

# BIOLOGICAL SCIENCES (BIO SCI)

## Biological Sciences Courses

### BIO SCI 100 Animals!

3 cr. Undergraduate.

Introduction to the diversity of invertebrate and vertebrate animals, focusing on their identifying features and natural history.

**Prerequisites:** none.

**Course Rules:** 2 hrs lec, 2 hrs lab. Does not carry credit towards biological sciences major.

**General Education Requirements:** Natural Science & Wellness Lab

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 101 General Survey of Microbiology

4 cr. Undergraduate.

The nature and activities of microorganisms, including surveys of bacteria, fungi, viruses, immunology, and disease applications. 3 hrs lec, 3 hrs lab.

**Prerequisites:** Chem 101(P) or 102(P).

**Course Rules:** Intended primarily for nursing students. Does not carry cr toward bio sci major.

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 102 How Life Works

3 cr. Undergraduate.

Organization and function of living systems.

**Prerequisites:** none.

**Course Rules:** 2 hrs lec, 2 hrs lab. Intended for non-majors; does not carry credit towards biological sciences major.

**General Education Requirements:** Natural Science & Wellness Lab

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 103 Topics in Modern Biology:

3 cr. Undergraduate.

How biological factors, processes, and reactions affect living systems. Emphasis on current issues in biology such as genetic engineering, bioethics, and population concerns.

**Prerequisites:** none, except as may be required for specific topics.

**Course Rules:** Intended for non-majors; does not carry credit towards biological sciences major. May be retaken with change in topic to 9 cr max. Students with credit in BIO SCI 226 or BIO SCI 250 may not take BIO SCI 103 with those topics.

**General Education Requirements:** Natural Science and Wellness

**Last Taught:** Fall 2025, Fall 2024, Fall 2023, Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 104 Plants in Today's World

3 cr. Undergraduate.

Introduction to major plant groups; principles of structure and function, ecology, and gardening.

**Prerequisites:** none.

**Course Rules:** 2 hrs lec, 2 hrs lab.

**General Education Requirements:** Natural Science & Wellness Lab

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 150 Foundations of Biological Sciences I

4 cr. Undergraduate.

Fundamental principles of biology (ecology, evolution, genetics, molecular and cell biology) integrated through evolutionary framework.

**Prerequisites:** none.

**Course Rules:** First of two-course sequence for biological sciences and other science majors. 3 hrs lec, 3 hrs lab.

**General Education Requirements:** Natural Science & Wellness Lab

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 152 Foundations of Biological Sciences II

4 cr. Undergraduate.

Organismal diversity, emphasizing structural and functional relationships in microorganisms, plants, and animals.

**Prerequisites:** a grade of C or better in BIO SCI 150(P) and concurrent enrollment in CHEM 100 or CHEM 102.

**Course Rules:** Second of a two-course sequence for Biological Sciences and other natural science majors. 3 hr lec, 3 hr lab.

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 194 First-Year Seminar:

3 cr. Undergraduate.

The specific topics are announced in the Schedule of Classes each time the class is offered.

**Prerequisites:** none.

**Course Rules:** Open only to freshmen. Students may earn cr in just one L&S First-Year Sem (course numbers 192, 193, 194).

**Last Taught:** Fall 2015, Fall 2014, Fall 2012, Fall 2009.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 201 Human Structure and Function

3 cr. Undergraduate.

Brief introduction to human anatomy and physiology.

**Prerequisites:** completion of GER Quantitative Literacy Part A (QL-A) requirement, or Math Placement Level 30, or a grade of C or higher in any 100-level Math course (excluding MATH 194 or MATH 199) or MATH 111/PHILOS 111.

**Course Rules:** 2 hrs lec; 3 hrs lab. No credit toward Bio Sci major. Does not substitute for BIO SCI 202 and BIO SCI 203 for Nursing or Health Science. No credit for students with credit in BIO SCI 202 or BIO SCI 203.

**Last Taught:** Spring 2024, Spring 2023, Spring 2022, Spring 2021.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

### BIO SCI 202 Anatomy and Physiology I

4 cr. Undergraduate.

Anatomy and physiology of the human body including cell, tissues, skeletal, muscular, and nervous systems.

**Prerequisites:** none.

**Course Rules:** 3 hrs lec, 3 hrs lab. Required for students in nursing, med tech and med rec admin. Cannot be combined with BIO SCI 150 and BIO SCI 203 for more than 9 cr toward the biological sciences major.

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 203 Anatomy and Physiology II**

4 cr. Undergraduate.

Anatomy and physiology of the human body including cardiovascular, respiratory, digestive, excretory, endocrine, and reproductive systems. 3 hrs lec, 3 hrs lab.

**Prerequisites:** C or better in either Bio Sci 202(P) or 315(P).

**Course Rules:** Cannot be combined with Bio Sci 150 & 202 for more than a total of 9 cr toward bio sci major. Cell & Molec Bio.

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 206 Biology of Women**

3 cr. Undergraduate.

An anatomical and physiological view of the human female life cycle with emphasis on women's health.

**Prerequisites:** none.

**General Education Requirements:** Natural Science and Wellness

**Last Taught:** UWinterIM 2026, Fall 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 210 Introduction to Fermentation Biology**

3 cr. Undergraduate.

Principles and microbiology of fermentation in the production of food and beverages.

**Prerequisites:** none.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 289 Internship in Biological Sciences, Lower Division**

1-6 cr. Undergraduate.

Application of basic principles of biological sciences in a business, organizational, educational, political, or other appropriate setting.

**Prerequisites:** introductory course in BIO SCI; 2.25 GPA, and consent of supervising faculty member.

**Course Rules:** Specific topics may satisfy major area req; consult dept.

One cr earned for academic work based on 40 hrs in internship. May be retaken to 6 cr max; combined limit of 3 cr in BIO SCI 289 and BIO SCI 489 counts toward Biological Sciences major.

**Last Taught:** Spring 2016, Fall 2015, Summer 2015, Fall 2010.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 290 Independent Study and Research:**

1-3 cr. Undergraduate.

