

BIOLOGY (BIO)

BIO111. Introduction To Animal Life. 3 Credits.

A survey of the animal phyla including the study of structure, metamorphosis, adaptations, and behavior. The development of the students' sensitivity and awareness of what can be learned from careful observations in natural field situations will be emphasized. Designed for non-science majors; does not count toward biology major.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO112. Biology Today. 3 Credits.

Designed to introduce students to selected aspects of biology science. By augmenting their understanding of biological concepts, students develop a deeper appreciation of the natural biological phenomena they are in contact with on a daily basis. In addition, students gain the working background necessary to understand contemporary biological issues such as environmental quality (population, pollution, global climate change), the human genome project, genetic engineering, and discoveries in medicine. When individuals become more biologically literate, they are also better equipped to make informed decisions that directly and indirectly impact their own lives.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO115. Intro To Plant Life. 3 Credits.

Introduction to the form and function of plants. The student should acquire an appreciation for plants as living organisms in a biological world, and their economic importance to human beings. Designed for non-science majors; does not count toward biology major.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO119. Inheritance. 3 Credits.

Students will learn and apply basic principles of Mendelian inheritance and DNA manipulation. Students will also examine current genetic technology advances as applied to genetic diseases.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

Prerequisites:

- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of D- or MAT193 Minimum Grade of D- or MAT153 Minimum Grade of D-

May not be repeated for credit

BIO120. Global Change Biology. 3 Credits.

An investigation of global environmental change from a biological and ecological perspective with a primary focus on human ecology, the global carbon cycle, climate change, and environmental sustainability.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO130. Cancer Biology. 3 Credits.

Students will explore the biological mechanisms that underlie the development of cancer and the mechanisms by which various cancer treatments work.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO135. Evolution for Everyone. 3 Credits.

An introduction to modern evolutionary theory and its applications to a wide range of topics, including epidemiology, forensic medicine, conservation, population biology, social behavior, altruism, sex/mating strategies, religion, and many other aspects of human biology.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO140. Modern Biotechnology. 3 Credits.

Students will explore how modern biotechnology impacts our everyday lives with a topical survey of applications that may include stem cells, biofuels, genetically modified organism (GMOs) and forensics. Students will also learn about the underlying biological principles and molecular techniques that are the basis of modern biotechnology.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

Prerequisites:

- Math Placement Level Minimum Score of 3 or MAT 151 Minimum Grade of D- or MAT093 Minimum Grade of D- or MAT120 Minimum Grade of D- or MAT121 Minimum Grade of D-

May not be repeated for credit

BIO150. Insects and Human Society. 3 Credits.

Students will be introduced to the most abundant, diverse, and widespread class of animals on Earth and investigate the critical interactions between insects and humans that influence human behaviors and activities.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO170. Human Biology. 3 Credits.

A survey in several phases of human biology. Normal life processes will first be explored followed by the alteration and relationship of alterations to life styles. Subject matter will include human physiology, genetics, evolution and behavior. Designed for non-science majors; does not count toward biology major.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May not be repeated for credit

BIO193. Biology Selected Topic. 1-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

May be repeated for credit

BIO199. Pre-Osteo Seminar. 1 Credit.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

BIO201. General Biology I. 3 Credits.

An introduction to modern biology: molecular and cellular organization of living systems, energy transformations and metabolism, the principles of classical and molecular genetics, and the basic embryological changes during the development of an organism.

Attributes:

- Liberal Arts
- GE4: Natural Science Lecture
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate

Prerequisites:

- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of C-

May not be repeated for credit

BIO202. General Biology II. 3 Credits.

An introduction to modern biology: diversity of life forms, the process of evolution, and the interactions of organisms with their environment and with each other.

Attributes:

- Liberal Arts
- GE4: Natural Science Lecture
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate

Prerequisites:

- BIO201 Minimum Grade of C-
- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of C-

May not be repeated for credit

BIO211. Gen Bio 1 Lab. 1 Credit.

An introduction to modern biology: molecular and cellular organization of living systems, energy transformations and metabolism, the principles of classical and molecular genetics, and the basic embryological changes during the development of an organism.

Attributes:

- Research
- Information Mgmt Intro
- Liberal Arts
- GE4: Natural Science Lab

Corequisites:

- BIO201

May not be repeated for credit

BIO212. Gen Bio 2 Lab. 1 Credit.

An introduction to modern biology: diversity of life forms, the process of evolution, and the interactions of organisms with their environment and with each other.

Attributes:

- Research
- Critical Thinking Introductory
- Liberal Arts
- GE4: Natural Science Lab

Corequisites:

- BIO202

May not be repeated for credit

BIO293. Biology Selected Topic. 1-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate

May be repeated for credit

BIO295. Indep Study Biology. 1-12 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

BIO296. Departmental Elective. 1-12 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

BIO299. Pre-Osteopathic Seminar. 1 Credit.**Attributes:**

- Clinical Placement

Restrictions:

- Must have the following level: Undergraduate

May be repeated for credit

BIO301. Field Biology Fall. 3 Credits.

