MICHIGAN STATE UNIVERSITY
University Committee on Curriculum

SUBCOMMITTEE A – AGENDA

Via Teams
September 11, 2025
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 **Minor** in **Applied Development in International Agriculture and Natural Resources** in the Department of Plant, Soil and Microbial Sciences.

   a. Under the heading **Requirements for the Minor in Applied Development in International Agriculture and Natural Resources** make the following changes:

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

CSS	294	Issues in International Agriculture	1

Add the following course:

CROP	294	Issues in International Agriculture	1

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

CSS	431	International Agricultural Systems	3

Add the following course:

CROP	431	International Agricultural Systems	3

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

ABM	427	Global Agri-Food Industries and Markets	3
EEM	260	World Food, Population and Poverty	3

Add the following courses:

AFRE	206	World Food, Population and Poverty	3
AFRE	327	Global Agri-Food Industries and Markets	3

Effective Fall 2026.

2. Request to change the requirements for the **Minor in Sustainable Agriculture and Food Systems** in the Department of Plant, Soil and Microbial Sciences.

   a. Under the heading **Minor in Sustainable Agriculture and Food Systems** make the following changes:

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

CSS	124	Introduction to Sustainable Agriculture and Food Systems	2
CSS	224	Sustainable Farm and Food Systems Field Studies	1
CSS	424	Sustainable Agriculture and Food Systems: Integration and Synthesis	3

Add the following courses:

CROP	124	Introduction to Sustainable Agriculture and Food Systems	2
CROP	224	Sustainable Farm and Food Systems Field Studies	1
CROP	424	Sustainable Agriculture and Food Systems: Integration and Synthesis	3

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

CSS	101	Introduction to Crop Science	3
CSS	360	Soil Biology	3
CSS	431	International Agricultural Systems	3
CSS	442	Agricultural Ecology	3

Add the following courses:

CROP	101	Introduction to Crop Science	3
CROP	360	Soil Biology	3
CROP	431	International Agricultural Systems	3
CROP	442	Agricultural Ecology	3

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

ABM	400	Public Policy Issues in the Agrifood System	3
EEP	225	Ecological Economics	3
EEP	260	World Food, Population and Poverty	3
RCAH	292B	Engagement and Reflection	3

Add the following courses:

AFRE	300	Public Policy Issues in the Agrifood System	3
AFRE	206	World Food, Population and Poverty	3
AFRE	265	Ecological Economics	3

Effective Fall 2026.

3. Request to change the requirements for the **Minor** in **Turfgrass Management** in the Department of Plant, Soil and Microbial Sciences.

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

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

SOIL	210	Fundamentals of Soil Science	3
TURF	212	Turfgrass Biology	3
TURF	232	Turf Cultural Practices	2
TURF	262	Turf Management Seminar I	1

2. One course from each of the following areas (a minimum of 6 credits):

Management of Turfgrass Cultural Practices

TURF	178	Turf Irrigation	3
TURF	267	Performance Turf Design and Construction	2
TURF	272	Turf Soil Fertility	2
TURF	282	Turfgrass Physiology	2

Management of Turfgrass Pests

CROP	326	Weed Science	2
and			
CROP	226L	Weed Science Laboratory	1
ENT	264	Turfgrass Entomology	3
PLP	266	Turf Pathology	3
TURF	181	Pesticide and Fertilizer Application Technology	3

General Turfgrass Management

HRT	214	Landscape and Turfgrass Business Operations	2
TURF	171	Operations Budgeting for Golf Course Managers	2
TURF	202	World of Turf	2

Effective Fall 2026.

4. Request to change the requirements for the **Agricultural Technology Certificate** in **Food Processing, Technology and Safety** in The Institute of Agricultural Technology.

   a. Under the heading **Requirements for Food Processing, Technology and Safety** make the following changes:

      (1) Change the total credits from ’60’ to ‘61’.

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

AT	193	Agricultural Technology Clerkship	2

Add the following course:

AT	195	Research and Practice in Agricultural Technologies	2

      (3) Delete item 3.

      (4) In item 4., change the credits from ‘26’ to ‘30’ and delete the reference to Wayne County Community College District.

Effective Fall 2026.

5. Request to change the requirements for the **Agricultural Technology Certificate** in **Fruit, Vegetable, and Organic Horticulture Management** in The Institute of Agricultural Technology.

   a. Under the heading **Requirements for Fruit, Vegetable, and Organic Horticulture Management** make the following changes:

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

CSS	110	Computer Applications in Agronomy	2
CSS	210	Fundamentals of Soil Science	3

Add the following courses:

CROP	110	Computer Applications in Agronomy	2
SOIL	210	Fundamentals of Soil Science	3

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

CSS	124	Introduction to Sustainable Agriculture and Food Systems	2
CSS	126	Introduction to Weed Management	2
CSS	135	Crop Scouting and Investigation	3
CSS	226L	Weed Science Laboratory	1

Add the following courses:

CROP	124	Introduction to Sustainable Agriculture and Food Systems	2
CROP	126	Introduction to Weed Management	2
CROP	135	Crop Scouting and Investigation	3
CROP	226L	Weed Science Laboratory	1

3) In the note following the requirements replace ‘AT 045’ with ‘AT 145’ and ‘AT 071’ with AT 171.

Effective Fall 2026.

6. Request to change the requirements for the **Agricultural Technology Certificate** in **Fruit and Vegetable Crop Management** in The Institute of Agricultural Technology.

a. Under the heading **Requirements for Fruit and Vegetable Crop Management** make the following changes:

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

CSS	126	Introduction to Weed Management	2
CSS	203	World of Soils	3

Add the following courses:

CROP	126	Introduction to Weed Management	2
SOIL	203	World of Soils	3

(2) In item 3., delete the reference to ‘Wayne Country Community College District’.

Effective Fall 2026.

7. Request to change the requirements for the **Agricultural Technology Certificate** in **Landscape Management** in The Institute of Agricultural Technology.

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

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

CSS	126	Introduction to Weed Management	2
CSS	203	World of Soils	2

Add the following courses:

CROP	126	Introduction to Weed Management	2
SOIL	203	World of Soils	2

(2) In item 2., delete the reference to ‘Wayne County Community College District’.

Effective Fall 2026.

8. Request to change the requirements for the **Agricultural Technology Certificate** in **Landscape and Nursery Management** in the Institute of Agricultural Technology.

a. Under the heading **Requirements for Landscape and Nursery Management** make the following changes:

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

CSS	110	Computer Applications in Agronomy	2
CSS	210	Fundamentals of Soil Science	3

Add the following courses:

CROP	110	Computer Applications in Agronomy	2
SOIL	210	Fundamentals of Soil Science	3

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

CSS	126	Introduction to Weed Management	2
CSS	181	Pesticide and Fertilizer Application Technology	3
CSS	202	World of Turf	2
CSS	226L	Weed Science Laboratory	1

Add the following courses:

CROP	126	Introduction to Weed Management	2
TURF	181	Pesticide and Fertilizer Application Technology	3
TURF	202	World of Turf	2
CROP	226L	Weed Science Laboratory	1

(3) In the paragraph following the requirements, change ‘AT 045’ to ‘AT 145’.

Effective Fall 2026.

9. Request to change the requirements for the **Agricultural Technology Certificate** in **Turfgrass Management-Sports and Commercial Turf Management Emphasis** in the Institute of Agricultural Technology.

a. Under the heading **Requirements for Turfgrass Management-Sports and Commercial Turf Management Emphasis** make the following changes:

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

CSS	110	Computer Applications in Agronomy	2
CSS	126	Introduction to Weed Management	2
CSS	171	Operations Budgeting for Golf Course Managers	2
CSS	178	Turfgrass Irrigation	3
CSS	181	Pesticide and Fertilizer Application Technology	3
CSS	210	Fundamentals of Soil Science	3
CSS	226L	Weed Science Laboratory	1
CSS	232	Turfgrass Management	4
CSS	262	Turfgrass Management Seminar	2
CSS	264	Golf Course Design and Construction Techniques	2
CSS	267	Performance Turf Design and Construction	2
CSS	269	Turfgrass Strategies: Integration and Synthesis	2
CSS	272	Turfgrass Soil Fertility	2
CSS	282	Turfgrass Physiology	2
ENT	364	Turfgrass Entomology	3

Add the following courses:

CROP	110	Computer Applications in Agronomy	2
CROP	126	Introduction to Weed Management	2
SOIL	210	Fundamentals of Soil Science	3
CROP	226L	Weed Science Laboratory	1
TURF	171	Operations Budgeting for Golf Course Managers	2
TURF	178	Turfgrass Irrigation	3
TURF	181	Pesticide and Fertilizer Application Technology	3
TURF	212	Turfgrass Biology	3
TURF	232	Turfgrass Management Cultural Practices	2
TURF	262	Turfgrass Management Seminar I	2
TURF	264	Golf Course Design and Construction Techniques	2
TURF	267	Performance Turf Design and Construction	2
TURF	269	Turfgrass Management Strategies	2
TURF	272	Turfgrass Soil Fertility	2
TURF	282	Turfgrass Physiology	2
ENT	264	Turfgrass Entomology	3

(2) Change the total credits of item 1. from ‘52’ to ‘53’.

(3) In item 1., change the note to: Students must enroll in two separate 1-credit sections of TURF 262.

(4) In the paragraph following the requirements, change ‘AT 045’ to ‘AT 145’.

(5) In item 2., change the credits from ‘2’ to ‘1’.

Effective Fall 2026.

