

BIOL COURSE STUDENT LEARNING OUTCOMES

BIOL 100 - General Biology for Non-Majors

Students will be able to explain the fundamental concepts associated with the properties of life, biological molecules, and cells.

Students will be able to explain the fundamental concepts and theories associated with human genetics, evolution, and ecology.

Students will be able to recognize the differences between scientific and non-scientific concepts and evaluate secondary sources of scientific information for evidence-based credibility and scientific accuracy.

Students will be able to utilize the scientific method to conduct an experiment, organize and interpret data, and appropriately report their experimental findings.

BIOL 100A - General Biology for Nonmajors Lecture

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BIOL 102 - Introduction to Wildlife Technician

Students will be able to characterize the job career opportunities for and responsibilities of wildlife technicians, including field techniques, safety, human impacts, and conservation.

Students will be able to explain the primary job responsibilities of a wildlife technician including data collection and reporting, professionalism, and ethics.

Students will be able to apply knowledge of science writing to tasks primary to technicians including data reports, finding and citing research literature, and communication.

Students will be able to develop and assemble application materials for wildlife technician opportunities in undergraduate research, State, and Federal entities.

BIOL 105 - Introduction to Neuroscience

Students will be able to describe the basic symptoms, treatment options and impact of prevalent neurological diseases.

Students will be able to identify and define the divisions of the human nervous system, the cells of the nervous system and the manner in which neurons function.

Students will be able to identify the connection between neural functioning and select examples of human behavior and cognition.

BIOL 106 - Introduction to Evolution and Adaptation

Students will be able to analyze the concepts and evidence of biological evolution and adaptation.

Students will be able to apply the scientific process.

Students will be able to apply the use of laboratory safety procedures and laboratory equipment.

BIOL 112 - Introduction to Animal Behavior

Students will be able to apply the scientific process to animal behavior observations and experiments.

Students will be able to distinguish between proximate mechanisms and ultimate causation, and explain the role of natural and sexual selection.

Students will be able to describe general patterns of animal behavior across a wide range of contexts.

Students will be able to evaluate sources of scientific information for credibility and scientific accuracy and determine the usefulness or appropriateness of information found.

BIOL 113 - Life in the Ocean

Students will be able to describe the geologic and chemical properties of the oceans and their impact on marine life.

Students will be able to utilize standard methodologies (e.g., dichotomous keys) to identify and classify marine organisms.

Students will be able to identify the unique challenges of life in different marine ecosystems and the human impacts on ocean habitats.

Students will be able to demonstrate use of the scientific method to perform an experiment, organize and interpret the experimental data, and accurately report the findings.

Students will be able to demonstrate the ability to effectively locate and assess sources for appropriateness, validity, and accuracy; and cite sources correctly.

BIOL 137 - Introduction to Entomology

Students will be able to describe fundamental attributes of insect biology including anatomy, physiology, reproduction, and biodiversity.

Students will be able to explain the importance of insects to both natural ecosystems and human society.

Students will be able to examine scientific research to draw connections between the course material and current research in entomology.

Students will be able to demonstrate the use of the appropriate scientific equipment and procedures to collect, preserve, and identify insects from major taxonomic orders.

BIOL 170 - Calling Bullshit: Reasoning in a World of Data and Misinformation

Students will be able to define and recognize bullshit within an experimental design, information and data.

Students will be able to discuss where bullshit can be found and why it should be called out.

Students will be able to analyze and evaluate the context, assumptions, statistical traps, and/or bias regarding the main problem, issue, or arguments.

Students will be able to define publication bias and identify predatory publishing in scientific literature.

Students will be able to explain the ethics behind calling out bullshit in different settings.

Students will be able to present a technical explanation of why a claim is bullshit for different audiences.

BIOL 188 - Foundations in Scientific Literacy

Students will be able to accurately perform metric conversions and mathematical calculations related to concentrations of solutions.

Students will be able to describe fundamental concepts associated with atomic structure, chemical bonding, water chemistry, and pH.

Students will be able to utilize standard biology laboratory equipment safely and accurately.

BIOL 189A - Fundamentals of Life Science

Students will be able to identify the basic concepts of the scientific method, characteristics of life, chemistry, and the major biological molecules and relate structure to function in prokaryotic and eukaryotic cells, with an emphasis on human cells and tissues.

Students will be able to describe cellular processes including membrane dynamics, signaling, energy acquisition via cellular respiration and fermentation and how they relate to human health and physiology.

Students will be able to identify the components of the cell cycle and its regulation and apply cell biology concepts to the understanding of stem cells, cancer, and viruses.

Students will be able to describe the foundations of Mendelian and molecular genetics, calculate probabilities related to inheritance of traits, and describe the importance of the structure of DNA and gene expression to human health.

BIOL 190A - Introduction to Cell and Molecular Biology

Students will be able to identify the basic concepts of the scientific method, characteristics of life, taxonomy, evolution, atomic structure, chemical bonding, and water chemistry, as well as identify and describe the structures and functions of key biological molecules and cellular structures.

Students will be able to recognize the components of and describe the processes of thermodynamics, enzyme regulation, redox reactions, fermentation, respiration and photosynthesis.

Students will be able to identify the components of the cell cycle and its regulation, the events of cell division and the processes of inheritance. Students will describe and apply these processes to patterns of inheritance (e.g., calculating probabilities related to inheritance of traits).

Students will be able to describe the structure and function of nucleic acids and chromosomes and the replication of DNA. Students will describe the process and regulation of eukaryotic gene expression and impact of DNA mutations.

