

Subcommittee A – Agenda

1:30 p.m. via Zoom

Part I – New Academic Programs and Program Changes

College of Agriculture and Natural Resources

1) Minor in Beverage Science and Technology

Request to change the requirements for the Minor in Beverage Science and Technology in the Department of Food Science and Human Nutrition.

Under the heading Requirements for the Minor in Beverage Science and Technology make the following changes:

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

CEM	482	Science and Technology of Wine Production	3
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- b) In item 3. add the following course:

FSC	482	Science and Technology of Wine Production	3
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Effective Fall 2026.

2) Emphasis in Sports and Commercial Turf Management program in the Institute of Agricultural Technology

Request to change the requirements for the Emphasis in Sports and Commercial Turf Management program in the Institute of Agricultural Technology.

Under the heading Requirements for the Sports and Commercial Turf Management Emphasis make the following changes:

- a) In item 1. delete the following course:

HRT	109	Introduction to Applied Plant Science	2
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- b) In item 1. add the following course:

TURF 242 Athletic Field Maintenance and Construction 2

- c) In item 2. remove the following language:

Complete a minimum of 1 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

Effective Spring 2026.

3) Emphasis in Golf Course program in the Institute of Agricultural Technology

Request to change the requirements for the Emphasis in Golf Course program in the Institute of Agricultural Technology.

Under the heading Requirements for the Sports and Commercial Turf Management Emphasis make the following changes:

- a) In item 1. delete the following course:

HRT 109 Introduction to Applied Plant Science 2

- b) In item 1. add the following course:

TURF 242 Athletic Field Maintenance and Construction 2

- c) In item 2. remove the following language:

Complete a minimum of 1 elective credits in the college as approved by the program coordinator in the Institute of Agricultural Technology.

Effective Spring 2026.

College of Engineering

4) Master of Science in Artificial Intelligence

Request to establish a Master of Science in Artificial Intelligence in the Department of Computer Science and Engineering. The University Committee on Undergraduate Education (UCUE) recommended approval of this request at its October 21, 2024 meeting.

Background Information

This program will fill an important gap in the current educational offerings at MSU by providing advanced AI training that aligns with industry needs for high-skilled AI professionals. Unlike existing programs at Michigan State University (MSU), which may focus on broader computer science principles or data science practices, this program would specifically cater to the nuanced and rapidly evolving field of AI, ensuring graduates are prepared for cutting-edge roles in AI research, development, and application across various sectors. It aims to distinguish itself through a curriculum that balances theoretical foundations with practical, industry-relevant experiences, positioning MSU as a leader in AI education.

Similar graduate programs have started recently in a few educational institutions (CMU, UT Austin, Stanford, University of Michigan Dearborn, Wayne State, John Hopkins, etc.). The program at MSU shares some characteristics with them. But it also differs in terms of providing students with additional flexibility, ability to take classes from various fields (outside CSE, CMSE, STT and MTH) by permitting them to take classes from Packaging, education, possibly business and law where AI technology is widely being deployed. MSU is also one of the few institutions (UT Austin being the other one) that will require Ethics as a required class.

Academic Programs Catalog Text:

The Masters in Artificial Intelligence (MSAI) program at Michigan State University will develop proficient, innovative, and ethically aware graduates in the field of artificial intelligence. Graduates of our program will be equipped with a deep understanding of both the theoretical underpinnings and practical applications of neural networks across diverse sectors. The specific objectives of the program include: Foundational Knowledge, Theoretical Mastery and Practical Application, Hands-on Experience in Specialty Domains along with Ethical Considerations.

Admission

For admission in the MS in Artificial Intelligence program, students must have a strong background in programming, mathematics and statistics. Students are expected to have a degree in STEM or related field with experience in Computer programming (CSE 231 and CSE 232) and algorithms (CSE 331), Linear Algebra (MTH 314), Probability and Statistics and Multivariable Calculus (MTH 234).

Requirements for Master of Science in Artificial Intelligence

Students must complete a minimum of 30 credit hours from the following:

	CREDITS
1. The following required courses (12 credits):	
CSE 840 Computational Foundations in Artificial Intelligence	3
CSE 841 Artificial Intelligence	3
CSE 804/CMSE 804/STT 804/MTH 804 Ethics of AI	3
MTH 800/ STT 800 Quantitative Foundations for Machine Learning	3
2. At least 3 of the following core courses:	
CSE 802 Pattern Recognition and Analysis	3
CSE 803 Computer Vision	3
CSE 842 Natural Language Processing	3
CSE 847 Machine Learning	3
CSE 849 Deep Learning	3
CSE 851 Adversarial Machine Learning	3
MTH 801 Machine Learning Algorithms: Mathematical Analysis	3
3. At most 3 of the following elective courses (Student may choose to take additional core courses instead of elective courses):	
CSE 404 Introduction Machine Learning	3
CSE 440 Introduction to Artificial Intelligence	3

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CSE 848 Evolutionary Computing	3
CSE 850 Genetic Programming	3
CSE 881 Data Mining	3
CSE 830 Design and Theory of Algorithms	3
CSE 885 Artificial Neural Networks	3
STT 465 Bayesian Statistical Methods	3
STT 810 Mathematical Statistics for Data Scientists	3
STT 811 Applied Statistical Modeling for Data Scientists	3
STT 812 Statistical Learning and Data Analysis	3
STT 873 Statistical Learning and Data Mining	3
MTH 844 Projects in Industrial Mathematics	3
MTH 468 Predictive Analysis	3
MTH 483 Mathematical Machine Learning	3
CMSE 823 Numerical Linear Algebra/Numerical analysis	3
CMSE 831 Computational Optimization	3
ECE 855 Noncooperative game theory	3

4. At most 6 credits of capstone/thesis.

Students will register for independent study with a faculty member (CSE 890/899, CMSE 891/899, STT 890/899, MTH 890/899). To register for capstone/thesis, students must submit a proposal to the director of the program at least 30 days before the start of the semester and have it approved.

