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.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Prerequisites:
• Math Placement Level with a score of 4 or MAT 152 with a minimum grade of D- or MAT 193 with a minimum grade of D- or MAT 153 with a minimum grade of D-

Restrictions:
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Prerequisites:
• Math Placement Level with a score of 3 or MAT 151 with a minimum grade of D- or MAT 093 or MAT 120 with a minimum grade of D- or MAT 121 with a minimum grade of D-

Restrictions:
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)
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 have the following field(s) of study (major, minor or concentration): Biology (508)

BIO199. Pre-Osteo Seminar. 1 Credit.
Restrictions:
• Must have the following level: Undergraduate

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.

Prerequisites:
• BIO 211 (may be taken concurrently) with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

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.

Prerequisites:
• BIO 201 with a minimum grade of C- and (Math Placement Level with a score of 4 or MAT 152 with a minimum grade of C)

Restrictions:
• Must have the following level: Undergraduate

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.

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. THERE WILL BE AN ADDITIONAL $30.00 FEE ASSOCIATED WITH THIS COURSE.

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

BIO295. Indep Study Biology. 1-12 Credits.
Restrictions:
• Must have the following level: Undergraduate

BIO296. Departmental Elective. 1,12 Credit.
Restrictions:
• Must have the following level: Undergraduate

BIO299. Pre-Osteopathic Seminar. 1 Credit.
Restrictions:
• Must have the following level: Undergraduate

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.

Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

BIO305. Plant Morphology. 4 Credits.
Comparative study of life histories, morphology, and phylogenetic relationships of the major plant groups.

Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

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.

Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

BIO309. Basic 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.

Prerequisites:
• BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D- and BIO 320 with a minimum grade of C- and CHE 201 with a minimum grade of D- and CHE 202 with a minimum grade of D-

Restrictions:
• Must have the following level: Undergraduate
BIO311. Developmental Plant Anatomy. 4 Credits.
Developmental phenomena and anatomical characteristics of plant cells, tissues, and organs.
Prerequisites:
• BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 321 (may be taken concurrently) with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

BIO321. Genetics Lab. 1 Credit.
Laboratory investigation of a broad range of topics in Genetics.

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

BIO335. 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.
Prerequisites:
• BIO 320 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

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. BIO 380 is recommended for students currently interested in or involved with research.
Prerequisites:
• BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D- and Math Placement Level with a score of 5
Restrictions:
• Must have the following level: Undergraduate

BIO349. Biology Research. 1-4 Credits.
Individual laboratory and/or field research under the supervision of a faculty member. Permission of instructor required.
Prerequisites:
• BIO 201 with a minimum grade of C-

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.
Prerequisites:
• BIO 320 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and CHE 201 with a minimum grade of D- and CHE 202 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and CHE 201 with a minimum grade of D- and CHE 202 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate
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.
Prerequisites:
• BIO 320 with a minimum grade of C- and CHE 201 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

BIO388. Biological Chemistry. 3 Credits.
Study of the chemistry of biologically significant compounds; enzymes and metabolic reactions involved in energy transformations.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and CHE 201 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Prerequisites:
• BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

BIO396. Departmental Elective. 0 Credits.
Prerequisites:
• BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D-
Restrictions:
• Must have the following level: Undergraduate

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.
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration): Biology (508)

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

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.
Prerequisites:
• BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
**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.

**Prerequisites:**
- BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate

**BIO440. Freshwater Biology. 4 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.

**Prerequisites:**
- BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate

**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.

**Prerequisites:**
- BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-

**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.

**Prerequisites:**
- BIO 201 with a minimum grade of C- and BIO 202 with a minimum grade of C- and BIO 320 with a minimum grade of C- and BIO 322 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate

**BIO493. Biology Selected Topic. 2-12 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.

**Prerequisites:**
- BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D-

**Restrictions:**
- Must have the following level: Undergraduate

**BIO495. Indep Study Biology. 1-12 Credits.**

**Restrictions:**
- Must have the following level: Undergraduate

**BIO499. Pre-Osteopathic Seminar. 1 Credit.**

**Prerequisites:**
- BIO 201 with a minimum grade of D- and BIO 202 with a minimum grade of D-

**Restrictions:**
- Must have the following level: Undergraduate