

Biology (BIOL)

BIOL 110 Research Methods 1 Credit (1,0)

Hypothesis-driven science; review of scientific literature; conducting literature reviews; critique of peer-reviewed articles; use of search engines and reference management software.

Course Offered at: Daytona Beach

BIOL 111 Research Symposium 1 Credit (1,0)

Research study design; mentor identification; proposal submission for research capstone; exposure to peer research presentations.

Prerequisites: BIOL 110

Course Offered at: Daytona Beach

BIOL 120 Foundations of Biology I 3 Credits (3,0)

Fundamentals of biology; biochemistry; cell structure, function, and division; biological energy sources and uses; genetics and inheritance.

Daytona Beach Corequisites: BIOL 120L

Prescott Corequisites: BIOL 120L

Course Offered at: Daytona Beach, Prescott, Worldwide

BIOL 120L Foundations of Biology I Laboratory 1 Credit (0,1)

General characteristics and concepts of living organisms; hierarchical organization of life, basic chemistry, cell types and structures, membrane function, energy flow, metabolic processes, cell cycle, meiosis, genetics.

Corequisites: BIOL 120

Course Offered at: Daytona Beach, Prescott

BIOL 121 Foundations of Biology II 3 Credits (3,0)

Organismal diversity; phylogenetic tree of life; phylogenetic reconstruction methods; evolution of key life innovations.

Prerequisites: BIOL 120

Corequisites: BIOL 121L

Course Offered at: Daytona Beach, Prescott

BIOL 121L Foundations of Biology II Laboratory 1 Credit (0,3)

Organismal diversity using the phylogenetic tree of life as an organizing theme; labs cover methods of phylogenetic reconstruction, knowledge of the tree of life, evolution of life's most important and interesting innovations.

Corequisites: BIOL 121

Course Offered at: Daytona Beach, Prescott

BIOL 199 Special Topics in Biology 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in biology.

Course Offered at: Daytona Beach, Prescott, Worldwide

BIOL 215 Genetics 3 Credits (3,0)

Fundamental principles of inheritance; application to plants, animals, fungi, and microorganisms.

Prerequisites: BIOL 121

Corequisites: BIOL 215L

Course Offered at: Daytona Beach, Prescott

BIOL 215L Genetics Laboratory 1 Credit (0,3)

Fundamental principles of inheritance; application to plants, animals, fungi, and microorganisms.

Prerequisites: BIOL 121 and BIOL 121L

Corequisites: BIOL 215

Course Offered at: Daytona Beach, Prescott

BIOL 216 Microbiology 3 Credits (3,0)

Microorganisms in disease processes; host-pathogen relationships; immune system functions; pathogenesis; biology of viruses, bacteria, and fungi.

Prerequisites: BIOL 121 and CHEM 111

Corequisites: BIOL 216L

Course Offered at: Daytona Beach, Prescott

BIOL 216L Microbiology Laboratory 1 Credit (0,3)

Identification, life history, and evolutionary history of microbes including viruses, bacteria, and fungi.

Prerequisites: BIOL 121 and BIOL 121L

Corequisites: BIOL 216

Course Offered at: Daytona Beach, Prescott

BIOL 245 Natural History of the Region 3 Credits (3,0)

Geology, paleo history, flora, fauna, and ecosystems of the region; relationship between slope, elevation, topography, and plant communities.

Course Offered at: Daytona Beach, Prescott

BIOL 245L Natural Hist of the Region Laboratory 1 Credit (0,3)

Practical applications and identification of geomorphology, paleohistory, flora, fauna, and ecosystem structure of the region; explores relationship between slope, elevation, topography, and plant communities.

Corequisites: BIOL 245

Course Offered at: Daytona Beach, Prescott

BIOL 299 Special Topics in Biology 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in biology.

Course Offered at: Daytona Beach, Prescott

BIOL 302 Instrumental Analysis and Trace Evidence 3 Credits (3,0)

Principles and techniques of forensic trace evidence analysis; proper collection, preservation, and characterization of forensic substances; hands-on analysis via microscopy.

