

# Biology (BIO)

## (Biology Department)

### **BIO 101—General Biology 1**

3 lect., 3 lab, 4 cr. (Fall/Summer)

Topics include a study of the nature and scope of science in general and biological science in particular: the chemical and physical basis of life; the structures and functions of the cell with an emphasis on photosynthesis, respiration, functions of DNA, and the processes of mitosis and meiosis. The course concludes with the genetic and evolutionary consequences of meiosis and reproduction. (GE 2)

### **BIO 102—General Biology 2**

3 lect., 3 lab, 4 cr. (Spring)

A study of the plant and animal organism with an emphasis on the vertebrate animal and the flowering plant. Comparative systems are studied. The relationships between organisms and the environment are also covered. (GE 2)

Prerequisite: BIO 101

### **BIO 110—Introduction to Biology**

2 lect., 3 lab, 3 cr. (Fall/Spring/Summer)

An introductory course covering the scientific method, basic chemistry, cell biology, structure and function of the vertebrate body, biochemical pathways, cellular division, genetics, diversity and biological systems. (GE 2)

Prerequisite: The course is designed for students with little or no academic background in biological sciences and want to pursue a career in the health professions or biology

### **BIO 111—Anatomy and Physiology 1**

3 lect., 3 lab, 4 cr. (Fall/Spring/Summer)

An introduction to the structure and function of human systems. Study begins with the organization of the body from the molecular to the organ/organ system level of function and continues through the Integumentary, Skeletal, Muscle, Nervous and Endocrine systems. Laboratory work includes cellular structure and function, histology, and gross anatomical analysis of the skeletal, muscular, and nervous systems. The laboratory experience includes use of human bones and dissection of the cat, sheep eye and brain as well as use of human anatomical models of organs and structures related to the above systems.

Prerequisite: BIO 110, or BIO 101 and BIO 102

### **BIO 112—Anatomy and Physiology 2**

3 lect., 3 lab, 4 cr. (Fall/Spring/Summer)

Continues the study of the structure and function of human systems begun in BIO 111. Included are the circulatory, lymphatic, immune, respiratory, digestive, urinary and reproductive systems. Acid-base, fluid and electrolyte balance are also discussed, and functional inter-relationships and homeostasis are stressed throughout. Laboratory work includes analysis of the structure and function of the above systems at the histological, gross anatomical and organ system levels. The laboratory experience includes dissection of the cat and beef and sheep hearts as well as prepared histological specimens, human anatomical models and computer/video presentations related to the above systems. Laboratory experiments also expose students to related clinical techniques/topics such as blood typing, ECG, blood pressures, pulse determination, heart and lung sounds, spirometry, and urinalysis.

Prerequisite: BIO 111

### **BIO 113—Neurobiology**

2 lect., 2 lab, 3 cr. (Fall)

This course is designed for students of Massage Therapy, Physical Therapist Assistants, Occupational Therapy Assistants, and other Health Sciences. It will provide the student with a foundation for understanding neurological dysfunction. Integration, rather than segregation, between structure and function are emphasized. This course will enable the student to be conversant in the structure and function of the nervous system, with emphasis on sensorimotor integration and neuromuscular physiology. The organizing theme is the regulation of body function, how the nervous system is influenced during development, learning, and by disease, or trauma. This is illustrated in a multidisciplinary fashion: morphology, physiology, biochemistry and clinical manifestations. Examples of pathological, occupational and environmental causes of neurological disease are highlighted through lectures and student presentations. The different approaches used in diagnosis and understanding physical impairment are stressed as essential components of devising effective therapy.

Prerequisite: BIO 112

### **BIO 115—Human Biology**

3 lect., 3 lab, 4 cr. (Fall)

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Human anatomy, physiology and pathology are discussed in lectures. Laboratory work includes microscopic study of tissues and a dissection of the cat. The anatomy of the cat is correlated with human anatomy.

Prerequisite: BIO 110 or BIO 101

## **BIO 120—Biology for Today**

3 lect., lab, 3 cr. (Spring)

The biological aspects of contemporary problems and issues will be explored. Selected topics will be chosen from the areas of Medicine and the Environment. Students will participate in discussions and class activities that will assess decision-making criteria relative to the issues being presented.

## **BIO 123—Prehistoric Life**

3 cr. (Fall/Spring/Summer)

A survey of the diversity of prehistoric life including the dinosaurs, mammals, birds, reptiles, amphibians, fish, invertebrates and plants of the past. An overview of other relevant topics such as fossilization, evolution, extinction, vertebrate anatomy and ecosystem structure will be presented. The course will include a trip to the Museum of Natural History. Students are responsible for their own transportation. The course does not include a laboratory component.

