

BIO

Biology

BIO 101 - E: Human Biology

The major concepts of biology are presented from historical, contemporary, and critical viewpoints. These concepts include the cell, the gene, molecular biology, development, and evolution. The human implications or values associated with each concept are emphasized. Not for Biology major credit.

3 credits

BIO 103 - E: Introduction to Biotechnology

Gene therapy, genetic modification, cloning, stem cells, and vaccines are covered in this course. Lectures and four supplemental laboratory activities use modern equipment and techniques to illustrate core concepts which class discussions relate to health, society, and public policy. Not for Biology major credit.

3 credits

BIO 104 - E: How Science Works

The course aims at expanding students' knowledge about the methods of the natural sciences and to develop the critical thinking abilities to understand scientific claims presented by the media. Students will learn about scientific discoveries as well as the differences between science and pseudoscience. The course includes lectures and discussions based on textbook material, examination of case studies in science, and discussion of items in the news. Not for Biology major credit.

3 credits

BIO 113 - E: General Ecology

A survey of the principles of ecology in the context of finding solutions to local, national, and global environmental problems. Not for Biology major credit.

3 credits

BIO 114 - E: Dinosaur Paleontology

A study of paleontology that includes evolution of dinosaurs, their classification system, a study of the important dinosaur families, dinosaur behavior, ecology, current controversies, hot topics and the KT extinction. Dinosaur paleontology will also cover the excavation of dinosaurs and the colorful history of the 'dinosaur hunters.' This course will emphasize the science and research involved in studying dinosaurs.

Using dinosaurs as a vehicle, students will be exposed to the scientific method of inquiry and will leave this course with a better understanding on how to evaluate science in the real world. Not for Biology major credit.

Advisory prerequisite: Entry level biology
3 credits

BIO 115 - E: Evolution and Society

The historical development of evolutionary thought, the evolutionary diversification of life, and the mechanisms of evolution are presented. The geological, genetic, and other biological principles necessary to comprehend evolutionary concepts are introduced as background. Current controversies over the evidence for evolution are reviewed. Human evolution, medical and agricultural applications of evolutionary theory, and its implications for the development of human and other social systems are considered. Not for Biology major credit.

Advisory Prerequisite: One biology course
3 credits

BIO 201 - E: Fundamentals of Biology: Organisms to Ecosystems

An introduction to the major groups of living organisms. Structure, functions, the ecological roles of organisms in communities and ecosystems, and their evolutionary history are covered. Genetics and demography are discussed in the context of evolution by natural selection. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so.

Prerequisite: Level 4 or higher on the mathematics placement examination or corequisite MAT 123 or higher
Advisory Prerequisite: High School Biology
3 credits

BIO 202 - E: Fundamentals of Biology: Molecular and Cellular Biology

The fundamentals of cell biology, biochemistry, and genetics. The biochemical and molecular bases of cell structure, energy metabolism, gene regulation, heredity, and development in living organisms from bacteria to man are discussed. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so.

Prerequisite: CHE 129 or 131 or 141
Pre- or Corequisite: MAT 125 or higher or AMS 151
3 credits

BIO 203 - E: Fundamentals of Biology: Cellular and Organ Physiology

The fundamentals of cell and organ physiology in mammalian and non-mammalian organisms. The structure and function of cell membranes and the physiology of cell to cell signaling, cellular respiration, and homeostasis of organs and organisms are examined with an emphasis on the comparative physiology of vertebrates and invertebrates. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so.

Prerequisite: CHE 129 or 131 or 141
Pre- or Corequisite: MAT 125 or higher or AMS 151
3 credits

BIO 204: Fundamentals of Scientific Inquiry in the Biological Sciences I

First course in the foundational laboratory sequence for all biology students, and students in related fields. Students will experience the laboratory process, research process, a wide range of laboratory tools, methods, skills, learn to read and write scientific presentations, and collaborate in formal inquiry. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: CHE 123, CHE 129, CHE 131, or CHE 141
Pre- or Corequisite: BIO 201, BIO 202, or BIO 203
2 credits

BIO 205: Fundamentals of Scientific Inquiry in the Biological Sciences IIA

Second course in the foundational laboratory sequence for all biology students, and students in related fields. Students will experience the laboratory process, research process, a wide range of laboratory tools, methods, skills, learn to read and write scientific presentations, and collaborate in formal inquiry. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. Not for credit in addition to BIO 207. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 204
Pre- or Corequisite: BIO 201, BIO 202, or BIO 203
2 credits