Prerequisites: CHEM 210

Corequisites: BIOL 302L

Course Offered at: Prescott

BIOL 302L Instrumental Analysis and Trace Evidence Laboratory 1 Credit (0,3)

Principles and techniques of trace evidence analysis using a course-based undergraduate research experience (CURE) framework; identification and classification of forensic substances including drugs, pollen, paint, heavy metals, fibers; hands-on analysis using chemical instrumentation.

Prerequisites: CHEM 210L

Corequisites: BIOL 302

Course Offered at: Prescott

BIOL 304 Critical Reading and Scientific Communication 1 Credit (1,0)

Reading and analyzing primary research in biology and chemistry; critical evaluation of experimental design and data interpretation; explaining findings from biological and chemical literature; effective presentation of research results; development of written and oral communication skills tailored to scientific audiences. Emphasizing clarity, precision, and engagement in scientific discourse.

Prerequisites: a grade of C or better in BIOL 121 and (CHEM 110 or CHEM 113)

Course Offered at: Prescott

BIOL 305 Human Anatomy and Physiology I 3 Credits (3,0)

Intensive lecture on the basic concepts and principles of human anatomy and physiology.

Prerequisites: BIOL 121

Course Offered at: Daytona Beach, Prescott

BIOL 305L Human Anatomy and Physiology Laboratory 1 Credit (0,3)

Intensive lab course emphasizing the basic concepts and principles of human anatomy and physiology.

Corequisites: BIOL 305

Course Offered at: Daytona Beach, Prescott

BIOL 306 Human Anatomy and Physiology II 3 Credits (3,0)

Intensive lecture emphasizing concepts and principles of human anatomy and physiology.

Daytona Beach Prerequisites: BIOL 305

Daytona Beach Corequisites: BIOL 306L

Prescott Prerequisites: BIOL 121

Prescott Corequisites: BIOL 306L

Course Offered at: Daytona Beach, Prescott

BIOL 306L Human Anatomy and Physiology II Laboratory 1 Credit (0,3)

Intensive lab course emphasizing concepts and principles of human anatomy and physiology.

Corequisites: BIOL 306

Course Offered at: Daytona Beach, Prescott

BIOL 308 Principles of Ecology 3 Credits (3,0)

Structure and function of ecosystems; interactions among organisms and between organisms and their physical environment; population, community, and ecosystem processes; biodiversity, biogeography, and human impacts on ecological systems.

Corequisites: BIOL 308L

Course Offered at: Prescott

BIOL 308L Principles of Ecology Laboratory 1 Credit (0,3)

Field and laboratory methods related to BIOL 308; ecological sampling, field equipment use, sample collection and sorting, data entry, data analysis, visualization, and presentation using appropriate software.

Prerequisites: BIOL 121L

Corequisites: BIOL 308

Course Offered at: Prescott

BIOL 310 Research 1 Credit (0,1)

Capstone research experience; engagement with a faculty mentor or approved external mentor; hypothesis formation; bench work; data collection and analysis; written report each term.

Course Offered at: Daytona Beach, Prescott

BIOL 321 Behavioral Neuroscience I 3 Credits (3,0)

Fundamental information about the human nervous system; neuron to complex central nervous system; impact on behavior; emphasis on molecular biology of the neuron; synaptic transmission; neural basis of cognition and perception, including touch, nociception, vision, audition, and vestibular physiology.

Prerequisites: BIOL 121

Course Offered at: Daytona Beach

BIOL 322 Behavioral Neuroscience II 3 Credits (3,0)

Emphasis on neural components of movement, sleep, and aging; special focus on nervous system disorders and potential interventions.

Prerequisites: BIOL 321

Course Offered at: Daytona Beach

BIOL 330 Environmental Consulting 3 Credits (3,0)

Overview of federal and state regulations; focus on Environmental Assessment (EA) under NEPA; analysis of local and regional projects; relevance to industries including aviation.

Course Offered at: Prescott

BIOL 335 Cell Signaling and Disease 3 Credits (3,0)

Impact of cellular signaling on function; environmental and genetic factors disrupting pathways; molecular mechanisms of diseases including cancers, autoimmunity, neurological, and cardiovascular disorders; focus on molecular biology and current research in signaling pathways.

Prerequisites: BIOL 120 and BIOL 215

Course Offered at: Daytona Beach

BIOL 399 Special Topics in Biology 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in biology.

