

Biological Sciences (BIOL)

BIOL 111. Concepts of Biology. 3 Credits.

Introduction to a wide range of biological topics, from the organism, ecology, and evolution to the cell, molecular biology, and genetics.

BIOL 111L. Concepts of Biology Lab. 1 Credit.

Introduction to a wide range of biological topics, from the organism, ecology, and evolution to the cell, molecular biology, and genetics.

BIOL 124. Environmental Science. 3 Credits.

Ecological principles related to human cultures, resource use, and environmental alterations.

BIOL 124L. Environmental Science Laboratory. 1 Credit.

Ecological principles related to human cultures, resource use, and environmental alterations.

BIOL 126. Human Biology. 3 Credits.

Consideration of selected problems in human biology. Cross-listed with ZOO 126.

BIOL 126L. Human Biology Laboratory. 1 Credit.

Consideration of selected problems in human biology. Cross-listed with ZOO 126L.

BIOL 150. General Biology I. 3 Credits.

Introduction to cellular and molecular biology, genetics, and evolution.

BIOL 150L. General Biology I Laboratory. 1 Credit.

Introduction to cellular and molecular biology, genetics, and evolution.

BIOL 151. General Biology II. 3 Credits.

An introduction to the biology of living organisms and their interactions with each other and their environments. Examples primarily involve plants and animals, but include other groups of organisms as well. Prereq: BIOL 150.

BIOL 151L. General Biology II Laboratory. 1 Credit.

An introduction to the biology of living organisms and their interactions with each other and their environments. Examples primarily involve plants and animals, but include other groups of organisms as well. Prereq: BIOL 150L.

BIOL 189. Skills for Academic Success. 1 Credit.

This course is designed to ease the transition for new students at NDSU. Students will learn skills and techniques used by successful college students. In addition to introducing the students to campus resources and governance, topics will include study techniques, time management, test taking, note taking, goal setting, wellness, stress management, and career orientation.

BIOL 194. Individual Study. 1-5 Credits.**BIOL 196. Field Experience. 1-15 Credits.****BIOL 199. Special Topics. 1-5 Credits.****BIOL 220. Human Anatomy and Physiology I. 3 Credits.**

An in-depth introduction to structure and function of human organ systems' cells, tissues, the integumentary system, the skeletal system, joints, muscle and muscular system, nervous tissue and nervous system, and the special senses. F.

BIOL 220L. Human Anatomy and Physiology I Laboratory. 1 Credit.

An in-depth introduction to structure and function of human organ systems' cells, tissues, the integumentary system, the skeletal system, joints, muscle and muscular system, nervous tissue and nervous system, and the special senses. F.

BIOL 221. Human Anatomy and Physiology II. 3 Credits.

A continuation of BIOL 220, 220L; the endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems and development. Prereq: BIOL 220. S.

BIOL 221L. Human Anatomy and Physiology II Laboratory. 1 Credit.

A continuation of BIOL 220, 220L; the endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems and development. S.

BIOL 252. Plant and Animal Diversity. 3 Credits.

An introduction to the anatomy and physiology of higher plants and animals. An integrative and comparative look at the organization and function of plants and animals. Prereq: BIOL 150 and BIOL 151.

BIOL 270. Antibiotic Drug Discovery. 3 Credits.

This course is an authentic research experience for undergraduates. Students in the course will participate in a larger national research initiative aimed at discovering new antibiotics produced by soil bacteria. Prereq: BIOL 150 and BIOL 151.

BIOL 271. Wildlife Ecology and Conservation: An Undergraduate Research Course. 3 Credits.

This course is an authentic research experience for undergraduates. Students in the course will participate in collaborative research projects with their teams, each team will design its own unique project focused on the wildlife population of interest. Prereq: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L.

BIOL 272. Research Experience: Learning in Biology. 3 Credits.

This course is an authentic research experience for undergraduates. Students in the course will explore the processes of learning and instruction in undergraduate biology through critical reading of literature, experimental design, data analysis, and communication of research findings. Prereq: BIOL 150, BIOL 150L, BIOL 151, BIOL 151L.

BIOL 291. Seminar. 1-3 Credits.

BIOL 292. Study Abroad. 1-15 Credits.

BIOL 293. Undergraduate Research. 1-5 Credits.

BIOL 294. Individual Study. 1-5 Credits.

BIOL 299. Special Topics. 1-5 Credits.