BIO 207: Fundamentals of Scientific Inquiry in the Biological Sciences IIB

An alternative to BIO 205, this course focuses on a relatively narrow range of current research topics but in greater depth. BIO 207 is the second course in the foundational laboratory sequence for all biology majors and students in related fields. Students will experience the laboratory process, research process, a wide range of laboratory tools, methods, and skills, learn to read and write scientific works, and collaborate in formal inquiry. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. Not for credit in addition to BIO 205. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 204

Pre- or Corequisite: BIO 201, BIO 202, or BIO 203

2 credits

BIO 208 - H: Cell, Brain, Mind

An introduction to the human brain and how it is the target of diseases, drugs, and psychological disturbances. The course explores these topics through a knowledge of basic cell neurobiology. The implications of brain science for human behavior in society are also considered. Not for major credit.

Prerequisite: Any BIO course

Advisory Prerequisite: High school chemistry

3 credits

BIO 211 - C: Statistics and Data Analysis: A Conceptual Approach

A conceptually-focused introduction to probability and data analysis emphasizing statistical literacy and critical thinking. Topics will include probability, t-tests, chi-squared tests, correlation, regression, and Analysis of Variance, as well as special topics of interest to undergraduate Biology majors such as case-control studies and meta-analysis. This course includes a one-hour recitation in which students will do hands-on activities, discuss papers from the primary literature, and gain experience with data analysis. May not be taken by students with credit for AMS 110, 310, 311, 312 or ECO 320.

Pre- or Corequisite: MAT 125 or higher or AMS 151

4 credits

BIO 301 - H: Sustainability of the Long Island Pine Barrens

The ecologically diverse Long Island Pine Barrens region provides a habitat for a large

number of rare and endangered species, but faces challenges associated with protection of a natural ecosystem that lies in close proximity to an economically vibrant urban area that exerts intense development pressure. In this course we will consider the interaction of the ecological, developmental and economic factors that impact the Pine Barrens and the effectiveness of decision support systems in promoting sustainability of the Pine Barrens. This course is offered as BIO 301, GEO 301, ECO 301, ENV 301, and ESG 301.

Prerequisites: U3 or U4 status and one of the following: BIO 201, CHE 131, ECO 108, ESG 100, ESG 198, GEO 101, GEO 102

3 credits

BIO 310: Cell Biology

The cell is studied as the unit of structure, biochemical activity, genetic control, and differentiation. The principles of biochemistry and genetics are applied to an understanding of nutrition, growth, and development.

Prerequisites: C or higher in BIO 202; C or higher in BIO 203; CHE 321 or CHE 341

3 credits

BIO 311: Techniques in Molecular and Cellular Biology

Techniques used in recombinant DNA and cell biology research. Topics include DNA manipulation and analysis, protein expression and analysis, and microscopy. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: BIO 202; BIO 205 or BIO 207; CHE 132 or 142; MAT 125 or higher or AMS 151

3 credits

BIO 312: Bioinformatics and Computational Biology

This course uses computational methods to analyze current problems and solutions in molecular biology research. Students are exposed to algorithms and tools available for both single gene and larger scale genome research. Emphasis is on practical application. Laboratories allow students to apply their knowledge to real life molecular biology problems.

Prerequisites: BIO 202; BIO 205 or BIO 207; MAT 126 or higher or AMS 161

3 credits

BIO 314: Cancer Biology

An examination of the biology of cancer. Emphasis is on molecular and cellular events, such as regulation of gene expression,

genome maintenance, cell growth and death, differentiation, cell-cell recognition, signaling and homeostasis, that are frequently disrupted in cancer. Recent advances in diagnosis and therapy will also be discussed.

Prerequisite: BIO 202

3 credits

BIO 315: Microbiology

The organization, structure, energetics, and reproduction of microorganisms. Interactions of bacteria and viruses are discussed. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so.

Prerequisites: BIO 202; CHE 132

3 credits

BIO 316: Molecular Immunology

Structure, function, and organization of the immune response at the molecular and cellular levels. Molecular mechanisms of immunological responses to microorganisms and various disease states are explored.

Prerequisites: BIO 202; BIO 203

Pre- or Corequisite: CHE 322 or CHE 326

3 credits

BIO 317: Principles of Cellular Signaling

Basic principles of cellular signaling and maintenance of cellular and organismic homeostasis through intra- and intercellular signaling mechanisms. The roles of membrane and nuclear receptors, second-messenger pathways and gene regulation in controlling diverse mammalian systems such as sensory physiology, organic metabolism, growth control, and neuronal development are discussed.