Course Offered at: Daytona Beach, Prescott

BIOL 403 Wildlife and Airports 3 Credits (3,0)

Problems and solutions associated with wildlife and their impact on airport safety; special focus on issues related to birds.

Course Offered at: Prescott

BIOL 405 Molecular and Cell Biology 3 Credits (3,0)

Basic processes of cells; correlation of structure and function at organelle and cellular levels; principles of molecular biology; recombinant DNA technology; investigation of cellular structure, development, gene expression, and regulation in bacteria, archaea, and eukaryotes.

Prerequisites: BIOL 215 and CHEM 310

Corequisites: BIOL 405L

Course Offered at: Daytona Beach, Prescott

BIOL 405L Molecular and Cell Biology Laboratory 1 Credit (0,3)

Processes of cells with emphasis on correlation of structure and function at organelle and cellular levels; principles of molecular biology including recombinant DNA technology and other methodologies; investigation of cellular structure, development, gene expression.

Corequisites: BIOL 405

Course Offered at: Daytona Beach, Prescott

BIOL 406 Forensic DNA Analysis 3 Credits (3,0)

Theories and practices in criminal investigations; collection, analysis, and interpretation of biological evidence; focus on forensic DNA analysis.

Prerequisites: BIOL 405

Corequisites: BIOL 406L

Course Offered at: Daytona Beach, Prescott

BIOL 406L Forensic DNA Analysis Laboratory 1 Credit (0,3)

Theories and practices in criminal investigations and legal proceedings; collection, analysis, and interpretation of biological evidence; focus on forensic DNA analysis.

Corequisites: BIOL 406

Course Offered at: Daytona Beach, Prescott

BIOL 430 Fundamentals of Infectious Diseases 3 Credits (3,0)

Principles and practices related to infectious diseases; Mechanisms by which pathogens cause disease; how the body responds to infections; effective strategies of disease prevention.

Course Offered at: Daytona Beach

BIOL 440 Clinical Rotation 3 Credits (1,6)

Advanced practicum at local hospitals and clinics; rotation through major medical disciplines combined with weekly case reports and classroom discussion

Prerequisites: Senior Standing

Course Offered at: Daytona Beach

BIOL 441 Clinical Rotation II: Advanced Practice 3 Credits (3,0)

Advanced observational experience in a clinical or hospital setting; exposure to healthcare delivery, interdisciplinary collaboration, and patient management; exposure to management of complex clinical cases.

Prerequisites: BIOL 440

Course Offered at: Daytona Beach

BIOL 444 Immunology 3 Credits (3,0)

Concepts related to the human immune system; microbial recognition, innate immunity, antibodies, lymphocyte development, adaptive immunity, antigens, T-cells, B-cells, humoral responses; immunological tolerance and responses; immune system disorders; cancer biology; immunotherapy.

Daytona Beach Prerequisites: BIOL 215

Prescott Prerequisites: BIOL 215, BIOL 215L, BIOL 216, and BIOL 216L

Course Offered at: Daytona Beach, Prescott

BIOL 445 Principles of Human Pathophysiology 3 Credits (3,0)

Alterations in cells and tissues in response to harmful stimuli that occur in prevalent or important medical conditions. Acquiring skills of general pathophysiology including inflammation, ischemia, infarction, necrosis, and neoplasia as applied to specific organ systems.

Prerequisites: BIOL 216 and BIOL 306 and CHEM 111

Course Offered at: Prescott

BIOL 450 Exercise Physiology and Human Performance 3 Credits (3,0)

Physiological concepts related to acute and chronic exercise responses; muscle bioenergetics, cellular metabolism, cardiopulmonary responses; fitness assessment; exercise in extreme conditions and environments, including space.

Prerequisites: BIOL 306

Course Offered at: Daytona Beach, Prescott

BIOL 490 Senior Seminar 3 Credits (3,0)

The core curriculum also includes a senior capstone that focuses on specific issues and applications related to their focal concentration. For example, those that wish to go to medical school or secure a job in the health science post-graduation may choose to do a clinical internship at the regional hospital in Prescott, Yavapai Regional Medical Center (YRMC).

Course Offered at: Prescott

BIOL 499 Special Topics in Biology 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in biology.

Course Offered at: Daytona Beach, Prescott