Directed library or laboratory/field research in biological sciences.

**Prerequisites:** 2.5 gpa; writ cons instr, dept chair, & asst dean for SAS.

**Course Rules:** Specific topics may satisfy major area req; consult dept.

May be retaken to 6 cr max. Does not count as a Bio Sci lab course.

**Last Taught:** Spring 2020, Fall 2019, Summer 2019, Fall 2018.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 296 UROP Apprenticeship**

1-3 cr. Undergraduate.

Undergraduate research participation in a project developed with a supervising member of the faculty or staff. One credit for 45 hrs research.

**Prerequisites:** acceptance to UROP; prior or conc reg in UROP seminar.

**Course Rules:** May be retaken to 9 cr max in any combination of UROP Apprenticeship courses. Not open to jrs and srs.

**Last Taught:** Spring 2019, Spring 2016, Spring 2014, Fall 2013.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 297 Study Abroad:**

1-12 cr. Undergraduate.

Designed to enroll students in UWM-sponsored program before course work level, content, and credits are determined and/or in specially-prepared program course work.

**Prerequisites:** acceptance for Study Abroad Program.

**Course Rules:** May be retaken with change in topic.

**Last Taught:** Spring 2025, Spring 2024, UWinterIM 2024, Fall 2013.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 299 Ad Hoc:**

1-6 cr. Undergraduate.

Course created expressly for offering in a specified enrollment period.

Requires only dept & assoc dean approval. In exceptional circumstances, can be offered in one add'l sem.

**Prerequisites:** none; add'l prereqs may be assigned to specific topic.

**Course Rules:** Specific topics may satisfy major area req; consult dept.

May be retaken w/chg in topic.

**Last Taught:** UWinterIM 2012, Spring 2003, Fall 2000, Fall 1995.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 310 General Ecology**

4 cr. Undergraduate.

Complex interrelationships between organisms and their environment.

Physiological and behavioral adaptations, populations, biotic communities, ecosystems. 3 hrs lec, 3 hrs lab, field work.

**Prerequisites:** grade of C or better in BIO SCI 152(P).

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 315 Cell Biology**

3 cr. Undergraduate.

Cell structure and function at the molecular level. Flow of material, energy, and information within prokaryotic and eukaryotic cells.

**Prerequisites:** a grade of C or better in BIO SCI 152(P) and CHEM 104(P).

**Course Rules:** 3 hrs lec. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 316 Laboratory in Genetics and Cell Biology**

2 cr. Undergraduate.

Laboratory studies in genetics and cell biology using microorganisms, plants, and animals. Hypothesis testing, data collection, computer and literature analyses, and writing of scientific papers.

**Prerequisites:** a grade of C or higher in BIO SCI 152(P) and CHEM 104(P);

BIO SCI 315(C) or BIO SCI 325(C); or graduate standing; or special student.

**Course Rules:** 1 hr dis, 3 hr lab. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2025, Spring 2024, Fall 2023, Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 325 Genetics**

4 cr. Undergraduate.

Principles of inheritance. Fundamental concepts of genetics.

**Prerequisites:** a grade of C or higher in BIO SCI 150(P); and BIO SCI 152(P) or BIO SCI 203(P); and either concurrent registration or a grade of C or higher in CHEM 104.

**Course Rules:** 3 hrs lec, 2 hrs dis. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 335 Mammalian Reproductive Biology**

3 cr. Undergraduate.

Anatomical and physiological aspects of mammalian reproductive systems, emphasis on humans.

**Prerequisites:** junior standing; BIO SCI 315(P) or consent of instructor.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 356 Developmental Biology**

3 cr. Undergraduate.

Development of living organisms at the molecular, cellular, and organismal levels.

**Prerequisites:** a grade of C or better in BIO SCI 315(P) or BIO SCI 325(P); or consent of instructor.**Course Rules:** 3 hrs lec. Cell & Molec Bio.**Last Taught:** Fall 2023, Fall 2022, Fall 2021, Fall 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 358 Birds of Wisconsin**

2 cr. Undergraduate.

Bird taxonomy and ecology, including the identification of Wisconsin birds.

**Prerequisites:** junior standing and BIO SCI 150(P).**Course Rules:** 4 hrs lab & field work. Field trip schedules (if any) and fees will be announced in class.**Last Taught:** Spring 2022, Spring 2019, Spring 2017, Spring 2016.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 370 Mammalian Physiology**

3 cr. Undergraduate.

Cellular and organ system physiology and comparative aspects of structure-function relationships.

**Prerequisites:** BIO SCI 315(P) or consent of instructor.**Course Rules:** Cell & Molec Bio.**Last Taught:** Fall 2025, Fall 2024, Fall 2023, Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 380 Honors Seminar**

3 cr. Undergraduate.

Selected topics in modern and traditional biology and their relation to society.

**Prerequisites:** 200-level HONORS course and consent of Honors College Director.**Course Rules:** Specific topics may satisfy major area requirements; consult department. May be retaken with change in topic to 9 cr max.**General Education Requirements:** Natural Science and Wellness**Last Taught:** Fall 2022, Spring 2019, Spring 2018, Spring 2017.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 383 General Microbiology**

4 cr. Undergraduate.

Nature and properties of microorganisms. Molecular biology and genetics of bacteria and viruses. Major groups, ecological relationships, and taxonomy.

**Prerequisites:** a grade of C or better in BIO SCI 152(P).**Course Rules:** 3 hrs lec, 4 hrs lab. Cell & Molec Bio; Microbio.**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 401 Immunology**

3 cr. Undergraduate/Graduate.

Fundamentals of the immune response, including cellular, physiological and molecular aspects.

**Prerequisites:** junior standing or greater, and a grade of C or greater in BIO SCI 315(P) or BIO SCI 325(P), and CHEM 341(P) or CHEM 343(P); or graduate standing; or special student.**Course Rules:** 3 hrs lec. Cell & Molec Bio; Microbio.**Last Taught:** Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 401G Immunology**

3 cr. Undergraduate/Graduate.