Prerequisite: C or higher in BIO 202

Advisory Prerequisite: BIO 203

3 credits

BIO 319: Landscape Ecology Laboratory

A computer lab course focusing on spatial concepts, methods, and tools for addressing ecological and environmental problems. The course will be based on fundamental concepts in ecology and environmental science and extend that knowledge, as well as teaching technical skills, including the use of geographic information systems (GIS) software, image processing, spatially explicit modeling, and spatial statistics. The lab exercises will introduce a variety of spatial approaches addressing problems in environmental protection, ecotoxicology,

natural resource management, conservation biology, and wildlife management.

Pre- or Corequisites: BIO 201; BIO 204
Advisory Prerequisites: AMS 110 or BIO 211; BIO 351

3 credits

BIO 320: General Genetics

Integrates classical and molecular approaches to the transmission and expression of biological information. Topics include: Mendelian and non-Mendelian inheritance; linkage analysis; population genetics; DNA replication, mutation and recombination; gene expression and its regulation; current genetic technology; developmental and cancer genetics, quantitative and complex traits, and relevant ethical issues.

Prerequisite: BIO 202

3 credits

BIO 321: Introduction to Ecological Genetics and Genomics

An introduction to the concepts, research questions, and methods involved in modern ecological genetics and genomics. The goal of the course is to provide a broad conceptual framework for students planning to engage in empirical work in conservation, management, ecology, and evolutionary biology. The course will cover basic Mendelian genetics, meiosis, and mating systems, standard population genetics methods for describing variation within and between populations, basic quantitative genetics, methods for molecular marker genotyping, informatic and genomic concepts, and organism-specific methods and case studies (e.g. plant ecological genetics).

Prerequisites: BIO 201; BIO 202
Advisory Prerequisite: BIO 351

3 credits

BIO 325: Animal Development

An overview of animal embryonic development, emphasizing molecular mechanisms regulating embryonic growth and differentiation. General areas to be discussed include: molecular basis of human birth defects, stem cells, identification of developmental genes, establishing polarity in *Drosophila* and vertebrates, regulation of cell differentiation, morphogenesis and organ development, development of cancer.

Prerequisite: C or higher in BIO 202

3 credits

BIO 327: Developmental Genetics Laboratory

Exploration of the fundamental concepts in developmental biology and genetics

through a combination of classical and modern molecular genetic approaches. Experiments are conducted using *Xenopus* and *Drosophila*, two important animal models for research in developmental biology and genetics. Students gain hands-on experience with the approaches used to investigate processes that control embryonic development on these two model systems, including the use of modern molecular methods for examining the regulation of gene expression during development. Exposure to the genetic approaches that are available in the *Drosophila* system will include participation in a genetic screen for new mutations. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: BIO 325; BIO 205 or BIO 207
Pre- or Corequisite: BIO 320 or BIO 321

3 credits

BIO 328: Mammalian Physiology

A continuation of the fundamental principles of cellular and organ physiology introduced in BIO 203. The subject matter includes advanced topics covering the origins of membrane potentials, describing properties of synaptic transmission, identifying the genetics and consequences of channelopathies in cellular and organ cardiac physiology, and advanced treatment of selected topics in endocrine, cardiac, respiratory, renal and nervous system physiology. The focus is on mammals in general and humans more particularly. May not be taken for credit in addition to HBV 350.

Prerequisite: C or higher in BIO 203
Advisory Prerequisite: CHE 132 or CHE 142

3 credits

BIO 332: Computational Modeling of Physiological Systems

Introduces students to the fundamental principles underlying computational modeling of complex physiological systems. A major focus of the course will be on the process by which a model of a biological system is developed. Students will be introduced to the mathematical methods required for the modeling of complex systems (including stochastic processes and both temporal and spatial dynamics) as well as to tools for computational simulation. Roughly one half of the class will focus on models for general cellular physiology, while the remaining half will focus on the development of higher-level models of a particular physiological system (for example, the neurobiological systems underlying learning).

Prerequisite: MAT 127 and one of the following: BIO 202, BIO 203, CHE 132, PHY 127, PHY 132

3 credits

BIO 334: Principles of Neurobiology

The ionic basis of nerve potentials, the physiology of synapses, sense organs and effectors, and the integrative action of the nervous system are discussed.

