

BIOLOGY (BIO)

BIO-1040 The Cell and DNA

3 Credits

Designed for non-science majors. Considers cell structure, function, and metabolism, cell division, DNA structure and function, and Mendelian and molecular genetics. Scientific method and reasoning are emphasized. To fulfill laboratory science requirements, students should enroll in the related laboratory course.

Lecture: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-104L The Cell and DNA Laboratory

1 Credit

Laboratory course examines the scientific method, cell structure and function, cell division, DNA structure and function, and Mendelian and molecular genetics. Includes microscope work, models, and various experiments designed to illustrate concepts covered in the lecture course.

Laboratory: 3 hours

Prerequisite(s): Concurrent enrollment in BIO-1040 The Cell and DNA is strongly recommended.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-1050 Human Biology

3 Credits

Designed for non-science majors. Considers concept of homeostasis of the human body. Basic structure and function of body systems and diseases of these systems studied. To fulfill laboratory science requirements, students should enroll in related laboratory course.

Lecture: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; or departmental approval. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-105L Human Biology Laboratory

1 Credit

Laboratory course designed for non-science majors that examines the microscopic and gross structure and function of the human body. Includes microscope work, models, animal dissections, and various experiments designed to illustrate concepts related to basic human biology and to complement topics covered in BIO-1050 Lecture course.

Laboratory: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Concurrent enrollment in BIO-1050 Human Biology is strongly recommended. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-1060 Environment, Ecology, and Evolution

3 Credits

Designed for non-science majors. Questions about the natural world are explored through an introduction to the principles of evolution and ecology, including how populations change over time and how organisms interact with each other and the environment. Topics include scientific inquiry; nature of science; evolutionary processes; diversity of life; population, community, and ecosystem ecology; human impacts on the environment; environmental stewardship; and regional environmental concerns.

Lecture: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-106L Environment, Ecology, & Evolution Laboratory

1 Credit

Designed for non-science majors. Questions about the natural world are explored through hands-on laboratory and field activities focusing on evolution, ecology, and environmental science. Scientific inquiry is used to investigate how populations change over time; the diversity of life; community ecology; ecosystem ecology; and human impacts on the environment.

Laboratory: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Concurrent enrollment in BIO-1060 Environment, Ecology, and Evolution is strongly recommended. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-1070 Insect Biology

3 Credits

Designed for non-science majors. Considers the use of insects as model organisms to direct learning of biological concepts. Discusses insect form, function, behavior, and evolution. Explores current and historical social and economic dynamics through the study of insect roles such as vectors of human diseases, food and fiber production, nutrition, medical/genetic research, and ethical issues surrounding topics such as pesticide use and genetically modified organisms.

Lecture: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; or departmental approval.

BIO-1100 Introduction to Biological Chemistry

3 Credits

Basic principles of inorganic chemistry, organic chemistry and biochemistry necessary for study of human physiology. Physiological applications of the chemical processes of cellular transport, communication and metabolism emphasized. Laboratory includes use of metric system, basic chemistry techniques and physiological applications.

Lecture: 2 hours. Laboratory: 2 hours

Prerequisite(s): Completion of MATH-0955 Beginning Algebra; or co-enrollment in a co-requisite pairing of MATH-0930 Essential Skills for Algebraic & Quantitative Reasoning and MATH-1190 Algebraic & Quantitative Reasoning; or co-enrollment in a co-requisite pairing of MATH-0940 Essential Skills for Contemporary Mathematics and MATH-1240 Contemporary Mathematics; or qualified Math placement.

OAN Approved: Ohio Transfer 36 TMNS.

**BIO-1221 Anatomy and Physiology for Diagnostic Medical Imaging
4 Credits**

Basic understanding of cells, tissues, organs and body systems. Examination of their function based on their relationship to diagnostic medical imaging examinations. Particular emphasis placed on the skeletal system and the radiographic appearance of anatomical structures.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): MA-1020 Medical Terminology I or concurrent enrollment.

