

SUBCOMMITTEE A – AGENDA

Via Teams
January 23, 2025
1:30 p.m.

PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to change the name of the **Minor in Marine Ecosystem Management** in the Department of Fisheries and Wildlife to **Marine Biology and Ecosystem Management**.

Effective Fall 2025, no new students are to be admitted to the Minor in Marine Ecosystem Management. Effective Fall 2025, no students are to be readmitted to the Minor in Marine Ecosystem Management. Effective Fall 2025, coding for the Minor in Marine Ecosystem Management will be discontinued and the program will no longer be available in the Department of Fisheries and Wildlife. Effective Fall 2025, students admitted to the minor will be awarded a Minor in Marine Biology and Ecosystem Management.

2. Request to change the requirements in the **Minor in Marine Biology and Ecosystem Management** in the Department of Fisheries and Wildlife.

- a. Under the heading **Requirements for the Minor in Marine Biology and Ecosystem Management** replace the entire entry with the following:

The student must complete 15 credits from the following:

	CREDITS
Marine Biology and Ecosystem Management	
All of the following courses (12 credits):	
FW 110 Conservation and Management of Marine Resources	3
FW 416 Marine Ecology and Management	3
FW 353 Marine Biology	3
GLG 303 Oceanography	3
Experiential Learning in Marine Biology and Ecosystem Management	
The following course which must contain a marine emphasis (3 credits):	
FW 494 Marine Biology and Ecosystem Experience	3

Effective Fall 2025.

COLLEGE OF NATURAL SCIENCE

1. Request to change the administrative responsibility for the **Bachelor of Science** degree in **Neuroscience** from the College of Natural Science to the Department of Physiology.

Effective Fall 2025.

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

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

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

MMG 409 Eukaryotic Cell Biology	3
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Add the following course:

MGI 409 Eukaryotic Cell Biology	3
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Effective Fall 2025.

3. Request to delete the curriculum and degree requirements for **the Disciplinary Teaching Minor in Mathematics-Elementary** in the Department of Mathematics. The University Committee on Undergraduate Education (UCUE) provided consultative commentary to the Provost after considering this request. The Provost made the determination to discontinue the program after considering the consultative commentary from the University Committee on Undergraduate Education.

No new students are to be admitted to the program effective Fall 2023. No students are to be readmitted to the program effective Fall 2023. Effective Spring 2030, coding for the program will be discontinued and the program will no longer be available in the Department of Mathematics. Students who have not met the requirements for the Disciplinary Teaching Minor in Mathematics-Elementary through the Department of Mathematics prior to Spring 2030 will have to change their disciplinary teaching minor.

Note: This program has been in moratorium since Fall 2023.

4. Request to change the administrative responsibility for the **Bachelor of Science** degree in **Microbiology** from the Department of Microbiology and Molecular Genetics to the Department of Microbiology, Genetics, and Immunology.

Effective Fall 2025.

5. Request to change the requirements in the **Bachelor of Science** degree in **Microbiology** in the Department of Microbiology, Genetics, and Immunology.

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

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

The University's Tier II writing requirement for the Microbiology major is met by completing Microbiology, Genetics, and Immunology 408 or 494L. Those courses are referenced in item 3. b. (1) below.

- (2) In item 3. a. (6) replace item (a) with the following:

PHY	221	Studio Physics for Life Scientists, I	4
PHY	222	Studio Physics for Life Scientists, II	4

- (3) In item 3. a. (6) delete items (e) and (f).

- (4) In item 3. b. update all MMG courses to MGI.

Effective Fall 2025.

6. Request to change the administrative responsibility for the **Bachelor of Science** degree in **Environmental Biology/Microbiology** from the Department of Microbiology and Molecular Genetics to the Department of Microbiology, Genetics, and Immunology.

Effective Fall 2025.

7. Request to change the requirements in the **Bachelor of Science** degree in **Environmental Biology/Microbiology** in the Department of Microbiology, Genetics, and Immunology.

- a. Under the heading **Requirements for the Bachelor of Science Degree in Environmental Biology/Microbiology** make the following changes:

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

The University's Tier II writing requirement for the Environmental Biology/Microbiology major is met by completing Microbiology, Genetics, and Immunology 408 or 494L. Those courses are referenced in item 3. b. (2) below.

- (2) In item 3. a. (9) replace item (a) with the following:

PHY	221	Studio Physics for Life Scientists, I	4
PHY	222	Studio Physics for Life Scientists, II	4

- (3) In item 3. a. (9) replace item (b) with the following:

LB	273	Physics I	4
LB	274	Physics II	4

- (4) In item 3. a. (9) delete items (d) and (f).
(5) Reletter item 3. a. (9) (e) to item 3. a. (9) (d).
(6) In item 3. b. update all MMG courses to MGI.
(7) In item 3. c. (8) change MMG 433 to MGI 433.

Effective Fall 2025.

8. Request to change the administrative responsibility for the **Bachelor of Science** degree in **Genomics and Molecular Genetics** from the Department of Microbiology and Molecular Genetics to the Department of Microbiology, Genetics, and Immunology.

Effective Fall 2025.

9. Request to change the name of the **Bachelor of Science** degree in **Genomics and Molecular Genetics** in the Department of Microbiology, Genetics, and Immunology to **Genetics and Genomics**.

Effective Fall 2025, no new students are to be admitted to the Bachelor of Science degree in Genomics and Molecular Genetics. Effective Fall 2025, no students are to be readmitted to the Bachelor of Science degree in Genomics and Molecular Genetics. Effective Fall 2025, coding for the Bachelor of Science degree in Genomics and Molecular Genetics will be discontinued and the program will no longer be available in the Department of Microbiology, Genetics, and Immunology. Effective Fall 2025, students admitted to the major will be awarded a Bachelor of Science degree in Genetics and Genomics.

10. Request to change the requirements in the **Bachelor of Science** degree in **Genetics and Genomics** in the Department of Microbiology, Genetics, and Immunology.

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

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

The University's Tier II writing requirement for the Genetics and Genomics major is met by completing Microbiology, Genetics, and Immunology 434 or 494L. Those courses are referenced in item 3. b. (2) below.

- (2) In item 3. a. (7) replace item (a) with the following:

PHY	221	Studio Physics for Life Scientists, I	4
PHY	222	Studio Physics for Life Scientists, II	4

- (3) In item 3. a. (7) delete items (e) and (f).
(4) In item 3. b. update all MMG courses to MGI.
(5) In item 3. c. update all MMG courses to MGI.

Effective Fall 2025.

11. Request to change the administrative responsibility for the **Master of Science** degree in **Microbiology and Molecular Genetics** from the Department of Microbiology and Molecular Genetics to the Department of Microbiology, Genetics, and Immunology.

Effective Fall 2025.
12. Request to change the name of the **Master of Science** degree in **Microbiology and Molecular Genetics** in the Department of Microbiology, Genetics, and Immunology to **Microbiology, Genetics, and Immunology**.

Effective Fall 2025, no new students are to be admitted to the Master of Science degree in Microbiology and Molecular Genetics. Effective Fall 2025, no students are to be readmitted to the Master of Science degree in Microbiology and Molecular Genetics. Effective Fall 2025, coding for the Master of Science degree in Microbiology and Molecular Genetics will be discontinued and the program will no longer be available in the Department of Microbiology, Genetics, and Immunology. Effective Fall 2025, students admitted to the major will be awarded a Master of Science degree in Microbiology, Genetics, and Immunology.
13. Request to change the requirements in the **Master of Science** degree in **Microbiology, Genetics, and Immunology** in the Department of Microbiology, Genetics, and Immunology. The University Committee on Graduate Studies (UCGS) will consider this request at its January 27, 2025 meeting.
 - a. Under the heading **Requirements for the Master of Science Degree in Microbiology, Genetics and Immunology** make the following changes:
 - (1) Update all MMG courses to MGI.
Effective Fall 2025.
14. Request to change the administrative responsibility for the **Doctor of Philosophy** degree in **Microbiology and Molecular Genetics** from the Department of Microbiology and Molecular Genetics to the Department of Microbiology, Genetics, and Immunology.