Prerequisites: C or higher in BIO 203; CHE 129, CHE 131, or CHE 141

3 credits

BIO 335: Neurobiology Laboratory

A laboratory course in physiology with a focus on neuromuscular function. Topics include acquisition and analysis of electrophysiological data; ion channels, electrical excitability and action potentials; synaptic transmission and muscular contraction; development of physiological functions; central control of movement; sensory function and behavior; cardiac function and regulation; and ethical and political issues of physiological relevance. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: C or higher in BIO 203 and the following: PHY 122/PHY 124 or PHY 127 or PHY 132; BIO 205 or 207

3 credits

BIO 336 - H: Conservation Biology

Society and individual lives are increasingly affected by environmental degradation at different scales. From the decline of local fisheries to global climate change, multiple crises threaten the biodiversity and ecosystems that sustain us humans. This course introduces the scientific foundations of conservation biology, along with examples from real-world conservation. The course reviews the biological concepts that underlie conservation including habitat requirements, population dynamics, biogeography, and population genetics. Analysis of case studies on the effects of human activities on biological diversity and ecosystem services will be used to explore the interdisciplinary nature of the practice of conservation. This course will prepare students for careers in environmental sciences and ecology.

Prerequisite: C or higher in BIO 201
Advisory Prerequisite: BIO 351

3 credits

BIO 337: Neurotransmission and Neuromodulation: Implications for Brain Function

Exploration of fundamental concepts of neurotransmission and neuromodulation of synaptic transmission. The subject matter includes an overview of the basic principles of neurotransmission and of the neuromodulatory systems in the brain. The involvement of these systems in behavior and neurological disorders is emphasized. We will discuss how specific neurological disorders can be investigated experimentally and how experimental results can contribute to understanding and treating these disorders.

Prerequisite: C or higher in BIO 203

3 credits

BIO 338: From Synapse to Circuit: Selforganization of the Brain

Exploration of basic neural and synaptic mechanisms and the operation of representative brain circuits, using both theoretical approaches and experimental evidence. Particular attention is given to Hebb's Rule, its cellular basis, its consequences for circuit selforganization, and its limits. A solid background in a mathematical, physical, or biological science is desirable, but most relevant background material is covered in the course.

Prerequisite: Instructor permission and BIO 203 or CHE 132 or PHY 122

Advisory Prerequisite: BIO 334

3 credits

BIO 339: Molecular Development of the Nervous System

An introduction to the molecular events that underlie development and plasticity of both the peripheral and central nervous systems, with a focus on neuronal mechanisms. Molecular and genetic approaches to the analysis of neural induction, neuronal differentiation, neuronal death and survival, neurotrophic factors, synapse formation and plasticity are presented.

Prerequisite: C or higher in BIO 202 or BIO 203

3 credits

BIO 340: Zoology

Aspects of the natural history, morphology, and evolution of selected marine invertebrates, arthropods, and vertebrates. Three hours of lecture and one three-hour laboratory per week. Not for credit in addition to BIO 343 or BIO 344 if passed with C or higher. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 201 or MAR 104; BIO 205 or BIO 207

4 credits

BIO 341: Plant Diversity

An introduction to the study of plants, especially green plants, including the origin and evolution of land plants. Topics include cellular structure and function, photosynthesis and respiration, gross anatomy, taxonomy and the diversity of organisms, plant ecology, agriculture. Three hours of lecture and one three-hour laboratory per week. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: BIO 201; BIO 202; BIO 205 or BIO 207

4 credits

BIO 343: Invertebrate Zoology

Aspects of the diversity, comparative and functional morphology, natural history, evolution, and water-land transitions of invertebrate animals. Three hours of lecture and one three-and-one-half hour laboratory per week. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: C or higher in BIO 201 or MAR 104; BIO 205 or BIO 207

4 credits

BIO 344: Chordate Zoology

Introduction to the diversity, natural history, and evolution of chordates, emphasizing the living vertebrates. Three hours of lecture or discussion and one three-hour laboratory per week. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 201

4 credits

BIO 348: Diversity and Evolution of Reptiles and Amphibians

The course will survey the diversity and natural history of the major groups of reptiles and amphibians, including snakes, lizards, turtles, crocodylians, frogs, and salamanders. Extinct groups (such as dinosaurs and pterosaurs) will also be covered. Furthermore, the course will showcase how studies of reptiles and amphibians have increased our general understanding of evolution and ecology, and will illustrate how diverse aspects of organismal biology (such as physiology, ecology, behavior, morphology) evolve and are interconnected.