Fundamentals of the immune response, including cellular, physiological and molecular aspects.

**Prerequisites:** junior standing or greater, and a grade of C or greater in BIO SCI 315(P) or BIO SCI 325(P), and CHEM 341(P) or CHEM 343(P); or graduate standing; or special student.**Course Rules:** 3 hrs lec. Cell & Molec Bio; Microbio.**Last Taught:** Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 405 General Virology**

3 cr. Undergraduate/Graduate.

Basic course in nature of viruses: bacterial, plant, and animal. The use of viruses in model systems for molecular biology and agents of disease.

**Prerequisites:** junior standing, BIO SCI 325(P), and BIO SCI 315(P) or BIO SCI 383(P); CHEM 501(R).**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Fall 2021, Fall 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 405G General Virology**

3 cr. Undergraduate/Graduate.

Basic course in nature of viruses: bacterial, plant, and animal. The use of viruses in model systems for molecular biology and agents of disease.

**Prerequisites:** junior standing, BIO SCI 325(P), and BIO SCI 315(P) or BIO SCI 383(P); CHEM 501(R).**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Fall 2021, Fall 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 406 Marine Biology**

3 cr. Undergraduate/Graduate.

Marine biology with a strong ecological focus; physical and chemical constraints that marine environments impose on organisms; specialized adaptations of marine organisms in response. 3 hrs lec, 1 hr dis.

**Prerequisites:** junior standing and BIO SCI 310(C); or consent of instructor.**Last Taught:** Spring 2025, Spring 2023.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 406G Marine Biology**

3 cr. Undergraduate/Graduate.

Marine biology with a strong ecological focus; physical and chemical constraints that marine environments impose on organisms; specialized adaptations of marine organisms in response. 3 hrs lec, 1 hr dis.

**Prerequisites:** junior standing and BIO SCI 310(C); or consent of instructor.**Last Taught:** Spring 2025, Spring 2023.**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 440 Ecology and Evolution of Amphibians and Reptiles**

3 cr. Undergraduate/Graduate.

Evolutionary history of amphibians and reptiles; their patterns of biological diversity, morphology, life history, ecology, and behavior.

**Prerequisites:** junior standing and BIO SCI 310(P).**Course Rules:** 3 hrs lec.**Last Taught:** Fall 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 440G Ecology and Evolution of Amphibians and Reptiles**

3 cr. Undergraduate/Graduate.

Evolutionary history of amphibians and reptiles; their patterns of biological diversity, morphology, life history, ecology, and behavior.

**Prerequisites:** junior standing and BIO SCI 310(P).**Course Rules:** 3 hrs lec.**Last Taught:** Fall 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 451 Field Methods in Conservation**

3 cr. Undergraduate/Graduate.

Introduction to methods, techniques and tools for natural area management, including plant/animal surveys, vegetation/habitat description, and incorporating hands-on experience.

**Prerequisites:** junior standing and BIO SCI 310(P) or equivalent; or consent of instructor.**Course Rules:** 2 hr lec, 3 hrs lab. BIO SCI 451 and CES 451 are jointly offered and count as repeats of one another.**Last Taught:** Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 451G Field Methods in Conservation**

3 cr. Undergraduate/Graduate.

Introduction to methods, techniques and tools for natural area management, including plant/animal surveys, vegetation/habitat description, and incorporating hands-on experience.

**Prerequisites:** junior standing and BIO SCI 310(P) or equivalent; or consent of instructor.**Course Rules:** 2 hr lec, 3 hrs lab. BIO SCI 451 and CES 451 are jointly offered and count as repeats of one another.**Last Taught:** Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 455 Cellular, Molecular and Developmental Neurobiology**

3 cr. Undergraduate/Graduate.

Nervous systems from cellular, molecular, and developmental perspectives; from basic biophysical properties of neurons to cellular and molecular basis of nervous system development and function.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 315(P); or graduate standing.**Course Rules:** Not open to students with credit BIO SCI 354 or PSYCH 354. Cell & Molec Bio.**Last Taught:** Spring 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 455G Cellular, Molecular and Developmental Neurobiology**

3 cr. Undergraduate/Graduate.

Nervous systems from cellular, molecular, and developmental perspectives; from basic biophysical properties of neurons to cellular and molecular basis of nervous system development and function.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 315(P); or graduate standing.**Course Rules:** Not open to students with credit BIO SCI 354 or PSYCH 354. Cell & Molec Bio.**Last Taught:** Spring 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 458 Community Ecology**

3 cr. Undergraduate/Graduate.

Theories and models in community ecology. Analysis of biological communities emphasizing the origin, maintenance and consequences of species diversity within local communities.

**Prerequisites:** junior standing, BIO SCI 152(P), and BIO SCI 310(P); or graduate standing; or consent of instructor.**Last Taught:** Spring 2018, Fall 2013.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 458G Community Ecology**

3 cr. Undergraduate/Graduate.

Theories and models in community ecology. Analysis of biological communities emphasizing the origin, maintenance and consequences of species diversity within local communities.

**Prerequisites:** junior standing, BIO SCI 152(P), and BIO SCI 310(P); or graduate standing; or consent of instructor.**Last Taught:** Spring 2018, Fall 2013.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 465 Biostatistics**

3 cr. Undergraduate/Graduate.

Simple distribution; statistical inference; simple regression theory; experimental design; analysis of variance and covariance as they relate to biology.

**Prerequisites:** junior standing, BIO SCI 150(P), and MATH 105(P).**Last Taught:** Fall 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 465G Biostatistics**

3 cr. Undergraduate/Graduate.

Simple distribution; statistical inference; simple regression theory; experimental design; analysis of variance and covariance as they relate to biology.

**Prerequisites:** junior standing, BIO SCI 150(P), and MATH 105(P).**Last Taught:** Fall 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 469 Genomic Data Analysis**

2 cr. Undergraduate/Graduate.

Methods for the analysis of large-scale genomic data sets, including whole-genome association studies and transcriptomics.

