

BIOLOGY (BIO) COURSES

BIO-101 Human Biology

A one-semester course offered primarily for majors in the social sciences and the humanities. This course will emphasize reproduction and development, structure/function, genetics, and evolution. The ethical implications of biological knowledge also will be considered. In the laboratory, students will investigate biological problems related to humans. Three lecture/discussions and one laboratory period weekly. A student who decides, on the basis of his experience in BIO-101, to major in biology can enroll in the appropriate semester of BIO-111 or 112.

Prerequisites: none

Corequisites: BIO-101L

Credit: 1

Distribution: Science Lab

BIO-102 Plants & Human Affairs

This lab science course is intended primarily for students not planning to major in the natural sciences. The course will provide an introduction to botany and will use that foundation to explore the emerging evidence on how plant phenology, physiology, and diversity may be affected by climate change. The laboratory portion of the course will include field and lab work, providing opportunities to hone students' observational skills and familiarity with experimental design and implementation. Laboratory and in-class exercises will give students practice in analyzing and interpreting data.

Prerequisites: none

Corequisites: BIO-102L

Credit: 1

Distribution: Science Lab

BIO-103 Environmental Science

This course surveys major environmental issues and the role of scientific inquiry in understanding and mitigating these problems. The course will explore specific topics including energy generation and use, water quality, agriculture, biodiversity, and climate change. For each topic, students will (1) learn about the causes and consequences of the problem in the context of basic biology and other natural sciences, (2) participate in and critically evaluate the collection and interpretation of data on the problem, and (3) discuss and critique potential responses to the problem. Laboratory activities will include collecting and analyzing environmental samples, exploring data available in public repositories, and visiting local sites to observe environmentally related activities in the area.

Prerequisites: none

Corequisites: BIO-103L

Credit: 1

Distribution: Science Lab,

Equated Courses: GHL-103

BIO-111 General Biology I

First semester of a two-course sequence in the concepts of biology for biology majors. This course is a prerequisite for all advanced courses in biology. BIO 111 covers biomolecules, cell biology, genetics, and evolution. Three lectures and one laboratory period weekly. Offered in the fall semester.

Prerequisites: none

Corequisites: BIO-111L

Credit: 1

Distribution: Science Lab, Quantitative Literacy

BIO-112 General Biology II

This is the second semester of a two-course sequence in the concepts of biology for biology majors. This course is a prerequisite for most advanced courses in biology. BIO 112 covers animal and plant structure/function relationships and evolution and diversity. Three lectures and one laboratory period weekly. This course is offered in the spring semester.

Prerequisites: BIO-111

Corequisites: BIO-112L

Credit: 1

Distribution: Science Lab

BIO-151 Intro to Evolution

This is a course designed to provide a basic introduction to the processes of evolutionary change and the pattern of biological diversity. Lecture/discussion will focus on the evidence for evolution, including case studies from a variety of organisms. This course is designed for students not planning to major in Biology and will not count toward the requirements for the Biology major, but it may count toward the Biology minor. This course is typically offered in the spring semester of even-numbered years.

Prerequisites: BIO-101 or BIO-111

Credit: 1

BIO-177 Special Topics (without Lab)

A special topics course with laboratory for non-majors. Topics vary with each scheduled offering. Refer to Student Planning's section information for descriptions of individual offerings, and applicability to distribution requirements.

Prerequisites: none

Credit: 1

BIO-178 Special Topics (with Lab)

A special topics course with laboratory for non-majors. Topics vary with each scheduled offering. Refer to Student Planning's section information for descriptions of individual offerings, and applicability to distribution requirements.

Prerequisites: none

Corequisites: BIO-178L

Credit: 1

BIO-187 Independent Study

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none

Credits: 0.5

BIO-188 Independent Study

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none

Credits: 0.5

BIO-202 Electron Microscopy

A laboratory course covering specimen preparation, microtomy, staining, operation of the transmission and scanning electron microscope, and darkroom methods.

Prerequisites: BIO-101 or BIO-112

Corequisites: BIO-202L

Credits: 0.5

BIO-211 Genetics

This is a course designed to introduce the modern concepts of the gene. The lectures stress the theory and experimental evidence relating to transmission, molecular, and developmental genetics. The laboratory is investigative in nature. This course should be taken during the sophomore year and is offered in the fall semester.