10. Request to change the requirements for the **Agricultural Technology Certificate** in **Turfgrass Management-Golf Course Emphasis** in the Institute of Agricultural Technology.

a. Under the heading **Requirements for Turfgrass Management-Golf Course Emphasis** make the following changes:

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

CSS	110	Computer Applications in Agronomy	2
CSS	126	Introduction to Weed Management	2
CSS	171	Operations Budgeting for Golf Course Managers	2
CSS	178	Turfgrass Irrigation	3
CSS	181	Pesticide and Fertilizer Application Technology	3
CSS	210	Fundamentals of Soil Science	3
CSS	226L	Weed Science Laboratory	1
CSS	232	Turfgrass Management	4
CSS	262	Turfgrass Management Seminar	2
CSS	264	Golf Course Design and Construction Techniques	2
CSS	267	Performance Turf Design and Construction	2
CSS	269	Turfgrass Strategies: Integration and Synthesis	2
CSS	272	Turfgrass Soil Fertility	2
CSS	282	Turfgrass Physiology	2
ENT	364	Turfgrass Entomology	3

Add the following courses:

CROP	110	Computer Applications in Agronomy	2
CROP	126	Introduction to Weed Management	2
TURF	171	Operations Budgeting for Golf Course Managers	2
TURF	178	Turfgrass Irrigation	3
TURF	181	Pesticide and Fertilizer Application Technology	3
SOIL	210	Fundamentals of Soil Science	3
CROP	226L	Weed Science Laboratory	1
TURF	212	Turfgrass Biology	3
TURF	232	Turfgrass Management Cultural Practices	2
TURF	262	Turfgrass Management Seminar I	2
TURF	264	Golf Course Design and Construction Techniques	2
TURF	267	Performance Turf Design and Construction	2
TURF	269	Turfgrass Management Strategies	2
TURF	272	Turfgrass Soil Fertility	2
TURF	282	Turfgrass Physiology	2
ENT	264	Turfgrass Entomology	3

(2) Change the total credits of item 1. from ‘52’ to ‘53’.

(3) In item 1., change the note to: Students must enroll in two separate 1-credit sections of TURF 262.

(4) In the paragraph following the requirements, change ‘AT 045’ to ‘AT 145’.

(5) In item 2., change the credits from ‘2’ to ‘1’.

Effective Fall 2026

11. Request to change the requirements for the **Agricultural Technology Certificate** in **Urban Forest Management** in the Institute of Agricultural Technology.

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

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

CSS	143	Introduction to Soil Science	2
PLP	105	Fundamentals of Applied Plant Pathology	2

Add the following courses:

SOIL	203	World of Soils	2
PLP	105	Fundamentals of Applied Plant Pathology	1
PLP	105L	Fundamentals of Applied Plant Pathology Lab	1

Effective Fall 2026.

12. Request to change the requirements for the **Agricultural Technology Certificate** in **Viticulture** in the Institute of Agricultural Technology.

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

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

CSS	126	Introduction to Weed Management	2
CSS	203	World of Soils	2

Add the following courses:

CROP	126	Introduction to Weed Management	2
SOIL	203	World of Soils	2

Effective Fall 2026.

COLLEGE OF ENGINEERING

1. Request to change the requirements for the **Bachelor of Science** degree in **Applied Engineering Sciences** in the College of Engineering.

The concentrations in the Bachelor of Science degree in Applied Engineering Sciences are noted on the student’s academic record when the requirements for the degree have been completed.

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

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

For students interested in computer science, the minimum criteria for acceptance is the completion of Computer Science and Engineering 231 and 260 with a combined grade-point average in those two courses of 3.0.

(2) In item 3. d., in the **Computer Science** concentration in item 2., delete the following course:

CSE	420	Computer Architecture	3

Effective Spring 2026.

COLLEGE OF HUMAN MEDICINE

1. Request to change the requirements for the **Master of Science** degree in **Biostatistics** in the Department of Epidemiology and Biostatistics. The University Committee on Graduate Studies (UCGS) will review this request at its September 15, 2025 meeting.

a. Under the heading **Requirements for the Master of Science** degree in **Biostatistics** make the following changes:

(1) In item 3., add the following courses:

CMSE	402	Data Visualization Principles and Techniques	3
CMSE	822	Parallel Computing	3
CMSE	830	Foundations of Data Science	3
CMSE	831	Computational Optimization	3
CMSE	890	Selected Topics in Computational Mathematics, Science and Engineering	3
CSE	482	Big Data Analysis	3
CSE	802	Pattern Recognition and Analysis	3
CSE	830	Design and Theory of Algorithms	3
CSE	847	Machine Learning	3
CSE	881	Data Mining	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
STT	874	Introduction to Bayesian Analysis	3

Delete the following courses:

EPI	858	Clinical Trials	3
EPI	951	Latent Variable Modeling	3

(2) In item 4., add the following courses:

EPI	829	Principles and Methods of Epidemiologic Study Design	3

Delete the following courses:

EPI	812	Causal Inference in Epidemiology	3
LCS	829	Design and Conduct of Epidemiologic Studies and Clinical Trials	3

Add the following note:

Courses from outside the department may also be used after approval by the advisor and the Graduate Program Director.

Effective Spring 2026.

2. Request to change the requirements for the **Master of Science** degree in **Epidemiology** in the Department of Epidemiology and Biostatistics. The University Committee on Graduate Studies (UCGS) will review this request at its September 15, 2025 meeting.

   a. Under the heading **Requirements for the Master of Science** degree in **Epidemiology** make the following changes:

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

EPI	829	Principles and Methods of Epidemiologic Study Design	3

      Delete the following course:

LCS	829	Design and Conduct of Epidemiological Studies and Clinical Trials	3

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

EPI	819	Spatial Epidemiology and Medical Geography	3

      Delete the following course:

EPI	950	Advanced Biostatistical Methods in Epidemiology	3

Effective Spring 2026.

COLLEGE OF NATURAL SCIENCE

1. Request to change the requirements for the **Bachelor of Science** degree in **Human Biology** in the College of Natural Science.

   a. Under the heading **Requirements for the Bachelor of Science Degree in Human Biology** replace the entry with the following:

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

         The University's Tier II writing requirement for the Human Biology major is met by completing HBIO 495. That course is referenced in item 3. f. below.

         Students who are enrolled in the College of Natural Science may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading Graduation Requirements in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.

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

         The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.

      3. The following requirements for the major:

         a. One course from each of the following groups (6 to 8 credits):

				CREDITS
(1)	MTH	124	Survey of Calculus I	3
	MTH	132	Calculus I	3
	MTH	152H	Honors Calculus I	4
	LB	118	Calculus I	4
(2)	MTH	126	Survey of Calculus II	3
	MTH	133	Calculus II	4
	MTH	153H	Honors Calculus II	4
	LB	119	Calculus II	4

		STT	201	Statistical Methods	4
		STT	231	Statistics for Scientists	3
		STT	421	Statistics I	3
b.	One of the following groups of courses (9 to 12 credits):				
	(1)	CEM	141	General Chemistry	4
		CEM	142	General and Inorganic Chemistry	3
		CEM	161	Chemistry Laboratory I	1
		CEM	162	Chemistry Laboratory II	1
	(2)	CEM	151	General and Descriptive Chemistry	4
		CEM	152	Principles of Chemistry	3
		CEM	161	Chemistry Laboratory I	1
		CEM	162	Chemistry Laboratory II	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	172	Principles of Chemistry II	3
		LB	171L	Introductory Chemistry Laboratory I	1
		LB	172L	Principles of Chemistry II - Reactivity Laboratory	1
c.	One of the following groups of courses (9 or 10 credits):				
	(1)	BS	161	Cell and Molecular Biology	3
		BS	162	Organismal and Population Biology	3
		BS	171	Cell and Molecular Biology Laboratory	2
		BS	172	Organismal and Population Biology Laboratory	2
	(2)	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
		BS	192H	Honors Organismal and Population Biology Laboratory	2
	(3)	LB	144	Biology I: Organismal Biology	4
		LB	145	Biology II: Cellular and Molecular Biology	5
d.	One of the following groups of courses (8 or 10 credits):				
	(1)	PHY	221	Studio Physics for Life Scientists I	4
		PHY	222	Studio Physics for Life Scientists II	4
	(2)	PHY	191	Physics Laboratory for Scientists, I	1
		PHY	192	Physics Laboratory for Scientists, II	1
		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.	All of the following courses (8 credits):				
	CEM	251		Organic Chemistry I	3
	CEM	252		Organic Chemistry II	3
	CEM	255		Organic Chemistry Laboratory	2
f.	Both of the following courses (5 credits):				
	HBIO	295		Human Biology and Society	2
	HBIO	495		Capstone in Human Biology (W)	3
g.	One of the following, either (1) or (2) (4 or 6 credits):				
	(1)	BMB	401	Comprehensive Biochemistry	4
	(2)	BMB	461	Advanced Biochemistry I	3
		BMB	462	Advanced Biochemistry II	3
h.	One of the following, either (1) or (2) (4 or 8 credits):				
	(1)	PSL	310	Physiology for Pre-Health Professionals	4
	(2)	PSL	431	Human Physiology I	4
		PSL	432	Human Physiology II	4
i.	One of the following courses (3 credits):				
	BLD	434		Clinical Immunology	3
	HBIO	410		Cellular Basis of Disease	3
	HBIO	425		Cells and Development (W)	4
	MGI	409		Eukaryotic Cell Biology	3
	MGI	413		Virology	3
	MGI	451		Immunology	3

j. At least 12 credits from the following courses:

ANP	204	Introduction to Medical Anthropology	3
ANP	206	Introduction to Physical Anthropology	3
ANP	270	Women and Health: Anthropological and International: Perspectives	3
ANP	370	Culture, Health, and Illness	3
ANP	425	Issues in Medical Anthropology	3
ANP	441	Osteology and Forensic Anthropology	4
ANP	443	Human Adaptability	3
ANTR	355	Human Gross Anatomy Laboratory	2
BLD	204	Mechanisms of Disease	3
BLD	213L	Clinical Laboratory Methods	2
BLD	324	Hematology and Hemostasis	3
BLD	430	Molecular Diagnostics	2
BLD	439	Histocompatibility and Immunogenetics	1
BLD	446	Immunobiology of Neoplasia	1
BLD	447	Immunomodulation and Immunotherapy	1
HBIO	300	Special Topics in Human Biology	1 to 3
HNF	310	Nutrition in Medicine for Pre-Health Professionals	3
IBIO	341	Fundamental Genetics	4
IBIO	408	Histology	4
IBIO	425	Cells and Development (W)	4
IBIO	445	Evolution (W)	3
IBIO	450	Cancer Biology (W)	3
EPI	390	Disease in Society: Introduction to Epidemiology and Public Health	4
MGI	301	Introductory Microbiology	3
MGI	302	Introductory Laboratory for General and Allied Health Microbiology	1
MGI	365	Medical Microbiology	3
MGI	365L	Medical Microbiology Laboratory	1
MGI	404	Human Genetics	3
MGI	431	Microbial Genetics	3
MGI	461	Molecular Pathogenesis	3
MGI	465	Advanced Medical Microbiology	3
MGI	465L	Advanced Medical Microbiology Laboratory	2
NEU	300	Neurobiology	3
NEU	310	Psychology and Biology of Human Sexuality	3
OST	450	Introduction to Global Health	3
PH	101	Introduction to Public Health	3
PHM	351	Fundamentals of Drug Safety	3
PHM	422	Fundamentals of Neuropharmocology	2
PHM	321	Common Drugs	3
PHM	350	Introductory Human Pharmacology	3
PHM	430	Human Pharmacology	3
PHM	431	Pharmacology of Drug Addiction	3
PHM	450	Introduction to Chemical Toxicology	3
PHM	461	Tropical Medicine Pharmacology	2
PSL	311L	Physiology Laboratory for Pre-Health Professionals	2
PSY	320	Health Psychology	3
PSY	333	The Neurobiology of Food Intake and Overeating	3

With the approval of the director of the human biology major, a maximum of 3 credits in research (HBIO 498), internship (HBIO 497) or independent study (HBIO 496) courses may be used to satisfy this requirement.

k. One of the following courses (4 credits):

ANTR	350	Human Gross Anatomy for Pre-Health Professionals	4
IBIO	320	Developmental Biology	4
IBIO	328	Comparative Anatomy and Biology of Vertebrates	4

Effective Spring 2026.

COLLEGE OF OSTEOPATHIC MEDICINE

1. Request to change the requirements for the **Professional Program in Osteopathic Medicine** leading to the Doctor of Osteopathic Medicine degree the College of Osteopathic Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its September 15, 2025 meeting.

   a. Under the heading **Requirements for the Doctor of Osteopathic Medicine Degree** make the following changes:

      (1) Under ***Clerkship Curriculum*** make the following changes:

         (a) Under the Required Clinical Clerkship Core Rotation Courses delete the following:

PSC	608	Psychiatry and Behavioral Science Clerkship	6

Add the following course:

OST	630	Psychiatry and Behavioral Science Clerkship	6

         (b) Under the Required Clinical Clerkship Core Rotation Courses that are credited toward the non-surgery requirement, make the following changes:

            (i) Delete the following course:

ANTR	685	Directed Study in Clinical Prosection	1 to 6
HM	610	Pathology Clerkship	3 to 6
PSC	609	Adult Psychiatry Clerkship	3 to 6
PSC	610	Child Psychiatry Clerkship	3 to 6
PSC	611	Addiction Psychiatry Clerkship	3 to 6
PSC	612	Geriatric Psychiatry Clerkship	3 to 6
RAD	609	Radiology Clerkship	3 to 12
RAD	610	Advanced Imaging	1 to 3

Add the following courses:

OST	631	Adult Psychiatry Clerkship	3 to 6
OST	632	Child Psychiatry Clerkship	3 to 6
OST	633	Addiction Psychiatry Clerkship	3 to 6
OST	634	Geriatric Psychiatry Clerkship	3 to 6
OST	640	Radiology Clerkship	3 to 12
OST	670	Directed Study in Clinical Prosection	1 to 6
OST	671	Pathology Clerkship	3 to 6

            (ii) Under the Required Clinical Clerkship Core Rotation Courses that are credited toward the surgery requirement, make the following changes:

               (i) Delete the following course:

RAD	612	Interventional Radiology	var.

Add the following course:

OST	641	Interventional Radiology	var.

Effective Spring 2026.

2. Request to change the requirements for the **Master of Science** degree in **Basic Medical Science** in the College of Osteopathic Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its September 15, 2025 meeting.

a. Under the heading **Requirements for the Master of Science Degree in Basic Medical Science** replace the entire entry with the following:

Students must complete 91 credits for the degree. The Master of Science Degree in Basic Medical Science is available under Plan A (with thesis) or Plan B (without thesis).

1. Complete all of the following courses in years one and two of the D.O. preclerkship curriculum:

Semester 1			
OST	510	Clinical Human Gross Anatomy and Palpatory Skills	8
OST	550	Introduction to Osteopathic Medicine and Clinical Skills	2
Semester 2			
OMM	511	Osteopathic Manipulative Medicine I	1
OST	520	Foundations of Biomedical Science for Osteopathic Medicine	8
OST	521	Musculoskeletal System	4
OST		522 Hematology, Oncology, and Infectious Diseases	3
OST	551	Osteopathic Patient Care I	2
Semester 3			
OMM	512	Osteopathic Manipulative Medicine II	1
OST	523	Neurological System	6
OST	524	Psychopathology	2
OST	525	Genitourinary System	4
OST	526	Endocrine System	3
OST	552	Osteopathic Patient Care II	2
Semester 4			
OMM	513	Osteopathic Manipulative Medicine III	1
OST	531	Reproduction, Development, and Sexuality	3
OST	532	Integumentary System	2
OST	533	Gastrointestinal System	6
OST	553	Osteopathic Patient Care III	3
Semester 5			
OMM	514	Osteopathic Manipulative Medicine IV	1
OST	534	Cardiovascular System	8
OST	535	Respiratory System	7
OST	554	Osteopathic Patient Care IV	3
Semester 6			
OMM	515	Osteopathic Manipulative Medicine V	1
OST	555	Osteopathic Patient Care V	3
OST	561	Ambulatory Care Capstone	3
OST	562	Hospital Care Capstone	3
OST	563	Health System Science Capstone	2
Semester 4, 5, or 6			
One of the following courses:			
FCM	650	Principles of Family Medicine II	1
FCM	660	Preclerkship International Preceptor	1
FCM	671	Pathway to Family Medicine I	1
OST	586	Community-Based Service Learning	1

2. Complete the Responsible and Ethical Conduct of Research (RECR) requirements in years one and two.

Additional Requirements for Plan A:

1. Complete the following course:

OST	899	Master's Thesis Research	4

This requirement must be completed within one full semester of entry into the program.

2. Pass an oral defense of the thesis.

Additional Requirements for Plan B:

1. Completion of a final examination or evaluation.

Effective Spring 2026.

COLLEGE OF VETERINARY MEDICINE

1. Request to change the requirements for the **Doctor of Veterinary Medicine** degree in **Veterinary Medicine** in the College of Veterinary Medicine. The University Committee on Graduate Studies (UCGS) will consider this request at its September 15, 2025 meeting.

   a. Under the heading **Requirements for the Doctor of Veterinary Medicine Degree in Veterinary Medicine** replace the entire entry with the following:

   Completion of the preclinical and clinical phase curriculum, 154 credits with a cumulative grade-point average of at least 2.0.

			CREDITS
PRECLINICAL PHASE			

The preclinical phase curriculum consists of 103 credits. The courses are offered in a predefined sequence. The following courses are required.

VM	500	Veterinary Science I	1
VM	501	One Health I	1
VM	503	Veterinary Career and Practice Management I	2
VM	504	One Health II	1
VM	506	Veterinary Career and Practice Management II	1
VM	507	One Health III	1
VM	508	Veterinary Doctoring III	1
VM	509	Veterinary Career and Practice Management III	1
VM	510	One Health IV	1
VM	512	Veterinary Doctoring IV	1
VM	515	Animals in Society	3
VM	516	Musculoskeletal System I	3
VM	517	Nervous System I	3
VM	518	Cardiovascular System I	3
VM	519	Cutaneous System I	2
VM	520	Respiratory System I	3
VM	523	Immunologic and Hematologic Systems I	3
VM	525	Digestive System I	3
VM	527	Endocrine System I	3
VM	528	Reproductive System I	2
VM	529	Urinary System I	2
VM	530	Veterinary Science II	4
VM	531	Immunologic and Hematologic Systems II	3
VM	534	Cutaneous System II	3
VM	535	Reproductive System II	3
VM	536	Respiratory System II	3
VM	537	Veterinary Career and Practice Management IV	1
VM	539	Veterinary Career and Practice Management V	1
VM	565	Cardiovascular System II	2
VM	568	Urinary System II	3
VM	569	Musculoskeletal System II	3
VM	571	Nervous System II	3
VM	575	Digestive System II	3
VM	577	Endocrine System II	3
VM	578	Clinical Reasoning I	6
VM	579	Clinical Reasoning II	5
VM	580	Veterinary Surgery and Anesthesia	3
VM	581	Clinical Reasoning III	5
VM	582	Veterinary Clinical Experience	3
VM	583	Clinical Pathology	2
VM	584	Pharmacology	2
VM	585	Diagnostic Imaging	2

CLINICAL PHASE

The clinical phase curriculum consists of 51 credits. Students will be required to complete 30 clerkship credits and an additional 21 credits of elective clerkships. Satisfactory completion of all preclinical phase courses is required for enrollment in any of the listed clerkships._

REQUIRED CLERKSHIPS (30 credits)

LCS	616	Large Animal Medicine and Surgery	6
PDI	630	Diagnostic Pathology Clerkship	3
SCS	611	Diagnostic Imaging Clerkship	3
SCS	625	Small Animal Primary Care Clerkship	3
SCS	626	Small Animal Soft Tissue Surgery Clerkship	3
SCS	646	Small Animal Orthopedic Surgery Clerkship	3
SCS	647	Small Animal Internal Medicine Clerkship	3
SCS	648	Anesthesia Clerkship	3
SCS	695	Emergency and Critical Care Medicine Clerkship	3