**Prerequisites:** junior standing, BIO SCI 325(P), and BIO SCI 465(P) or equivalents; or consent of instructor.**Last Taught:** Spring 2023.**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 469G Genomic Data Analysis**

2 cr. Undergraduate/Graduate.

Methods for the analysis of large-scale genomic data sets, including whole-genome association studies and transcriptomics.

**Prerequisites:** junior standing, BIO SCI 325(P), and BIO SCI 465(P) or equivalents; or consent of instructor.

**Last Taught:** Spring 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 480 Ecological Genetics**

3 cr. Undergraduate/Graduate.

Origin and maintenance of genetic variation within and among populations. Fundamental theory and application to ecology and conservation.

**Prerequisites:** junior standing and a grade of C or greater in BIO SCI 310(P) and BIO SCI 325(P); or graduate standing.

**Course Rules:** 3 hrs lec/dis.

**Last Taught:** Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 480G Ecological Genetics**

3 cr. Undergraduate/Graduate.

Origin and maintenance of genetic variation within and among populations. Fundamental theory and application to ecology and conservation.

**Prerequisites:** junior standing and a grade of C or greater in BIO SCI 310(P) and BIO SCI 325(P); or graduate standing.

**Course Rules:** 3 hrs lec/dis.

**Last Taught:** Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 489 Internship in Biological Sciences, Upper Division**

1-6 cr. Undergraduate.

Application of advanced principles of biological sciences in a business, organizational, educational, political, or other appropriate setting.

**Prerequisites:** junior standing, completion of at least one 300-level or above course in BIO SCI, 2.50 GPA, and consent of supervising faculty member.

**Course Rules:** One cr earned for academic work based on 40 hrs in internship. May be retaken to 6 cr max; combined limit of 3 cr in BIO SCI 289 and BIO SCI 489 counts toward Biological Sciences major. Specific topics may satisfy major area requirements; consult department.

**Last Taught:** Summer 2025, Summer 2024, Spring 2024, Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 490 Molecular Genetics**

3 cr. Undergraduate/Graduate.

Molecular mechanisms of higher organisms and model systems. Topics include gene structure, genetic and genomic analysis, gene expression and regulation.

**Prerequisites:** a grade of C or better in BIO SCI 325(P) or BIO SCI 315(P); or graduate standing.

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 490G Molecular Genetics**

3 cr. Undergraduate/Graduate.

Molecular mechanisms of higher organisms and model systems. Topics include gene structure, genetic and genomic analysis, gene expression and regulation.

**Prerequisites:** a grade of C or better in BIO SCI 325(P) or BIO SCI 315(P); or graduate standing.

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 495 Internship in Biotechnology, Upper Division**

3-6 cr. Undergraduate.

Application of advanced principles in microbiology and biotechnology in appropriate settings.

**Prerequisites:** junior standing in microbiology major, BIO SCI 383(P) and BIO SCI 529(P), 2.5 GPA, and consent of supervising faculty member.

**Course Rules:** One cr earned for academic work based on 40 hrs in internship. May be retaken to 6 cr max.

**Last Taught:** Spring 2017, Fall 2016.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 496 UROP Apprenticeship, Upper-Level**

1-3 cr. Undergraduate.

Undergraduate research participation in a project developed with a supervising member of the faculty or staff. One credit for 45 hrs research.

**Prerequisites:** junior standing and acceptance to UROP, or prior or concurrent registration in UROP seminar.

**Course Rules:** May be retaken to 9 cr max in any combination of UROP apprenticeship courses.

**Last Taught:** Fall 2019, Spring 2017, Fall 2016, Fall 2015.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 497 Study Abroad:**

1-12 cr. Undergraduate/Graduate.

Designed to enroll students in UWM-sponsored program before course work level, content, and credits are determined and/or in specially-prepared program course work.

**Prerequisites:** junior standing and acceptance for Study Abroad Program.

**Course Rules:** May be retaken with change in topic.

**Last Taught:** Fall 2016, Fall 2014.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 497G Study Abroad:**

1-12 cr. Undergraduate/Graduate.

Designed to enroll students in UWM-sponsored program before course work level, content, and credits are determined and/or in specially-prepared program course work.

**Prerequisites:** junior standing and acceptance for Study Abroad Program.

**Course Rules:** May be retaken with change in topic.

**Last Taught:** Fall 2016, Fall 2014.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 498 Genetics of Development and Cancer**

3 cr. Undergraduate/Graduate.

The genetic mechanisms governing animal development, cellular proliferation, and cellular death. Focus on how these cellular processes are investigated using experimental biology and human cancers.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 325(P).

**Course Rules:** Cell & Molec Bio.

**Last Taught:** Fall 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 498G Genetics of Development and Cancer**

3 cr. Undergraduate/Graduate.

The genetic mechanisms governing animal development, cellular proliferation, and cellular death. Focus on how these cellular processes are investigated using experimental biology and human cancers.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 325(P).

**Course Rules:** Cell & Molec Bio.

**Last Taught:** Fall 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 499 Ad Hoc:**

1-6 cr. Undergraduate.

Course created expressly for offering in a specified enrollment period. Requires department and associate dean approval. In exceptional circumstances, can be offered in one additional semester.

**Prerequisites:** junior standing; additional prerequisites may be assigned to specific topic.

**Course Rules:** Specific topics may satisfy major area requirements; consult department. May be retaken with change in topic.

**Last Taught:** Fall 2003, Summer 2000, Summer 1996, Summer 1992.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 500 Plant Physiology**

3 cr. Undergraduate/Graduate.

Major biological activities of plants; including growth, development, and metabolism.

**Prerequisites:** junior standing, a grade of C or better in BIO SCI 325(P); and a grade of C or better in BIO SCI 310(P) or BIO SCI 315(P); or consent of instructor; or graduate standing.

**Course Rules:** 3 hrs lec/dis. Cell & Molec Bio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 500G Plant Physiology**

3 cr. Undergraduate/Graduate.

Major biological activities of plants; including growth, development, and metabolism.