BIOL 315. Genetics. 3 Credits.

Study of the basis of heredity with emphasis on structure and function of DNA and Mendelian genetics. 3 lectures. Cross-listed with BOT 315, PLSC 315 and ZOO 315. F, S.

BIOL 315L. Genetics Laboratory. 1 Credit.

Study of the basis of heredity with emphasis on structure and function of DNA and Mendelian genetics. 1 two-hour laboratory. Cross-listed with BOT 315L, PLSC 315L and ZOO 315L. F, S.

BIOL 359. Evolution. 3 Credits.

Discussion of the mechanisms of evolution, including population genetics, selection, speciation, adaptation, and molecular evolution. Capstone course for Botany and Biological Sciences majors. Prereq: BIOL 150, BIOL 151 and BIOL 315.

BIOL 364. General Ecology. 3 Credits.

Ecological principles associated with organism environment interactions, populations, communities, and ecosystems. Quantitative approach with examples (animal, plant, microbial) included. Prereq: BIOL 150 or BIOL 151. Cross-listed with ZOO 364.

BIOL 379. Study Tour Abroad. 1-6 Credits.

BIOL 391. Seminar. 1-3 Credits.

BIOL 392. Study Abroad. 1-15 Credits.

BIOL 393. Undergraduate Research. 1-5 Credits.

BIOL 394. Individual Study. 1-5 Credits.

BIOL 399. Special Topics. 1-5 Credits.

BIOL 478. Methods in Animal Physiology. 3 Credits.

Students will investigate physiological functions at the cell, tissue, organ and organismal levels. Prereq: BIOL 150 and BIOL 151 and ZOO 460 or ZOO 462. {Also offered for graduate credit - see BIOL 678.}.

BIOL 479. Biomedical Genetics and Genomics. 3 Credits.

This course will cover the diagnoses, clinical presentations, prevention and treatments of hereditary diseases (Mendelian and complex); the ever-increasing roles that genetics and genomics have in advancing medicine (including personalized medicine). Prereq: BIOL 150, BIOL 151 and BIOL 315 or BOT 315 or PLSC 315 or ZOO 315. {Also available for graduate credit - see BIOL 679.}.

BIOL 480. Ecotoxicology. 3 Credits.

Ecotoxicology, the behavior of pollutants in and effects on ecosystems; top-down and bottom-up approaches for assessment/prediction of effects on populations, communities and ecosystems; ecotoxicological testing at single/multi-species levels; biomarkers; passive/active biomonitoring. Prereq: BIOL 151 and BIOL 151L. {Also offered for graduate credit - see BIOL 680.}.

BIOL 481. Wetland Science. 3 Credits.

Definition of wetlands, biogeochemistry, ecophysiology and adaptations to wetland conditions in plants and animals, biodiversity and productivity, wetland ecology, applications of wetlands for treatment of wastewater and other forms of bioremediation. Prereq: BIOL 151, BIOL 151L. {Also offered for graduate credit - see BIOL 681.}.

BIOL 483. Cellular Mechanisms of Diseases. 3 Credits.

This course will be focused on the cellular and molecular bases of selected diseases and some non-human animal diseases. Key cellular pathways/processes and molecular mechanisms that, when altered/disrupted, result in pathological changes/conditions will be discussed from scientific (e.g., functions, regulation and structures of cells, proteins and organs) and medical (e.g., clinical presentation, diagnostic and treatment) perspectives. Prereq: BIOL 150, BIOL 151, BIOL/BOT/PLSC/ZOO 315, ZOO 370. {Also offered for graduate credit - See BIOL 683.}.

BIOL 491. Seminar. 1-5 Credits.

BIOL 492. Study Abroad. 1-15 Credits.

BIOL 493. Undergraduate Research. 1-5 Credits.

BIOL 494. Individual Study. 1-5 Credits.

BIOL 496. Field Experience. 1-15 Credits.

BIOL 499. Special Topics. 1-5 Credits.

BIOL 678. Methods in Animal Physiology. 3 Credits.

Students will investigate physiological functions at the cell, tissue, organ and organismal levels. {Also offered for undergraduate credit - see BIOL 478.}.

BIOL 679. Biomedical Genetics and Genomics. 3 Credits.