5. If a student is interested in taking other courses (including special topics courses) in place of core or elective courses, they should get approval from the director at least 30 days before the start of the semester when the course is offered.
6. Students cannot take more than 6 credits at 400-level. All 400-level courses must be approved by the director and are only intended for students who lack a background in the relevant area.

Effective Fall 2025.

College of Natural Science

5) Bachelor of Science degree in Biomedical Laboratory Science

Request to change the requirements for the Bachelor of Science degree in Biomedical Laboratory Science in the Biomedical Laboratory Diagnostics Program.

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

- a) In item 3. a. change the total credits from '44 to 51' to '46 to 53'.
- b) In item 3. a. change the credit amounts in the following courses:

CEM	251	Organic Chemistry I	4
CEM	252	Organic Chemistry II	4
STT	200	Statistical Methods	4
STT	231	Statistics for Scientists	4
- c) In item 3. c. change the total credits from '5 or 6' to '5 to 7'.
- d) In item 3. c. change the credit amounts in the following courses:

CEM	311	Inorganic Chemistry	4
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Effective Fall 2026.

6) Bachelor of Science degree in Medical Laboratory Science

Request to change the requirements for the Bachelor of Science degree in Medical Laboratory Science in the Biomedical Laboratory Diagnostics Program. The University Committee on Undergraduate Education (UCUE) will review and consider the requested admissions changes during their meeting on September 10, 2026.

Under the heading Requirements for the Bachelor of Science Degree in Medical Laboratory Science make the following changes:

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- a) In item 4. a. change the total credits from '52 to 59' to '54 to 59'.
- b) In item 4. a. change the credit amounts in the following courses:

CEM	251	Organic Chemistry I	4
CEM	252	Organic Chemistry II	4
STT	200	Statistical Methods	4
STT	231	Statistics for Scientists	4

- c) In the Academic Standards section, replace the first paragraph with the following:

To progress to the clinical phase of the curriculum, students must earn a grade-point average of 2.50 or higher in MGI 465, MGI 465L, BLD 402, BLD 424, BLD 424L, BLD 430, BLD 435, and BLD 435L, with no course grade below 1.5. Students who do not meet this progression standard will either need to repeat course(s) or be dismissed from the medical laboratory science degree and can graduate with a biomedical laboratory science degree.

Effective Fall 2026.

7) Bachelor of Arts in Computational and Applied Mathematics

Request to change the requirements for the Bachelor of Arts degree in Computational and Applied Mathematics in the Department of Mathematics.

- a) Under the heading Requirements for the Bachelor of Arts Degree in Computational and Applied Mathematics make the following changes:
 - (1) In item 1. delete MTH 309 and 310 as courses that meet the University Tier II writing requirement.
 - (2) In item 3. delete the following course:

PHY	173	Physics for Scientists and Engineers I	5
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Effective Fall 2026.

8) Bachelor of Science in Computational and Applied Mathematics

Request to change the requirements for the Bachelor of Science degree in Computational and Applied Mathematics in the Department of Mathematics

- a) Under the heading Requirements for the Bachelor of Science Degree in Computational and Applied Mathematics make the following changes:

(1) In item 1. delete MTH 309 and 310 as courses that meet the University Tier II writing requirement.

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

PHY	173	Physics for Scientists and Engineers I	5
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PHY	174	Physics II	5
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Effective Fall 2026.

9) Bachelor of Science degree in Data Science

Request to change the requirements for the Bachelor of Science degree in Data Science in the Department of Computational Math, Science and Engineering.

Under the heading Requirements for the Bachelor of Science Degree in Data Science make the following changes:

- a) In item 3. a. change the total credits from '8 or 10' to '8 to 10'.

- b) In item 3. a. change the credit amounts in the following courses:

CEM	142	General and Inorganic Chemistry	4
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CEM	152	Principles of Chemistry	4
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- c) In item 3. b. change the total credits from '8 to 10' to '8'.

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

PHY	173	Studio Physics for Scientists and Engineers I	5
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PHY	174	Studio Physics for Scientists and Engineers II	5
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e) In item 3. f. add the following courses:

MTH	483	Mathematical Machine Learning	3
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STT	470	Modern Regression Modeling	3
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Effective Fall 2026.

10) Bachelor of Science degree in Integrative Biology

Request to change the requirements for the Bachelor of Science degree in Integrative Biology in the Department of Integrative Biology.

Under the heading Requirements for the Bachelor of Science Degree in Integrative Biology make the following changes:

a) In item 1. change the following text:

The University's Tier II writing requirement for the Integrative Biology major is met by completing both of the following courses: Integrative Biology 355L and 445. These courses are referenced in item 3. g. below.

b) Replace item 3.c. with the following:

One of the following groups of courses (5-10 credits):

(1)	CEM	144	Organic Chemistry Survey and Applications	4
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	CEM	145L	Basic Organic Chemistry Laboratory	1
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(2)	CEM	251	Organic Chemistry I	4
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	CEM	252	Organic Chemistry II	4
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	CEM	255	Organic Chemistry Laboratory	2
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c) In item 3.d.(5) delete the following courses:

PHY	191	Physics Laboratory for Scientists, I	1
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Effective Spring 2026.

