- CJ 871 Advanced Crime Analysis
Spring of every year. 3(3-0) P: CJ 870 or approval of school
Advanced application of intelligence and crime analysis skills and techniques.
~~Effective Fall 2021~~ Effective Summer 2022
- CJ 896 Policy Analysis under Conditions of Change
Fall of every year. Spring of every year. 3(3-0) P: CJ 811 and (CJ 887 or concurrently) RB: At least 75% of MS course work complete R: Open to graduate students in the School of Criminal Justice
~~Methods of policy analysis in criminal justice settings. Policy analysis for the formulation, adoption, and implementation of changes. Capstone. Methods of policy analysis in criminal justice settings. Policy analysis for the formulation, adoption, and implementation of changes.~~ Methods of policy analysis in criminal justice settings. Policy analysis for the formulation, adoption, and implementation of changes.
~~Effective Fall 2019~~ Effective Spring 2022
- CJ 897 Comprehensive Threat Assessment
Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: CJ 837 R: Open to graduate students in the Law Enforcement Intelligence and Analysis Major.
~~Methods of conducting a comprehensive threat assessment in criminal justice settings. Comprehensive threat assessment for the formulation, adoption, and implementation of prevention and intervention practices. Capstone. Methods of conducting a comprehensive threat assessment in criminal justice settings. Comprehensive threat assessment for the formulation, adoption, and implementation of prevention and intervention practices.~~ Methods of conducting a comprehensive threat assessment in criminal justice settings. Comprehensive threat assessment for the formulation, adoption, and implementation of prevention and intervention practices.
~~Effective Fall 2019~~ Effective Spring 2022

DEPARTMENT OF ECONOMICS

- EC 406 Economic Analysis of Russia and the Commonwealth of Independent States (W)
Spring of even years. 3(3-0) P: (EC 202 or EC 252H) and (EC 301 or EC 251H) and Completion of Tier I Writing Requirement
Analysis of structure and performance of planning, transition economy, and post-transition economy in Russia and the commonwealth of independent states (CIS) with focus on micro foundations of macroeconomic outcomes.
DELETE COURSE
Effective Spring 2022
- EC 412 Economic Analysis of Latin America (W)
Fall of even years. 3(3-0) P: (EC 202 or EC 252H) and (EC 301 or EC 251H) and Completion of Tier I Writing Requirement
Population growth, agriculture, and urbanization. Dependence on primary exports and import protection. Inequality and populist-orthodox policy cycles. Hyper-inflation, international debt crises, and adjustments. United States policy interests and interventions.
DELETE COURSE
Effective Spring 2022

- EC 420 Introduction to Econometric Methods
Fall of every year. Spring of every year. ~~Summer of every year.~~ 3(3-0) ~~P: (EC 202 or EC 252H) and (EC 251H or EC 301) and (MTH 124 or MTH 132 or MTH 152H) and (STT 315 or STT 351 or STT 380 or STT 421 or STT 430 or STT 442)~~ P: (EC 202 or EC 252H) and (EC 251H or EC 301) and (MTH 124 or MTH 132 or MTH 152H) and (STT 315 or STT 351 or STT 380 or STT 421 or STT 430 or STT 442)
Specification, estimation, and interpretation of econometric models. Evaluation of current quantitative work in economics.
~~Effective Fall 2024~~ Effective Summer 2022
- EC 491 ~~Advanced Topics in Economics~~
Topics in Economics
Fall of every year. Spring of every year. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: (EC 251H or EC 301) and (EC 252H or EC 302) and (MTH 124 or MTH 132 or MTH 152H) ~~R: Approval of department.~~
~~Advanced work in specialized topics of economics.~~ Select work in specialized topics of economics.
~~Effective Fall 2014~~ Effective Fall 2022