**Prerequisites:** junior standing, a grade of C or better in BIO SCI 325(P); and a grade of C or better in BIO SCI 310(P) or BIO SCI 315(P); or consent of instructor; or graduate standing.

**Course Rules:** 3 hrs lec/dis. Cell & Molec Bio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 501 Plant and Aquatic Ecophysiology Laboratory**

3 cr. Undergraduate/Graduate.

Hands-on examination of ecophysiological activities in plants and aquatic ecosystems using diverse field and lab experimental methods.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 325(P) or BIO SCI 310(P); or graduate standing.

**Course Rules:** 1 hr lec, 1 hr dis. 2 hrs lab. Cell & Molec Bio.

**Last Taught:** Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 501G Plant and Aquatic Ecophysiology Laboratory**

3 cr. Undergraduate/Graduate.

Hands-on examination of ecophysiological activities in plants and aquatic ecosystems using diverse field and lab experimental methods.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 325(P) or BIO SCI 310(P); or graduate standing.

**Course Rules:** 1 hr lec, 1 hr dis. 2 hrs lab. Cell & Molec Bio.

**Last Taught:** Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 502 Introduction to Programming and Modeling in Ecology and Evolution**

3 cr. Undergraduate/Graduate.

Using R statistical language to teach script programming to address data manipulation, statistical modeling, and simple simulations in an ecological and evolutionary context.

**Prerequisites:** junior standing and an introductory statistics course (e.g., BIO SCI 465(P)).

**Course Rules:** Counts as repeat of BIO SCI 599 with similar topic.

**Last Taught:** Fall 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 502G Introduction to Programming and Modeling in Ecology and Evolution**

3 cr. Undergraduate/Graduate.

Using R statistical language to teach script programming to address data manipulation, statistical modeling, and simple simulations in an ecological and evolutionary context.

**Prerequisites:** junior standing and an introductory statistics course (e.g., BIO SCI 465(P)).

**Course Rules:** Counts as repeat of BIO SCI 599 with similar topic.

**Last Taught:** Fall 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 505 Conservation Biology**

3 cr. Undergraduate/Graduate.

Genetic and ecological approaches to the conservation of biological diversity. Topics include biology of rare plants and animals, design of nature reserves, and restoration ecology. 3 hrs lec.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 152(P) and BIO SCI 325(P); or graduate standing.

**Last Taught:** Fall 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 505G Conservation Biology**

3 cr. Undergraduate/Graduate.

Genetic and ecological approaches to the conservation of biological diversity. Topics include biology of rare plants and animals, design of nature reserves, and restoration ecology. 3 hrs lec.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 152(P) and BIO SCI 325(P); or graduate standing.

**Last Taught:** Fall 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 512 Limnology I**

3 cr. Undergraduate/Graduate.

The ecology of freshwater ecosystems as influenced by physical and chemical processes.

**Prerequisites:** junior standing or greater and a grade of C or better in BIO SCI 325(P), BIO SCI 310(P), or BIO SCI 315(P); or graduate standing; or special student.

**Last Taught:** Fall 2024, Fall 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 512G Limnology I**

3 cr. Undergraduate/Graduate.

The ecology of freshwater ecosystems as influenced by physical and chemical processes.

**Prerequisites:** junior standing or greater and a grade of C or better in BIO SCI 325(P), BIO SCI 310(P), or BIO SCI 315(P); or graduate standing; or special student.

**Last Taught:** Fall 2024, Fall 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 523 Evolution and Ecology of Birds**

3 cr. Undergraduate/Graduate.

Study of the origin and maintenance of diversity in birds. Topics include systematics, biogeography, life-history behavior, and conservation.

**Prerequisites:** junior standing, BIO SCI 152(P) and BIO SCI 310(P).

**Course Rules:** 3 hrs lec.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 523G Evolution and Ecology of Birds**

3 cr. Undergraduate/Graduate.

Study of the origin and maintenance of diversity in birds. Topics include systematics, biogeography, life-history behavior, and conservation.

**Prerequisites:** junior standing, BIO SCI 152(P) and BIO SCI 310(P).

**Course Rules:** 3 hrs lec.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 529 Molecular Biology of Microorganisms**

3 cr. Undergraduate/Graduate.

Molecular analysis of microbial genetic systems of bacteria, phage, fungi, and yeast.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 383(P); or graduate standing.

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 529G Molecular Biology of Microorganisms**

3 cr. Undergraduate/Graduate.

Molecular analysis of microbial genetic systems of bacteria, phage, fungi, and yeast.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 383(P); or graduate standing.

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 532 Behavioral Ecology**

3 cr. Undergraduate/Graduate.

Behavioral adaptations of organisms in relation to their environment, including social organization, territoriality, cooperation and conflict, parental care, breeding strategies, foraging.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 310(P); or graduate standing.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 532G Behavioral Ecology**

3 cr. Undergraduate/Graduate.

Behavioral adaptations of organisms in relation to their environment, including social organization, territoriality, cooperation and conflict, parental care, breeding strategies, foraging.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 310(P); or graduate standing.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 535 Bacterial Pathogenesis**

3 cr. Undergraduate.

Structural and physiological characteristics of important bacteria causing human and animal diseases. Interactions between pathogen and host, including host defense mechanisms.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 383(P).

**Course Rules:** Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2023, Spring 2022, Spring 2021, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 539 Laboratory Techniques in Molecular Biology**

4 cr. Undergraduate.

Molecular biological techniques, including cell cultures, RNA and DNA isolation, cloning and sequencing of genes; use of expression vectors; protein electrophoresis.

**Prerequisites:** junior standing and BIO SCI 315(P) or BIO SCI 325(P).

**Course Rules:** 2 hrs lec/dis, 6 hrs lab. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2025, Fall 2024, Fall 2023, Fall 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 540 Microbial Diversity and Physiology**

3 cr. Undergraduate/Graduate.

Physiology, ecology, and diversity of microorganisms.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 383(P); or graduate standing.