Prerequisites: BIO-112

Corequisites: BIO-211L

Credit: 1

Distribution: Science Lab, Quantitative Literacy

BIO-212 Cell Biology

The primary emphasis of this course is the structure and function of the eukaryotic cell. Lectures, readings, and discussions will cover cellular organelles, types, metabolism, interactions, and regulation of activities. The laboratory focuses on cellular structure and function through the techniques of modern cell biology. This course should be taken during the sophomore year and is offered in the spring semester.

Prerequisites: BIO-211 or BIO-213

Corequisites: BIO-212L

Credit: 1

Distribution: Science Lab, Quantitative Literacy

BIO-213 Ecology

This course is an introduction to the interrelations of plants and animals with their environment. Terrestrial and aquatic ecosystems are considered. Some weekend field trips may be included. This course is offered in the fall semester.

Prerequisites: BIO-112

Corequisites: BIO-213L

Credit: 1

Distribution: Science Lab, Quantitative Literacy

BIO-287 Independent Study

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none

Credits: 0.5

BIO-288 Independent Study

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none

Credits: 0.5

BIO-311 Molecular Genetics

This is a course designed to explore in detail the molecular biology of the gene. Lecture/discussion will focus on areas of current interest and will include analysis of experimental evidence which underpins our understanding of gene structure and function. The laboratory is investigative in nature and provides primary experience with recombinant DNA technology, genomics, and bioinformatics.

Prerequisites: BIO-211

Corequisites: BIO-311L

Credit: 1

BIO-313 Advanced Ecology

This course emphasizes the investigative approach to ecology including experimental design and data analysis. Lectures/discussions focus on areas of current interest in ecosystem, community, and population ecology. Several field trips and an independent investigation are required. This course is offered in the spring semester of even-numbered years.

Prerequisites: BIO-213

Corequisites: BIO-313L

Credit: 1

Distribution: Science Lab,

BIO-314 Developmental Biology

Through lectures, current readings, and discussions, this course considers the principles of development with emphasis on experimental evidence for underlying mechanisms. The laboratory work includes molecular, cellular, and supracellular approaches to the investigation of developmental questions in animals and plants.

Prerequisites: BIO-211

Corequisites: BIO-314L

Credit: 1

BIO-315 Organismal Physiology

The major physiological systems (nutrition, transport, gas exchange, elimination of wastes, coordination, and defense) are considered from the adaptational perspective in this course. The emphasis is on the physiological system as it is related to the survival of vertebrates in their natural environments. The laboratory focuses on physiological techniques and methods of analysis. This course is offered fall semester of even-numbered years.

Prerequisites: Prerequisite: BIO-212

Credit: 1

BIO-316 Evolution of Developmental Mechanisms

Research into embryogenesis has illuminated the molecular mechanism of development for a select few organisms in exquisite detail. The field of Evolutionary Developmental Biology compares the developmental mechanisms of these model systems to distinct, understudied taxa. Using this comparative approach, we can infer the characteristics of the common ancestors of these organisms. In this course, we will explore how molecular, paleontological and evolutionary techniques can yield insights into animals that existed half a billion years ago. Evaluations will be based on discussion of primary literature and several short papers.

Prerequisites: BIO-211

Credit: 1

BIO-321 Comparative Anatomy & Embryology

This is a course presenting a broad evolutionary theme of the vertebrates using the facts of comparative anatomy, embryology, and paleobiology.

Prerequisites: BIO-112

Corequisites: Must take BIO-321L concurrently

Credit: 1

Equated Courses: BIO-221

BIO-322 Biology of Invertebrates

This is a course designed to provide students with an introduction to the diversity of invertebrate organisms through lectures, reading and discussion of primary literature, student presentations, and laboratory work. Emphasis is placed on structure, functional morphology, physiology, ecology, and evolution. A field trip during spring break has been included in the past few years. This course is offered in the spring semester of odd-numbered years.