**BIO-1230 Anatomy and Physiology of the Eye
4 Credits**

Detailed examination of the anatomy and physiology of the eye. Emphasis on ocular terminology, structure, function, movement, disorders, diseases, lens physics, and visual testing/analysis. Study of eye model and preserved eye dissection.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): Departmental approval: admission to Optical Technology program.

**BIO-1410 Anatomy & Physiology of Domestic Animals I
4 Credits**

Explores the comparative anatomy and physiology of the canine, feline, equine, bovine, ovine, porcine and avian species. Focuses on cellular biology, tissues and membranes, and the integumentary, skeletal, muscular, nervous, endocrine, and circulatory systems with emphasis on species variations. Laboratory includes preserved and fresh specimens, models, microscopic observations, and audio/visual aids.

Lecture: 3 hours. Laboratory: 2 hours

Prerequisite(s): BIO-1100 Introduction to Biological Chemistry or concurrent enrollment; or CHEM-1010 Introduction to Inorganic Chemistry, or concurrent enrollment; or departmental approval: comparable knowledge or skills.

OAN Approved: Ohio Transfer 36 TMNS. Note: Due to COVID-19 safety guidelines, lab space in this course is currently limited. Students who have been accepted to the Veterinary Technology program are given priority for enrollment in this class. Students who have not yet been admitted to the program will be admitted on a space available basis. Please contact the Veterinary Technology program director for permission to enroll in this course.

**BIO-1420 Anatomy & Physiology of Domestic Animals II
3 Credits**

Explores the comparative anatomy and physiology of the canine, feline, equine, bovine, ovine, avian and porcine species. Focuses on lymphatic, digestive, respiratory, urinary and reproductive systems. Immunology, pregnancy, lactation, blood and genetics considered. Laboratory includes preserved and fresh specimens, models, microscopic observations, demonstrations and audio/visual aids.

Lecture: 2 hours. Laboratory: 2 hours

Prerequisite(s): BIO-1410 Anatomy and Physiology of Domestic Animals I.

OAN Approved: Ohio Transfer 36 TMNS.

**BIO-1500 Principles of Biology I
4 Credits**

Designed for science majors. The molecular and cellular basis of life is explored through an introduction to cell biology, molecular biology, genetics, and evolution in both lecture and laboratory settings. Topics include scientific inquiry; chemical aspects of life; cell structure and function; energy and metabolism; cell division; molecular genetics; inheritance; population genetics; mechanisms of evolution; and evidence for evolution.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; and MATH-0955 Beginning Algebra or qualified math placement. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

OAN Approved: Ohio Transfer 36 TMNS and Transfer Assurance Guide OSC003 and OSC024 (1 of 2 courses, both must be taken).

**BIO-150H Honors Principles of Biology I
4 Credits**

Honors course designed for science majors with exploration of the molecular and cellular basis of life through an introduction to cell biology, molecular biology, genetics and evolution with a strong focus on inquiry-based learning as the basis of scholarly research. Emphasis on evolution as the unifying theory in biology.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): ENG-1010 College Composition I with grade of "B" or higher; or ENG-101H Honors College Composition I; and MATH-0955 Beginning Algebra or qualified math placement.

OAN Approved: Ohio Transfer 36 TMNS and Transfer Assurance Guide OSC003 and OSC024 (1 of 2 courses, both must be taken).

**BIO-1510 Principles of Biology II
4 Credits**

Designed for science majors. The diversity of life, animals, plants, and ecology are explored in both lecture and laboratory settings. Topics include the origin and evolution of life, systematics, classification, structural and functional variations in animals and plants, populations, communities, and ecosystems.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): BIO-1500 Principles of Biology I, or BIO-150H Honors Principles of Biology I; or departmental approval: equivalent knowledge or skills.

OAN Approved: Ohio Transfer 36 TMNS and Transfer Assurance Guide OSC004 and OSC024 (2 of 2 courses, both must be taken).

**BIO-151H Honors Principles of Biology II
4 Credits**

Honors course designed for science majors. The diversity of life, animals, plants, and ecology are explored in both lecture and laboratory settings. Topics include the origin and evolution of life, systematics, classifications, structural and functional variations in animals and plants, populations, communities, and ecosystems. Emphasis on evolution as the unifying theory in biology. Strong focus on inquiry-based learning.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): BIO-150H Honors Principles of Biology I or BIO-1500 Principles of Biology I.