Effective Fall 2025.
15. Request to change the name of the **Doctor of Philosophy** degree in **Microbiology and Molecular Genetics** in the Department of Microbiology, Genetics, and Immunology to **Microbiology, Genetics, and Immunology**.

Effective Fall 2025, no new students are to be admitted to the Doctor of Philosophy degree in Microbiology and Molecular Genetics. Effective Fall 2025, no students are to be readmitted to the Doctor of Philosophy degree in Microbiology and Molecular Genetics. Effective Fall 2025, coding for the Doctor of Philosophy degree in Microbiology and Molecular Genetics will be discontinued and the program will no longer be available in the Department of Microbiology, Genetics, and Immunology. Effective Fall 2025, students admitted to the major will be awarded a Doctor of Philosophy degree in Microbiology, Genetics, and Immunology.
16. Request to change the requirements in the **Doctor of Philosophy** degree in **Microbiology, Genetics, and Immunology** in the Department of Microbiology, Genetics, and Immunology. The University Committee on Graduate Studies (UCGS) will consider this request at its January 27, 2025 meeting.
 - a. Under the heading **Requirements for the Doctor of Philosophy Degree in Microbiology, Genetics and Immunology** make the following changes:
 - (1) Update all MMG courses to MGI.
Effective Fall 2025.

PART II - NEW COURSES AND CHANGES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

- ANS 810 Stem Cells in Reproduction and Development
~~Fall of odd years.~~ Fall of every year. 3(3-0) RB: ANS 307 and ANS 425 Not open to students with credit in ANS 410.
Properties and classification of stem cells; methodology to isolate, culture, and differentiate stem cells; mechanisms underlying stemness and differentiation of stem cells; application of stem cells in agricultural studies, veterinary medicine, and biomedical research. Advanced problem solving in agricultural and biomedical research using stem cell technologies. Advanced problem solving in agricultural and biomedical research using stem cell technologies.
Effective Fall Semester 2025
- ANS 936 ~~Protein Nutrition and Metabolism~~ Amino Acid Nutrition and Metabolism
~~Spring of odd years.~~ Spring of every year. 3(3-0) Interdepartmental with Human Nutrition and Foods RB: Courses in biochemistry and nutrition.
~~Nutritional and endocrine regulation of protein synthesis and degradation, protein quality assessment, protein status, and protein energy malnutrition. Protein metabolism during exercise. Metabolism, digestion, and absorption of amino acids and proteins. Physiological and nutritional significances of proteins and amino acids as applied to higher animals. Classification, digestion, absorption, utilization, and metabolism of protein, amino acids, and peptides. Topics in dietary deficiencies, excess of amino acids as well as nutritional regulation of protein turnover.~~
Nutritional and endocrine regulation of protein synthesis and degradation, protein quality assessment, protein status, and protein energy malnutrition. Protein metabolism during exercise. Metabolism, digestion, and absorption of amino acids and proteins. Physiological and nutritional significances of proteins and amino acids as applied to higher animals. Classification, digestion, absorption, utilization, and metabolism of protein, amino acids, and peptides. Topics in dietary deficiencies, excess of amino acids as well as nutritional regulation of protein turnover.
Effective Fall Semester 2025
- ~~IBIO 353~~
FW 353 ~~Marine Biology (W)~~ Marine Biology
Fall of every year. ~~4(4-0)~~ 3(3-0) P: (BS 162 or LB 144 or BS 182H) and completion of Tier I writing requirement
~~Analysis of marine and estuarine systems. Integration of biology, chemistry, and physics. Life histories of marine organisms. Biology of special marine habitats including rocky intertidal zones, upwellings, coral reefs and deep sea. Integration of biology, chemistry, and physics on organisms and habitats in the ocean and estuaries. Life history, functional adaptation, reproduction and physiology of marine organisms.~~
SA: ZOL 353 SA: IBIO 353, ZOL 353
Effective Spring Semester 2025
- FW 364 Ecological Problem Solving
~~Fall of every year.~~ Spring of every year. Spring of every year. 3(2-2) P: ((MTH 124 or concurrently) or (MTH 132 or concurrently) or (LB 118 or concurrently)) and (STT 224 or STT 231 or STT 421) and (IBIO 355 or BE 230)
Application of ecological concepts and models to problems in natural resource and ecosystem management.
Effective Fall Semester 2025
- FW 417 Wetland Ecology and Management
Fall of every year. ~~3(2-3)~~ 3(3-0) P: (BS 162 or BS 182H or LB 144 or FOR 340) and Completion of Tier I Writing Requirement RB: IBIO 355
Biological, physical, and chemical processes controlling wetland structure and function. Utilization, mitigation, and conservation of wetlands on a sustainable basis.
SA: FW 412
Effective Fall Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 6
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- FW 417L Wetland Ecology and Management Laboratory
Fall of every year. 1(0-3) P: FW 417 or concurrently R: Open to students in the Department of Fisheries and Wildlife or approval of department.
- NEW Methods and tools for assessing wetland ecosystems and applying that information to develop conservation and management plans. Field trips required.
Effective Fall Semester 2025
- FW 494 Marine Biology and Ecosystem Experience
On Demand. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: FW 110 or FW 416 or FW 353 R: Open to undergraduate students in the Marine Ecosystem Management Minor or approval of department; application required.
- NEW Marine-based experiential learning field experience.
Effective Summer Semester 2025
- FSC 807 Advanced Food Toxicology
~~Fall of even years.~~ Fall of odd years. 3(3-0) R: Approval of department.
Toxicology related to food safety. Metabolism of toxicants as influenced by food constituents, mutagenesis, and chemical carcinogenesis. Risk assessment.
Effective Fall Semester 2024
- PKG 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.
Selected topics of current interest.
Effective Fall Semester 2025
- PKG 493 Professional Internship in Packaging
Fall of every year. Spring of every year. Summer of every year. ~~3 credits.~~ 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~P: (PKG 322 and PKG 323) and (PKG 315 or EGR 102) P: (PKG 101 and PKG 102) or (PKG 315 and PKG 322 and PKG 323) R: Open to juniors or seniors or graduate students in the School of Packaging. 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 R: Open to undergraduate students in the School of Packaging and open to graduate students in the School of Packaging. 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 experience in the field of packaging offered through corporations and other businesses throughout the U.S.
Request the use of the Pass-No Grade (P-N) system.
Request the use of ET-Extension to postpone grading.
The work for the course must be completed and the final grade reported within 1 semester after the end of the semester of enrollment.
Effective Fall Semester 2025
- CSS 424 ~~Sustainable Agriculture and Food Systems: Integration and Synthesis~~
~~Sustainable Agriculture and Food Systems Capstone~~
~~Fall of every year. Spring of every year. 3(3-0) Interdepartmental with Animal Science, Community Sustainability, Horticulture Interdepartmental with Animal Science, Community Sustainability, Horticulture, Human Nutrition and Foods-P: CSS 124 and (CSS 224 or concurrently) P: CSS 124 and CSS 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.~~
~~Biogeochemical and socio-economic aspects of food, fiber, and fuel production. Environmental impacts and social context. Experiential learning projects. Application of interdisciplinary considerations of sustainable agriculture and food systems. Community engagement, small-group projects, and practitioner speakers prepare students for potential career pathways.~~
Effective Spring Semester 2024

- CSS 441 Plant Breeding and Biotechnology
Spring of every year. 3(3-0) ~~Interdepartmental with Forestry, Horticulture P: (CSS 350 or concurrently) or (IBIO 341 or concurrently)~~ RB: Knowledge of plant biology, genetics, and basic statistics.
Plant improvement by genetic manipulation. History of plant breeding. Traditional and biotechnological means of improving plant cultivars by genetic manipulation. Importance of plant breeding to our food system, economy, and environment. Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes and cultivars.
Effective Spring Semester 2025
- CSS 480 Soil Fertility and Management
Fall of every year. ~~3(3-0)~~ 4(4-0) P: CSS 210 and (CSS 330 or CSS 340 or CSS 360 or (CSS 470 or concurrently)) P: (CSS 210) and (CSS 330 or CSS 340 or CSS 360 or (CSS 470 or concurrently)) R: Open to seniors in the Agronomy minor or in the Crop and Soil Sciences major. R: Open to seniors.
Comprehensive management of agricultural soils. Soil fertility, including liming and fertilizer materials and other nutrient sources. Site specific soil management. Environmental impacts including soil erosion, runoff, and organic matter mineralization. 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.
Effective Fall Semester 2025
- PLP 105L Fundamentals of Applied Plant Pathology Lab
Spring of every year. 1(0-2) R: ~~Open to students in the Agricultural Industries Major. R: Open to agricultural technology students in the College of Agriculture and Natural Resources or in the Institute of Agricultural Technology.~~ C: PLP 105 concurrently C: PLP 105 concurrently
Identification of disease signs and symptoms in major agronomic and horticultural plants.
Disease management techniques.
Effective Spring Semester 2025