Diversity in the plant and animal kingdom; sound scientific methods of observation; interrelationships of organisms to each other and to their environment. Importance of the flora and fauna in our economic and cultural life and the need for conservation practices. Field trips are devoted to the study of several ecological units during fall. Identifications of the common plants and animals and the ability to interpret the signs, sounds, and behavior patterns or organisms.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO305. Plant Morphology. 4 Credits.

Comparative study of life histories, morphology, and phylogenetic relationships of the major plant groups.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO307. Comparative Vertebrate Anatomy. 4 Credits.

Gross anatomy and functions of systems of representative vertebrates. Skeletal, muscular, circulatory, digestive, respiratory, excretory, reproductive, nerve, and endocrine systems. Dissection is required.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO311. Developmental Plant Anatomy. 4 Credits.

Developmental phenomena and anatomical characteristics of plant cells, tissues, and organs.

Attributes:

- Research
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO320. Genetics. 3 Credits.

A study of the principles of heredity from classical experiments with *Drosophila* to current research in molecular genetics utilizing recombinant DNA and gene cloning methodologies. The organization, function, and behavior of the genetic material are discussed on the molecular, chromosomal and population levels. COURSE FEE.

Attributes:

- Research
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO321 Minimum Grade of C-*

* May be taken at the same time

May not be repeated for credit

BIO321. Genetics Lab. 1 Credit.

Laboratory investigation of a broad range of topics in Genetics.

Attributes:

- Information Mgmt Intrmd
- Liberal Arts

Corequisites:

- BIO320

May not be repeated for credit

BIO322. Evolution. 3 Credits.

A survey of evolutionary principles, hypotheses, and interactions, with particular emphasis on population-level thinking, phylogenetics, and mechanisms of evolution. Topics will include hypothesis testing, selection, drift, quantitative genetics, genomics, adaptation, speciation, costs and benefits of sex, and coevolution.

Attributes:

- Critical Thinking Intermediate
- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO340. Ecology. 4 Credits.

A study of principles and concepts of ecology at the ecosystem, community, population, and organism levels of organization. Laboratory and fieldwork emphasize methods of acquiring, analyzing, and interpreting ecological data.

Attributes:

- Research
- Liberal Arts
- Writing Intensive

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO346. Bio Data Analysis & Communicat. 3 Credits.

An introduction to computer programming in R to perform biological data analytics including reading/writing files, data manipulations, graphics, and statistical analyses. Additionally, a focus on improving scientific communication skills including reading, writing, and presentation.

Attributes:

- Writing Intensive

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May not be repeated for credit

BIO348. Biological Statistics. 4 Credits.

A practical application of data collection and statistical methods for biologists and will include topics such as hypothesis testing, t-tests, analysis of variance, and regression. This course is recommended for students currently interested in or involved with research.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of D-
- BIO202 Minimum Grade of D-
- Math Placement Level Minimum Score of 5

May not be repeated for credit

BIO349. Biology Research. 1-4 Credits.

Individual laboratory and/or field research under the supervision of a faculty member. Permission of instructor required.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-

May be repeated for credit

BIO350. General Microbiology. 4 Credits.

Morphological, biochemical, physiological, and genetic aspects of microbial growth, especially bacteria. Bacterial classification, growth control, and roles in environment and health also considered. Laboratory teaches essential techniques.

Attributes:

- Research
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-

May not be repeated for credit

BIO358. Molecular Biology. 4 Credits.

Background, theory and techniques of molecular biology with the analysis of published research. Class discussions, independent research, written and oral presentations required.

Attributes:

- Research
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- CHE201 Minimum Grade of D-
- CHE202 Minimum Grade of D-

May not be repeated for credit

BIO359. Cell Biology. 4 Credits.

A detailed examination of the events that occur within living cells. Particular attention is paid to current experimental techniques and analysis of the recent literature.

Attributes:

- Research
- Liberal Arts
- Writing Intensive

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- CHE201 Minimum Grade of D-
- CHE202 Minimum Grade of D-

May not be repeated for credit

BIO360. Virology. 3 Credits.

Prokaryotic and eukaryotic viral structure and function as they relate to replication strategies, control, pathogenesis, the immune system and laboratory analysis methods. Emphasis will be placed on viruses that cause human disease.

Attributes:

- Liberal Arts

May not be repeated for credit

BIO370. Animal Physiology. 4 Credits.

Physiology is the study of how living organisms function. This course is designed to give students a basic understanding of physiological principles relating to cells, organs and organ systems and the integration of animals with their environment. Material presented in lecture and lab will use comparative animal models to demonstrate general physiological concepts.

Attributes:

- Research
- Liberal Arts
- Writing Intensive

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-
- CHE201 Minimum Grade of D-

May not be repeated for credit

BIO388. Biological Chemistry. 3 Credits.