ELECTIVE CLERKSHIPS

LCS	610	Clinical Problems in Large Animal Clinical Sciences	3
LCS	611	Research Problems in Large Animal Clinical Sciences	3
LCS	613	Special Problems in Large Animal Clinical Sciences at Off-Campus Sites	3
LCS	614	Equine Clinical Proficiency Clerkship	3
LCS	615	Equine Emergency and Critical Care Clerkship	3
LCS	621	Practice-Based Ambulatory Clerkship	3
LCS	622	Advanced Equine Clinical Clerkship	3
LCS	623	Equine Musculoskeletal Diseases Clerkship	3
LCS	624	Equine Theriogenology Clerkship	3
LCS	625	Equine Primary Care Clerkship	3
LCS	626	Advanced Equine Surgery Clerkship	3
LCS	627	Advanced Equine Medicine Clerkship	3
LCS	628	Techniques in Equine Anesthesia and Surgery Clerkship	3
LCS	632	Advanced Food Animal Medicine and Surgery	3
LCS	640	Large Animal Anesthesia Clerkship	3
LCS	646	Equine Neonatal Medicine Clerkship	3
LCS	647	Concepts of Agricultural Practice Clerkship	3
LCS	660	Wildlife Disease Ecology and Management	3
LCS	678	Government and Corporate Veterinary Practice	3
LCS	679	Food Animal Production Medicine I	3
LCS	682	Food Animal Production Medicine II	3
LCS	685	Ruminant Health Problem Solving Clerkship	3
LCS	690	Veterinary Public Health Field Experience Clerkship	3
LCS	691	Veterinary Public Health Research Clerkship	3
MGI	690	Veterinary Microbiology Clerkship	3
PDI	610	Veterinary Gross Anatomy Dissection	3
PDI	611	Research Problems in Veterinary Anatomy	3
PDI	631	Necropsy Clerkship	3
PDI	632	Problems in Veterinary Pathology	3
PDI	633	Special Problems in Veterinary Pathology	3
PDI	634	Endocrinology Clerkship	3
PDI	635	Special Problems in Histopathology and Cytology Clerkship	3
PDI	636	Aquatic Animal Medicine Clerkship	3
PHM	658	Research Problems in Pharmacology or Toxicology	3
SCS	613	Diagnostic Ultrasound Clerkship	3
SCS	630	Spay/Neuter Clerkship	3
SCS	640	Cardiology Clerkship	3
SCS	641	Comparative Ophthalmology Clerkship	3
SCS	642	Zoo and Wildlife Clerkship	3
SCS	644	Dermatology Clerkship	3
SCS	651	Advanced Comparative Ophthalmology Clerkship	3
SCS	654	Clinical Medical Oncology Clerkship	3
SCS	690	Veterinary Molecular Biology Clerkship	3
SCS	693	Problems in Small Animal Clinical Sciences Clerkship	3
SCS	694	Small Animal Specialty Practice Clerkship	3
VM	611	Veterinary Externship	3
VM	690	Special Problems in Veterinary Medicine	3

VM	692	Career Development and Business Skills	3

Effective Spring 2026.

PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

~~AT 045~~
AT 145 Agricultural Communications
~~Fall of every year.~~ Spring of every year. 2(2-0) ~~R: Open only to students in the Institute of Agricultural Technology.~~ R: Open to agricultural technology students in the College of Agriculture and Natural Resources and open to undergraduate students in the College of Agriculture and Natural Resources.
Communication in agriculture including public speaking, group discussion, business correspondence, technical reports and a review of grammar and mechanics.
SA: AT 045
Effective Summer Semester 2025

~~AT 055~~
AT 155 Agricultural Finance
~~Spring of every year.~~ Spring of every year. 3(4-0) ~~R: Open only to students in the Institute of Agricultural Technology.~~ R: Open to agricultural technology students in the College of Agriculture and Natural Resources and open to undergraduate students in the College of Agriculture and Natural Resources.
Introduction to agricultural finance. Types of credit. Financial alternatives.
SA: AT 055
Effective Summer Semester 2025

~~AT 071~~
AT 171 Technical Mathematics
Fall of every year. 2(0-4) ~~R: Open to students in the Institute of Agricultural Technology.~~ R: Open to agricultural technology students in the College of Agriculture and Natural Resources and open to undergraduate students in the College of Agriculture and Natural Resources.
~~Basic arithmetic. Whole numbers, common fractions, decimals, percentage, ratio, and proportion. Basic algebraic concepts and solutions for practical geometric problems.~~ Basic arithmetic. Whole numbers, common fractions, decimals, percentage, ratio, and proportion. Basic algebraic concepts and solutions for practical geometric problems.
SA: AT 071
Effective Summer Semester 2025

AT 195 Research and Practice in Agricultural Technologies
Fall of every year. Spring of every year. Summer of every year. ~~3(1-4)~~ 2(1-2) A student may earn a maximum of 6 credits in all enrollments for this course. P: (AT 100 or concurrently) or AT 214 or ANS 110 or (FSC 111 or concurrently) or (FOR 115 or concurrently) or HRT 207 or AT 102 or (FOR 112 or concurrently) or approval of department R: Open to agricultural technology students or approval of department.
Scope, impacts, and challenges of technologies transforming modern agriculture. Field trips required.
Effective Spring Semester 2026

ANS 147 Horse Management Placement Seminar
Spring of every year. 1(1-0) R: Open to students in the Institute of Agricultural Technology.
Securing a placement training experience. Writing a resume.
SA: ANS 064
DELETE COURSE
Effective Summer Semester 2025

ANS 148 Methods of Instructing Safe Horsemanship
Spring of every year. 2(2-0) R: Open to students in the Institute of Agricultural Technology.
Lesson planning and communication skills for riding instructors. Safety and legal issues. Riding instructor certification. Organizations.
SA: ANS 041
DELETE COURSE
Effective Summer Semester 2025

ANS 412 Introduction to Precision Livestock Technology
Fall of every year. 3(2-2) P: (AFRE 203 or concurrently) and ANS 110 and ANS 210
NEW Overview of the principles and applications of precision livestock technology in modern animal agriculture.
Effective Fall Semester 2025

HNF 894 Human Nutrition Practicum
Fall of every year. Spring of every year. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to graduate students in the Nutrition and Dietetics Major.
Experience in agencies or offices related to Human Nutrition. Field experience required.
~~Request the use of the Pass-No Grade (P-N) system.~~
Effective Fall Semester 2025

PKG 221 Packaging with Glass and Metal
Fall of every year. Spring of every year. 2(2-0) ~~P: (CEM 141 or CEM 151 or LB 171) and (PHY 231 or PHY 231C or PHY 183 or PHY 183B or LB 273) and (PKG 102 or concurrently)~~ P: (CEM 141 or CEM 151 or LB 171) and (PHY 231 or PHY 183 or LB 273) and (PKG 102 or concurrently) R: Open to undergraduate students in the School of Packaging or approval of department.
Physical and chemical properties of glass and metals and their applications to packaging.
SA: PKG 320, PKG 325
Effective Summer Semester 2025

PKG 432 Packaging Processes
Fall of every year. Spring of every year. 4(3-2) ~~P: (PKG 322 and PKG 323) and (PHY 232 or PHY 232C or PHY 184 or PHY 184B or PHY 294H or LB 274)~~ P: (PKG 322 and PKG 323) and (PHY 232 or PHY 184 or PHY 294H or LB 274) R: Open to undergraduate students in the School of Packaging and not open to graduate students in the School of Packaging or approval of department.
Integrated study of packaging and production operations, quality control, and organization and control of machines. Interrelationship of products, packaging, machinery layout and efficiency, and quality issues.
Effective Summer Semester 2025

PKG 441 AI and Robotics in Packaging
~~Fall of every year. Spring of every year.~~ Fall of every year. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: PKG 323 and PKG 322 R: Open to undergraduate students or graduate students in the School of Packaging. Approval of department. A student may earn a maximum of 6 credits
Principles and use of AI and Robotics in Packaging.
Effective Fall Semester 2025

~~CSS 101~~
CROP 101 Introduction to Crop Science
Fall of every year. Spring of every year. 3(3-0) R: Open to undergraduate students or agricultural technology students.
Principles of crop production including integrated crop management. Sustainable agriculture. International agriculture. Environmental challenges to crop production.
SA: CSS 101
Effective Fall Semester 2026

~~CSS 101L~~
CROP 101L Introduction to Crop Science Laboratory
Fall of every year. 1(0-2) ~~P: CSS 101 or concurrently~~ P: CROP 101 or concurrently R: Open to undergraduate students or agricultural technology students.
Identification of crops, seeds, plant structures; plant nutrient deficiency symptoms; crop growth stages and environmental stresses including pests, nutrients, drought, and temperature. Field trips required.
SA: CSS 101L
Effective Fall Semester 2026

~~CSS 110~~
CROP 110 Computer Applications in Agronomy
Fall of every year. 2(1-2) R: Open to undergraduate students or agricultural technology students in the College of Agriculture and Natural Resources. ~~Not open to students with credit in CSE 101.~~
Use of computers in agriculture. Basic computer operating systems. Management and use of storage media. Laboratory experience in word processing, spreadsheets, databases, programming languages, networking, and software related to agriculture.
SA: CSS 110
Effective Fall Semester 2026

~~CSS 120~~
CROP 120 Issues in Food and Agriculture
Fall of every year. 3(3-0) R: Open to undergraduate students or agricultural technology students.
Current and historical issues impacting food and agriculture.
SA: CSS 120
Effective Fall Semester 2026