This course will cover the diagnoses, clinical presentations, prevention and treatments of hereditary diseases (Mendelian and complex); the ever-increasing roles that genetics and genomics have in advancing medicine (including personalized medicine). {Also available for undergraduate credit - see BIOL 479.}.

BIOL 680. Ecotoxicology. 3 Credits.

Ecotoxicology, the behavior of pollutants in and effects on ecosystems; top-down and bottom-up approaches for assessment/prediction of effects on populations, communities and ecosystems; ecotoxicological testing at single/multi-species levels; biomarkers; passive/active biomonitoring. {Also offered for undergraduate credit - see BIOL 480.}.

BIOL 681. Wetland Science. 3 Credits.

Definition of wetlands, biogeochemistry, ecophysiology and adaptations to wetland conditions in plants and animals, biodiversity and productivity, wetland ecology, applications of wetlands for treatment of wastewater and other forms of bioremediation. {Also offered for undergraduate credit - see BIOL 481.}.

BIOL 683. Cellular Mechanisms of Disease. 3 Credits.

This course will be focused on the cellular and molecular bases of selected diseases and some non-human animal diseases. Key cellular pathways/processes and molecular mechanisms that, when altered/disrupted, result in pathological changes/conditions will be discussed from scientific (e.g., functions, regulation and structures of cells, proteins and organs) and medical (e.g., clinical presentation, diagnostic and treatment) perspectives. {Also offered for undergraduate credit. See BIOL 483.}.

BIOL 695. Field Experience. 1-15 Credits.

BIOL 696. Special Topics. 1-5 Credits.

BIOL 766. Advanced Animal Behavior. 3 Credits.

This course investigates current concepts and research areas in animal behavior, with a focus on topics that lie at the interface between animal behavior, ecology and evolution. Cross-listed with ZOO 766.

BIOL 790. Graduate Seminar. 1-3 Credits.

BIOL 791. Temporary/Trial Topics. 1-5 Credits.

BIOL 793. Indiv Study/Tutorial. 1-5 Credits.

BIOL 794. Practicum/Internship. 1-10 Credits.

BIOL 795. Field Experience. 1-15 Credits.

BIOL 796. Special Topics. 1-5 Credits.

BIOL 797. Master's Paper. 1-3 Credits.

Literature review, research, and preparation for paper required for the comprehensive study option. Graded S or U.

BIOL 798. Master's Thesis. 1-10 Credits.

BIOL 825. Biology of Aging. 3 Credits.

This course will take an integrative approach to understanding the biology of aging. We will examine both the evolutionary causes and underlying mechanisms of aging in diverse organisms including humans.

BIOL 842. Quantitative Biology. 3 Credits.

Philosophy and techniques for collecting, handling, and interpreting research data in the biological sciences. S Cross-listed with ENT 842.

BIOL 850. Advanced Ecology. 3 Credits.

This course covers classical ecological literature and current literature focusing on ecological research philosophy and techniques. An overview/introduction of a variety of statistical methods for analyzing ecological data is covered.

BIOL 859. Evolution. 3 Credits.

Evolution is the process by which species change over time through descent with modification. This course will focus on understanding the different applications of evolutionary theory to current issues in the biological sciences.

BIOL 865. Biological Rhythms. 3 Credits.

This course will provide a greater understanding of the nature of endogenous time keeping ("clocks") and will investigate A) the biological mechanisms by which these 'clocks' interface with the environment, both biotic (e.g. social behavioral) and abiotic, to B) enable adaptive responses. This class will focus almost exclusively on vertebrates, but may include classic examples and insights gained from plants and invertebrates.

BIOL 876. Population Dynamics. 4 Credits.

Principles and mechanics of animal population dynamics. Prereq: an interest in working with numbers. S (odd years).

BIOL 877. Analysis of Population and Demographic Data. 3 Credits.

Contemporary maximum likelihood approaches to estimating abundance, survival, reproduction, and dispersal in free-living populations. Goodness-of-fit and information theory applied to population model selection. Examples from a variety of real populations. Prereq: BIOL 876, STAT 660 or STAT 661, ENT 842.

BIOL 884. Biological Research Principles. 3 Credits.

Discussion, analysis of published research papers, lectures on selected topics, and student research proposal. Prereq: STAT 725.

BIOL 892. Graduate Teaching Experience. 1-6 Credits.

BIOL 893. Individual Study/Tutorial. 1-5 Credits.

BIOL 895. Field Experience. 1-15 Credits.