Prerequisite: BIO 201

3 credits

BIO 350 - H: Darwinian Medicine

The ecology and evolution of disease, including evolution of human resistance to infection by pathogens, pathogen evolution in response to natural and technological defenses, and the ecological context of disease. Evolutionary phenomena are treated from molecular, organismal, populational, and environmental perspectives.

Prerequisites: BIO 201 and 202

3 credits

BIO 351 - H: Ecology

An examination of the interactions of living organisms with their physical and biological environments. Special attention is given to population dynamics and the interactions among organisms that determine the structure, function, and evolutionary development of biological communities.

Prerequisite: C or higher in BIO 201 or permission of instructor

3 credits

BIO 352: Ecology Laboratory

Stresses the collection, analysis, and interpretation of ecological data, mostly in terrestrial settings. Laboratory and field exercises demonstrate the operation of general ecological principles in specific populations and communities. One lecture, one three-hour field trip or laboratory, and one hour of recitation per week. Three all-day Saturday field trips. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 205 or BIO 207

Pre- or Corequisite: BIO 351 or permission of instructor

3 credits

BIO 353: Marine Ecology

A survey of biotic responses to ecological challenges in different marine realms. Controls of diversity and trophic structure in the marine ecosystem, historical aspects of marine realms, productivity in the oceans, plankton, soft-bottom communities, intertidal habitats, coral reefs, deep-sea environments, and effects of pollution in the ocean are discussed.

Prerequisite: C or higher in BIO 201 or MAR 104

Advisory Prerequisite: BIO 343

3 credits

BIO 354: Evolution

A detailed discussion of the mechanisms of evolution, focusing on the ways in which genetic changes in populations lead to adaptation, speciation, and historical patterns of evolutionary change.

Prerequisites: C or higher in BIO 201; BIO 202

Advisory Pre- or Corequisite: BIO 320 or 321
3 credits

BIO 356: Applied Ecology and Conservation Biology Laboratory

A computer laboratory course introducing students to ecological risk analysis and conservation biology. Laboratories are based on interactive software. Computer simulation techniques for addressing problems in applied ecology are emphasized.

Prerequisites: BIO 201, BIO 202, or BIO 203; BIO 205 or BIO 207; MAT 126 or higher
2 credits

BIO 358 - H: Biology and Human Social and Sexual Behavior

Major features of human social and sexual behavior are examined from a biological perspective. Insights from ethology, evolutionary biology, and neurobiology are synthesized into a picture of human nature and behavior. Implications of this picture for human sexual and social behavior are considered. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so.

Prerequisites: U3 or U4 standing; and one of the following: BIO 101, BIO 115, BIO 201, BIO 202, or BIO 203

3 credits

BIO 359: Behavioral Ecology

A consideration of the patterns of animal behavior in relation to ecological circumstances and evolutionary history. Vertebrate examples are emphasized.

Prerequisites: BIO 201; BIO 203

3 credits

BIO 361: Biochemistry I

First course of a two-semester survey of the major chemical constituents of the cell, including carbohydrates, lipids, and proteins. Emphasis is on enzyme structure, enzyme kinetics, reaction mechanisms, and metabolic pathways.

Prerequisites: C or higher in BIO 202; C or higher in CHE 322 or 326 or permission of instructor

3 credits

BIO 362: Biochemistry II

Second course of a two-semester Biochemistry survey. BIO 362 is the Molecular Biochemistry section that treats nucleic acid

structure, replication, and transcription, both in vivo and in vitro. The machinery and regulation of prokaryotic and eukaryotic protein synthesis is also covered, including amino acid activation; transfer RNA; ribosomes; the genetic code; and peptide chain initiation, elongation, and termination.

Prerequisites: C or higher in BIO 361

3 credits

BIO 364: Laboratory Techniques in Cancer Biology

This course will introduce contemporary concepts of cancer initiation, progression, metastasis and therapy. The lectures and recitations will include discussions of appropriate review articles, textbook readings and research articles. In the laboratory, students will be introduced to and recapitulate key techniques used in the selected research articles. This course will require significant work on computers outside of class time (more than 3 hours per week).

Prerequisites: C or higher in BIO 205 or BIO 207 Pre- or Corequisite: BIO 314, C or higher if used as a prereq.