11) Bachelor of Science degree in Actuarial Science

Request to change the requirements for the Bachelor of Science degree in Actuarial Science in the Department of Mathematics.

Under the heading Requirements for the Bachelor of Science Degree in Actuarial Science make the following changes:

- a) Replace Item 3. with the following:

The following requirements for the major:

- a. One course of at least 3 credits in biological science, entomology, microbiology, physiology, plant biology, or integrative biology.
- b. A least 2 credits in laboratory in biological science, chemistry, entomology, microbiology, physics, physiology, plant biology, or integrative biology.
- c. One of the following groups of courses (8 to 10 credits):
 - (1)

CEM 141	General Chemistry	4
CEM 142	General and Inorganic Chemistry	4
CEM 161	Chemistry Laboratory I	1
 - (2)

CEM 151	General and Descriptive Chemistry	4
CEM 152	Principles of Chemistry	4
CEM 161	Chemistry Laboratory I	1
 - (3)

CEM 181H	Honors Chemistry I	4
CEM 182H	Honors Chemistry II	4
CEM 185H	Honors Chemistry Laboratory I	2
 - (4)

LB 171	Principles of Chemistry I	4
LB 171L	Introductory Chemistry Laboratory I	1

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	LB	172	Principles of Chemistry II	3
d.	One of the following groups of courses (8 credits):			
(1)	PHY	183	Physics for Scientists and Engineers I	4
	PHY	184	Physics for Scientists and Engineers II	4
(2)	PHY	193H	Honors Physics I – Mechanics	4
	PHY	294H	Honors Physics II – Electromagnetism	4
(3)	LB	273	Physics I	4
	LB	274	Physics II	4
e.	One of the following groups of courses (11 or 12 credits):			
(1)	MTH	132	Calculus I	3
	MTH	133	Calculus II	4
	MTH	234	Multivariable Calculus	4
(2)	LB	118	Calculus I	4
	LB	119	Calculus II	4
	LB	220	Calculus III	4
(3)	MTH	152H	Honors Calculus I	3
	MTH	153H	Honors Calculus II	4
	MTH	254H	Honors Multivariable Calculus	4
f.	One of the following courses (1 credit):			
	MTH	490	Directed Studies	1
	MTH	491B	Teamwork Experience	1
g.	All of the following courses (27 credits):			
	MTH	235	Differential Equations	3
	MTH	309	Linear Algebra I	3
	MTH	360	Theory of Mathematical Interest	3

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	MTH	361	Financial Mathematics for Actuaries I	3
	MTH	458	Computational Methods in Mathematical Finance and Insurance	3
	STT	441	Probability and Statistics I: Probability	3
	STT	455	Actuarial Models I	3
	STT	456	Actuarial Models II	3
	STT	459	Construction and Evaluation of Actuarial Models	3
h.	One of the following courses (3 credits):			
	MTH	457	Introduction to Financial Mathematics	3
	STT	442	Probability and Statistics II: Statistics	3
i.	One of the following courses (3 credits):			
	MTH	491A	Actuarial Internship (W)	3
	MTH	496	Capstone in Mathematics (W)	3
j.	All of the following courses (15 credits):			
	ACC	230	Survey of Accounting Concepts	3
	EC	201	Introduction to Microeconomics	3
	EC	202	Introduction to Macroeconomics	3
	FI	311	Financial Management	3
	FI	321	Theory of Investments	3
k.	One of the following courses (4 credits):			
	CSE	231	Introduction to Programming I	4
	CMSE	201	Computational Modeling and Data Analysis I	4
	STT	180	Introduction to Data Science	4

Effective Fall 2026.

12) Bachelor of Science degree in Neuroscience

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

Under the heading Requirements for the Bachelor of Science Degree in Neuroscience make the following changes:

a) In item 3. replace the entire entry with the following:

a. The following courses (54 to 62 credits):

(1) One course from each of the following groups of courses (7 to 8 credits):

(a)	MTH	124	Survey of Calculus I	3
	MTH	132	Calculus I	3
	MTH	152H	Honors Calculus I	3
	LB	118	Calculus I	4
(b)	STT	201	Statistical Methods	4
	STT	231	Statistics for Scientists	4

(2) One of the following groups of courses (7 or 8 credits):

(a)	CEM	141	General Chemistry	4
	CEM	142	General and Inorganic Chemistry	4
(b)	CEM	151	General and Descriptive Chemistry	4
	CEM	152	Principles of Chemistry	4
(c)	CEM	181H	Honors Chemistry I	4
	CEM	182H	Honors Chemistry II	4
(d)	LB	171	Principles of Chemistry I	4
	LB	172	Principles of Chemistry II	3

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(3) One of the following courses (1 or 2 credits):

CEM	161	Chemistry Laboratory I	1
LB	171L	Introductory Chemistry Laboratory	1
CEM	185H	Honors Chemistry Laboratory I	2

(4) One of the following groups of courses (8 or 9 credits):

(a)	BS	161	Cell and Molecular Biology	3
	BS	162	Organismal and Population Biology	3
	BS	171	Cell and Molecular Biology Laboratory	2
(b)	BS	181H	Honors Cell and Molecular Biology	3
	BS	182H	Honors Organismal and Population Biology	3
	BS	191H	Honors Cell and Molecular Biology Laboratory	2
(c)	LB	144	Biology I: Organismal Biology	4
	LB	145	Biology II: Cellular and Molecular Biology	5

(5) Both of the following courses (8 credits):

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

(6) One of the following groups of courses (6 or 8 credits):