~~CSS 124~~
CROP 124 Introduction to Sustainable Agriculture and Food Systems
Fall of every year. Spring of every year. 2(2-0) Interdepartmental with Animal Science, Community Sustainability, Horticulture R: Open to undergraduate students or agricultural technology students.
Contemporary research and movements involving agricultural and food system sustainability. Socio-cultural factors influencing food and agriculture.
SA: CSS 124
Effective Fall Semester 2026

~~CSS 126~~
CROP 126 Introduction to Weed Management
Fall of every year. 2(2-0) P: CSS 101 or CSS 232 or HRT 109 R: Open to students in the Institute of Agricultural Technology.
Biology, identification, and management of weeds.
~~SA: CSS 156~~ SA: CSS 156, CSS 126
Effective Fall Semester 2026

~~CSS 135~~
CROP 135 Crop Scouting and Investigation
Spring of every year. 3(4-0) Interdepartmental with Horticulture P: CSS 101 or HRT 203 RB: CSS 101L R: Open to undergraduate students or agricultural technology students.
Crop scouting and agricultural clientele interactions for improved crop management. Offered first ten weeks of semester.
SA: CSS 135
Effective Fall Semester 2026

~~CSS 151~~
CROP 151 Seed and Grain Quality
Spring of every year. 2(2-2) R: Open to undergraduate students or agricultural technology students.
Principles and practices of producing, conditioning, testing and marketing field crop seed. Grain grading and quality evaluation. Offered first ten weeks of semester.
~~SA: CSS 051~~ SA: CSS 051, CSS 151
Effective Fall Semester 2026

~~CSS 192~~
CROP 192 Professional Development Seminar I
Fall of every year. 1(0-2) R: Open to students in the Department of Plant, Soil and Microbial Sciences or in the Agricultural Industries Major.
Career exploration and preparation, and written, verbal, and visual communication in crop and soil sciences
Request the use of the Pass-No Grade (P-N) system.
SA: CSS 192
Effective Fall Semester 2026

~~CSS 201~~
CROP 201 Forage Crops
Fall of every year. 3(2-2) R: Open to undergraduate students or agricultural technology students.
Identification, production, management, and use of grass and legume forage crops as hay, silage, and pasture.
SA: CSS 201
Effective Fall Semester 2026

~~CSS 212~~
CROP 212 Advanced Crop Production
Fall of every year. 2(2-0) P: CSS 101 RB: CSS 210 and CSS 110 R: Open to undergraduate students or agricultural technology students.
Systems approach to production of field crops including corn, soybeans, small grains, sugar beets, and dry beans.
SA: CSS 212
Effective Fall Semester 2026

~~CSS 222~~
CROP 222 New Horizons in Biotechnology
Fall of every year. 2(2-0) R: Open to undergraduate students or agricultural technology students.
Perspectives on biotechnology for safer food production, environmental quality, and improved human health. Impacts of biotechnology on the national economy. Political and ethical ramifications of applied biotechnology.
SA: CSS 222
Effective Fall Semester 2026

~~CSS 224~~
CROP 224 Sustainable Farm and Food Systems Field Studies
Fall of every year. 1(0-4) Interdepartmental with Animal Science, Community Sustainability, Horticulture P: CSS 124 R: Not open to freshmen or agricultural technology students.
Field visits to farm and food system operations that utilize sustainable practices in Michigan. Offered first half of semester.
SA: CSS 224
Effective Fall Semester 2026

~~CSS 226L~~
CROP 226L Weed Science Laboratory
Fall of every year. 1(0-2) P: ((CSS 126 or concurrently) or (CSS 326 or concurrently)) and (CSS 101 or CSS 232 or HRT 203 or HRT 109)
Weed and weed seed collection and identification. Mechanical and chemical tools involved in managing weeds. Herbicide application and calibration. Weed and crop selectivity, crop injury symptoms.
~~SA: CSS 156, CSS 302, CSS 402~~ SA: CSS 156, CSS 302, CSS 402, CSS 226L
Effective Fall Semester 2026

~~CSS 290~~
CROP 290 ~~Independent Study in Crop and Soil Science~~ Independent Study in Cropping Systems Science
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open to students in the Institute of Agricultural Technology. Approval of department; application required.
Field, laboratory, or library research problems.
~~SA: CSS 057~~ SA: CSS 057, CSS 290
Effective Fall Semester 2026

~~CSS 294~~
CROP 294 Issues in International Agriculture
Spring of every year. 1(1-0) P: Completion of Tier I Writing Requirement R: Open to undergraduate students or agricultural technology students.
Global issues related to food production, soil resources and sustainability of agriculture in developing and developed countries.
~~SA: CSS 494~~ SA: CSS 494, CSS 294
Effective Fall Semester 2026

~~CSS 313~~
CROP 313 Data Interpretation and Writing in the Agronomic Sciences (W)
Spring of every year. 2(2-0) P: ((CSS 110 and CSS 210) and completion of Tier I writing requirement) and (CSS 101 or CSS 232) R: Not open to freshmen.
Data analysis, interpretation, integration, and technical writing in agronomic sciences.
SA: CSS 313
Effective Fall Semester 2026

~~CSS 326~~
CROP 326 Weed Science
Fall of every year. 2(2-0) P: CSS 101 or CSS 232 or HRT 203 R: Not open to students in the Institute of Agricultural Technology.
Weed biology and ecology. Integrated weed management including cultural, mechanical, biological, and chemical control practices. Herbicide mode of action, selectivity in plants, environmental considerations.
~~SA: CSS 302, CSS 402~~ SA: CSS 302, CSS 402, CSS 326
Effective Fall Semester 2026

~~CSS 350~~
CROP 350 Introduction to Plant Genetics
Spring of every year. 3(4-0) P: PLB 105 or BS 161 R: Not open to freshmen.
Fundamentals of plant genetics with applications to agriculture and natural resources.
SA: CSS 350
Effective Fall Semester 2026

~~CSS 411~~
CROP 411 Fire and Environmental Quality
Spring of odd years. 3(3-0) Interdepartmental with Forestry P: (CSS 210) and (CEM 141 or LB 171 or CEM 181H) RB: BS 162 or BS 172 or BS 182H or PLB 105 or LB 144
The role of fire in cultivated and natural environments. Use of fire by humans. Combustion reactions, fire effects on soil health, and air and water quality, and impacts on human communities around the world. Local field trip required.
SA: CSS 411
Effective Fall Semester 2026

~~CSS 420~~
CROP 420 Cover Crops in Agroecosystems
Fall of every year. 3(2-2) Interdepartmental with Horticulture P: (CSS 101 or HRT 251 or HRT 341) and CSS 210 and Completion of Tier I Writing Requirement
Management, environmental, economic, and social considerations of cover crops across agroecosystems.
SA: CSS 420
Effective Fall Semester 2026

~~CSS 424~~
CROP 424 Sustainable Agriculture and Food Systems Capstone
Spring of every year. 3(3-0) ~~Interdepartmental with Animal Science, Community Sustainability, Horticulture, Human Nutrition and Foods~~ ~~P: CSS 124 and CSS 224~~ P: CROP 124 and CROP 224 RB: At least one SAFS Minor selective course in a discipline outside a student's major area of study. Prior coursework in scientific writing and formal citations. R: Open to juniors or seniors or graduate students.
Application of interdisciplinary considerations of sustainable agriculture and food systems. Community-engagement, small-group projects, and practitioner speakers prepare students for potential career pathways.
SA: CSS 424
Effective Fall Semester 2026

~~CSS 431~~
CROP 431 International Agricultural Systems
Spring of every year. 3(3-0) P: (ANR 250 or ISS 310 or ISS 315 or ISS 318 or ISS 320 or ISS 330A or ISS 330B or ISS 330C) and completion of Tier I writing requirement R: Not open to freshmen and not open to sophomores.
World production capacity for food, fiber and biofuel as related to soil, biology and climatic resources. Principles and case studies of sustainable systems presented from developing and developed countries. Emerging issues in agricultural globalization and biodiversity.
SA: CSS 431
Effective Fall Semester 2026

~~CSS 441~~
CROP 441 Plant Breeding and Biotechnology
Spring of every year. 3(3-0) RB: Knowledge of plant biology, genetics, and basic statistics.
Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes and cultivars.
SA: CSS 441
Effective Fall Semester 2026

~~CSS 442~~
CROP 442 Agricultural Ecology
Fall of every year. 3(3-0) R: Open to juniors or seniors or graduate students.
Ecological principles in the design and management of agricultural ecosystems. Integration of ecological factors regulating crop and rangeland productivity.
SA: CSS 442
Effective Fall Semester 2026

~~CSS 451~~
CROP 451 Biotechnology Applications for Plant Breeding and Genetics
Spring of every year. 3(2-2) Interdepartmental with Forestry, Horticulture ~~P: CSS 350 or IBIO 341~~ P: CROP 350 or IBIO 341 R: Open to juniors or seniors or graduate students.
Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology and transformation in relation to plant improvement.
SA: CSS 451
Effective Fall Semester 2026

~~CSS 460~~
CROP 460 Plant-Microbe Interactions
Spring of every year. 3(3-0) ~~P: CSS 360 or MMG 301 or approval of department~~ P: SOIL 360 or approval of department
Plant responses to the surrounding microbial communities, including pathogens and mutualists. Evaluation of the role of microbial communities in plant health
SA: CSS 460
Effective Fall Semester 2026

~~CSS 467~~
CROP 467 BioEnergy Feedstock Production
Fall of every year. 3(3-0) Interdepartmental with Biosystems Engineering, Forestry P: MTH 103 or MTH 116 or MTH 124 or MTH 132 or LB 118 or MTH 152H or MTH 133 or MTH 153H or LB 119 ~~RB: CSS 101 and CSS 210~~ RB: CROP 101 and SOIL 210
Agronomic, economic, technological, and environmental principles involved in bioenergy feedstock production. Cultivation, harvest, transportation, and storage of agricultural and forest biomass.
SA: CSS 467
Effective Fall Semester 2026