3 credits

BIO 365: Biochemistry Laboratory

series of laboratory experiments and discussions designed particularly to complement BIO 361 and BIO 362. This laboratory covers such topics as enzyme kinetics, spectrophotometry, technology protein purification, the polymerase chain reaction and genotyping mitochondrial evolutionary biology, cellular extraction of DNA, RNA, and proteins, and analytical biochemistry. Four hours of laboratory and discussion per week. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisite: BIO 205 or BIO 207

Pre- or Corequisite: BIO 310 or BIO 361

2 credits

BIO 366: Molecular Microbiology Laboratory

conventional and contemporary Molecular Microbiological techniques. The lectures will cover a variety of microorganisms; Bacteria, Fungi, Viruses, and Protozoans based on textbook readings and current research articles. In the laboratory, students will learn fundamental and applied microbiological methods, biochemical and DNA profiling of microorganisms, and the molecular basis of physiological processes used for the identification of unknown bacteria. This course will serve as an upper-division elective for BIO majors. The course has an associated fee.

Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: BIO 202; BIO 205 or 207; BIO 315 or HBM 320 with a grade of C or better
3 credits

BIO 367: Molecular Diversity Laboratory

Hands-on experience with methods to detect and analyze molecular (DNA, RNA, protein) variation to study ecology, adaptation, and evolutionary history using natural populations of *Drosophila*, plankton, and other locally available species.

Prerequisites: C or higher in BIO 201; C or higher in BIO 202; BIO 205 or BIO 207

Advisory Pre- or Corequisite: One of the following: BIO 320, BIO 321, BIO 351, or BIO 354

3 credits

BIO 371: Restoration of Aquatic Ecosystems

A field and laboratory course designed to introduce students to field methods in assessing the long-term effects of pollution and restoration of aquatic and marsh systems. Students will work in teams to collaborate on measuring exchange of pollutants between a restored Superfund site and adjacent areas, the long-term effects of ecological restoration, habitat assessment, aquatic community structure in restored and adjacent systems, and long-term evolutionary effects on aquatic pollutants. Other restoration systems will be compared. This course has an associated fee. Please see www.stonybrook.edu/coursefees for more information.

Prerequisites: BIO 201; BIO 202; BIO 205 or BIO 207

Advisory Prerequisite: BIO 353

4 credits

BIO 380: Entomology

A survey of the anatomy, development, classification, biogeography, physiology, ecology, and evolution of the insects. The laboratory stresses a knowledge of insect diversity and morphology. Three hours of lecture and three hours of laboratory per week.

Prerequisites: C or higher BIO 201; BIO 202; BIO 205 or BIO 207

4 credits

BIO 385 - H: Plant Ecology

Basic ecological principles as applied to the biology of individual plants, plant populations, communities, and ecosystems in relation to their environments. Examples from Long Island pine barrens, tropical rain

forests, beaches, deserts, and other plant communities are studied. Examination of the connections between human societies and plant communities, which are rapidly being altered or destroyed worldwide.

Prerequisite: C or higher in BIO 201
Advisory Pre- or Corequisite: BIO 351
 3 credits

BIO 386 - H: Ecosystem Ecology and the Global Environment

Ecosystem ecology with an emphasis on biogeochemical cycling in oceans and on land, as well as on biosphere-atmosphere interactions. Topics include earth system processes such as climate and atmospheric composition, the hydrological cycle, cycling of chemicals such as nutrients and metals in the oceans, the soil cycle, and the fate and transport of materials in the atmosphere. Natural and perturbed systems are discussed. This course is offered as both BIO 386 and ENS 311.

Prerequisites: C or higher in BIO 201; CHE 129 or CHE 131 or CHE 141
Advisory Prerequisite: MAR 104
 3 credits

BIO 401: Seminar in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Semester Supplements to this Bulletin contain topic description when standard course is offered. May be repeated as the topic changes.

Prerequisite: Permission of instructor
 2-3 credits

BIO 402: Seminar in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Semester Supplements to this Bulletin contain topic description when standard course is offered. May be repeated as the topic changes.

Prerequisite: Permission of instructor
 2-3 credits

BIO 403: Seminar in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Semester Supplements to this Bulletin contain topic description when standard course is offered. May be repeated as the topic changes.

Prerequisite: Permission of instructor
 2-3 credits

BIO 404: Seminar in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Semester Supplements to this Bulletin contain topic description when standard course is offered. May be repeated as the topic changes.