DEPARTMENT OF FORESTRY

- FOR 110 ~~Seminar on Contemporary Issues in Forests and the Environment~~
Contemporary Issues in Forests and the Environment
Fall of every year. 1(1-0)
Role of forests in environmental quality and human well-being.
Request the use of the Pass-No Grade (P-N) system.
~~Effective Fall 2013~~ Effective Fall 2022
- FOR 335 ~~Socioeconomics of Sustainable Bioproducts~~
Business Innovation Toward a Sustainable BioEconomy
~~Fall of every year. Spring of every year.~~ 3(3-0) RB: FOR 212 R: Not open to freshmen.
Role of forest bioproducts in developing sustainable communities. Resource planning and availability for value added bioproducts. Bioproducts supply-chains analysis and principles of life cycle implementation.
~~Effective Fall 2018~~ Effective Fall 2022
- FOR 340 Forest Ecology
Fall of every year. 3(3-0) ~~P: ((CSS 210) and completion of Tier I writing requirement) and (PLB 105 or BS 162 or LB 144)~~ P: ((CSS 210 or GEO 206) and completion of Tier I writing requirement) and (PLB 105 or BS 162 or LB 144) RB: IBIO 355
Ecological interactions crucial to the sustainable management of forest ecosystems. Plant resources, species interactions, succession, biodiversity, productivity, nutrient and carbon cycling, ecosystem structure and function, exotic species, global environmental change.
SA: FOR 404
~~Effective Fall 2019~~ Effective Fall 2022
- FOR 372 Ecological Monitoring and Data Analysis
Spring of every year. 3(2-2) Interdepartmental with Geography. ~~P: ((MTH 124 or MTH 132) and completion of Tier I writing requirement) and (STT 201 or STT 224 or STT 231 or STT 421)~~ P: ((MTH 124 or MTH 132) and completion of Tier I writing requirement) and (STT 201 or STT 224 or STT 231 or STT 421 or GEO 363)
Design of ecological monitoring systems and analysis of resulting ecological data sets. Monitoring system design, model specification and implementation, and computational considerations from both a design- and model-based perspective. Hands-on introduction to statistical software.
SA: FOR 472
~~Effective Spring 2020~~ Effective Summer 2022

- FOR 405 Forest Ecosystem Services
Spring of every year. 3(3-0) P: ((MTH 124 or MTH 132) and completion of Tier I writing requirement) and EC 201 RB: FOR 202 and FOR 404 R: Not open to freshmen or sophomores.
Ecosystem services and their quantification and valuation. Sustainable management of forest ecosystem services. Global overview of non-timber forest products. Field trips required.
~~DELETE COURSE~~
Effective Spring 2022
- FOR 406 Applied Forest Ecology: Silviculture
Fall of every year. 3(3-0) ~~P: ((FOR 404 or concurrently) or (IBIO 355 or concurrently)) and completion of Tier I writing requirement~~ P: ((FOR 340 or concurrently) or (IBIO 355 or concurrently)) and completion of Tier I writing requirement R: Not open to freshmen or sophomores.
Ecophysiology of tree growth and reproduction. Stand structure, composition and growth. Intermediate stand treatments. Natural and artificial reproduction. Silvicultural techniques.
~~Effective Fall 2016~~ Effective Fall 2022
- FOR 420 Forestry Field Studies
Summer of every year. Huron-Manistee National Forest, Huron-Manistee National Forest, Huron-Manistee National Forest 3 credits. ~~P: FOR 204 and FOR 222 and FOR 404 and FOR 406 and CSS 210~~ P: FOR 204 and FOR 222 and FOR 340 and FOR 406 and CSS 210 R: Open to juniors or seniors in the College of Agriculture and Natural Resources.
Integration of tree biology, forest ecology, soil science, silviculture, forest mapping and inventory methods in a variety of forest ecosystems in Michigan. Quantitative and qualitative assessments of forests, defining silvicultural alternatives and executing a stand management plan. Field trips required.
~~Effective Fall 2013~~ Effective Summer 2022
- FOR 427 Biomass and Bioproducts Chemistry
~~Spring of every year.~~ Spring of even years. 3(2-2) P: CEM 141 or CEM 151 or LB 171 RB: FOR 212 R: Not open to freshmen.
Chemistry of wood, engineered composites and bioproducts. Chemical characterization of biopolymers from woody biomass and bioproducts. Analytical methods related to bioproducts chemistry.
~~Effective Fall 2018~~ Effective Spring 2022