~~CSS 485~~
CROP 485 Physiology in Plant Nutrition
Spring of every year. 3(3-0) Interdepartmental with Horticulture P: PLB 301 or HRT 361 or approval of department
Nutrient uptake, transport and storage in plants. Regulation of nutrient homeostasis in crop plants and genetic variation in plant nutrition.
SA: CSS 485
Effective Fall Semester 2026

~~CSS 488~~
CROP 488 Agricultural Cropping Systems: Integration and Problem Solving
Spring of every year. 3(2-2) ~~P: (CSS 101 and CSS 210) and completion of Tier I writing requirement.~~ P: (CROP 101 and SOIL 210) and completion of Tier I writing requirement RB: (PLP 405 and ENT 404) and Course work in crop production and management. ~~R: Open to seniors in the Agronomy minor or in the Crop and Soil Sciences major.~~ R: Open to seniors.
Integration and synthesis of agronomic and related concepts in agricultural cropping systems. Problem solving and application of information.
SA: CSS 488
Effective Fall Semester 2026

~~CSS 490~~
CROP 490 Independent Study
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. ~~P: CSS 101 or CSS 210~~ P: CROP 101 or SOIL 210 R: Approval of department; application required.
Individual work on field, laboratory, or library research problem of special interest to the student.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
SA: CSS 490
Effective Fall Semester 2026

~~CSS 491~~
CROP 491 Special Topics
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. ~~P: CSS 101 or CSS 210~~ P: CROP 101 or SOIL 210
Topics from crop production, crop physiology, turfgrass management, organic soils, turfgrass soils, soil fertility, plant and soil relationships, genetics, biotechnology, environmental science, or sustainable agriculture.
SA: CSS 491
Effective Fall Semester 2026

~~CSS 492~~
CROP 492 Professional Development Seminar II (W)
Fall of every year. 1(0-2) ~~P: (CSS 192 or CSS 262) and Completion of Tier I Writing Requirement~~ P: (CROP 192) and Completion of Tier I Writing Requirement R: Open to seniors in the Department of Plant, Soil and Microbial Sciences.
Professionalism and proficiency in oral and written communication skills in agronomy and turfgrass, including life skills.
Request the use of the Pass-No Grade (P-N) system.
SA: CSS 492
Effective Fall Semester 2026

~~CSS 493~~
CROP 493 Professional Internship in Crop and Soil Sciences
Summer of every year. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: Completion of Tier I Writing Requirement R: Approval of department; application required. A student may earn a maximum of 6 credits in all enrollments for any or all of these courses: ABM 493, ANR 493, ANS 493, CMP 493, CSS 493, CSUS 493, EEP 493, FIM 493, FSC 493, FW 493, HRT 493, PKG 493, and PLP 493.
Supervised professional experiences in crop and soil sciences.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
SA: CSS 493
Effective Fall Semester 2026

~~CSS 499~~
CROP 499 Undergraduate Research
Fall of every year. Spring of every year. Summer of every year. 3(0-9) A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department; application required.
Faculty supervised research in a selected area of crop and soil sciences or environmental soil science.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
SA: CSS 499
Effective Fall Semester 2026

PLP 813 Applied Molecular Evolution and Genetics of Microbes
Spring of odd years. 3(3-0) P: PLP 805 or PLP 405
NEW Characterize plant-associated microbes using phylogenetics and population genetics.
Effective Spring Semester 2026

PLP 850 Physiological Plant Pathology
Fall of even years. 3(3-0) P: PLP 805 or concurrently RB: PLP 405 and PLB 415
Cytology of infection and mechanisms of colonization of plant by pathogens. Effects of disease on plant physiology. Plant-pathogen genetics and plant defenses.
DELETE COURSE
Effective Spring Semester 2025

~~CSS 203~~
SOIL 203 World of Soils
Fall of every year. Spring of every year. 2(2-0) ~~Not open to students with credit in CSS 210.~~
Importance of soils in all ecosystems focusing on agriculture and urban landscapes.
SA: CSS 203
Effective Fall Semester 2026

~~CSS 210~~
SOIL 210 Fundamentals of Soil Science
Fall of every year. Spring of every year. 3(2-3) RB: CEM 141 R: Open to undergraduate students or agricultural technology students.
Agricultural and natural resource ecosystems: soil, vegetation, and ground water components. Energy, water, and nutrient cycles. Soil classification and mapping. Land management and use issues.
SA: CSS 210
Effective Fall Semester 2026

SOIL 290 Independent Study in Environmental Soil and Water Sciences
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department; application required. A student may earn a maximum of 6 credits A combined max of 6 credits may be earned from this course and SOIL 490
NEW Field, laboratory, or library research problems.
SA: CSS 290, CSS 057
Effective Fall Semester 2026

~~CSS 330~~
SOIL 330 Soil Chemistry
Spring of every year. ~~2(2-2)~~ 2(1-2) P: CSS 210 and CEM 141
Organic and inorganic soil processes including mineralogy, adsorption, desorption, and precipitation. Chemistry of soil organic matter and inorganic soil components.
SA: CSS 330
Effective Fall Semester 2026

~~CSS 340~~
SOIL 340 Applied Soil Physics
Spring of every year. ~~2(2-2)~~ 2(1-2) P: CSS 210
Soil physical properties including solids, water, air, and heat. Transport processes in soil.
SA: CSS 340
Effective Fall Semester 2026

~~CSS 360~~
SOIL 360 Soil Biology
Fall of every year. 3(2-2) P: CSS 210 RB: CSS 330
Overview of organismal diversity and biological soil processes. Role of macroorganisms and microorganisms in soil processing, including nutrient cycling.
SA: CSS 360
Effective Fall Semester 2026

~~CSS 455~~
SOIL 455 Environmental Pollutants in Soil and Water
Spring of every year. 3(3-0) P: CEM 143 or CEM 251 RB: CSS 210 R: Open to juniors or seniors or graduate students.
Environmental sources, physiochemical and biological processes, management of plant nutrients, heavy metals, organic contaminants, pesticides and pharmaceuticals in soil and water.
SA: CSS 455
Effective Fall Semester 2026

~~CSS 470~~
SOIL 470 Soil Resources
Fall of every year. ~~3(2-3)~~ 3(2-2) P: CSS 210 R: Not open to freshmen or sophomores.
Evaluation of the properties, genesis, and classification of soil resources to assist in making land-use decisions.
SA: CSS 470
Effective Fall Semester 2026

~~CSS 480~~
SOIL 480 Soil Fertility and Management
Fall of every year. 4(4-0) P: (CSS 210) and (CSS 330 or CSS 340 or CSS 360 or (CSS 470 or concurrently)) R: Open to seniors.
Comprehensive nutrient management of agricultural and urban soils. Site- and field-specific soil and nutrient management strategies. Cation exchange capacity, soil pH, liming requirements, macro and micronutrient crop requirements, water and soil quality.
SA: CSS 480
Effective Fall Semester 2026

SOIL 490 Independent Study in Environmental Soil and Water Sciences
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: SOIL 210 R: Approval of department; application required. A student may earn a maximum of 6 credits A combined max of 6 credits may be earned from this course and SOIL 290
NEW Individual work on field, laboratory, or library research problem of special interest to the student.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
SA: CSS 490
Effective Fall Semester 2026

SOIL 491 Special Topics in Environmental Soil and Water Sciences.
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: SOIL 210
NEW Topics in environmental soil and water science
SA: CSS 491
Effective Fall Semester 2026

SOIL 499 Undergraduate Research
Fall of every year. Spring of every year. Summer of every year. 3(0-9) A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department; application required.
NEW Faculty supervised research in a selected area of environmental soil sciences
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
SA: CSS 499
Effective Fall Semester 2026

~~CSS 178~~
TURF 178 ~~Turfgrass Irrigation~~ Turf Irrigation
Spring of every year. ~~3(3-2)~~ 3(2-2) P: CSS 232
Turfgrass irrigation systems. Installation and maintenance including water management. Offered first ten weeks of semester.
Effective Fall Semester 2025

~~CSS 181~~
TURF 181 Pesticide and Fertilizer Application Technology
Spring of every year. ~~3(3-3)~~ 3(2-2)
Effective and efficient application of pesticides and fertilizers to turf and ornamentals. Pesticide handling, legal, and environmental concerns. Calibration of equipment. Offered first ten weeks of semester.
SA: CSS 081
Effective Fall Semester 2025

~~CSS 202~~
TURF 202 World of Turf
Fall of every year. Spring of every year. Summer of every year. 2(2-0) Not open to students with credit in CSS 232.
Role of turf in society and the environment. Principles underlying establishment and maintenance of turf on athletic fields, parks, home lawns, and golf courses. Aesthetic, safety, and economic aspects of turfgrass management practices.
Effective Fall Semester 2026

~~CSS 202L~~
TURF 202L World of Turf Lab
Fall of every year. Spring of every year. Summer of every year. 1(0-2) P: CSS 202 or concurrently Not open to students with credit in CSS 232.
Turfgrass identification. Site analysis and recommendations. On campus facility and venue visits. Mowing equipment and practices. Turf establishment. Soil cultivation and amendments. Fertilizer and pest management. Field trips required.
Effective Fall Semester 2026

TURF 212 Turfgrass Biology
Fall of every year. 3(2-2)
NEW Turfgrass plant structure, function, physiology, and reproduction. Identification of cool and warm season turfgrass species
SA: CSS 232
Effective Fall Semester 2026

~~CSS 232~~
TURF 232 ~~Turfgrass Management~~ Turf Cultural Practices
Fall of every year. ~~4(3-2)~~ 2(1-2) ~~P: CSS 210 or concurrently~~ P: (SOIL 210 or concurrently) and (TURF 212 or concurrently) ~~RB: CSS 110 or CSE 101~~ C: TURF 202 concurrently
~~Turfgrass utilization, identification, establishment and management principles. Responses to various cultural practices.~~ Establishing and maintaining golf courses and athletic fields, operating equipment, and using literature resources related to turf.
SA: CSS 232
Effective Fall Semester 2026