COLLEGE OF ENGINEERING

- CSE 845 Multi-disciplinary Research Methods for the Study of Evolution
Spring of every year. 3(3-0) ~~Interdepartmental with Integrative Biology, Microbiology and Molecular Genetics~~ Interdepartmental with Integrative Biology, Microbiology, Genetics, and Immunology
Techniques for engaging in multi-disciplinary research collaborations, including biology, computer science, and engineering. Students engage in group projects to answer fundamental questions about the dynamics of actively evolving systems including both natural and computational. Multi-disciplinary teams will learn to overcome discipline-specific language and conceptual issues. Experimental design, statistical analysis, data visualization, and paper and grant writing for multi-disciplinary audiences.
Effective Fall Semester 2025
- ECE 446 Biomedical Signal Processing
Fall of odd years. 3(3-0) P: ECE 366 RB: Basic linear systems and probability theory. R: Open to students in the Department of Electrical and Computer Engineering.
- REINSTATEMENT Deterministic and random digital signal processing theory in the context of biomedical applications with computer projects on the analysis of real physiologic signals.
Effective Fall Semester 2025

ME 823 Fracture Mechanics and Fatigue
Fall of even years. 3(3-0) RB: Undergraduate solid mechanics, Linear Elasticity, Engineering Mathematics
NEW Brittle and ductile fracture. Elastic stress fields near cracks. Elastic-plastic analysis of crack extension. Plastic instability. Cyclic crack propagation. Models of cyclic deformation and fatigue failure. Environmental effects. Case studies. Fracture behavior of thin films.
Effective Fall Semester 2025

COLLEGE OF NATURAL SCIENCE

BLD 204 Mechanisms of Disease
~~Fall of every year. Spring of every year. Summer of every year. Spring of every year. Summer of every year.~~ 3(3-0) P: PSL 310 or PSL 431 R: Not open to seniors.
Pathophysiological mechanisms of diseases. Selected applications to organ system pathology.
SA: MT 204
Effective Fall Semester 2025

BLD 313 Quality in Clinical Laboratory Practice
~~Fall of every year. Spring of every year. Summer of every year.~~ 3(3-0) P: ((BLD 121 or concurrently and BLD 213L) and ((STT 201 or STT 200 or STT 231) and completion of Tier I writing requirement) RB: PHY 232
Concepts and principles of clinical laboratory analysis and the statistical evaluation of the data produced as related to quality.
SA: BLD 414, BLD 417
Effective Fall Semester 2025

BLD 434 Clinical Immunology
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Summer of every year.~~ 3(3-0) P: PSL 250 or PSL 310 or PSL 432 ~~RB: (MMG 201 or MMG 301) and BLD 204~~ RB: (MGI 201 or MGI 301) and BLD 204 ~~Not open to students with credit in MMG 451. Not open to students with credit in MGI 451.~~
Concepts of innate and adaptive immunity. Immunodeficiency and autoimmunity.
Principles and applications of immunoassays in medical laboratories.
SA: MT 432, MT 434
Effective Fall Semester 2025

BLD 456 Medical Laboratory Professionalism (W)
~~Fall of every year. Spring of every year. Summer of every year.~~ 2(2-0) P: (BLD 121 and BLD 313) and completion of Tier I writing requirement ~~RB: (BLD 302 and BLD 324 and BLD 435) and (MMG 201 or MMG 301)~~ RB: (BLD 302 and BLD 324 and BLD 435) and (MGI 201 or MGI 301) R: Open to seniors in the Biomedical Laboratory Diagnostics Program.
Basic principles and concepts in education and professional behavior in clinical laboratories. Systematic approach to instructional design, delivery and evaluation.
Principles of leadership.
Effective Fall Semester 2025

BLD 461 Advanced Biomedical Technologies
Fall of every year. 3(3-0) P: (BLD 430) and (BLD 434 or MMG 451) RB: BLD 314L R: Open to students in the Biomedical Laboratory Science Major.
Common and specialized molecular and antibody-based diagnostic technologies applied to medical diagnostics and related biomedical research applications.
SA: BLD 460
DELETE COURSE
Effective Fall Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 9
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- BLD 461L Advanced Biomedical Technologies Laboratory
Fall of every year. 1(0-3) P: (BLD 461 or concurrently) and (BLD 314L or concurrently) R: Open to students in the Biomedical Laboratory Science Major.
Laboratory in molecular and antibody-based technologies with emphasis on clinical and diagnostic applications.
SA: BLD 430L, BLD 452L
DELETE COURSE
Effective Fall Semester 2025
- BLD 830 Concepts in Molecular Biology
~~Fall of every year. Spring of every year.~~ Fall of every year. 2(2-0) Interdepartmental with Pathobiology and Diagnostic Investigation RB: One course in biochemistry or concurrently.
Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.
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 830
Effective Spring Semester 2021
- GLG 301 Geology of the Great Lakes Region
Spring of every year. 3(3-0) P: (PHY 231 or PHY 183 or LB 273 or PHY 193H) and (CEM 141 or CEM 151 or LB 171 or CEM 181H) RB: Physical science, environmental engineering, civil engineering R: Open to undergraduate students in the Department of Civil and Environmental Engineering. Not open to students with credit in GLG 201.
Geological, physical and chemical processes related to the origin and evolution of the Earth, North American continent, and the Great Lakes environment. Soils, hydrology, Earth structure and materials, geologic hazards.
DELETE COURSE
Effective Spring Semester 2025
- GLG 435 Geomicrobiology (W)
Spring of odd years. 4(3-2) ~~Interdepartmental with Microbiology and Molecular Genetics~~ Interdepartmental with Microbiology, Genetics, and Immunology P: Completion of Tier I Writing Requirement RB: ~~GLG 201 or MMG 201 or BS 161 or LB 145~~ RB: GLG 201 or MGI 201 or ~~BS 161 or LB 145~~ R: Open to juniors or seniors or graduate students in the College of Natural Science or in the Lyman Briggs College.
Geological and microbiological perspectives on microbial activities in diverse environmental settings, including geological change mediated by microorganisms, microbial evolution driven by geologically diverse habitats.
Effective Fall Semester 2025
- IBIO 897 Ecosystem Ecology and Global Change
Fall of odd years. 4(4-0) Interdepartmental with Fisheries and Wildlife, Plant Biology
REINSTATEMENT Structure and function of natural ecosystems and their responses to global environmental change. Biogeochemical cycles, food webs, energy flow, nutrient cycling, and ecosystem management and restoration.
SA: ZOL 897
Effective Spring Semester 2026
- ISP 220 Quarks, Spacetime, and the Big Bang
~~Spring of odd years.~~ Fall 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
Elementary particle physics and the Big Bang for non-scientists. A survey of particles and forces in the early universe as it is recreated at high energy particle colliders in laboratories around the world.
Effective Spring Semester 2024