OAN Approved: Transfer Assurance Guide OSC004.

BIO-179H Honors Contract in Biology**1 Credit**

Honors Contract complements and exceeds requirements and expected outcomes for an existing 1000-level honors course through formulation of a contract with a faculty mentor. This independent study at the honors level may also be taken with a non-honors course. When taken with a non-honors course the Honors Contract adds an honor experience to that course. In conjunction with a faculty mentor, student will formulate a contract, which upon completion will result in distinctive scholarship. The student is required to meet on a regularly scheduled basis with the instructor for mentor-student tutorial sessions. A maximum of six Honor Contracts (six credit hours) may be taken at the college (includes 179H and 279H).

Lecture: 1 hours

Prerequisite(s): Must be taken concurrently with a 1000-level course whose instructor agrees to mentor the student in this contract. Departmental approval required.

BIO-1813 Special Topics Laboratory: Insect biology, behavior, and their impact on our daily lives**1 Credit**

Laboratory course designed for non-science majors. Examines the use of insects as model organisms to direct learning of biological concepts, such as curation and identification, external and internal morphology, insect behavior and ecology, and the exploration of topics to which insects are important such as public health, forensics, and water quality. Includes microscope work, models, curated specimens, and various experiments designed to illustrate concepts covered in the lecture course.

Laboratory: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test, and concurrent enrollment in BIO-1812 Special Topics: Insect biology, behavior, and their impact on our daily lives is strongly recommended.

BIO-1814 Special Topics in Course-based Undergraduate Research Experience**3 Credits**

This course is designed to teach science majors how to gather factual evidence by applying the scientific process to their own curiosities about the biological world. The steps of the scientific method are investigated, with detailed attention given to quality performance, reproducibility, and rigor throughout the process. A relationship between the reproducibility of science and the application of rigorous steps towards evidence collection is explored. Students will perform various career responsibilities associated with the research pillar of land-grant institutions, including writing and submitting a peer-reviewed manuscript, and delivering an oral presentation.

Lecture: 2 hours. Laboratory: 3 hours

Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test.

BIO-1820 Independent Study/Research in Biology**1-3 Credits**

Directed individual study. Study/research title and specific content arranged between instructor and student. (see Credit Schedule of classes for current offerings). May be repeated for a maximum of six credits of different topics.

Lecture: 1-3 hours

Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

BIO-182H Honors Independent Study in Biology**1-3 Credits**

Honors-level directed individual study. Must meet criteria set forth in the Honors Course Checklist used to approve regular honors courses. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

Lecture: 1-3 hours

Prerequisite(s): Departmental approval and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; and must have earned an A or B in at least 3 honors courses. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

BIO-2020 Tropical Biology**4 Credits**

Introduction to biology of the tropics. Topics include major tropical biomes, biodiversity, conservation, sustainability, and consequences of human impact on the tropics. Studies include identification of flora and fauna and adaptations of tropical organisms. In addition to on-campus lecture/lab during an academic term, students are required to participate and travel to a tropical location for a real-world experience. A portion of the laboratory hours will be completed during the mandatory field trip to a tropical ecosystem. Field trip requires additional costs.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): Departmental approval and any 1000 level science course.

BIO-2060 Principles of Genetics**3 Credits**

Introductory level course. Topics include: structure and function of DNA, patterns of inheritance, gene expression and mutations, population genetics and gene technology.

Lecture: 3 hours

Prerequisite(s): BIO-1500 Principles of Biology I or BIO-2341 Anatomy and Physiology.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-2100 Biology of Aging**3 Credits**

Exploration of current biological theories of aging with emphasis on humans. Fundamental concepts of cell biology and physiology will be used to study extrinsic and intrinsic factors of aging. Topics will include normal age-related changes and pathology in body systems, senescence, genetics, life expectancy, and improving longevity.