~~CSS 262~~
TURF 262 ~~Turfgrass Management Seminar~~ Turf Management Seminar I
Fall of every year. 1(2-0) A student may earn a maximum of 2 credits in all enrollments for this course. P: CSS 232 or concurrently
Presentations by turf students and industry professionals. Topics include internship experiences, technical expertise, and keys to successful career pathways.
Effective Fall Semester 2025

~~CSS 264~~
TURF 264 Golf Course Design and Construction Techniques
Fall of every year. 2(2-0) P: CSS 210 and CSS 232 and CSS 267
Concepts and theory of golf course design and construction including location, space, topography, clientele, and environmental concerns.
SA: CSS 164
Effective Fall Semester 2025

~~CSS 267~~
TURF 267 Performance Turf Design and Construction
Spring of every year. ~~2(2-2)~~ 2(1-2) P: CSS 232
Performance turfgrass design, construction, renovation and establishment principles.
Effective Fall Semester 2025

~~CSS 269~~
TURF 269 ~~Turfgrass Strategies: Integration and Synthesis~~ Turf Management Strategies
Spring of every year. 2(3-0) P: CSS 232 and CSS 267
Issues in turfgrass management including employee relations, cultural, and environmental problems. Offered first ten weeks of semester.
Effective Fall Semester 2025

~~CSS 272~~
TURF 272 ~~Turfgrass Soil Fertility~~ Turf Soil Fertility
Spring of every year. 2(3-0) RB: CSS 210
Soil-plant relationships, soil acidity and alkalinity, macro- and micro-nutrients, fertilizer materials, soil fertility, evaluations, and fertilizer programming. Offered first ten weeks of semester.
SA: CSS 044, CSS 342
Effective Fall Semester 2025

~~CSS 282~~
TURF 282 Turfgrass Physiology
Spring of every year. 2(3-0) P: (CSS 232) Completion of Tier I writing requirement. RB: PLB 105
Physiological principles of turfgrass growth and development. Water relations, light, temperature, respiration, photosynthesis, mineral nutrition, and hormone action. Impact of mowing, cultivation, and traffic on turfgrass growth. Offered first ten weeks of semester.
SA: CSS 382, CSS 068, CSS 332
Effective Fall Semester 2025

TURF 290 Turfgrass Science and Management
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
NEW Field, laboratory, or library research problems.
SA: CSS 057, CSS 290
Effective Fall Semester 2026

TURF 402 Turfgrass in the Environment and Society (W)
Fall of every year. 3(3-0) P: (TURF 272 and TURF 267) and completion of Tier I writing requirement
NEW Turfgrass and recreational facility management practices and regulations to protect natural resources and ecosystems.
Effective Spring Semester 2026

TURF 462 Turf Management Seminar II
Spring of every year. 1(0-2) P: TURF 262
NEW Presentations by turf students and industry professionals. Topics include internship experiences, technical expertise, and keys to successful career pathways.
Effective Spring Semester 2026

TURF 469 Advanced Turf Management Strategies
Spring of every year. 1(3-0) P: TURF 269
NEW Developing critical thinking skills using case studies to explore strategies in turfgrass management and environmental stewardship. Offered last five weeks of the semester.
Effective Spring Semester 2026

TURF 472 Advanced Turf Soil Fertility
Spring of every year. 1(3-0) P: SOIL 210
NEW Develop a nutrient management plan for a golf course or athletic field. Knowledge of soil testing, fertilizer products, environmental fate of applied fertilizers, and application rate and timing will be included in the plan.
Effective Fall Semester 2026

TURF 482 Advanced Turfgrass Physiology
Spring of every year. 1(3-0) P: TURF 212
NEW Importance of turfgrass physiology in managing turfgrass systems. Plant growth regulators (PGRs), sustainable turfgrass systems
Effective Fall Semester 2026

TURF 490 Independent Study in Turfgrass Science and Management
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: TURF 212 R: Approval of department; application required.
NEW Individual work on field, laboratory, or library research problem of special interest to the student.
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 2025

TURF 491 Special Topics in Turfgrass science and management
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: SOIL 210 or TURF 212 or TURF 232
NEW Special Topics in Turfgrass science and management
SA: CSS 491
Effective Fall Semester 2026

TURF 493 Professional Internship in Turfgrass Science and Management
Summer of every year. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course. P: Completion of Tier I Writing Requirement R: Approval of department; application required. A student may earn a maximum of 6 credits
NEW Supervised professional experiences in turfgrass science and management
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall Semester 2025

TURF 499 Undergraduate Research
Fall of every year. Spring of every year. Summer of every year. 3(0-9) A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department; application required.
NEW Faculty supervised research in a selected area of turfgrass science and management.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall Semester 2025

COLLEGE OF ENGINEERING

BE 221 Introduction to Smart Agriculture
Spring of every year. 1(1-1) Interdepartmental with Engineering ~~P: (MTH 114 or MTH 116 or LB 117) or ((MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently))~~ P: (MTH 103 or MTH 114 or MTH 116 or LB 117) or ((MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently))
Concepts of smart agriculture and its role in addressing global challenges. Sustainable agricultural systems management incorporating digital tools, AI, and machine learning.
Effective Spring Semester 2026

CSE 102 Algorithmic Thinking and Programming
Fall of every year. Spring of every year. Summer of every year. ~~3(2-2)~~ 3(1-4) P: (MTH 103 or MTH 103B or MTH 116 or MTH 124 or MTH 132 or MTH 152H or LB 118 or LB 117) or designated score on Mathematics Placement test Not open to students with credit in CSE 231.
Fundamentals of computing, algorithms and programming, using a high-level language such as Python.
Effective Spring Semester 2026

MSE 460 Electronic Structure and Bonding in Materials and Devices
Spring of every year. 3(3-0) ~~P: MSE 260~~ P: (MSE 250) and ((PHY 184 or concurrently) or (PHY 294H or concurrently) or (LB 274 or concurrently) or (PHY 232 or concurrently)) ~~R: Open to seniors or juniors in the Department of Chemical Engineering and Materials Science or in the Materials Science and Engineering Minor.~~ R: Open to juniors or seniors in the College of Engineering.
Relationship between quantum mechanics and material properties. Free electron theory. Energy bands, semiconductors. Dielectrics and ferroelectrics. Dia-, para-, ferro-, and antiferro-magnetism. Superconductivity. Thermal properties.
Effective Fall Semester 2026

COLLEGE OF HUMAN MEDICINE

HM 150 Careers in Healthcare
Fall of every year. Spring of every year. 1 to 2 credits. Interdepartmental with Arts and Humanities Health and Wellbeing, Osteopathic Medicine A student may earn a maximum of 3 credits in all enrollments for this course.
NEW Healthcare career identification and exploration; development of educational and experiential learning pathways. Emphasis on emerging careers with sensitivity to patient populations and workforce projections.
Effective Fall Semester 2026

COLLEGE OF NATURAL SCIENCE

BMB 401 Comprehensive Biochemistry
Fall of every year. Spring of every year. Summer of every year. 4(4-0) P: CEM 252 or CEM 352 RB: BS 161 or BS 181H or LB 145 ~~R: Not open to students in the Biochemistry and Molecular Biology/Biotechnology Major or in the Biochemistry and Molecular Biology major.~~ R: Not open to students in the Biochemistry and Molecular Biology/Biotechnology Major or in the Biochemistry and Molecular Biology major or in the Lyman Briggs Biochemistry and Molecular Biology Coordinate Major or in the Lyman Briggs-Biochemistry/Biotechnology Coordinate Major. ~~Not open to students with credit in BMB 461.~~
Structure and function of major biomolecules, organization and regulation of metabolic pathways. Special emphasis on eukaryotic systems and the biochemical basis of human disease.
SA: BCH 401
Effective Fall Semester 2025

BMB 461 Advanced Biochemistry I
Fall of every year. Spring of every year. 3(3-0) P: (CEM 251 or CEM 351 or LB 271) and (CEM 252 or CEM 352) and (MTH 124 or MTH 132 or MTH 152H or LB 118) and (BS 161 or BS 181H or LB 145) and ((BS 162 or concurrently) or (BS 182H or concurrently) or (LB 144 or concurrently)) ~~Not open to students with credit in BMB 401.~~
Structure, function, and biophysical properties of biomolecules in a wide variety of organisms. Emphasis on proteins and carbohydrates including enzyme catalysis and kinetics, the central metabolic pathways, and photosynthesis.
SA: BCH 461
Effective Fall Semester 2025

ISB 201L Insects, Globalization, and Sustainability Laboratory
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 2(1-2) P: ISB 201 or concurrently
Problem-based learning activities involved with observing, hypothesizing, experimenting, and analysis of data related to environmental science.
Effective Summer Semester 2025

ISB 208L Applications in Biological Science Laboratory
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 2(1-2) P: (ISB 202 or concurrently) or (ISB 204 or concurrently)
Problem solving activities based on observation and interpretation of selected biological systems.
SA: ISB 202L, ISB 204L
Effective Summer Semester 2025

ISE 490 Special Problems
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.
Faculty directed individualized study of an interdisciplinary problem.
SA: SME 490
Effective Summer Semester 2025

ISE 600 Special Problems for K-8 Teachers
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 1 to 5 credits. A student may earn a maximum of 10 credits in all enrollments for this course. RB: Elementary teacher certification, 3 years teaching experience. R: Approval of college.
Supervised study of problems or issues in biological sciences, physical sciences, earth sciences or mathematical sciences.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 4 semesters after the end of the semester of enrollment.
SA: NSC 600, SME 600
Effective Summer Semester 2025

ISE 800 Problems in Science or Mathematics for Teachers
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 1 to 5 credits. A student may earn a maximum of 15 credits in all enrollments for this course. RB: Secondary certification in biological sciences, physical sciences or chemistry; secondary certification in Mathematics or Mathematics Education. R: Approval of college.
Supervised study of problems or issues in biological science, or physical sciences, or mathematical sciences.
SA: NSC 800, SME 800
Effective Summer Semester 2025