~~MMG 141~~
MGI 141

Introductory Human Genetics

Fall of every year. Spring of every year. 3(3-0) ~~R: Not open to students in the Biochemistry and Molecular Biology major or in the Biological Science Major or in the Biomedical Laboratory Science Major or in the Clinical Laboratory Sciences Major or in the Environmental Biology/Microbiology Major or in the Environmental Biology/Plant Biology Major or in the Environmental Biology/Zoology Major or in the Genomics and Molecular Genetics Major or in the Human Biology Major or in the Microbiology Major or in the Neuroscience Major or in the Physiology Major or in the Plant Biology Major or in the Zoology Major and not open to students in the Lyman Briggs Biochemistry and Molecular Biology Coordinate Major or in the Lyman Briggs Biological Science Interdepartmental Coordinate Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major or in the Lyman Briggs Environmental Biology/Plant Biology Coordinate Major or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Environmental Biology/Zoology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Human Biology Coordinate Major or in the Lyman Briggs Neuroscience Major or in the Lyman Briggs Microbiology Coordinate Major. R: Not open to students in the Biochemistry and Molecular Biology major or in the Biological Science-Secondary Education Major or in the Biomedical Laboratory Science Major or in the Environmental Biology/Microbiology Major or in the Environmental Biology/Plant Biology Major or in the Environmental Biology/Zoology Major or in the Genomics and Molecular Genetics Major or in the Human Biology Major or in the Integrated Science-Secondary Education Major or in the Microbiology Major or in the Neuroscience Major or in the Physiology Major or in the Plant Biology Major or in the Bachelor of Science in Zoology and not open to students in the Lyman Briggs Biochemistry and Molecular Biology Coordinate Major or in the Lyman Briggs Biological Science-Secondary Education Coordinate Major or in the Lyman Briggs Biomedical Laboratory Science Coordinate Major or in the Lyman Briggs Environmental Biology/Plant Biology Coordinate Major or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Environmental Biology/Zoology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Human Biology Coordinate Major or in the Lyman Briggs Neuroscience Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major.~~ Not open to students with credit in IBIO 341.

Inheritance of human traits. Impact of genetic technology on society. Ethical and legal issues. Risks and benefits of genetic technology.

~~SA: ZOL 144~~ SA: MMG 141, ZOL 141

Effective Fall Semester 2025

~~MMG 201~~
MGI 201

Fundamentals of Microbiology

~~Spring of every year. Fall of every year. Spring of every year. 3(3-0) RB: (CEM 141 or ISP 207 or ISP 209 or ISP 217 or LB 171) and (BS 161 or BS 181H or LB 145) RB: (CEM 141 or LB 171 or ISP 209) and (BS 161 or BS 181H or LB 145)~~

Microbial structure, function, growth, control, and diversity. Role of microbes in health, industry, and the environment.

~~SA: MMG 105, MMG 205~~ SA: MMG 105, MMG 205, MMG 201

Effective Fall Semester 2025

~~MMG 301~~
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))

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

~~SA: MIC 301~~ SA: MIC 301, MMG 301

Effective Fall Semester 2025

~~MMG 302~~
MGI 302

Introductory Laboratory for General and Allied Health Microbiology
~~Spring of every year. Fall of every year. Spring of every year. Summer of every year. 1(0-3)-P: (MMG 201 or concurrently) or (MMG 301 or concurrently) 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~~ SA: MIC 302, MMG 302
Effective Fall Semester 2025

~~MMG 365~~
MGI 365

Medical Microbiology
Spring of every year. 3(3-0) Interdepartmental with Biomedical Laboratory Diagnostics-P: ~~(BS 161 or LB 145) and (MMG 201 or MMG 301) and (CEM 141 or LB 171) P: (BS 161 or LB 145) and (MGI 201 or MGI 301) and (CEM 141 or LB 171)~~ ~~Not open to students with credit in MMG 463.~~
Laboratory diagnosis, disease and epidemiology of the most common bacterial, viral, fungal and parasitic pathogens and concepts in infectious disease control, prevention and treatment.
SA: MMG 365
Effective Fall Semester 2025

~~MMG 365L~~
MGI 365L

Medical Microbiology Laboratory
Spring of every year. 1(0-2) Interdepartmental with Biomedical Laboratory Diagnostics-P: ~~(MMG 365 or concurrently) and (MMG 201 or MMG 301) P: (MGI 365 or concurrently) and (MGI 201 or MGI 301)~~ ~~Not open to students with credit in MMG 464.~~
Practical experience in safely and accurately performing standard clinical microbiology tests to diagnose disease-causing microbes.
SA: MMG 365L
Effective Fall Semester 2025

~~MMG 404~~
MGI 404

Human Genetics
Fall of every year. 3(3-0) P: IBIO 341
Inheritance of human traits. Medical, molecular, physiological and forensic applications. Biochemical, clinical, and molecular genetics of human disease. Prenatal, pre-symptomatic, and clinical diagnosis. Ethical, legal and social considerations.
SA: ZOL 344, ZOL 404 SA: MMG 404, ZOL 344, ZOL 404
Effective Fall Semester 2025

~~MMG 408~~
MGI 408

Advanced Microbiology Laboratory (W)
Fall of every year. 3(1-6) P: ~~(MMG 302 and (MMG 431 or concurrently)) and completion of Tier I writing requirement P: (MGI 302 and (MGI 431 or concurrently)) and completion of Tier I writing requirement R: Open to students in the Environmental Biology/Microbiology Major or in the Genomics and Molecular Genetics Major or in the Microbiology Major or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major. R: Open to students in the Environmental Biology/Microbiology Major or in the Genomics and Molecular Genetics Major or in the Microbiology Major or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major or approval of department.~~
Microbiological techniques and procedures to study physiology and genetics of bacteria and bacteriophages. Collection and critical assessment of quantitative data and written communication of results.
SA: MPH 408 SA: MMG 408
Effective Fall Semester 2025

~~MMG 409~~
MGI 409

Eukaryotic Cell Biology
Spring of every year. 3(3-0) P: (BS 161 or LB 145 or BS 181H) and ((BMB 401 or concurrently) or (BMB 462 or concurrently))
Structure and function of nucleated cells. Emphasis on the molecular mechanisms that underlie cell processes.
~~SA: MIC 403, MPH 403~~ SA: MIC 403, MMG 409
Effective Fall Semester 2025

~~MMG 413~~
MGI 413

Virology
Spring of every year. 3(3-0) P: (BMB 462 or concurrently) or BMB 401
Viruses and modern molecular biology. Viral replication and gene expression of the major classes of viruses. Virus-cell interactions and viral diseases.
SA: MMG 413
Effective Fall Semester 2025

~~MMG 421~~
MGI 421

Prokaryotic Cell Physiology
Fall of every year. 3(3-0) P: ~~(MMG 301 and (BMB 461 or concurrently)) or (MMG 301 and (BMB 401 or concurrently))~~ P: (MGI 301 and (BMB 461 or concurrently)) or (MGI 301 and (BMB 401 or concurrently))
Prokaryotic cell structure and function. Growth and replication. Macromolecular synthesis and control.
~~SA: MIC 401, MPH 401~~ SA: MIC 401, MMG 421
Effective Fall Semester 2025

~~MMG 425~~
MGI 425

Microbial Ecology
Fall of every year. 3(3-0) Interdepartmental with Crop and Soil Sciences P: ~~MGI 301~~ ~~RB: MMG 301~~ RB: MGI 301
Microbial population and community interactions. Microbial activities in natural systems, including associations with plants or animals.
~~SA: MPH 425~~ SA: MMG 425
Effective Fall Semester 2025

~~MMG 431~~
MGI 431

Microbial Genetics
Fall of every year. 3(3-0) P: (BMB 461 or concurrently) or (BMB 401 or concurrently) ~~RB: MMG 301 or ZOL 341~~ RB: MGI 301 or IBIO 341
Genetics of bacteria, their viruses, plasmids, and transposons. Emphasis on genetic principles.
~~SA: MIC 401, MPH 401~~ SA: MIC 401, MMG 431
Effective Fall Semester 2025

~~MMG 433~~
MGI 433

Genomics (W)
Spring of every year. 3(3-0) P: ~~MMG 431~~ P: MGI 431 ~~RB: (MMG 421 or BMB 461) and CSE 404~~ RB: MGI 421 or BMB 461
High-throughput DNA sequencing and the study of genome structure, replication, evolution. Application of bioinformatics analyses for functional annotation, genetic diversity, ecology, and human health.
SA: MMG 433
Effective Fall Semester 2025

~~MMG 434~~

MGI 434

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

~~Genomics and molecular genetic techniques using microbes. Collection and critical assessment of quantitative data and written communication of results.~~ Genetics & genomics techniques using microbes. Collection and critical assessment of quantitative data and written communication of results.