BIOL 190L - Introduction to Cell and Molecular Biology Laboratory

Students will be able to apply the scientific method by designing a controlled experiment; and, by collecting, graphically representing, statistically analyzing and interpreting data, and presenting scientific findings using discipline-standard formats.

Students will be able to identify and use standard laboratory equipment in an accurate and safe manner to demonstrate knowledge of the principles of cell and molecular biology.

Students will be able to perform metric conversions and mathematical calculations related to concentrations of solutions.

BIOL 191A - Introduction to Organismal Biology

Students will be able to analyze how the distribution and abundance of organisms is determined by the interactions between other organisms and the environment.

Students will be able to analyze how ecological principles operate at the levels of the individual organism, the population, the community, and the ecosystem.

Students will be able to describe the characteristics, phylogenetic diversity, and ecology of the prokaryotic and eukaryotic kingdoms.

Students will be able to describe the structure and function of animal and plants, and explain how they relate to environmental adaptations.

Students will be able to explain the underlying mechanisms of evolution.

BIOL 191L - Intro to Organismal Biology Lab

Students will apply the scientific method to field techniques used on plants and animals.

Students will demonstrate the use of field techniques to investigate plants and animals.

Students will demonstrate the scientific practices used by organismal biologists in various taxonomic disciplines.

BIOL 198 - Special Topics in Biology

Students will be able to exhibit knowledge of the specific substantive area of Biology being studied.

Students will be able to synthesize existing knowledge, abilities and skills with new practical skills while gaining theoretical understanding of the substantive area of Biology being taught.

BIOL 202 - General Botany

Students will be able to identify plant anatomy and describe corresponding functions.

Students will be able to describe the evolutionary history and biodiversity of major plant lineages.

Students will be able to describe the importance of plants to ecosystems and humans.

Students will be able to describe the natural history and adaptations of plants with an emphasis on the Great Basin ecosystem.

Students will be able to identify anatomical features and plant families using taxonomic keys.

BIOL 223 - Human Anatomy and Physiology I

Students will be able to describe the anatomical position, body directions, planes, sections, and major body cavities using correct terminology.

Students will be able to identify anatomical structures of the integumentary, skeletal, muscular, and nervous systems, including the major tissue types.

Students will be able to explain the principles of homeostasis and the physiological functions of the integumentary, skeletal, muscular, and nervous systems, including the interpretation of data and impact of diseases on these systems.

BIOL 224 - Human Anatomy and Physiology II

Students will be able to identify the anatomical structures of the cardiovascular, respiratory, lymphatic/immune, endocrine, urinary, reproductive and digestive systems.

Students will be able to describe the physiological function and homeostatic regulation of the cardiovascular, respiratory, lymphatic/immune, endocrine, urinary, reproductive and digestive systems and the impact of disease on these body systems.

Students will be able to apply analytical thinking skills in interpreting both qualitative and quantitative data and understanding the interrelationship between body systems as well as the regulation of fluid, electrolyte and acid-base balance in the body.

BIOL 234 - Natural History of the Great Basin

Students will be able to characterize the ecosystems of the Great Basin desert including biodiversity and adaptations of species.

Students will be able to explain how geographic and geologic forces create patterns in climate and biodiversity at the landscape scale.

Students will be able to understand the human history of the Great Basin desert including its occurrence and both indigenous and modern use of its resources.

Students will be able to apply knowledge of human activities and impacts to make informed decisions regarding the management, conservation, and protection of the Great Basin desert.

Students will be able to recognize and identify common fungi, plants, and animals of the Great Basin desert, including the habitats in which they are found and their ecological roles, using taxonomic keys and field guides.

BIOL 251 - General Microbiology

Students will be able to identify microbial structures and their relationship to microbial function.

Students will be able to apply scientific reasoning to identify or test hypotheses about microorganisms.

Students will be able to evaluate disease scenarios based on the mechanisms of microbial pathogenicity and epidemiology.

Students will be able to use a multi-step mathematical process through to a logical conclusion and critically evaluate the reasonableness of the result.

Students will be able to describe and demonstrate aseptic laboratory technique to transfer, isolate, and stain microorganisms.

Students will be able to discuss the host immune response as it relates to colonization, infection, and disease.

BIOL 273 - Research Experience

Students will be able to effectively communicate scientific ideas and findings in written and oral formats.

Students will be able to execute standard research techniques to collect, organize, analyze, and interpret data with accuracy and precision in a safe and ethical manner.

Students will be able to identify a question, formulate hypotheses, and conduct a properly designed experiment.

BIOL 275 - Gross Anatomy Dissection

Students will be able to accurately present completed dissections to their peers and the course instructor in a way that demonstrates knowledge of each system presented in their assigned region.

Students will be able to develop skills using dissection tools, terminology, and different techniques in order to appropriately visualize structures.

BIOL 290 - Internship in Biology

Students will be able to demonstrate proficiency in individualized specific learning outcomes written by the faculty member.

Students will be able to synthesize existing knowledge, skills and abilities with new practical skills gained in the course.

BIOL 298 - Independent Study in Biology

Students will be able to develop and complete an independent project focused on one or more of the following skills used in biological research: reading and synthesizing primary literature, experimental design, proposal writing, laboratory techniques, field techniques, data collection, data analysis, and/or communication of scientific findings.

BIOL 299 - Selected Topics in Biology

CSLOs are under review.