Study of the chemistry of biologically significant compounds; enzymes and metabolic reactions involved in energy transformations.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman
- Must be enrolled in the following field(s) of study (major, minor or concentration): Biology (508)

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- CHE201 Minimum Grade of C-
- CHE202 Minimum Grade of C-

May not be repeated for credit

BIO393. Biology Selected Topic. 1-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of D-
- BIO202 Minimum Grade of D-

May be repeated for credit

BIO396. Departmental Elective. 1-12 Credits.**Restrictions:**

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of D-
- BIO202 Minimum Grade of D-

May be repeated for credit

BIO399. Pre-osteopathic Seminar. 1 Credit.

Third year students participate in patient care including performing patient interviews and some routine medical procedures, to the extent allowed by state law. Third year students visit the NYCOM campus in the fall for their final interview with the NYCOM admissions committee.

Attributes:

- Clinical Placement

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

BIO412. Evolutionary Theory. 3 Credits.

A survey of evolutionary theory, including population genetics, drift, adaptive mechanisms and application to modern biology. The historical development of the subject will illustrate the philosophy of science.

Attributes:

- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO413. Developmental Biology. 4 Credits.

Fundamental concepts, principles, and mechanisms of animal development, including classical descriptive embryology and cellular and molecular mechanisms. Laboratory sessions focus on experimental manipulations of early invertebrate and vertebrate embryos and include student-designed research projects.

Attributes:

- Research
- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO418. Animal Behavior. 3 Credits.

A survey of the field of animal behavior as understood through modern evolutionary theory, including the behaviors of wild and domestic animals, such as learning, communication, foraging, migration, mating, parental care, and sociality.

Attributes:

- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO425. Plant Ecophysiology. 4 Credits.

The physiological mechanisms underlying the ecological relationships of plants. Explores processes affecting plant growth, reproduction, survival, and biogeography in the context of global environmental change. Lab emphasizes local ecosystems and teaches modern instrumentation, techniques, and field skills.

Attributes:

- Research
- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO435. Entomology. 4 Credits.

An introduction to the biology of insects and closely related arthropods. Topics covered will include the evolutionary history, developmental biology, physiology, diversity, behavior, and ecology of insects. The laboratory will provide hands-on experience with insect identification, specimen preparation, and behavioral and physiological experimentation.

Attributes:

- Research
- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO440. Freshwater Biology. 3 Credits.

Students will learn the applied and theoretical concepts of freshwater biology. The class will have weekly laboratories and field trips aimed at the study of the biological, chemical, and physical properties of lakes and streams.

Attributes:

- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO441. Freshwater Bio Lab. 1 Credit.

Students will examine aquatic ecosystems through field and laboratory experiences. The class will examine ecological concepts and take field trips that will help examine the biological, chemical, and physical properties of lakes and streams.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Corequisites:

- BIO440

May not be repeated for credit

BIO444. Nucleic Acid Technologies. 3 Credits.

Seminar course where primary literature is used to explore several Nucleic Acid-based technologies (ribozymes/aptamers, RNAi, CRISPR/Cas9, etc.)

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-

May not be repeated for credit

BIO445. Ornithology. 4 Credits.

Students will learn about the biology of birds, including avian evolution, anatomy and physiology, ecology, behavior, and conservation. In the laboratory and on field trips, students will explore avian taxonomy, develop identification skills, and undertake ornithological research.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO446. Cellular Evolution. 3 Credits.

Discussion-based seminar course in which primary literature is used to explore the origins of life on earth, the deep evolutionary history of cells, and cellular diversity among living cells.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-

May not be repeated for credit

BIO448. Host-Microbe Coevolution. 3 Credits.

Discussion-based seminar course in which primary literature is used to explore the coevolutionary interactions between prokaryotic microbes and eukaryotic hosts, ranging from pathogenic to symbiotic associations.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-

May not be repeated for credit

BIO451. Capstone Microbiology. 4 Credits.

The application of molecular microbial ecology concepts to examine bacterial structure, genetics and metabolism. Activities will include bioinformatics and bacteriological laboratory work.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-

May not be repeated for credit

BIO491. Capstone Research. 3 Credits.

Individual laboratory and field research under the supervision of a faculty member, resulting in a written report, and an oral presentation to biology faculty and students.

Attributes:

- Critical Thinking Advanced
- Information Mgmt Advanced
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must be enrolled in the following class: Senior

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May not be repeated for credit

BIO493. Biology Selected Topic. 1-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- BIO201 Minimum Grade of C-
- BIO202 Minimum Grade of C-
- BIO320 Minimum Grade of C-
- BIO322 Minimum Grade of C-
- Math Placement Level Minimum Score of 5 or MAT181 Minimum Grade of C-

May be repeated for credit

BIO494. Fieldwork In Biology. 1-12 Credits.

Attributes:

- Field Study
- Research

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May not be repeated for credit

BIO495. Indep Study Biology. 1-12 Credits.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

BIO499. Modular Course. 1-3 Credits.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit