

# Biology (BIO)

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## Courses

### BIO 110 Research Methods I 1 Credit (1,0)

Introduction to hypothesis-driven science. Review of scientific literature. Practice in conducting focal literature reviews and critiquing peer-reviewed articles. Familiarization with search engines and reference management software

**Prerequisites:** Open to BSAP major only

### BIO 111 Research Symposium 1 Credit (1,0)

Introduction to research study design. Identification of a mentor and potential research project. Submission of formal proposal to be developed as research capstone experience. Exposure to research presentations by peer undergraduates and graduate students.

**Prerequisites:** BIO 110

### BIO 120 Foundations of Biology I 3 Credits (3,0)

A biological science course introducing the fundamentals of biology and essential structures, components, and processes of life. Emphasis placed on biochemistry; cell structure, function, organization, and division; sources and uses of biological energy; as well as genetics and inheritance.

**Corequisites:** BIO 120L

### BIO 120L Foundations of Biology I Laboratory 1 Credit (0,3)

To present a study of the general characteristics and basic concepts of living organisms, which includes: the hierarchical organization of life, basic chemistry of life (inorganic and organic), cell types and structures, membrane structure and function, thermodynamics/energy flow, metabolic processes (photosynthesis & cellular respiration), the cell cycle, meiosis, and an introduction to genetics.

**Corequisites:** BIO 120

### BIO 121 Foundations of Biology II 3 Credits (3,0)

An introduction to organismal diversity, using the phylogenetic tree of life as an organizing theme. Emphasizes methods of phylogenetic reconstruction, current knowledge of the tree of life, and the evolution of life's most important and interesting innovations.

**Prerequisites:** BIO 104 or BIO 120 **Corequisites:** BIO 121L

### BIO 121L Foundations of Biology II Lab 1 Credit (0,3)

An introduction to organismal diversity, using the phylogenetic tree of life as an organizing theme. Laboratories cover methods of phylogenetic reconstruction, current knowledge of the tree of life, and the evolution of life's most important and interesting innovations.

**Corequisites:** BIO 121

### BIO 142 Introduction to Environmental Science 3 Credits (3,0)

An introductory course which stresses the interrelations of all aspects of the living and the nonliving world. Introduces the student to key concepts and principles that govern how nature works and the application of these concepts and principles to possible solutions to environmental and resource problems.

### BIO 210 Research 1 Credit (1,0)

Cluster of courses constituting a capstone experience. Engagement in research in conjunction with a faculty mentor or an approved mentor from collaborating institution, agency or firm. Hypothesis formation, bench work, data collection/analysis with written report of progress and/or findings each term. Course substitution offered for study abroad, study away or other experiential learning opportunities.

**Prerequisites:** BIO 111

### BIO 211 Research 1 Credit (1,0)

Engagement in research in conjunction with a faculty mentor or an approved mentor from collaborating institution, agency or firm. Hypothesis formation, bench work, data collection/analysis with written report of progress and/or findings each term. Course substitution offered for study abroad, study away or other experiential learning opportunities.

**Prerequisites:** BIO 111

### BIO 215 Genetics 3 Credits (3,0)

A study of the fundamental principles of inheritance and their application to plants, animals, fungi, and microorganisms.

**Prerequisites:** BIO 120 and BIO 121 **Corequisites:** BIO 215L

### BIO 215L Genetics Laboratory 1 Credit (0,3)

A study of the fundamental principles of inheritance and their application to plants, animals, fungi, and microorganisms.

**Prerequisites:** BIO 120 BIO 120L BIO 121 and BIO 121L **Corequisites:** BIO 215

### BIO 216 Microbiology 3 Credits (3,0)

A comprehensive course covering the involvement of microorganisms in disease processes. Course topics include the relationship between host and pathogen, opportunism, the basic functions of the immune system, molecular mechanisms of pathogenesis, and a significant section on the biology of viruses, bacteria, and fungi.

**Prerequisites:** BIO 120 and BIO 121 and CHM 111 **Corequisites:** BIO 216L

### BIO 216L Microbiology Laboratory 1 Credit (0,3)

Emphasizes the identification, life history, evolutionary history microbes including viruses, bacteria and fungi.

**Prerequisites:** (BIO 120L or BIO 120L) and (BIO 105L or BIO 121L) and (CHM 106L or CHM 111L) **Corequisites:** BIO 216

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

Focuses on the geology, paleohistory, flora, fauna, and ecosystems of the region, including such topics as the relationship between slope, elevation, topography, and plant communities.

### BIO 245L Natural History of the Region Laboratory 1 Credit (0,3)

Focuses on the practical applications and identification of geomorphology, paleohistory, flora, fauna, and ecosystem structure of the region. Explores the relationship between slope, elevation, topography, and plant communities.

### BIO 299 Special Topics in Biology 1-6 Credit

Individual independent or directed studies of selected topics.

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

It is an intensive lecture course emphasizing the basic concepts and principles of human anatomy and physiology.

**Prerequisites:** BIO 120 and BIO 121 **Corequisites:** BIO 305L

### BIO 305L Human Anatomy & Physiology Laboratory 1 Credit (0,3)

It is an intensive laboratory course emphasizing the basic concepts and principles of human anatomy and physiology.

**Corequisites:** BIO 305

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

A continuation of BIO 305. Intensive lecture emphasizing concepts and principles of human anatomy and physiology.

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

A continuation of BIO 305L. Intensive laboratory course emphasizing concepts and principles of human anatomy and physiology.

### BIO 310 Research 1 Credit (1,0)

Cluster of courses constituting a capstone experience. Engagement in research in conjunction with a faculty mentor or an approved mentor from collaborating institution, agency or firm. Hypothesis formation, bench work, data collection/analysis with written report of progress and/or findings each term. Course substitution offered for study abroad, study away or other experiential learning opportunities.

**Prerequisites:** BIO 211

### BIO 311 Research 1 Credit (1,0)

Cluster of courses constituting a capstone experience. Engagement in research in conjunction with a faculty mentor or an approved mentor from collaborating institution, agency or firm. Hypothesis formation, bench work, data collection/analysis with written report of progress and/or findings each term. Course substitution offered for study abroad, study away or other experiential learning opportunities.

**Prerequisites:** BIO 211

**BIO 321 Behavioral Neuroscience I 3 Credits (3,0)**

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

**Prerequisites:** BIO 120 and BIO 121

**BIO 322 Behavioral Neuroscience II 3 Credits (3,0)**

A continuation of Behavioral Neuroscience I. Emphasis on neural components of movement, sleep, and aging. Special emphasis on disorders of the nervous system and potential interventions.

**Prerequisites:** BIO 321

**BIO 335 Cell Signaling and Disease 3 Credits (3,0)**

Fundamental impacts of cellular signaling on cellular function, and by extension, whole organism function. Environmental or genetic risk factors that disrupt cellular signaling pathways leading to disease. Molecular mechanisms involved in malfunction of biological processes that results in, but are not limited to, cancers, autoimmunity, neurological diseases, and cardiovascular disorders. Basic molecular biology coupled to current research to elucidate cellular signaling pathways that lead to disease.

**Prerequisites:** BIO 120 and BIO 215

**BIO 399 Special Topics in Biology 1-6 Credit**

Individual independent or directed studies of selected topics.

**BIO 405 Molecular and Cell Biology 3 Credits (3,0)**

A study of basic and essential processes of cells with emphasis on the correlation of structure and function at the organelle and cellular levels. Basic study of the principles of molecular biology including recombinant DNA technology and other approaches and methodologies used in investigating bacterial, archaeal, and eukaryotic cellular structure, development, chromosome organization, gene expression, and gene regulation.

**Prerequisites:** BIO 215 and CHM 310 **Corequisites:** BIO 405L

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

A study of basic and essential processes of cells with emphasis on the correlation of structure and function at the organelle and cellular levels. Basic study of the principles of molecular biology including recombinant DNA technology and other approaches and methodologies used in investigating bacterial, archaeal, and eukaryotic cellular structure, development, chromosome organization, gene expression, and gene regulation.

**Corequisites:** BIO 405

**BIO 406 Forensic DNA Analysis 3 Credits (3,0)**

Examining the theories and current practices used in criminal investigations and legal proceedings to collect, analyze, and interpret biological evidence using molecular biology with emphasis on forensic DNA analysis.

**Prerequisites:** BIO 405 or BIO 400 **Corequisites:** BIO 406L

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

Examining the theories and current practices used in criminal investigations and legal proceedings to collect, analyze, and interpret biological evidence using molecular biology with emphasis on forensic DNA analysis.

**Prerequisites:** BIO 400 or BIO 405 **Corequisites:** BIO 406

**BIO 410 Research 1 Credit (1,0)**

Cluster of courses constituting a capstone experience. Engagement in research in conjunction with a faculty mentor or an approved mentor from collaborating institution, agency or firm. Hypothesis formation, bench work, data collection/analysis with written report of progress and/or findings each term. Course substitution offered for study abroad, study away or other experiential learning opportunities.

**Prerequisites:** BIO 311

**BIO 411 Research Symposium II 1 Credit (1,0)**

Culminating course in series of required research seminars. Presentation and discussion of research project, including related literature review and hypothesis, research premises, methodologies, findings, and recommendations in a colloquium format directed at peers and incoming freshman.

**Prerequisites:** BIO 311

**BIO 440 Clinical Rotation 3 Credits (1,6)**

Advanced practicum, completed at Florida Hospital. Rotation through major medical disciplines. Lecture with case study review, presentation, and discussion. One (1) lecture hour and five (5) hours of practicum at Florida Hospital each week.

**Prerequisites:** Senior Standing

**BIO 444 Immunology 3 Credits (3,0)**

Concepts related to the human immune system: Microbial recognition and responses to the innate immunity-nonspecific defenses of the host, innate immunity and inflammation, the structure and function of antibodies, diversity and development of lymphocyte, adaptive immunity including antigens, T-Cells, B-Cells, and humoral responses. Immunological tolerances and responses, disorders associated with the immune system, microbial mechanisms of pathogenicity, cancer biology, immunology-based therapy of diseases, and current research topics in immunology.

**Prerequisites:** BIO 120 BIO 120L BIO 121 BIO 121L BIO 215 and BIO 215L

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

Physiological concepts related to the acute and chronic responses to exercise and human performance. Muscle bioenergetics, cellular metabolism and the cardiopulmonary responses during and following exercise. Fitness assessment and exercise in extreme conditions and environments, including space.

**Prerequisites:** BIO 305 and BIO 306

**BIO 499 Special Topics in Biology 1-6 Credit**

Individual independent or directed studies of selected topics.