

SUBCOMMITTEE A – AGENDA

Via Zoom
November 11, 2021
1:30 p.m.

PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to change the requirements for the **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.

2. Request to 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
FOR	340L	Forest Ecology Laboratory	1
FOR	413	Wildland Fire Ecology and Management	3

Effective Fall 2022.

3. Request to 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.

COLLEGE OF ENGINEERING

1. Request to 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) will consider 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. Request to 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) will consider 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.

COLLEGE OF NATURAL SCIENCE

1. Request to 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
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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

- (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 (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. Request to 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
- (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 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
Add the following courses:
BMB 370 Introductory Biochemistry Laboratory 3
BMB 471 Advanced Biochemistry Laboratory 4

Effective Summer 2022.

3. Request to change the requirements for the **Graduate Certificate in Neuroscience and the Law** in the Program in Neuroscience. The University Committee on Graduate Studies (UCGS) will consider 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:

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|----|--|--|---|
| 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. Request to 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.

Effective Summer 2022.

5. Request to 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) will consider 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.

PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

ENT 804	Scientific Communication Fall of every year. 2(2-0) R: Open to graduate students.
NEW	Topics in scientific communication, the publication process, publication ethics and the development of scientific manuscript writing skills. Effective Fall 2020
FOR 110	Seminar on Contemporary Issues in Forests and the Environment <u>Contemporary Issues in Forests and the Environment</u> 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 <u>Effective Fall 2021</u>
FOR 111	Field Explorations of Urban and Community Forestry Summer of every year. 1 credit. R: Open to agricultural technology students.
NEW	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.
NEW	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.
NEW	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.
NEW	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.
NEW	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.
NEW	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.
NEW	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.
NEW Practice of skills associated with urban tree care work.
Effective Fall 2022
- FOR 240 Crew Leadership & Management in Arboriculture
Spring of every year. 2(1-3) P: FOR 235 RB: It is recommended that you enroll in this course after completing a majority of the other IAT Urban Forest Management courses OR that you enroll in this course with an already 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.
NEW 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.
NEW 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 335 ~~Socioeconomic 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 2021
- FOR 340 Forest Ecology
Fall of every year. 3(3-0) ~~P: ((CSS 210) and completion of Tier I writing requirement) and (PLB 405 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 424)~~ 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 Spring 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 2021

- 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~~ 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, forest 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
- FOR 471 Consulting Forestry
Spring of every year. 3(3-0) P: FOR 419 or concurrently
NEW Basics of running a consulting forestry business. Ethics, business establishment, marketing, and taxes. Field trip required.
Effective Spring 2022
- FOR 870 Spatial Ecology
Fall of every year. 3(2-2) ~~Interdepartmental with Fisheries and Wildlife.~~ Interdepartmental with Fisheries and Wildlife and Integrative Biology ~~RB: (ZOL 851 or concurrently) or Equivalent RB: (IBIO 830 or concurrently) or Equivalent~~
Science of understanding and predicting ecological patterns in space.
~~Effective Fall 2015~~ Effective Fall 2021
- 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 Fall 2020

COLLEGE OF 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.
NEW This course will serve as an introductory course for graduate students interested to 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.
- NEW Deep neural networks are a class of machine learning algorithms that are originally inspired by the brain, but have witnessed considerable success in real-world applications in artificial intelligence. These methods are at the core of production systems at companies like Google, Facebook, Amazon etc. for image processing, speech processing, and language understanding. This course will give an 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.
- NEW Exploration of Research in Computer Science and Engineering
Request the use of the Pass-No Grade (P-N) system.
Effective Fall 2022

COLLEGE OF NATURAL SCIENCE

- 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 Spring 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 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
- NEU 892 Special Topics in Neuroscience and the Law
~~Fall of every year. Summer of every year. 4 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
- STT 810 Mathematical Statistics for Data Scientists
Fall of every year. Summer of every year. 3(3-0) RB: STT 442 R: Not open to freshmen or sophomores or juniors and not open to graduate students in the Department of Statistics and Probability and open to seniors. Approval of department.
- NEW Random variables; Probability distributions; transformation of variables; maximum likelihood estimation; interval estimation; hypothesis testing
Effective Fall 2021

STT 811	Applied Statistical Modeling for Data Scientists Spring of every year. Summer of every year. 3(3-0) RB: STT 442 R: Not open to freshmen or sophomores or juniors and not open to graduate students in the Department of Statistics and Probability and open to seniors in the Department of Statistics and Probability. Approval of department.
NEW	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 Spring 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: Not open to freshmen or sophomores or juniors and not open to graduate students in the Department of Statistics and Probability and open to seniors in the Department of Statistics and Probability.
NEW	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 Spring 2022