Lecture: 3 hours

Prerequisite(s): BIO-1040 The Cell and DNA, or BIO-1050 Human Biology, or BIO-1500 Principles of Biology I, or BIO-2331 Anatomy and Physiology I.

BIO-2150 Environmental Science

3 Credits

Fundamental ecological concepts and their application to environmental issues emphasizing the impact of human activity on the biosphere. Topics include natural resources, air, water and land pollution, energy, and populations.

Lecture: 3 hours

Prerequisite(s): BIO-1060 Environment, Ecology and Evolution; or BIO-1510 Principles of Biology II.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-2200 Radiobiology

2 Credits

Theories of the biological effects of ionizing radiation, quantities and units of measurement, proper protective measures for patient and personnel, effective dose equivalents radiation absorption processes and shielding, exposure monitoring devices.

Lecture: 2 hours

Prerequisite(s): BIO-1221 Anatomy and Physiology for Diagnostic Medical Imaging, and departmental approval: admission to Radiography Program.

BIO-2331 Anatomy and Physiology I

4 Credits

Study of structure and function of human body. Focus on fundamental concepts of cellular structure, tissues, organs, and systems. Considers structure, function, and terminology of skeletal, muscular, integumentary, nervous and endocrine systems. Laboratory experiences include demonstrations, microscopic observations, anatomic models, and videos related to topics.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): Sufficient score on Biology Placement Test or BIO-1100 Introduction to Biological Chemistry; or CHEM-1010 Introduction to Inorganic Chemistry and CHEM-1020 Introduction to Organic Chemistry and Biochemistry; or BIO-1500 Principles of Biology.

BIO-2341 Anatomy and Physiology II

4 Credits

Study the structure and function of cells, tissues, and organs of the human cardiovascular, lymphatic/immune, respiratory, urinary, digestive, and reproductive systems. Includes the study of cellular division, embryological and fetal development, and classical genetics. Laboratory may include demonstrations, dissections, microscopic observations, anatomical models, and videos pertaining to the topic.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): BIO-2331 Anatomy and Physiology I.

BIO-2500 Microbiology

4 Credits

The diversity of the microbial world is explored through subjects including microbial ecology, evolution, structure and function of microorganisms, metabolism, genetics, control of microorganisms, and host-microbe interactions.

Lecture: 3 hours. Laboratory: 3 hours

Prerequisite(s): BIO-1410 Anatomy and Physiology of Domestic Animals I; or BIO-2331 Anatomy and Physiology I; or BIO-1500 Principles of Biology I; or BIO-1050 Human Biology and BIO-105L Human Biology Laboratory and BIO-1100 Introduction to Biological Chemistry; or departmental approval: comparable knowledge or skills.

OAN Approved: Ohio Transfer 36 TMNS.

BIO-2600 Pathophysiology

3 Credits

General mechanisms of disease processes and health problems including inflammation, degeneration, immunity, congenital, hereditary, and neoplasia as well as diseases caused by deficiencies or excesses. The most commonly occurring diseases of body systems are surveyed.

Lecture: 3 hours

Prerequisite(s): BIO-2341 Anatomy and Physiology II.

OAN Approved: Transfer Assurance Guide OHL019.

BIO-2820 Independent Advanced Study/Research in Biology

1-3 Credits

Directed individual advanced study. Study/research title and specific content arranged between instructor and student. (See Credit Schedule of classes for current offerings). May be repeated for a maximum of six credits of different topics.

Lecture: 1-3 hours

Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

BIO-282H Advanced Honors Independent Study in Biology

1-3 Credits

Advanced Honors-level directed individual study. Must meet criteria set forth in the Honors Course Checklist used to approve regular honors courses. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

Lecture: 1-3 hours

Prerequisite(s): Departmental approval and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test; and must have earned an A or B in at least 3 honors courses. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.

BIO-282S Independent Advanced Laboratory Study/Research in Biology

1-3 Credits

Independent two-hour lab per credit. Directed individual advanced study. Study/research title and specific content arranged between instructor and student (see Credit Schedule of classes for current offerings). May be repeated for a maximum of six credits of different topics.

Laboratory: 2-6 hours

Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.