SA: MMG 434

Effective Fall Semester 2025

~~MMG 451~~

MGI 451

Immunology

Fall of every year. 3(3-0) P: (BS 161 or LB 145 or BS 181H) and ((BMB 401 or concurrently) or (BMB 461 or concurrently)) Not open to students with credit in BLD 434.

Structure and function of molecules involved in immune responses. Quantification of immune responses and cellular participants. Immunologic abnormalities. Immunotherapy. Experimental approaches to dissection of immune functions.

SA: MMG 451

Effective Fall Semester 2025

~~MMG 461~~

MGI 461

Molecular Pathogenesis

Spring of even years. 3(3-0) ~~P: (MMG 301)~~ P: MGI 301 ~~RB: MMG 434~~ RB: MGI 431

Molecular basis of microbial virulence. Nature of determinants and their role in overcoming host defense mechanisms.

SA: MPH 461 SA: MMG 461

Effective Fall Semester 2025

~~MMG 465~~

MGI 465

Advanced Medical Microbiology

Fall of every year. 3(3-0) Interdepartmental with Biomedical Laboratory Diagnostics ~~P: MMG 365~~ P: MGI 365 ~~Not open to students with credit in MMG 463.~~

Advanced laboratory diagnosis, epidemiology, and prevention of infectious diseases using an anatomical system specimen approach to study a comprehensive set of human pathogens and microbiota.

SA: MMG 465

Effective Fall Semester 2025

~~MMG 465L~~

MGI 465L

Advanced Medical Microbiology Laboratory

Fall of every year. 2(0-6) Interdepartmental with Biomedical Laboratory Diagnostics ~~P: MMG 365L and (MMG 465 or concurrently)~~ P: MGI 365L and (MGI 465 or concurrently) ~~Not open to students with credit in MMG 464.~~ ~~C: MMG 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.

SA: MMG 465L

Effective Fall Semester 2025

~~MMG 490~~
MGI 490

Special Problems in Microbiology
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Approval of department.
Library research or tutorial instruction in advanced laboratory techniques.
SA: MMG 490
Effective Fall Semester 2025

~~MMG 491~~
MGI 491

Current Topics in Microbiology and Molecular Genetics
Spring of every year. 3(4-0)~~R: Open to seniors in the Lyman Briggs College or in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.~~ 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.
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.
SA: MIC 491 SA: MIC 491, MMG 491
Effective Fall Semester 2025

~~MMG 492~~
MGI 492

Undergraduate Research Seminar
Spring of every year. 1(2-0)~~P: MMG 499 or MMG 499H P: MGI 499 or MGI 499H R: Open to students in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.~~ R: Open to students in the Department of Microbiology, Genetics, and Immunology or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major.
Presentation and group discussion of undergraduate research results.
SA: MIC 492 SA: MIC 492, MMG 492
Effective Fall Semester 2025

~~MMG 493~~
MGI 493

Professional Internship in Microbiology and Molecular Genetics
Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. P: Completion of Tier I Writing Requirement~~R: Open to sophomores or juniors or seniors in the Department of Microbiology and Molecular Genetics. Approval of department.~~ R: Open to sophomores or juniors or seniors in the Department of Microbiology, Genetics, and Immunology. Approval of department.
Professional work experience in a private or public sector organization related to the student's major.
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: MMG 493
Effective Fall Semester 2025

~~MMG 494L~~
MGI 494L

Summer Undergraduate Research Institute in Genomics (W)
Summer of every year. 3(2-12)~~P: (Completion of Tier I Writing Requirement) and (MMG 301 and MMG 302) P: (Completion of Tier I Writing Requirement) and (MGI 301 and MGI 302) RB: MMG 431 or IBIO 344 RB: MGI 431 or IBIO 341 R: Open to undergraduate students in the Environmental Biology/Microbiology Major or in the Genomics and Molecular Genetics Major or in the Microbiology Major. Not open to students with credit in MMG 408 or MMG 434. Not open to students with credit in MGI 408 or MGI 434.~~
Directed independent research in teams using state-of-the-art genetic and genomic methods. Offered first half of semester.
SA: MMG 494L
Effective Fall Semester 2025

~~MMG 499~~
MGI 499

Undergraduate Research

Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~R: Open to students in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major.~~ R: Open to students in the Department of Microbiology, Genetics, and Immunology or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major.

Participation in a laboratory research project.

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.

~~SA: MIC 499~~ SA: MIC 499, MMG 499

Effective Fall Semester 2025

~~MMG 499H~~
MGI 499H

Honors Research

Fall of every year. Spring of every year. Summer of every year. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. ~~R: Open to students in the Department of Microbiology and Molecular Genetics or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major.~~ R: Open to students in the Department of Microbiology, Genetics, and Immunology or in the Lyman Briggs Environmental/Biology/Microbiology Coordinate Major or in the Lyman Briggs Genomics and Molecular Genetics Coordinate Major or in the Lyman Briggs Microbiology Coordinate Major.

Research project with thesis and oral report. A portion of Microbiology or Genomics and Molecular Genetics capstone experience.

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.

~~SA: MIC 499H~~ SA: MIC 499H, MMG 499H

Effective Fall Semester 2025

~~MMG 531~~
MGI 531

Medical Immunology

Fall of every year. 2(2-0) R: Open to graduate-professional students in the College of Osteopathic Medicine.

Basic principles of immunology. Overview of concepts and terminology in relation to human disease defenses.

Request the use of the Pass-No Grade (P-N) system.

SA: MMG 531

Effective Fall Semester 2025

~~MMG 532~~
MGI 532

Medical Microbiology

Fall of every year. 2(1-2) R: Open to graduate-professional students in the College of Osteopathic Medicine.

Basic principles of microbiology including bacteriology, virology, mycology, and parasitology and their relationship to disease in humans.

Request the use of the Pass-No Grade (P-N) system.

SA: MMG 532

Effective Fall Semester 2025

~~MMG 660~~
MGI 660

Veterinary Clinical Bacteriology Clerkship
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate students.
Guided clinical bacteriology experience.
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: MMG 660
Effective Fall Semester 2025

~~MMG 662~~
MGI 662

Clinical Veterinary Virology Clerkship
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Open to graduate students.
Guided clinical virology experience.
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: MMG 662
Effective Fall Semester 2025

~~MMG 664~~
MGI 664

Veterinary Clinical Parasitology Clerkship
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Guided clinical parasitology experience.
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: MMG 664
Effective Fall Semester 2025

~~MMG 690~~
MGI 690

Veterinary Microbiology Clerkship
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of 5 semesters of the graduate-professional program in the College of Veterinary Medicine.
Laboratory-based investigation of microbiological problems pertinent to veterinary medicine.
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: MPH 690~~ SA: MMG 690
Effective Fall Semester 2025

~~MMG 804~~
MGI 801

Integrative Microbial Biology
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 4(4-0) RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. R: Open to graduate students. ~~Not open to students with credit in MMG 821 or MMG 829 or MMG 841 or MMG 827.~~
Structural, metabolic, phylogenetic, and genomic diversity of microbes and microbial communities. Microbial ecology, evolution, and behavior. Regulation of gene expression. Microbial interactions with other microbes, animals, or plants
SA: MMG 801
Effective Fall Semester 2025

~~MMG 803~~
MGI 803

Topics in Integrative Microbial Biology
Fall of every year. Spring of every year. 2(2-0) A student may earn a maximum of 10 credits in all enrollments for this course. ~~P: MMG 801 or concurrently~~ P: MGI 801 or concurrently RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. R: Open to graduate students.
In-depth study of a particular topic from integrative microbial biology.
Request the use of the Pass-No Grade (P-N) system.
SA: MMG 803
Effective Fall Semester 2025

~~MMG 813~~
MGI 813

Molecular Virology
~~Spring of even years.~~ Spring of even years. 3(3-0) RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources. R: Open to graduate students or human medicine students or osteopathic medicine students in the College of Natural Science or in the College of Agriculture and Natural Resources or in the College of Human Medicine or in the College of Osteopathic Medicine or in the College of Veterinary Medicine.
Molecular nature and biochemistry of replication of animal viruses. Current advances, research concepts, and the role of viruses in molecular biology research.
SA: MPH 813 SA: MMG 813
Effective Fall Semester 2025

~~MMG 833~~
MGI 833

Microbial Genetics
~~Fall of every year.~~ Fall of every year. 3(3-0) RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources. R: Open to graduate students or human medicine students or osteopathic medicine students in the College of Natural Science or in the College of Agriculture and Natural Resources or in the College of Human Medicine or in the College of Osteopathic Medicine or in the College of Veterinary Medicine.
Gene structure and function. Genetic regulation at classical and molecular levels in prokaryotes and lower eukaryotes.
SA: MPH 833 SA: MMG 833
Effective Fall Semester 2025

~~MMG 835~~
MGI 835

Eukaryotic Molecular Genetics
Spring of every year. 3(3-0) Interdepartmental with Genetics ~~RB: BMB 462 and ZOL 341~~ RB: Completion of BMB 462 and IBIO 341 or successful completion of the equivalent: 2-semester undergraduate major's biochemistry sequence and upper-level genetics course. R: Open only to graduate students in the colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Natural Science, Osteopathic Medicine, and Veterinary Medicine. R: Open to graduate students or human medicine students or osteopathic medicine students in the College of Human Medicine or in the College of Agriculture and Natural Resources or in the College of Engineering or in the College of Natural Science or in the College of Osteopathic Medicine or in the College of Veterinary Medicine.
Gene structure and function in animals, plants, and fungi. Basic aspects of modern human genetics and the genetic basis for disease. Molecular genetic analyses.
Eukaryotic modeling systems.
SA: MMG 835
Effective Fall Semester 2025

~~MMG 852~~
MGI 852

Molecular Immunology
Fall of every year. 1(1-0) ~~RB: (MMG 451) or Basic knowledge of molecular biology, cell biology, physiology and genetics.~~ 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~~ SA: MMG 851, MMG 852
Effective Fall Semester 2025

~~MMG 853~~
MGI 853

Cellular Immunology
Fall of every year. 1(1-0) ~~RB: (MMG 451) or Basic knowledge of molecular biology, cell biology, physiology, and genetics.~~ 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~~ SA: MMG 851, MMG 853
Effective Fall Semester 2025

~~MMG 854~~
MGI 854

Applied Immunology
Fall of every year. 1(1-0) ~~RB: (MMG 451) or Basic knowledge of molecular biology, cell biology, physiology, and genetics.~~ 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~~ SA: MMG 851, MMG 854
Effective Fall Semester 2025

~~MMG 864~~
MGI 861

Advanced Microbial Pathogenesis
Spring of odd years. 3(3-0) ~~RB: MMG 461 or MMG 409~~ RB: (MGI 461 or MGI 409) or Or equivalent R: Open to graduate students.
Molecular basis of microbial virulence. Virulence factors of microorganisms and the relationship of these factors to disease; host-pathogen interactions.
SA: MMG 861
Effective Fall Semester 2025

~~MMG 890~~
MGI 890

Special Problems in Microbiology
Fall of every year. Spring of every year. Summer of every year. 1 to 6 credits. A student may earn a maximum of 16 credits in all enrollments for this course. RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. ~~R: Open to master's students in the Department of Microbiology and Molecular Genetics.~~ R: Open to master's students in the Department of Microbiology, Genetics, and Immunology.
Individualized laboratory or library research.
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.
~~SA: MIC 890~~ SA: MIC 890, MMG 890
Effective Fall Semester 2025

~~MMG 892~~
MGI 892

Seminar
~~Fall of every year. Spring of every year. Fall of every year. Spring of every year.~~ 1(1-0) A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. ~~R: Open only to graduate students in the College of Agriculture and Natural Resources or College of Engineering or College of Human Medicine or College of Natural Science or College of Osteopathic Medicine or College of Veterinary Medicine.~~ R: Open to graduate students or human medicine students or osteopathic medicine students in the College of Human Medicine or in the College of Agriculture and Natural Resources or in the College of Engineering or in the College of Natural Science or in the College of Osteopathic Medicine or in the College of Veterinary Medicine.
Student review and presentation of selected topics in microbiology and public health.
Request the use of the Pass-No Grade (P-N) system.
SA: MPH 892 SA: MMG 892
Effective Fall Semester 2025

~~MMG 899~~
MGI 899

Master's Thesis Research
~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year.~~ 1 to 12 credits. A student may earn a maximum of 36 credits in all enrollments for this course. RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. ~~R: Open only to graduate students in the Department of Microbiology and Molecular Genetics.~~ R: Open to graduate students in the Department of Microbiology, Genetics, and Immunology.
Master's thesis research.
SA: MPH 899 SA: MMG 899
Effective Fall Semester 2025

~~MMG 994~~
MGI 991

Topics in Microbiology
~~Fall of every year. Spring of every year. Fall of every year. Spring of every year.~~ 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. R: Open to graduate students.
Topics are selected from traditional subdisciplines such as bacteriology, virology, cell biology, and immunology or from transecting subdisciplines such as microbial genetics, physiology, molecular biology and ecology.
SA: MPH 994 SA: MMG 991
Effective Fall Semester 2025

~~MMG 999~~
MGI 999

Doctoral Dissertation Research
Fall of every year. Spring of every year. Summer of every year. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. RB: Completion of an undergraduate program in Microbiology, Genetics, or similar. ~~R: Open to graduate students in the Genetics Major or in the Microbiology and Molecular Genetics Major.~~ R: Open to doctoral students in the Department of Microbiology, Genetics, and Immunology.
Doctoral dissertation research.
Request the use of the Pass-No Grade (P-N) system.
SA: MMG 999
Effective Fall Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 20
January 23, 2025

- AST 207 The Science of Astronomy
Fall of every year. 3(3-0) P: ~~((PHY 231 or concurrently) or (PHY 231C or concurrently) or (PHY 183 or concurrently) or (PHY 183B or concurrently) or (PHY 173 or concurrently) or (LB 273 or concurrently)) and ((MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently))~~ P: ((PHY 231 or concurrently) or (PHY 183 or concurrently) or (PHY 193H or concurrently) or (LB 273 or concurrently)) and ((MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 117 or concurrently) or (LB 118 or concurrently))
In-depth study of one topic in astronomy with emphasis on key discoveries. Topics may be cosmology, the solar system, and the life of stars.
Effective Fall Semester 2025
- AST 208 Planets and Telescopes
Spring of every year. 3(2-2) P: ~~(PHY 183 or PHY 183B or PHY 193H or LB 273) and ((MTH 103 or concurrently) or (MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently) or (LB 118 or concurrently))~~ P: (PHY 183 or PHY 193H or LB 273) and ((MTH 103 or concurrently) or (MTH 114 or concurrently) or (MTH 116 or concurrently) or (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 117 or concurrently) or (LB 118 or concurrently)) RB: AST 207 R: Open to undergraduate students in the Astrophysics Major or in the LB-Astrophysics Coordinate Major.
Origin and nature of the solar system. Planets of the solar system and other star systems. Determination of time and celestial coordinates. Astronomical instruments and observational methods.
SA: AST 303, AST 312
Effective Fall Semester 2025
- AST 308 Galaxies and Cosmology
~~Fall of odd years. Spring of every year.~~ 3(3-0) P: ~~(AST 208) and ((PHY 215 or concurrently) or PHY 215B) and (PHY 321 or concurrently)~~ P: (AST 208) and (PHY 215 or concurrently) and (PHY 321 or concurrently)
The Milky Way. Structure and content of galaxies. Active galaxies and quasars. The expanding universe. Modern cosmological models.
SA: AST 402
Effective Spring Semester 2026
- PHY 183 Physics for Scientists and Engineers I
~~Fall of every year.~~ Spring of every year. ~~Fall of every year. Spring of every year. Summer of every year.~~ 4(5-0) 4(4-0) P: (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) ~~Not open to students with credit in LB 273 or PHY 193H or PHY 231 or PHY 231C or PHY 183B or PHY 233B.~~ Not open to students with credit in PHY 193H.
Mechanics, Newton's laws, momentum, energy conservation laws, rotational motion, oscillation, gravity, and waves.
SA: PHY 183B
Effective Fall Semester 2025
- PHY 183B Physics for Scientists and Engineers I
Summer of every year. 4 credits. P: (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) Not open to students with credit in LB 273 or PHY 183 or PHY 193H or PHY 231 or PHY 231C.
Mechanics, Newton's laws, momentum, energy conservation laws, rotational motion, oscillation, gravity, waves. This course is given in the competency based instruction format.
DELETE COURSE
Effective Summer Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 21
January 23, 2025