(a)	PHY	221	Studio Physics for Life Scientists I	4
	PHY	222	Studio Physics for Life Scientists II	4
(b)	PHY	231	Introductory Physics I	3
	PHY	232	Introductory Physics II	3
(c)	PHY	183	Physics for Scientists and Engineers I	4
	PHY	184	Physics for Scientists and Engineers II	4

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(d)	PHY	193H	Honors Physics I-Mechanics	4
	PHY	294H	Honors Physics II-Electromagnetism	4
(e)	LB	273	Physics I	4
	LB	274	Physics II	4
(7)	One of the following courses (3 or 4 credits):			
	IBIO	341	Fundamental Genetics	4
	MMG	409	Eukaryotic Cell Biology	3
(8)	Both of the following courses (8 credits):			
	BMB	401	Comprehensive Biochemistry	4
	PSY	101	Introductory Psychology	4
(9)	One of the following courses (3 or 4 credits)			
	NEU	403	Communication in Neuroscience (W)	3
	LB	492	Senior Seminar (W)	4
(10)	Complete a minimum of 3 credits from the following			
	NEU	310	Psychology and Biology of Human Sexuality	3
	NEU	416	Development of the Nervous System Through the Lifespan	3
	NEU	417	Instrumental Methods of Analysis in Neuroscience	3
	NEU	420	Neurobiology of Disease	3
	NEU	440	Synaptic Transmission	3
	NEU	450	The Autonomic Nervous System	3
	NEU	460	Current Approaches in Molecular and Cellular Neuroscience	3
	NEU	492	Special Topics in Neuroscience	1 to 3
	PHM	422	Fundamentals of Neuropharmacology	3

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PHM 431 Pharmacology of Drug Addiction 3

b. The following courses in the Department of Physiology (19 to 23 credits):

(1) One of the following groups of courses (4 or 8 credits):

(a) PSL 310 Physiology for Pre-Health Professionals 4

(b) PSL 431 Human Physiology I 4

PSL 432 Human Physiology II 4

(2) All of the following courses (15 credits):

NEU 101 Frontiers in Neuroscience 1

NEU 301 Introduction to Neuroscience I 3

NEU 302 Introduction to Neuroscience II 3

NEU 311L Neuroscience Laboratory (W) 2

NEU 401 Cellular and Molecular Neuroscience 3

NEU 402 Behavioral and Cognitive Neuroscience 3

Effective Fall 2026.

Part II – New Courses and Changes

College of Agriculture and Natural Resources

ANS 272 Introductory Swine Management

Fall of every year. 3(2-2) ~~Not open to students with credit in ANS 472.~~

~~Swine production principles, practices, technologies, and systems. Field trip required.~~ Principles of swine production: systems, nutrition, reproduction, genetics, herd health, welfare, data/technology, economics, and sustainability.

~~Numerical~~ Undergraduate Graded

Effective Fall Semester 2027

ANS 313 Principles of Animal Feeding and Nutrition (W)

Fall of every year. 4(3-2) P: ~~((BS 161 or LB 145 or BS 181H) and completion of Tier I writing requirement) and ((CEM 143 or concurrently) or (CEM 251 or concurrently))~~ P: ((BS 161 or LB 145 or BS 181H) and completion of Tier I writing requirement) and ((CEM 144 or concurrently) or (CEM 251 or concurrently))

Comparative nutrition and metabolism for production, health, and stewardship of cattle, horses, swine, poultry, dogs and cats. Diet evaluation and formulation. Feeding management.

Numerical

Effective Fall Semester 2027

NEW COURSE

ANS 881 Orientation to Animal Science Graduate Studies

Fall of every year. 1(1-0)

Practical aspects of conducting animal science and developing the professional skills and networks needed to succeed in graduate school and future careers.

Pass/No Grade/ Incomplete / DF

Effective Fall Semester 2026

NEW COURSE

ANS 883 Selected Topics in Animal Science

On Demand. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open to students in the Department of Animal Science

Selected topics in the animal sciences of current interest and importance to supplement and enrich existing courses.

Graduate Graded

Effective Fall Semester 2026

NEW COURSE

BE 851 Machine Learning in Biosystems

Spring of even years. 3(2-2) A student may earn a maximum of 3 credits in all enrollments for this course. RB: Introductory courses in linear algebra, statistics, and calculus R: Open

to graduate students and open to juniors or seniors in the Honors College or approval of department.

Fundamental concepts of data analysis and machine learning for biosystems engineering applications. Emphasis on applying machine learning to food, agricultural, environmental, and other biological systems using domain-specific datasets. Covers data preprocessing, feature extraction, and model development, with a focus on interpretation and integration into biosystems workflows (e.g., sensor-based monitoring, non-destructive quality assessment, or microbiological data analysis). Designed for practical and intuitive understanding of AI tools in interdisciplinary biosystems contexts.

Numerical

Effective Spring Semester 2026

ENT 264 Turfgrass Entomology

Fall of every year. 3(2-2)

Life history, identification, and collection of turfgrass insects. Cultural, biological and insecticide control. Principles of pest management.

Numerical

SA: CSS 362, ENT 364

Effective Fall Semester 2026

NEW COURSE

ENT 304 Entomology Field Techniques

Summer of every year. 2(0-4) RB: ENT 205

Insect collecting and standardized techniques for air, foliage, water, and soil environments. Field data collection and analysis.

Numerical

Effective Summer Semester 2027

ENT 478 Integrated Pest Management (W)

Spring of odd years. 3(3-0) ~~Interdepartmental with Cropping Systems Science, Forestry, Horticulture~~ P: (ENT 404 or PLP 405) and completion of Tier I writing requirement P:

Completion of Tier I Writing Requirement R: Open to juniors or seniors in the Department of Entomology or approval of department.