**Course Rules:** 3 hrs lec. Cell & Molec Bio; Microbio.

**Last Taught:** Fall 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 540G Microbial Diversity and Physiology**

3 cr. Undergraduate/Graduate.

Physiology, ecology, and diversity of microorganisms.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 383(P); or graduate standing.**Course Rules:** 3 hrs lec. Cell & Molec Bio; Microbio.**Last Taught:** Fall 2025.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 542 Biological Electron Microscopy**

3 cr. Undergraduate/Graduate.

Theory, design, and operating principles of scanning and transmission electron microscopes; preparation of biological specimens.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 315(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Fall 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 542G Biological Electron Microscopy**

3 cr. Undergraduate/Graduate.

Theory, design, and operating principles of scanning and transmission electron microscopes; preparation of biological specimens.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 315(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Fall 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 543 Scanning Electron Microscopy Laboratory**

2 cr. Undergraduate/Graduate.

Laboratory and discussion with an emphasis on 'hands-on' exercises including biological specimen prep, microscope operation, and photography.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 542(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio.**Last Taught:** Fall 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 543G Scanning Electron Microscopy Laboratory**

2 cr. Undergraduate/Graduate.

Laboratory and discussion with an emphasis on 'hands-on' exercises including biological specimen prep, microscope operation, and photography.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 542(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio.**Last Taught:** Fall 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 544 Transmission Electron Microscopy Laboratory**

3 cr. Undergraduate/Graduate.

Laboratory and discussion with an emphasis on 'hands-on' exercises including fixation and sectioning of biological specimens, microscope operation, and photography.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 542(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 544G Transmission Electron Microscopy Laboratory**

3 cr. Undergraduate/Graduate.

Laboratory and discussion with an emphasis on 'hands-on' exercises including fixation and sectioning of biological specimens, microscope operation, and photography.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 542(P); or graduate standing; or consent of instructor.**Course Rules:** Cell & Molec Bio; Microbio.**Last Taught:** Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 562 Topics in Field Biology:**

1-2 cr. Undergraduate/Graduate.

Intensive mini-course on applied and basic field biology topics, e.g. vegetation sampling; natural area management; wetland delineation; identification, ecology of a taxon.

**Prerequisites:** junior standing and BIO SCI 310(P) or equivalent; additional prerequisites may be required depending on topic.**Course Rules:** May be retaken with change in topic to 6 cr max. Online component; 2 or more days (depending on topic) in-person instruction.**Last Taught:** Summer 2022, Summer 2021.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 562G Topics in Field Biology:**

1-2 cr. Undergraduate/Graduate.

Intensive mini-course on applied and basic field biology topics, e.g. vegetation sampling; natural area management; wetland delineation; identification, ecology of a taxon.

**Prerequisites:** junior standing and BIO SCI 310(P) or equivalent; additional prerequisites may be required depending on topic.**Course Rules:** May be retaken with change in topic to 6 cr max. Online component; 2 or more days (depending on topic) in-person instruction.**Last Taught:** Summer 2022, Summer 2021.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 564 Endocrinology**

3 cr. Undergraduate/Graduate.

Physiological, biochemical, and phylogenetic aspects of hormonal communication; emphasis on vertebrates.

**Prerequisites:** junior standing, BIO SCI 315(P), and one of the following: CHEM 103(P), CHEM 341(P), or CHEM 341(P); or consent of instructor.**Course Rules:** 3 hrs lec. Cell & Molec Bio.**Last Taught:** Fall 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 564G Endocrinology**

3 cr. Undergraduate/Graduate.

Physiological, biochemical, and phylogenetic aspects of hormonal communication; emphasis on vertebrates.

**Prerequisites:** junior standing, BIO SCI 315(P), and one of the following: CHEM 103(P), CHEM 341(P), or CHEM 341(P); or consent of instructor.**Course Rules:** 3 hrs lec. Cell & Molec Bio.**Last Taught:** Fall 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 565 Gene Regulation in Stem Cells and Regeneration**

3 cr. Undergraduate.

Molecular mechanism by which genes are regulated in higher eukaryotes, including humans. Role of gene regulation during normal development and disease in eukaryotes.

**Prerequisites:** junior standing and BIO SCI 315(P) or BIO SCI 325(P).

**Course Rules:** Cell & Molec Bio.

**Last Taught:** Fall 2019, Fall 2017.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 565G Gene Regulation in Stem Cells and Regeneration**

3 cr. Undergraduate.

Molecular mechanism by which genes are regulated in higher eukaryotes, including humans. Role of gene regulation during normal development and disease in eukaryotes.

**Prerequisites:** junior standing and BIO SCI 315(P) or BIO SCI 325(P).

**Course Rules:** Cell & Molec Bio.

**Last Taught:** Fall 2019, Fall 2017.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 566 Cell Biology of Human Disease**

3 cr. Undergraduate.

Cellular and molecular mechanisms of human developmental diseases; cell signaling in the treatment and prevention of diseases and genetic syndromes.

**Prerequisites:** junior standing and BIO SCI 315(P).

**Course Rules:** Cell & Molec Bio.

**Last Taught:** Spring 2025, Spring 2024, Spring 2023, Spring 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 572 Functional Genomics**

3 cr. Undergraduate/Graduate.

Organization, function, and analysis of genes, proteins, and genomes using internet databases and bioinformatic tools; current knowledge of genomes in various organisms; transcriptomics and proteomics.

**Prerequisites:** junior standing and BIO SCI 325(P).

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 572G Functional Genomics**

3 cr. Undergraduate/Graduate.

Organization, function, and analysis of genes, proteins, and genomes using internet databases and bioinformatic tools; current knowledge of genomes in various organisms; transcriptomics and proteomics.

**Prerequisites:** junior standing and BIO SCI 325(P).

**Course Rules:** 2 hrs lec, 1 hr dis. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 575 Evolutionary Biology**

3 cr. Undergraduate/Graduate.

Evolutionary processes in natural populations. Topics include mating patterns, speciation, gene flow, natural selection, and genetic approaches to conservation.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 152(P) and BIO SCI 325(P); or graduate standing.