DEPARTMENT OF GEOGRAPHY, ENVIRONMENT, AND SPATIAL SCIENCES

- GEO 201 Introduction to Plant Geography
~~Fall of even years.~~ Spring of even years. 3(3-0) R: Not open to graduate students.
Geographic distribution and characteristics of plants throughout the world; relationships between biomes and aspects of the physical environment (climate, soils, landforms, disturbance); plant ecology; human impacts on vegetation; optional field trip on campus.
~~Effective Fall 2017~~ Effective Spring 2024

DEPARTMENT OF INTEGRATIVE BIOLOGY

- ~~FOR 870~~
IBIO 870 Spatial Ecology
Fall of every year. 3(2-2) ~~Interdepartmental with Fisheries and Wildlife.~~ Interdepartmental with Forestry and Fisheries and Wildlife RB: (ZOL 851 or concurrently) or Equivalent
Science of understanding and predicting ecological patterns in space.
~~Effective Fall 2016~~ Effective Fall 2022

DEPARTMENT OF LINGUISTICS, LANGUAGES AND CULTURES

LIN 463 Introduction to Cognitive Science
Fall of every year. ~~3(3-0) Interdepartmental with Philosophy and Psychology.~~ Interdepartmental with Communication Arts and Sciences and Philosophy and Psychology
Cognitive processing of information by animals, humans, and computers. Relevant issues in philosophy, linguistics, psychology, neurophysiology, and artificial intelligence.
~~Effective Fall 2015~~ Effective Summer 2022

PROGRAM IN NEUROSCIENCE

NEU 840 ~~Social, Cognitive, and Affective Neuroscience~~
Introduction to the Brain and Behavioral Disorders
Fall of every year. ~~3(3-0)~~ 2(2-0) Not open to students with credit in NEU 839 or NEU 841.
Introduction to nervous system structure and function aimed at students and professionals with limited biological science background.
~~Effective Fall 2021~~ Effective Summer 2022

NEU 844 The Science and Ethics of Brain Interventions
~~Fall of every year.~~ Summer of every year. ~~2(2-0)~~ 3(3-0) ~~RB: (NEU 840 or concurrently) or (NEU 841 or concurrently)~~ RB: (NEU 841 or concurrently) or (NEU 840 or concurrently)
Introduction to cognitive enhancement to improve intellect and cognition, and legal and ethical implications of this.
~~Effective Summer 2017~~ Effective Summer 2022

NEU 892 Special Topics in Neuroscience and the Law
~~Fall of every year.~~ Summer of every year. ~~1 to 3 credits.~~ 1(1-0) ~~A student may earn a maximum of 4 credits in all enrollments for this course.~~ RB: NEU 840 or concurrently
Topics in which the field of neuroscience and the legal system intersect
~~Effective Fall 2016~~ Effective Summer 2022

SCHOOL OF PACKAGING

PKG 492 Senior Seminar
Spring of every year. 1(2-0) R: Open to seniors in the Packaging major.
Seminar on current packaging issues, business organization and operations, and accepted practices in a corporate environment.
DELETE COURSE
Effective Spring 2022

DEPARTMENT OF SOCIOLOGY

SOC 840 Animals and Social Transformations
Fall of every year. Spring of every year. Summer of every year. 3(3-0)
~~Historical examination of the human-animal relationships.~~ Historical examination of human-animal relationships.
~~Effective Spring 2007~~ Effective Fall 2020