~~Theory, philosophy and application of pest management focusing on agricultural and natural systems.~~ Philosophy and principles of Integrated Pest Management (IPM) in agricultural, urban, and landscape settings.

Numerical

Effective Spring Semester 2027

ENT 479 Organic Pest Management (W) Organic Pest Management

~~Spring of every year.~~ Spring of even years. ~~3(2-2) 3(3-0) P: Completion of Tier I Writing Requirement RB: An undergraduate course in ecology and/or pest management. R: Open to juniors or seniors or graduate students or approval of department.~~ R: Open to juniors or seniors or graduate students in the College of Agriculture and Natural Resources.

~~Theory, philosophy and application of organic pest management systems. Field trips required.~~ Theory, philosophy and application of organic pest management systems.

Numerical

Effective Spring Semester 2027

PKG 322 Packaging with Paper and Paperboard

Fall of every year. Spring of every year. ~~4(3-2) P: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) P: (PKG 221 or concurrently) AND (MTH 132 or MTH 152H or LB 118) R: Open to undergraduate students in the School of Packaging or approval of department.~~ R: Open to students in the School of Packaging or approval of department.

Physical and chemical properties, manufacture, conversion, and use of wood, paper, paperboard, and related components in packaging. Design, use, and evaluation of packages.

Numerical Undergraduate Graded

SA: PKG 325

Effective Fall Semester 2027

PLP 407 Diseases and Insects of Forest and Shade Trees

Spring of every year. 4(3-3) ~~Interdepartmental with Entomology, Forestry, Plant Biology~~ Interdepartmental with Entomology, Plant Biology, Plant Pathology P: ~~(PLB 105 or BS 162 or LB 144) and Completion of Tier I Writing Requirement~~ P: (PLB 105 or BS 162 or LB 144) OR ((PLB 105 or BS 162 or LB 144) AND completion of Tier I writing requirement)

Diseases, insects, and environmental problems affecting trees in forests, parks, suburbs, and nurseries. Methods of control.

Numerical Undergraduate Graded

SA: BOT 407

Effective Spring Semester 2027

College of Engineering

REINSTATEMENT

CSE 452 Organization of Programming Languages

Fall of every year. 3(3-0) P: (CSE 331 or CSE 335) and (CSE 320 or ECE 331) R: Open only to students in the Department of Computer Science and Engineering or Computer Engineering major or the LBS Computer Science coordinate major or the LBS Computer Science field of concentration or the Computer Science disciplinary teaching minor.

Organization of programming languages. Type systems. Alternative execution models. Comparison of language features: functional, imperative, logical and object-oriented.

Numerical

SA: CPS 452

Effective Fall Semester 2026

NEW COURSE

EGR 200 Engineering Career Development

Fall of every year. Spring of every year. 1(1-0) RB: Recommended that students be in at least their 2nd semester of coursework at MSU and are at least a year from graduation. R: Open to undergraduate students in the College of Engineering.

This course will equip engineering students with the skills, tools, and strategies necessary to navigate and successfully pursue internships, co-ops, and entry-level opportunities.

Numerical

Effective Spring Semester 2027

College of Human Medicine

ANTR 685 Directed Study in Clinical Prosection

Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 15 credits in all enrollments for this course. ~~P: ANTR 510 or ANTR 551 or HM 556~~ P: HM 556 RB: ~~Open to Clerkship Students in the College of Human Medicine and College of Osteopathic Medicine.~~ RB: Open to third and fourth-year students in the College of Human Medicine. R: ~~Open to human medicine students in the College of Human Medicine and open to osteopathic medicine students in the College of Osteopathic Medicine. Approval of department.~~ R: Open to human medicine students in the College of Human Medicine or in the Department of Radiology or in the Human Medicine Major and not open to osteopathic medicine students or undergraduate students or graduate students or master's students or educational specialist or MBA students or Executive MBA students or master of fine arts students or doctoral students or graduate-professional students or teaching students or veterinary medicine students or agricultural technology students or English Language Center students or lifelong graduate students or lifelong undergraduate students or Law students or law advanced students or law lifelong students or law non-degree students in the College of Osteopathic Medicine. Approval of department.

Anatomical prosection and body-region specific pathologies.

Pass-No Grade (P-N)

Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.

Effective Fall Semester 2026

College of Natural Science

BS 200 Biological Sciences Fellows Directed Studies

Fall of every year. Spring of every year. ~~2(2-0)~~ 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course. RB: Recommended for students who have taken

or are enrolled in BS161, BS171, BS162, BS172, BS181H, BS191H, BS182H, and/or BS192H. R: Approval of department.

Develop and implement a collaborative project that improves student experiences and success in STEM and BioSci.

Numerical

Effective Fall Semester 2026

BLD 832 Molecular Pathology Laboratory

Summer of even years. ~~2(0-4)~~ 2(2-0) P: BLD 831 or concurrently

~~Equipment operation, DNA extraction and measurement, electrophoresis, hybridization and transfers, amplification and detection including techniques and automated sequencing. Clinical applications.~~ Trouble shooting and interpretation of DNA extraction and measurement, electrophoresis, hybridization and transfers, amplification and detection including techniques and automated sequencing. Clinical applications.

Numerical

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: MT 832, MT 831L

Effective Summer Semester 2026

BLD 852 Immunodiagnostics Laboratory

Summer of even years. 2(2-0) ~~P: BLD 850~~ P: BLD 850 and (BLD 851 or concurrently) RB: Previous introductory course in Immunology

~~Performance of immunopurifications, in vitro diagnostic assays and basic flow cytometry. Data analysis and quality control evaluation.~~ Trouble shooting and interpretation of immunopurifications, in vitro diagnostic assays and basic flow cytometry. Data analysis and quality control evaluation.

Numerical

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: MT 852, MT 851L

Effective Summer Semester 2026

GLG 821 Aqueous Geochemistry

~~Fall of odd years. Fall of even years. 3(2-2) 3(3-0) RB: CEM 383 or CSS 455 or FW 472 or GLG 421 RB: Introductory Chemistry and Earth and Environmental Science coursework. R: Open to graduate students.~~ R: Open to graduate students in the College of Natural Science or approval of department.

~~Controls on the chemical and isotopic nature of water (fresh, marine, brine) and its solutes. Data acquisition and synthesis. Chemical modeling and evolution of water masses.~~ Geochemical thermodynamics, kinetics, and analytical techniques applied to aqueous geochemistry, with a focus on water-rock interactions within the critical zone. Combines theory, modeling, and case studies to explore speciation, activity, dissolution/precipitation reactions, redox processes, surface complexation, and human/societal impacts within geochemistry.

Numerical

Effective Fall Semester 2026

MTH 310 Abstract Algebra I and Number Theory

Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ((MTH 299 or MTH 317H) or approval of department) and completion of Tier I writing requirement Not open to students with credit in MTH 418H.

~~Structure of the integers, congruences, rings, ring homomorphisms, ideals, quotient rings. A writing course with an emphasis on proofs.~~ Structure of the integers, complex numbers, congruences, modular arithmetic, groups, subgroups, cyclic groups, permutation groups, groups of symmetries, normal subgroups, homomorphisms and isomorphisms, overview of the structure of finite abelian groups

Numerical

Effective Fall Semester 2026

MTH 411 Abstract Algebra II

~~Fall of every year. Spring of every year. Spring of every year. 3(3-0) P: MTH 310~~ Not open to students with credit in MTH 419H.

~~Continuation of MTH 310. Permutation groups, groups of transformations, normal subgroups, homomorphism theorems, modules. Principal ideal rings, unique factorization domains, noncommutative rings, rings of fractions, ideals. Rings, ring homomorphisms, ideals, rings of polynomials, overview of group actions and Sylow theorems, fields, algebraic field extensions, splitting fields, introduction to Galois theory.~~

Numerical

SA: MTH 419H

Effective Fall Semester 2026

MTH 414 Linear Algebra II

Fall of every year. 3(3-0) P: MTH 309 or MTH 317H Not open to students with credit in MTH 415.

~~Linear transformations on finite dimensional vector spaces. Invariant subspaces, rank, eigenvalues and eigenvectors. Canonical forms. Bilinear and multilinear forms. Abstract vector spaces and their duals. Minimal polynomials, invariant subspaces, diagonalization, and adjoints of linear transformations. Inner products, normal and unitary operators.~~

Applications.

Numerical

Effective Fall Semester 2026

MTH 418H Honors Algebra I

Fall of every year. 3(3-0) ~~P: MTH 317H or MTH 299~~ P: (MTH 317H) or (MTH 299 and MTH 309) ~~RB: Linear Algebra~~ RB: NA R: Approval of department. Not open to students with credit in MTH 310.

~~Theory of groups, Sylow theory, the structure of finite Abelian groups, ring theory, ideals, homomorphisms, and polynomial rings. Theory of groups, Sylow theory, the structure of finite abelian groups. Additional topics may include bilinear forms and an introduction to representation theory~~

Numerical

Effective Fall Semester 2026

MTH 419H Honors Algebra II

Spring of every year. 3(3-0) P: MTH 418H R: Approval of department.

~~Algebraic field extensions, Galois theory. Classification of finite fields. Fundamental Theorem of Algebra. Ring theory, ideals, homomorphisms, polynomial rings, algebraic field extensions, classification of finite fields, Fundamental Theorem of Algebra, Galois theory~~
Numerical

SA: MTH 411

Effective Fall Semester 2026

MTH 442 Partial Differential Equations

Spring of every year. 3(3-0) P: MTH 235 or MTH 340 or MTH 347H

~~Classification of second order partial differential equations. Boundary and initial value problems for heat, Laplace, and wave equations in dimensions 1, 2 and 3. Variational methods and maximum principles. Separation of variables, Fourier series, Sturm-Liouville theory. Greens functions.~~ Classification of second order partial differential equations. Initial and boundary value problems for wave, diffusion, and Laplace equations. Greens functions, separation of variables, and Fourier series methods.

Numerical

Effective Spring Semester 2027

MGI 301 Introductory Microbiology

Fall of every year. Spring of every year. Summer of every year. 3(3-0) P: ~~(BS 161 or LB 145 or BS 181H) and ((CEM 251 or concurrently) or (CEM 351 or concurrently) or (CEM 143 or concurrently) or (LB 271 or concurrently))~~ P: (BS 161 or LB 145 or BS 181H) AND ((CEM 251 or concurrently) or (CEM 351 or concurrently) or (LB 271 or concurrently) or (CEM 144 or concurrently))

Fundamentals of microbiology, including microbial structure and function, nutrition and growth, death and control. Importance and applications of major microbial groups.

~~Numerical~~ Undergraduate Graded

SA: MIC 301, MMG 301

Effective Fall Semester 2026

MGI 425 Microbial Ecology

Fall of every year. ~~3(3-0) Interdepartmental with Crop and Soil Sciences~~ Interdepartmental with Cropping Systems Science ~~P: MGI 301~~ P: BS 161 or LB 145 or BS 162 or LB 144 or BS 181H or BS 182H or approval of department ~~RB: MGI 301~~

Microbial population and community interactions. Microbial activities in natural systems, including associations with plants or animals.

Numerical

SA: MMG 425

Effective Fall Semester 2026

MGI 465L Advanced Medical Microbiology Laboratory

Fall of every year. ~~2(0-6)~~ 2(0-4) Interdepartmental with Biomedical Laboratory Diagnostics ~~P: MGI 365L and (MGI 465 or concurrently)~~ P: (MGI 365L and (MGI 465 or concurrently)) ~~C: MGI 465 concurrently~~ C: MGI 465 concurrently

Practical experience in safely and accurately performing standard clinical microbiology tests to process clinical specimens, identify pathogens and perform and interpret susceptibility testing.

~~Numerical~~ Undergraduate Graded

SA: MMG 465L

Effective Fall Semester 2026

PHY 215 ~~Thermodynamics and Modern Physics~~ Modern Physics

Fall of every year. Spring of every year. ~~3(4-0)~~ 4(4-0) P: ~~{{(PHY 184 or PHY 294H or LB 274 or PHY 184B) or (PHY 232 and PHY 234B) or (PHY 232C and PHY 234B)}} and ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently))~~ P: {(PHY 184 or PHY 294H or LB 274) or (PHY 232 and PHY 234)} and ((MTH 234 or concurrently) or (MTH 254H or concurrently) or (LB 220 or concurrently)) ~~Not open to students with credit in PHY 215B.~~

Thermodynamics, atomic physics, quantized systems, nuclear physics, solids, elementary particles.

~~Numerical~~ Undergraduate Graded

SA: PHY 215B

Effective Fall Semester 2026

PHY 905 Special Problems

~~Fall of every year. Spring of every year. Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.~~ A student may earn a maximum of 18 credits in all enrollments for this course. R: ~~Open only to graduate students in the Department of Physics and Astronomy.~~ R: Open to graduate students in the Department of Physics and Astronomy.

In-depth study of a topic in physics or in astrophysics and astronomy.

Numerical

Effective Fall Semester 2026

NEU 300 Neurobiology

~~Fall of every year. Spring of every year. Fall of every year. 3(3-0) Interdepartmental with Integrative Biology P: (BS 162 or LB 144 or BS 182H) and (BS 161 or LB 145 or BS 181H) R: Not open to freshmen or sophomores and not open to students in the Program in Neuroscience and not open to students in the Lyman Briggs Neuroscience Major.~~ R: Not open to freshmen or sophomores and not open to students in the Neuroscience Major and not open to students in the Lyman Briggs Neuroscience Coordinate Major.

Structure and function of nerve cells and nervous systems.

Numerical

SA: ZOL 402

Effective Fall Semester 2026

NEU 301 Introduction to Neuroscience I

~~Fall of every year. Fall of every year. Summer of every year. 3(3-0) P: (BS 161 or BS 181H or LB 145) and (BS 162 or BS 182H or LB 144) RB: PSY 101 R: Open to undergraduate students in the Program in Neuroscience or in the Lyman Briggs Neuroscience Coordinate Major.~~ R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.

Survey of the field of neuroscience, including molecular, cellular, and autonomic, sensory and motor systems.

Numerical

Effective Summer Semester 2026

NEU 302 Introduction to Neuroscience II

~~Spring of every year.~~ Fall of every year. Spring of every year. 3(3-0) P: NEU 301 ~~RB: PSY 101 R: Open to undergraduate students in the Lyman Briggs College or in the College of Natural Science or in the Program in Neuroscience.~~ R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.

Survey of brain-based behavioral and cognitive systems and related human diseases.

Numerical

Effective Spring Semester 2026

NEU 310 Psychology and Biology of Human Sexuality

~~Spring of even years.~~ Fall of odd years. 3(3-0) Interdepartmental with Integrative Biology, Psychology P: (PSY 101 or concurrently) and ((BS 161 or concurrently) or (BS 162 or concurrently) or (LB 144 or concurrently) or (LB 145 or concurrently) or (BS 181H or concurrently) or (BS 182H or concurrently)) Not open to students with credit in HDFS 445.

Sexual behavior from biological, psychological and neuroscience perspectives. Sexual differentiation of the body. Role of hormones in development and reproduction in humans and other animals. Human sexual orientation. Fertility and contraception. Sexual disorders. Sexually transmitted diseases.

Numerical

Effective Fall Semester 2026

NEU 311L Neuroscience Laboratory (W)

Fall of every year. Spring of every year. ~~2(1-3)~~ 2(0-4) P: ~~((NEU 301 or concurrently) and completion of Tier I writing requirement) and (STT 201 or STT 231 or STT 421) and (BS 171 or BS 191H or LB 145)~~ P: ((NEU 301) and completion of Tier I writing requirement) and (STT 201 or STT 231) and (BS 171 or BS 191H or LB 145) RB: PSY 101 ~~R: Open to undergraduate students in the Program in Neuroscience or in the Lyman Briggs Neuroscience Coordinate Major.~~ R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.

Overview of neuroscience research methodology, including experimental design, data analysis, and presentation of results.

Michigan State University

University Committee on Curriculum – September 17, 2026

Numerical

Effective Spring Semester 2026

NEU 416 Development of the Nervous System Through the Lifespan

~~Fall of every year. Fall of even years. 3(3-0) Interdepartmental with Integrative Biology P: NEU 302 or IBIO 300 or PSY 209 P: NEU 302 or NEU 300 or PSY 209 RB: IBIO 341 R: Open to undergraduate students in the Program in Neuroscience or in the Department of Integrative Biology or in the Department of Psychology or in the Lyman Briggs Neuroscience Major or in the Lyman Briggs Zoology Coordinate Major. R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major and open to undergraduate students in the Integrative Biology major or in the Lyman Briggs Zoology Coordinate Major and open to undergraduate students in the Psychology Major.~~

Development of neurons and their connections, roles of both genetics and behavioral experience in shaping the mammalian nervous system.

Numerical

Effective Fall Semester 2026

NEU 440 Synaptic Transmission

~~Spring of even years. Fall of every year. Spring of every year. 3(3-0) P: NEU 301 P: (NEU 301) and ((PSL 310 or concurrently) or (PSL 431 or concurrently)) R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Major. R: Open to undergraduate students in the Neuroscience Major or in the Lyman Briggs Neuroscience Coordinate Major.~~

~~Chemical and electrical aspects of nerve impulse transmission at synaptic and neuroeffector junctions. Influence of drugs. Chemical and electrical aspects of nerve impulse transmission at synaptic and neuroeffector junctions.~~

Numerical

Effective Spring Semester 2026

PLB 218 Plants of Michigan

~~Fall of every year. Fall of even years. 3(2-2) P: BS 162 or PLB 105 or LB 144 or BS 182H P: (BS 162 or PLB 105 or LB 144 or BS 182H)~~

Plant taxa of Michigan and the Great Lakes region and the major habitats in which they occur. Principles and rationale of classification. Relationships between life histories, morphology and environment.

~~Numerical~~ Undergraduate Graded

SA: BOT 218

Effective Fall Semester 2027

College of Nursing

NUR 957 Clinical Diagnosis and Management V – Clinical Immersion – Psychiatric Mental Health

Spring of every year. 6(2-12) P: NUR 956 R: Open to graduate students in the College of Nursing.

Evidence-based management of chronic stable and complex mental health problems within collaborative practice in complex health systems across the lifespan.

Numerical

Effective Fall Semester 2026

College of Veterinary Medicine

LCS 624 ~~Equine Theriogenology Clerkship~~ Comparative Theriogenology

~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.~~

~~Diagnostic methods used in equine reproduction.~~ Comprehensive foundation in reproductive management and common clinical reproductive conditions across the major domestic species. Content is presented using both comparative and species-specific approaches. Students are expected to review reproductive anatomy and physiology prior to the course.

Numerical

~~Request the use of ET-Extension to postpone grading.~~

~~The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.~~ Request the use of ET-Extension to postpone grading.

The work for the course must be completed and the final grade reported within 2 semesters after the end of the semester of enrollment.

Effective Summer Semester 2026

NEW COURSE

LCS 648 Equine Welfare in Practice

Spring of every year. 3 credits. RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

Students travel abroad and provide veterinary care to working equids in rural communities.
Numerical

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 Summer Semester 2026

PHM 819 Principles of Drug-Tissue Interactions

Fall of every year. Summer of every year. ~~2(2-0)~~ 1 to 2 credits. A student may earn a maximum of 3 credits in all enrollments for this course. ~~R: Open to graduate students in the Integrative Pharmacology Major or in the Pharmacology and Toxicology Major. Approval of department.~~ R: Approval of department. ~~Not open to students with credit in PHM 801.~~

~~General principles of interaction of chemicals with biological systems.~~ General principles relevant to the interaction of chemicals with biological systems. Topics include pharmacokinetics and/or pharmacodynamics.

~~Numerical~~ Graduate Graded

SA: PHM 801

Effective Fall Semester 2026

PHM 850 Communications for Scientists

~~Fall of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year. 2(2-0)-R: Open to master's students or lifelong graduate students in the College of Osteopathic Medicine or in the Department of Pharmacology and Toxicology or in the Integrative Pharmacology Major or in the Pharmacology and Toxicology Major. R: Open to students in the Department of Pharmacology and Toxicology and Open to students in the Master of Science in Integrative Pharmacology and Open to students in the Master of Science in Pharmacology and Toxicology~~

Effective research and business communication, including written skills for scientific audiences.

~~Numerical~~ Graduate Graded

Effective Fall Semester 2026

NEW COURSE

SCS 614 CSNIP

Fall of every year. Spring of every year. Summer of every year. 3 credits. RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

High volume spay and neuter clerkship with some small animal primary care cases.

Pass-No Grade (P-N)

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 Summer Semester 2026

NEW COURSE

SCS 615 Small Animal Rehabilitation

Fall of every year. Spring of every year. Summer of every year. 3 credits. RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

Rehabilitation and sports medicine of companion animals (mainly dogs and cats). These areas of the profession will be explored through patient evaluations, rehabilitation

treatments (planning and performing), and client education.

Numerical

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 Summer Semester 2026

NEW COURSE

SCS 616 Spay - Neuter in Mexico

Spring of every year. 3 credits. RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

High volume spay and neuter clerkship in Mexico. A One Health approach will be used to examine the interconnected nature of the health of animals, people, and the greater ecosystem.

Numerical

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 Summer Semester 2026

NEW COURSE

SCS 696 Advanced Small Animal Critical Care and ICU

Fall of every year. Spring of every year. Summer of every year. 3 credits. P: SCS 695 RB: Satisfactory completion of the preclinical phase of the graduate-professional (DVM) program in the College of Veterinary Medicine. R: Open to graduate-professional students in the College of Veterinary Medicine.

Focused experience in small animal critical care and ICU case management.

Numerical

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 Summer Semester 2026