**Course Rules:** 3 hrs lec.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 575G Evolutionary Biology**

3 cr. Undergraduate/Graduate.

Evolutionary processes in natural populations. Topics include mating patterns, speciation, gene flow, natural selection, and genetic approaches to conservation.

**Prerequisites:** junior standing and a grade of C or better in BIO SCI 152(P) and BIO SCI 325(P); or graduate standing.

**Course Rules:** 3 hrs lec.

**Last Taught:** Spring 2025.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 580 Experimental Microbiology**

4 cr. Undergraduate.

Modern experimental approaches to study of microbial physiology and genetics.

**Prerequisites:** junior standing and BIO SCI 383(P).

**Course Rules:** 2 hrs lec, 6 hrs lab. Cell & Molec Bio; Microbio.

**Last Taught:** Spring 2024, Spring 2023, Spring 2022, Spring 2021.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 599 Special Topics in Biological Sciences:**

1-3 cr. Undergraduate/Graduate.

In-depth examination of important subjects in one or more areas of the biological sciences. Specific credits and additional prerequisites announced in Schedule of Classes each time course offered.

**Prerequisites:** junior standing.

**Course Rules:** May be retaken with change in topic to 9 cr max.

**Last Taught:** Spring 2025, Spring 2016.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 599G Special Topics in Biological Sciences:**

1-3 cr. Undergraduate/Graduate.

In-depth examination of important subjects in one or more areas of the biological sciences. Specific credits and additional prerequisites announced in Schedule of Classes each time course offered.

**Prerequisites:** junior standing.

**Course Rules:** May be retaken with change in topic to 9 cr max.

**Last Taught:** Spring 2025, Spring 2016.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 611 Seminar on Recent Advances in Limnology and Oceanography**

2 cr. Undergraduate/Graduate.

Lectures and discussion of current issues in limnology and oceanography; focus on a specific issue or research topic.

**Prerequisites:** senior standing, BIO SCI 310(P), and one of the following: BIO SCI 315(P), BIO SCI 316(P), or BIO SCI 383(P).

**Course Rules:** May not be retaken for credit.

**Last Taught:** Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 611G Seminar on Recent Advances in Limnology and Oceanography**

2 cr. Undergraduate/Graduate.

Lectures and discussion of current issues in limnology and oceanography; focus on a specific issue or research topic.

**Prerequisites:** senior standing, BIO SCI 310(P), and one of the following: BIO SCI 315(P), BIO SCI 316(P), or BIO SCI 383(P).

**Course Rules:** May not be retaken for credit.

**Last Taught:** Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 670 Senior Seminar in Biological Sciences**

1 cr. Undergraduate.

Examination of biological literature and preparation, presentation, and discussion of oral reports by individual students.

**Prerequisites:** senior standing in biological sciences major and completion of a 300-349 BIO SCI lab course.**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 671 Undergraduate Seminar in Microbiology**

1 cr. Undergraduate.

Examination of microbiological literature; preparation, presentation, and discussion of oral reports by individual students.

**Prerequisites:** senior standing and a grade C or better in BIO SCI 383(P).**Last Taught:** Fall 2024, Fall 2023, Spring 2023, Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 672 Undergraduate Seminar in Cell and Molecular Biology**

1 cr. Undergraduate.

Examination of cell and molecular biology literature; preparation, presentation, and discussion of oral reports by individual students.

**Prerequisites:** senior standing or greater and a grade of C or better in BIO SCI 315(P).**Last Taught:** Spring 2025, Spring 2024, Fall 2023, Spring 2023.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 695 Independent Study in Freshwater Sciences for Biological Sciences Students**

1-3 cr. Undergraduate.

Independent and original research on a topic not available as a regular course; conducted under the direction of faculty or staff scientist from the School of Freshwater Science.

**Prerequisites:** junior standing, BIO SCI 325(P), one of the following: BIO SCI 310(P), BIO SCI 315(P), BIO SCI 316(P), or BIO SCI 383(P); 2.50 GPA, and written consent of instructor, department chair, and assistant dean for student academic services.**Course Rules:** BIO SCI 695 and FRSHWTR 695 are jointly offered and count as repeats of one another. May be retaken to 6 cr max. Does not count as a biological sciences lab course.**Last Taught:** Spring 2022, Fall 2021, Spring 2019, Fall 2017.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 697 Independent Study in Cell and Molecular Biology**

1-3 cr. Undergraduate.

Independent and original research conducted under the direction of a cell/molecular biology faculty or staff member.

**Prerequisites:** junior standing, BIO SCI 315(P), BIO SCI 316(P), 2.5 GPA, and written consent of instructor, department chair, and assistant dean for student academic services.**Course Rules:** May be retaken to 6 cr max. Does not count as a biological sciences lab course.**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 698 Independent Study in Microbiology**

1-3 cr. Undergraduate.

Introduction to research. Independent and original study conducted under the direction of a faculty or staff member.

**Prerequisites:** junior standing, BIO SCI 383(P), 2.5 GPA, and written consent of instructor, department chair, and assistant dean for student academic services**Course Rules:** May be retaken to 6 cr max. Does not count as a biological sciences lab course.**Last Taught:** Fall 2025, Spring 2024, Fall 2023, Spring 2023.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 699 Independent Study**

1-3 cr. Undergraduate.

Independent study on a topic not available as a regular course; conducted under the supervision of a faculty member. Requires submission of a formal study proposal.

**Prerequisites:** junior standing and BIO SCI 325(P); BIO SCI 310(P) or BIO SCI 315(P) and BIO SCI 316(P); 2.5 GPA, and written consent of instructor, department chair, and assistant dean for student academic services.**Course Rules:** May be retaken to 6 cr max. Does not count as a biological sciences lab course.**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 735 Bacterial Pathogenesis**

3 cr. Graduate.

Structural and physiological characteristics of important bacteria causing human and animal diseases. Interactions between pathogen and host, including host defense mechanisms.