- PHY 184 Physics for Scientists and Engineers II
~~Fall of every year. Spring of every year. Fall of every year. Spring of every year. Summer of every year. 4(5-0) 4(4-0)~~ P: ~~{{(PHY 183 or PHY 183B or PHY 193H or LB 273) or (PHY 231 and PHY 233B) or (PHY 231C and PHY 233B)} and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently))~~ P: {{(PHY 183 or PHY 193H or LB 273) or (PHY 231 and PHY 233)} and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)) ~~Not open to students with credit in LB 274 or PHY 184B or PHY 232 or PHY 232C or PHY 234B or PHY 294H. Not open to students with credit in PHY 294H.~~
Electricity and magnetism, electromagnetic waves, light and optics, interference and diffraction.
SA: PHY 184B
Effective Fall Semester 2025
- PHY 184B Physics for Scientists and Engineers II
Summer of every year. 4 credits. P: {{(PHY 183 or PHY 183B or PHY 193H or LB 273) or (PHY 231 and PHY 233B) or (PHY 231C and PHY 233B)} and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)) ~~Not open to students with credit in LB 274 or PHY 184 or PHY 232 or PHY 232C or PHY 234B or PHY 294H.~~
Electricity and magnetism, electromagnetic waves, light and optics, interference and diffraction. This course is given in the competency based instruction format.
DELETE COURSE
Effective Summer Semester 2025
- PHY 191 Physics Laboratory for Scientists, I
~~Fall of every year. 1(0-3) 1(0-2)~~ P: ~~((PHY 183 or concurrently) or (PHY 193H or concurrently) or PHY 183B) or (PHY 231 and (PHY 233B or concurrently)) or (PHY 231C and (PHY 233B or concurrently))~~ P: ((PHY 183 or concurrently) or (PHY 193H or concurrently)) or (PHY 231 and (PHY 233 or concurrently)) ~~Not open to students with credit in LB 273 or PHY 251. Not open to students with credit in PHY 251.~~
Error analysis, exercises in motion, forces, conservation laws and some electricity and magnetism studies.
Effective Fall Semester 2025
- PHY 192 Physics Laboratory for Scientists, II
Spring of every year. 1(0-3) P: ~~{PHY 191 and ((PHY 184 or concurrently) or PHY 184B)} or (PHY 232 and (PHY 234B or concurrently)) or (PHY 232C and (PHY 234B or concurrently))~~ P: {(PHY 191) and ((PHY 184 or concurrently) or (PHY 294H or concurrently))} or (PHY 191 and PHY 232 and (PHY 234 or concurrently)) ~~Not open to students with credit in LB 274 or PHY 252. Not open to students with credit in PHY 252.~~
Electric and magnetic fields, circuits, wave optics, modern physics.
Effective Fall Semester 2025
- PHY 193H Honors Physics I-Mechanics
Fall of every year. 4(4-0) P: (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) ~~Not open to students with credit in LB 273 or PHY 183 or PHY 183B or PHY 231 or PHY 231C. Not open to students with credit in PHY 183.~~
Mechanics and waves. Mechanics, Newton's laws, momentum, energy conservation laws, rotational motion, oscillations, gravity, and waves.
Effective Fall Semester 2025
- PHY 221 Studio Physics for Life Scientists I
Fall of every year. Spring of every year. 4(3-2) P: (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) ~~Not open to students with credit in LB 273 or PHY 173 or PHY 183 or PHY 183B or PHY 193H or PHY 231 or PHY 231C or PHY 233B or PHY 241 or PHY 251. Not open to students with credit in LB 273.~~
Basic principles of mechanics including applications to biological systems, development of scientific skills and problem-solving through integrated physics laboratory and discussion.
Effective Fall Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 22
January 23, 2025

- PHY 222 Studio Physics for Life Scientists II
Fall of every year. Spring of every year. 4(3-2) P: ~~[(PHY 221 or LB 273) or (PHY 231 and PHY 251) or (PHY 231C and PHY 251) or (PHY 183 and PHY 191) or (PHY 193H and PHY 191)] and (MTH 124 or MTH 132 or MTH 152H or LB 118) P: [(PHY 221 or LB 273) or (PHY 231 and PHY 251) or (PHY 183 and PHY 191) or (PHY 193H and PHY 191)] and (MTH 124 or MTH 132 or MTH 152H or LB 118) Not open to students with credit in LB 274 or PHY 174 or PHY 184 or PHY 184b or PHY 192 or PHY 232 or PHY 232c or PHY 234b or PHY 242 or PHY 252. Not open to students with credit in LB 274.
Basic principles of electricity and magnetism including applications to biological systems, development of scientific skills and problem-solving through integrated physics laboratory and discussion.
Effective Fall Semester 2025~~
- PHY 231 Introductory Physics I
~~Fall of every year. Spring of every year. Fall of every year. Spring of every year. Summer of every year. 3(4-0) 3(3-0) P: MTH 114 or MTH 116 or MTH 124 or (MTH 132 or concurrently) or (MTH 152H or concurrently) or LB 117 or (LB 118 or concurrently) Not open to students with credit in LB 273 or PHY 183 or PHY 183B or PHY 193H or PHY 231C or PHY 241.~~
Mechanics, Newton's Laws, momentum, energy, conservation laws, thermodynamics, waves, sound.
SA: PHY 231C
Effective Fall Semester 2025
- PHY 231C Introductory Physics I
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: MTH 114 or MTH 116 or MTH 124 or (MTH 132 or concurrently) or (MTH 152H or concurrently) or LB 117 or (LB 118 or concurrently) RB: MTH 116 Not open to students with credit in LB 273 or PHY 183 or PHY 183B or PHY 193H or PHY 231 or PHY 241.
Mechanics, Newton's Laws, momentum, energy, conservation laws, thermodynamics, waves, sound. This course is an internet based course.
DELETE COURSE
Effective Summer Semester 2025
- PHY 232 Introductory Physics II
~~Fall of every year. Spring of every year. Fall of every year. Spring of every year. Summer of every year. 3(4-0) 3(3-0) P: PHY 231 or PHY 231C or PHY 183 or PHY 183B or PHY 193H or PHY 221 or LB 273 P: PHY 231 or PHY 183 or PHY 193H or PHY 221 or LB 273 Not open to students with credit in LB 274 or PHY 184 or PHY 184B or PHY 232C or PHY 294H or PHY 222 or PHY 234B.~~
Electricity and magnetism; optics; atomic, nuclear, and subnuclear physics.
SA: PHY 232C
Effective Fall Semester 2025
- PHY 232C Introductory Physics II
Fall of every year. Spring of every year. Summer of every year. 3 credits. P: PHY 183 or PHY 183B or PHY 193H or PHY 231 or PHY 231C or LB 273 Not open to students with credit in PHY 184 or PHY 184B or PHY 232 or PHY 294H or LB 274.
Electricity and magnetism; optics; atomic, nuclear, and subnuclear physics. This course is an internet based course.
DELETE COURSE
Effective Summer Semester 2025

PHY 233B
PHY 233

Calculus Concepts in Physics I

~~Fall of every year. Spring of every year. Summer of every year. 2 credits. P: (PHY 231 or PHY 231C) and ((MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently)) P: (PHY 231) and ((MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently)). Not open to students with credit in LB 273 or PHY 183 or PHY 183B or PHY 193H.~~

~~Kinematics, dynamics, applications of Newton's laws. This course is given in the competency based instruction format. Kinematics, dynamics, applications of Newton's laws. PHY 233 with PHY 231 meets the requirements for calculus-based physics.~~

SA: PHY 233B

Effective Fall Semester 2025

PHY 234B
PHY 234

Calculus Concepts in Physics II

~~Spring of every year. Summer of every year. Fall of every year. Spring of every year. Summer of every year. 2 credits. P: (PHY 232 or PHY 232C) and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)) P: (PHY 232) and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)). Not open to students with credit in LB 274 or PHY 184 or PHY 184B or PHY 294H.~~

~~Electricity and magnetism. This course is given in the competency based instruction format. Electricity and magnetism. PHY 342 with PHY 232 meets the requirements for calculus-based physics.~~

SA: PHY 234B

Effective Fall Semester 2025

PHY 241

Physics for Cellular and Molecular Biologists I

Fall of every year. 4(4-0) P: (MTH 124 or concurrently) or (MTH 132 or concurrently) or (MTH 152H or concurrently) or (LB 118 or concurrently) RB: CEM 141 and BS 161 R: Not open to students in the College of Engineering or in the Department of Physics and Astronomy. Not open to students with credit in LB 273 or PHY 183 or PHY 183B or PHY 193H or PHY 231 or PHY 231C or PHY 233B.