Prerequisites: Prerequisite: BIO-112

Credit: 1

Equated Courses: BIO-222

BIO-322L Invertebrates Lab**Prerequisites:** none**Credits:** 0**BIO-324 Vascular Plants**

This course is an introduction to the science of botany. A strong emphasis will be placed on the evolutionary trends in the vascular plants, with additional coverage of developmental biology, plant breeding systems, and some of the physiological adaptations plants have evolved in the transition to life in terrestrial environments. The laboratories will be primarily observational (in the field or the lab), with a broad exposure to plant diversity and taxonomy. This course is offered in the spring semester of even-numbered years.

Prerequisites: BIO-112**Corequisites:** BIO-324L**Credit:** 1**Equated Courses:** BIO-224**BIO-324L Vascular Plants Lab****Prerequisites:** none**Corequisites:** BIO-324**Credits:** 0**BIO-325 Microbiology**

This course is designed to introduce the student to the lifestyles and impact of the smallest organisms known. Lecture/discussion will examine topics such as microbial cell structure and function, growth and nutrition, genetics, antibiotics and pathogenesis, and microbial diversity. The laboratory is organized around an investigative, discovery driven project.

Prerequisites: BIO-211**Corequisites:** BIO-325L**Credit:** 1**Distribution:** Science Lab**Equated Courses:** BIO-225**BIO-326 Parasitology**

This is a course designed to introduce students to the major groups of animal parasites. Emphasis in lectures and discussion of primary literature is placed on general principles, including diversity, morphology, transmission biology, and the ecology and evolution of the different parasite taxa. The laboratory work includes the detailed consideration of particular parasite species as representatives of larger groups, as well as an independent research project on the parasites of a selected host species. This course is offered in the fall semester.

Prerequisites: BIO-112**Corequisites:** BIO-326L**Credit:** 1**Distribution:****Equated Courses:** BIO-226**BIO-326L Parasitology Lab****Prerequisites:** none**Corequisites:** BIO-326**Credits:** 0**BIO-351 Evolution of Populations**

This course will provide an in-depth examination of the population-level effects of evolutionary processes. The first half of the semester will focus on examining advances in evolutionary biology, centered around a quantitative approach to understanding the principles of population genetics. The second half of the semester will involve close reading of primary literature focused on a narrow topic in population biology. Offered in the spring semester of odd-numbered years.

Prerequisites: BIO-211**Credit:** 1**BIO-371 Special Topics**

These are innovative courses and special programs in library research. Descriptions of special topics courses will be posted at the time of advance registration. Students desiring a special library research project should make the appropriate arrangements with individual faculty members. Topics vary with each scheduled offering. Refer to Student Planning's section information for descriptions of individual offerings, and applicability to distribution requirements.

Prerequisites: BIO-212**Credits:** 0.5-1**BIO-387 Independent Study**

Students may pursue independent research on selected problems. Students should make arrangements with individual faculty members during the semester preceding their enrollment in the course to determine their research focus and to discuss expectations. Students are typically expected to produce a final research paper and to present the work at an on- or off-campus colloquium. Students may repeat BIO 387 and/or BIO 388, but only 1 credit total of Introduction to Research may be counted toward the major. Enrollment through Instructor and Department Chair approval.

Prerequisites: none**Credits:** 0.5**BIO-388 Independent Study**

Students may pursue independent research on selected problems. Students should make arrangements with individual faculty members during the semester preceding their enrollment in the course to determine their research focus and to discuss expectations. Students are typically expected to produce a final research paper and to present the work at an on- or off-campus colloquium. Students may repeat BIO 387 and/or BIO 388, but only 1 credit total of Introduction to Research may be counted toward the major. Enrollment through Instructor and Department Chair approval.

Prerequisites: none**Credits:** 0.5**BIO-401 Senior Seminar**

This is a seminar course required of all majors. Critical reading of primary literature, oral expression, and experimental design are emphasized. Students intending to be off-campus during the first semester of their senior year should take this course during their junior year. This course is offered in the fall semester.

Prerequisites: none**Credit:** 1**BIO-487 Independent Study**

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none**Credits:** 0.5

BIO-488 Independent Study

Individual research projects. The manner of study will be determined by the student in consultation with the instructor. Students must receive written approval of their project proposal from a department Chair before registering for the course.

Prerequisites: none

Credits: 0.5