## **BIO 125—Nutrition**

3 cr. (Fall/Spring/Summer)

Students study carbohydrate, fat, protein, mineral and vitamin requirements; an overview of the chemical and biological body functions, nutrient metabolism and deficiencies, food safety legislation, functions of the Food and Drug Administration and the USDA. Students conduct a caloric self-study.

## **BIO 141—The Diversity of Life**

2 lect., 3 lab, 3 cr. (Fall/Spring)

This course offers the non-science major an opportunity to study representatives of the major groups of bacteria, protists, plants, fungi, and animals in both lecture and lab. Emphasis will be placed on the major characteristics of each group. The inter-relationships among these organisms will be studied both through discussion and through field trips to local sites. The global loss of biodiversity and its significance will be discussed. Students are responsible for their own transportation on field trips. (GE 2)

## **BIO 143—Field Biology**

2 lect., 3 lab, 3 cr. (Fall)

This course will acquaint students with the plants and animals of the Orange County area, with emphasis on ecological relationships between them and their environment. Weekly field trips within the area will identify organisms found and conduct outdoor studies to better understand interactions among them. Real data will be collected and analyzed to answer scientific questions concerning the natural history of the county's biodiversity. Students are responsible for their own transportation. (GE 2)

## **BIO 146—Avian Biology**

2 lect., 3 lab, 3 cr. (Spring-alternate years)

A study of the birds of the Mid-Hudson Region, emphasizing field identification, migration, flight and ecological adaptations, voice and behavior, distribution and classification. Lectures and weekly field trips to diverse habitats are included. Students are responsible for their own transportation.

## **BIO 148—Environmental Conservation**

2 lect., 3 lab, 3 cr. (Spring)

This course will explore local, regional, national, and global issues of water quality and usage, such as types and sources of pollutants and their effects on humans and wildlife, surface and ground water overuse, and conservation of water resources. The expanding human population and its creation of resource conflicts and their resolutions are presented and discussed. Lab experiences will focus on monitoring the quality of nearby waterbodies, with the collection of real data that will be used by Orange County in their formulation of a watershed management plan. Students are responsible for their own transportation to off-campus sites. (GE 2)

## **BIO 201—Genetics**

3 lect., 3 lab, 4 cr. (Fall)

This is a survey course which introduces students to the various fields of modern genetics. Topics include the diverse forms of inheritance, the structure of chromosomes, the nature of function of genes, the regulation of gene activity, mutation, biotechnology, and evolution. Special reference is made to human genetic disorders and cancer. Lab work includes observing the inheritance traits in fruit flies and plants, mapping genes to regions of chromosomes, transformation, conjugation, plasmid DNA isolation, DNA gel electrophoresis, and protein gel electrophoresis. Students will learn techniques for the handling of bacteria and bacteriophage. (GE 2)

Prerequisite: One year of biological science including BIO 101

**BIO 202—Comparative Vertebrate Anatomy**

3 lect., 3 lab, 4 cr. (Spring)

The morphology, physiology, evolutionary development, and adaptations of major organ systems in vertebrate animals are studied. Laboratory work includes histology and dissection of vertebrate animals.

Prerequisite: One year of biological science, including BIO 101

**BIO 204—General Botany**

3 lect., 3 lab, 4 cr. (Spring)

This is a general botany course that will study plant morphology and physiology of herbaceous and woody plant divisions within the plant kingdom as well as other related plant-like organisms. Topics covered include plant structure and function, plant growth, transpiration, photosynthesis, evolution, and reproductive cycles. The course concludes with the diversity of flowers and plant life. Laboratory work includes: microscopic examination of cells and tissues of typical plants, set up and monitoring of a hydroponics experiment that will utilize the scientific method and allow for continual plant growth observations. Students will also be assigned seeds from differing plant families to germinate and tend to until plant maturity. The course will also require a plant collection prepared by each student. (GE 2)

Prerequisite: One year of biological science, including BIO 101

**BIO 205—General Ecology**

3 lect., 3 lab, 4 cr. (Fall)

Ecology is the branch of science studying interactions and relationships between organisms and their environment. Topics include a study of individual, population, community and ecosystem ecology. Applications of ecology and the influence of humans on the biosphere will also be addressed. (GE 2)

Prerequisite: One year of college-level biological science including BIO 101 or permission of the instructor

**BIO 210—Study of Biological Habitats**

2 lect., 2 lab, 3 cr. (Intersession-Spring Break/Summer)

A 10 to 15 day field experience in a marine, fresh water or terrestrial habitat at an off campus location. The ecological interactions of flora and fauna, with their habitats, are examined in detail. The Catskills, Maine, the Southwest Desert Biome, and Tropics are among the habitats studied. Fee charged for transportation and living expenses. (GE 2)

Prerequisite: One year of college biological science or permission of the instructor