ISP 203L Geology of the Human Environment Laboratory
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 2(1-2) P: (ISP 203A or concurrently) or (ISP 203B or concurrently)
Exercises in the scientific method applied to earth materials and their impact on society.
Effective Summer Semester 2025

ISP 205L Visions of the Universe Laboratory
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 2(1-2) P: ISP 205 or concurrently
Observations of the sky, laboratory experiments, and computer simulations exploring the development of the modern conception of the universe.
Effective Summer Semester 2025

ISP 209 The Mystery of the Physical World
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. 3(3-0) P: (MTH 101 or MTH 103 or MTH 103B or (MTH 116 or concurrently) or (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 201 or concurrently) or (LB 118 or concurrently) or (STT 200 or concurrently) or (STT 201 or concurrently)) or designated score on Mathematics Placement test
Laws of physics through demonstrations and analyses of every day phenomena. Optics, mechanical systems and electromagnetic phenomena.
Effective Summer Semester 2025

ISP 209L The Mystery of the Physical World Laboratory
Fall of every year. Spring of every year. Summer of every year. 2(1-2) P: ISP 209 or concurrently
Physical phenomena: optics, mechanical systems and electromagnetics.
DELETE COURSE
Effective Summer Semester 2025

ISP 215 The Science of Sound
Fall of every year. Spring of every year. 3(3-0) P: (MTH 101 or MTH 103 or MTH 103B or (MTH 116 or concurrently) or (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 201 or concurrently) or (LB 118 or concurrently) or (STT 200 or concurrently) or (STT 201 or concurrently)) or designated score on Mathematics Placement test
The science of speech, communication, musical instruments, room acoustics, and analogue and digital audio. Integrating the physical, physiological, and psychological principles involved.
DELETE COURSE
Effective Summer Semester 2025

ISP 217 Water and the Environment
Fall of every year. Spring of every year. 3(3-0) P: MTH 101 or MTH 103 or MTH 103B or (MTH 116 or concurrently) or (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 201 or concurrently) or (LB 118 or concurrently) or (STT 200 or concurrently) or (STT 201 or concurrently)
Application of the scientific method to identification and solution of environmental problems related to water.
DELETE COURSE
Effective Summer Semester 2025

MGI 302 Introductory Laboratory for General and Allied Health Microbiology
Fall of every year. Spring of every year. Summer of every year. ~~1(0-3)~~ 2(1-3) P: (MGI 201 or concurrently) or (MGI 301 or concurrently)
Methodology of microbiology. Microscopy, staining, aseptic technique, media, quantification, diagnostics, and laboratory safety.
SA: MIC 302, MMG 302
Effective Fall Semester 2026

MGI 434 Laboratory in Genetics & Genomics (W)
Spring of every year. 4(1-8) ~~P: (MGI 301 and (MGI 433 or concurrently)) and completion of Tier I writing requirement~~ P: (MGI 301 and MGI 302 and (MGI 433 or concurrently)) and completion of Tier I writing requirement ~~R: Open to students in the Genomics and Molecular Genetics Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.~~ R: Open to students in the Genetics and Genomics Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.

Genetics & genomics techniques using microbes. Collection and critical assessment of quantitative data and written communication of results.
SA: MMG 434
Effective Spring Semester 2026

MGI 491 ~~Current Topics in Microbiology and Molecular Genetics~~
Current Topics in Microbiology, Genetics, & Immunology
Spring of every year. ~~3(1-0)~~ 3(3-0) ~~R: Open to seniors in the Lyman Briggs College or in the Department of Microbiology, Genetics, and Immunology or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.~~ R: Open to seniors in the Department of Microbiology, Genetics, and Immunology or in the Lyman Briggs Microbiology Coordinate Major and open to seniors in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major and open to seniors in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.

~~Capstone experience for microbiology majors. Presentation and discussion of journal articles. Writing of position papers. Topics such as microbial physiology, ecology, genetics, molecular biology, virology, immunology, or pathogenesis.~~ Scientific literature research experience for Microbiology, Genetics, and Immunology majors. Presentation and discussion of journal articles. Writing of position papers. Topics such as microbial physiology, ecology, genetics, molecular biology, virology, immunology, or pathogenesis.
SA: MIC 491, MMG 491
Effective Fall Semester 2025

MGI 852 Molecular Immunology
~~Fall of every year.~~ Fall of even years. 1(1-0) RB: Basic knowledge of molecular biology, cell biology, physiology, immunology, and genetics. R: Open to graduate students.

Protein structures and functions of immune receptors and molecules, gene expression and regulation, DNA rearrangements and antigen receptors diversifications.
SA: MMG 851, MMG 852
Effective Fall Semester 2025

MGI 853 Cellular Immunology
~~Fall of every year.~~ Fall of even years. 1(1-0) RB: Basic knowledge of molecular biology, cell biology, physiology, and genetics. R: Open to graduate students.

Cells in the immune system, lymphocytes development and differentiation, cellular interactions in immune responses.
SA: MMG 851, MMG 853
Effective Fall Semester 2025

MGI 854 Applied Immunology
~~Fall of every year.~~ Fall of even years. 1(1-0) RB: Basic knowledge of molecular biology, cell biology, physiology, and genetics. R: Open to graduate students.

Immunity against bacterial and viral infections, and cancer cells. Vaccines, Transplantation and Immunotherapies. Immunodeficiency and autoimmune diseases.
SA: MMG 851, MMG 854
Effective Fall Semester 2025

COLLEGE OF NURSING

NUR 990 ~~Special Problems~~ Independent Study for Graduate Nursing
Fall of every year. Spring of every year. Summer of every year. 1 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open to doctoral students in the College of Nursing or approval of college.
~~Individual or group in-depth study of specific areas in nursing research.~~ Individual or group in-depth study of specific areas in nursing research.
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2025

COLLEGE OF VETERINARY MEDICINE

LCS 617 Honeybee Medicine
Summer of every year. 3 credits. RB: Fourth year student at MSU CVM graduate Professional (DVM) in clinical year R: Open to graduate-professional students in the College of Veterinary Medicine or in the Professional Program in Veterinary Medicine.
NEW Honey Bee Medicine is a 3-week clerkship designed to provide information on and experience working with honey bees and beekeepers. This course provides an introduction to the beekeeping industry, honey bee biology, animal handling, and disease diagnostics and treatment recommendations. Course time is a mix of hands-on work with honey bees, visits to apiaries, discussions with professionals in the apicultural industry, self-directed learning, and classroom participation.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Summer Semester 2026

PHM 811 Global Health: Pharmacology and Toxicology Perspective
Summer of every year. 2(2-0) ~~P: PHM 350 or concurrently or approval of department~~ RB: biology and/or pathology and/or toxicology ~~R: Approval of department.~~ R: Open to graduate students.
General concepts of global health that are relevant to pharmacology and toxicology.
Effective Spring Semester 2026

PHM 838 Pharmacogenomics
~~Fall of every year.~~ Spring of every year. 2(2-0) P: PHM 819 RB: Knowledge of general principles of pharmacology, physiology, and genetics R: Open to graduate students in the Integrative Pharmacology Major or in the Pharmacology and Toxicology Major. Approval of department.
Dissection of the basics of genomics and its interplay with traits, efficacy, toxicity, kinetics and dosage involving drugs and drug pathways.
Effective Fall Semester 2025

PHM 842 Introduction to Medical Device Toxicology
Summer of every year. 2(2-0) A student may earn a maximum of 2 credits in all enrollments for this course. RB: SCIENCE / BIOLOGY / CHEMISTRY / PHYSIOLOGY
NEW This class outlines the foundations of medical device biocompatibility and toxicology, including a review of the regulatory expectations and standards, endpoint assessment, and the data needed for toxicological risk assessment (TRA) to assess safety of medical devices. Course instructors and contributors are experts in the field from industry, contract research organizations, and regulatory agencies.
Effective Summer Semester 2026

VM 502 Veterinary Doctoring I
Fall of every year. 1(0-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
Introduction to professionalism, basic communication skills, effective use of teams, medical ethics, health records, confidentiality, professional use of social media, and safe veterinary practices. Clinical doctoring skills, with emphasis on cutaneous, hematologic, immunologic, reproductive, and respiratory systems in health.
DELETE COURSE
Effective Fall Semester 2025

VM 505 Veterinary Doctoring II
Spring of every year. 1(0-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
Professionalism, communication, medical ethics, and social competence, including professional interactions, client communication, history taking, and recognizing cultural differences and their impact. Clinical doctoring skills, with emphasis on cardiovascular, digestive, endocrine, musculoskeletal, nervous, and urinary systems in health.
DELETE COURSE
Effective Fall Semester 2025

VM 578 Clinical Reasoning I
Fall of every year. ~~8(2-12)~~ 6(2-8) R: Open to graduate-professional students in the College of Veterinary Medicine.
Clinical reasoning in veterinary medicine.
Effective Fall Semester 2025

VM 579 Clinical Reasoning II
Fall of every year. ~~7(2-10)~~ 5(2-6) R: Open to graduate-professional students in the College of Veterinary Medicine.
Advanced clinical reasoning skill development. Complex cases that involve multiple systems, animal populations, and public health implications.
Effective Fall Semester 2025

VM 583 Clinical Pathology
Fall of every year. 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
NEW Fundamental knowledge and application of clinical pathology in veterinary medicine.
Effective Fall Semester 2025

VM 584 Pharmacology
Fall of every year. 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
NEW Fundamental knowledge and application of pharmacological principles in veterinary medicine.
Effective Fall Semester 2025

VM 585 Diagnostic Imaging
Spring of every year. 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
NEW Fundamental knowledge and application of diagnostic imaging principles in veterinary medicine.
Effective Fall Semester 2025