Prerequisite: Permission of instructor
 2-3 credits

BIO 405: Seminar in Biology

Discussions of a specific area of current interest in biology. The work of each semester covers a different area of biology. Semester Supplements to this Bulletin contain topic description when standard course is offered. May be repeated as the topic changes.

Prerequisite: Permission of instructor
 2-3 credits

BIO 446: Readings in Neurobiology and Physiology

Tutorial readings in the biological sciences. These courses may be repeated, but not more than two credits may be used toward biology major requirements. Limit of one topic per semester.

Prerequisites: Written permission of instructor and undergraduate studies committee
 1-2 credits, S/U grading

BIO 447: Readings in Molecular, Cellular, and Developmental Biology

Tutorial readings in the biological sciences. These courses may be repeated, but not more than two credits may be used toward biology major requirements. Limit of one topic per semester.

Prerequisites: Permission of instructor and Department of Biochemistry and Cell Biology
 1-2 credits, S/U grading

BIO 449: Readings in Ecology and Evolution

Tutorial readings in the biological sciences. These courses may be repeated, but not more than two credits may be used toward biology major requirements. Limit of one topic per semester.

Prerequisites: Written permission of instructor and undergraduate studies committee
 1-2 credits, S/U grading

BIO 475: Undergraduate Teaching Practicum in College Biology I

Study of the literature, resources, and teaching strategies in a field of biology, coordinated with a supervised clinical experience in instruction. Not for major credit. Students may not serve as teaching assistants in the same course twice.

Prerequisites: Permission of instructor and undergraduate studies committee
 0-3 credits, S/U grading

BIO 476: Undergraduate Teaching Practicum in College Biology II

Study of the literature, resources, and teaching strategies in a field of biology, coordinated with a supervised clinical experience in instruction. Not for major credit. Students may not serve as teaching assistants in the same course twice.

Prerequisites: BIO 475; permission of instructor and undergraduate studies committee
 0-3 credits, S/U grading

BIO 484: Research in Biology and Society

In these courses, the student works under the supervision of a faculty member in developing an individual project that makes use of the knowledge and techniques acquired in previous courses. The student prepares an appropriate report on the project. Any of the courses may be taken for more than two semesters, but no more than four credits of research and internship may be used for biology major requirements. Limit of one topic per semester.

Prerequisite: Written permission of instructor and undergraduate studies committee. Request for committee approval must be submitted no later than two days prior to the last day of the add/drop period as scheduled in the academic calendar.

0-6 credits, S/U grading

BIO 486: Research in Neurobiology and Physiology

In these courses, the student works under the supervision of a faculty member in developing an individual project that makes use of the knowledge and techniques acquired in previous courses. The student prepares an appropriate report on the project. Any of the courses may be taken for more than two semesters, but no more than four credits of research and internship may be used for biology major requirements. Limit of one topic per semester.

Prerequisite: Written permission of instructor and undergraduate studies committee. Request for committee approval must be submitted no later than two days prior to the last day of the add/drop period as scheduled in the academic calendar.

0-6 credits, S/U grading

BIO 487: Research in Molecular, Cellular, and Developmental Biology

In these courses, the student works under the supervision of a faculty member in developing an individual project that makes use of the knowledge and techniques acquired in previous courses. The student prepares an appropriate report on the project. Any of the courses may be taken for more than two semesters, but no more than four credits of research may be used for biology major requirements. Limit of one topic per semester.

Prerequisite: Permission of instructor and Department of Biochemistry and Cell Biology
0-6 credits, S/U grading

BIO 488: Internship in Biological Sciences

May be repeated up to a limit of 12 credits.
Not for biology major credit.

Prerequisites: BIO 201, 202, 203; CHE 132; permission of faculty sponsor and biology internship committee
0-6 credits, S/U grading

BIO 489: Research in Ecology and Evolution

In these courses, the student works under the supervision of a faculty member in developing an individual project that makes use of the knowledge and techniques acquired in previous courses. The student prepares an appropriate report on the project. Any of the courses may be taken for more than two semesters, but no more than four credits of research may be used for biology major requirements. Limit of one topic per semester.

Prerequisite: Written permission of instructor and undergraduate studies committee. Request for committee approval must be submitted no later than two days prior to the last day of the add/drop period as scheduled in the academic calendar.

0-6 credits, S/U grading