**Prerequisites:** Graduate standing.**Last Taught:** Fall 2023, Spring 2022, Spring 2021, Spring 2020.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 739 Laboratory Techniques in Molecular Biology**

4 cr. Graduate.

Molecular biological techniques, including cell cultures, RNA and DNA isolation, cloning and sequencing of genes; use of expression vectors; protein electrophoresis. 2 hrs lec/dis, 6 hrs lab.

**Prerequisites:** graduate standing.**Course Rules:** Not open to students w/ credit in BIO SCI 539.**Last Taught:** Fall 2025, Fall 2024, Fall 2023, Fall 2022.**Current Offerings:** <https://catalog.uwm.edu/course-search/>**BIO SCI 750 Scientific Writing**

2 cr. Graduate.

Writing techniques for the sciences, including proposal writing, submission of papers to journals. Writing and editing research proposals, scientific papers, and review papers. Critique of published papers.

**Prerequisites:** grad st.**Last Taught:** Fall 2025, Spring 2024, Fall 2022, Fall 2021.**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 765 Gene Regulation in Stem Cells and Regeneration**

3 cr. Graduate.

Molecular mechanism by which genes are regulated in higher eukaryotes, including humans. Role of gene regulation during normal development and disease in eukaryotes.

**Prerequisites:** graduate standing.

**Course Rules:** Not open to students w/ credit in BIO SCI 565.

**Last Taught:** Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 766 Cell Biology of Human Disease**

3 cr. Graduate.

Cellular and molecular mechanisms of human developmental diseases; cell signaling in the treatment and prevention of diseases and genetic syndromes.

**Prerequisites:** Graduate standing.

**Last Taught:** Spring 2025, Spring 2024, Spring 2023, Spring 2022.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 780 Experimental Microbiology**

4 cr. Graduate.

Modern experimental approaches to study of microbial physiology and genetics. 2 hrs lec/6 hrs lab.

**Prerequisites:** Graduate standing.

**Last Taught:** Spring 2023, Spring 2022, Spring 2021, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 800 Graduate Capstone in Biological Sciences:**

2 cr. Graduate.

Capstone Seminar involving extensive research and evaluation of the scientific literature on a specific topic. Group and individual oral presentations required. Not re-takable for credit.

**Prerequisites:** Open only to MS students in non-thesis track; cons instr.

**Last Taught:** Spring 2021, Spring 2020, Spring 2019, Fall 2018.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 899 Advanced Independent Studies**

1-3 cr. Graduate.

Special studies at the graduate level involving independent reading, library research, and/or field for laboratory study other than thesis research.

**Prerequisites:** grad st; cons instr.

**Course Rules:** Retakable w/chg in topic to 8 cr max.

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Summer 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 900 Biology Colloquium**

1 cr. Graduate.

Talks by invited speakers and faculty members on topics of biological interest.

**Prerequisites:** grad st.

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 925 Graduate Seminar in Biological Sciences**

1-2 cr. Graduate.

Carries 1 cr when offered once weekly; carries 2 cr when offered twice weekly.

**Prerequisites:** grad st.

**Course Rules:** Retakable to 12 cr max.

**Last Taught:** Fall 2025, Spring 2025, Spring 2024, Fall 2023.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 927 Seminar: Population and Community Ecology:**

1-2 cr. Graduate.

Carries 1 cr when offered once weekly; carries 2 cr when offered twice weekly.

**Prerequisites:** grad st.

**Course Rules:** Retakable w/chg in topic to 9 cr max.

**Last Taught:** Spring 2023, Spring 2021, Spring 2015, Spring 2010.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 929 Special Topics in Ecology, Evolution and Behavior**

1-2 cr. Graduate.

Current topics in EEB examined in a seminar format.

**Prerequisites:** grad st.

**Course Rules:** Retakable to 12 cr max.

**Last Taught:** Fall 2024, Fall 2023, Fall 2022, Fall 2019.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 931 Seminar in Systematic Biology and Evolution:**

1-2 cr. Graduate.

Current topics in systemic biology and evolution explored in a seminar format.

**Prerequisites:** grad st.

**Course Rules:** Retakable w/chg in topic to 9 cr max.

**Last Taught:** Spring 2019, Spring 2018, Fall 2017, Spring 2017.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 933 Seminar in Neuroscience**

2 cr. Graduate.

Student oral and poster presentations in cellular, molecular, behavioral, and cognitive neuroscience. Students will also write evaluations and summaries of external presentations.

**Prerequisites:** grad st in Psych, Bio Sci, or Ed Psych or cons instr

**Course Rules:** Retakable to 8 cr max. Bio Sci 933 & Psych 933 are jointly offered; students may enroll under only one of the curricular areas in any single semester.

**Last Taught:** Fall 2025, Spring 2025, Fall 2024, Spring 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 934 Research Advances in Cell and Molecular Biology**

1 cr. Graduate.

Presentation and discussion of original research and current topics in cell and molecular biology. Retakable to 10 cr max.

**Prerequisites:** grad st.

**Last Taught:** Fall 2023, Fall 2022, Spring 2022, Fall 2021.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 935 Research Advances in Ecology, Evolution and Behavior**

1 cr. Graduate.

Presentation and discussion of original research and current topics in evolution, ecology, and behavior.

**Prerequisites:** grad st.

**Course Rules:** Retakable to 10 cr max.

**Last Taught:** Spring 2025, Fall 2022, Spring 2022, Fall 2021.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 936 Research Advances in Microbiology**

1 cr. Graduate.

Presentation and discussion of original research and current topics in microbiology.

**Prerequisites:** grad st.

**Course Rules:** Retakable to 10 cr max.

**Last Taught:** Spring 2024, Spring 2021, Fall 2020, Spring 2020.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>

**BIO SCI 990 Research**

1-8 cr. Graduate.

Mentored research in partial fulfillment of thesis requirements.

**Prerequisites:** grad st.

**Last Taught:** Fall 2025, Summer 2025, Spring 2025, Fall 2024.

**Current Offerings:** <https://catalog.uwm.edu/course-search/>