Physics of cellular and molecular biology. Examples will be drawn from systems such as bacterial flagella, myosin and protein folding.

DELETE COURSE

Effective Fall Semester 2025

PHY 242

Physics for Cellular and Molecular Biologists II

Spring of every year. 4(4-0) P: PHY 241 RB: CEM 141 and BS 161 R: Not open to students in the College of Engineering or in the Department of Physics and Astronomy. Not open to students with credit in PHY 184 or PHY 184B or PHY 294H or PHY 232 or PHY 232C or PHY 234B or LB 274.

Physics of cellular and molecular biology. Examples will be drawn from systems such as ATPase and photosynthesis.

DELETE COURSE

Effective Fall Semester 2025

PHY 251

Introductory Physics Laboratory I

~~Fall of every year. Spring of every year. Summer of every year. Fall of every year. Summer of every year. 1(0-2) P: (PHY 183 or concurrently) or (PHY 183B or concurrently) or (PHY 193H or concurrently) or (PHY 231 or concurrently) or (PHY 231C or concurrently) or (PHY 241 or concurrently) P: (PHY 183 or concurrently) or (PHY 193H or concurrently) or (PHY 231 or concurrently) RB: MTH 103 Not open to students with credit in LB 273 or PHY 191. Not open to students with credit in PHY 191.~~

Laboratory exercises involving simple mechanical systems.

Effective Fall Semester 2025

PHY 294H Honors Physics II-Electromagnetism
Spring of every year. 4(4-0) P: ~~(PHY 193H or PHY 183 or PHY 183B) and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently))~~ P: (PHY 193H or PHY 183) and ((MTH 133 or concurrently) or (MTH 153H or concurrently) or (LB 119 or concurrently)). ~~Not open to students with credit in PHY 184 or PHY 184B or PHY 232 or PHY 232C or LB 274.~~ Not open to students with credit in PHY 184.
~~Electricity and magnetism, electromagnetic waves and optics.~~ Electricity and magnetism, circuits, electromagnetic waves and optics.
Effective Fall Semester 2025

PHY 440 Electronics
~~Fall of every year. Spring of every year. Fall of every year.~~ 4(3-3) P: ~~(((PHY 184 or PHY 184B) or (PHY 232 and PHY 234B) or (PHY 232C and PHY 234B)) and PHY 192) or LB 274 and (((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently))) and completion of Tier I writing requirement~~ P: (((PHY 184 or PHY 294H) or (PHY 232 and PHY 234B)) and PHY 192) or LB 274) and (((MTH 235 or concurrently) or (MTH 340 or concurrently) or (MTH 347H or concurrently))) and completion of Tier I writing requirement
Concepts of electronics used in investigating physical phenomena. Circuits, amplifiers, diodes, LEDs, transistors.
Effective Spring Semester 2024

COLLEGE OF VETERINARY MEDICINE

LCS 639 Small Ruminant Medicine and Management Clerkship
~~Spring of every year. Summer of every year.~~ On Demand. 3 credits. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Health care to small ruminants on an individual and flock or herd basis. Emphasis on sheep.
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 Spring Semester 2025

SCS 611 Diagnostic Imaging Clerkship
~~Fall of every year. Spring of every year. Summer of every year.~~ Fall of every year. Spring of every year. Summer of every year. 3 credits. RB: Completion of semester 5 of the professional veterinary program.
Diagnostic radiography and ultrasound imaging. Radiation safety. Special procedures.
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 Spring Semester 2025

SCS 636 Problems in Soft Tissue Surgery Clerkship
~~Fall of every year. Spring of every year. Summer of every year.~~ On Demand. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 626) and and completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Soft tissue surgery problems.
Effective Spring Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 25
January 23, 2025

- SCS 656 Advanced Small Animal Orthopedics
On Demand. 3(2-2) A student may earn a maximum of 3 credits in all enrollments for this course. P: VM 569 RB: Successful completion of year 3 of the graduate-professional program in the College of Veterinary Medicine, including VM 569. R: Open to veterinary medicine students in the College of Veterinary Medicine.
- NEW This course will introduce students to basic biomechanics in orthopedics. Additionally, it will offer in depth discussions to gain understanding of novel concepts and techniques in fracture management, joint pathology, implant design, arthroscopy and joint replacement. Course will also contain practical exercises on cadavers like surgical approaches, basic orthopedic procedures and introduction to arthroscopy.
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 Spring Semester 2025
- VM 518 Cardiovascular System I
~~Fall of every year.~~ Spring of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Structure and function of the cardiovascular system in health.
Effective Fall Semester 2025
- VM 519 Cutaneous System I
~~Fall of every year.~~ 3(1-4) 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
Structure and function of the cutaneous system in health.
Effective Fall Semester 2025
- VM 523 Immunologic and Hematologic Systems I
~~Spring of every year.~~ Fall of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Structure and function of the immunological and hematologic systems in health.
Effective Fall Semester 2025
- VM 531 ~~Immunologic and Hematologic System II~~ Immunologic and Hematologic Systems II
~~Fall of every year.~~ Spring of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Immunologic and hematologic disorders of animals.
Effective Fall Semester 2025
- VM 534 Cutaneous System II
~~Fall of every year.~~ Spring of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Cutaneous system disorders of animals.
Effective Fall Semester 2025
- VM 565 Cardiovascular System II
~~Spring of every year.~~ Fall of every year. 2(1-2) R: Open to graduate-professional students in the College of Veterinary Medicine.
Cardiovascular system disorders of animals.
Effective Fall Semester 2025
- VM 568 Urinary System II
~~Spring of every year.~~ Fall of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Urinary system disorders of animals.
Effective Fall Semester 2025

PART II - NEW COURSES AND CHANGES – continued - 26
January 23, 2025

- VM 569 Musculoskeletal System II
Spring of every year. ~~2(1-2)~~ 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Musculoskeletal disorders of animals
Effective Fall Semester 2025
- VM 577 Endocrine System II
~~Spring of every year.~~ Fall of every year. 3(1-4) R: Open to graduate-professional students in the College of Veterinary Medicine.
Endocrine system disorders of animals.
Effective Fall Semester 2025
- VM 851 Independent Study
Fall of every year. Spring of every year. Summer of every year. 1 to 9 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: Graduate students in the Comparative Medicine and Integrative Biology Graduate Program R: Open to graduate-professional students in the College of Veterinary Medicine or in the Comparative Medicine Integrative Biology-Environmental Toxicology Major or in the Comparative Medicine and Integrative Biology Major. Approval of department.
- NEW Non-thesis research for CMIB students
Request the use of the Pass-No Grade (P-N) system.
Effective Fall Semester 2024
- VM 862 Grant Writing in the Biomedical Sciences
Fall of every year. 2(2-0) A student may earn a maximum of 2 credits in all enrollments for this course. RB: Minimum of 1 year completed in a graduate program and active engagement in biomedical research. R: Open to graduate students in the College of Veterinary Medicine or in the Comparative Medicine Integrative Biology-Environmental Toxicology Major or in the Comparative Medicine and Integrative Biology Major or approval of department.
- NEW Practical approach to grant application development, preparation and submission
Effective Fall Semester 2024