BIOLOGY COURSES (BIOL)

BIOL 111 ORGANISMS, ECOLOGY, AND EVOLUTION (3) *Co-requisite: BIOL 111L.* Three hours lecture. The emphasis of this course is on the fundamentals of the relationships among organisms and their environment.

BIOL 111L ORGANISMS, ECOLOGY, AND EVOLUTION LABORATORY (1) *Co-requisite: BIOL 111.* Three hours laboratory to accompany BIOL 111.

BIOL 112 CELLS: GENETIC AND MOLECULAR PERSPECTIVES (3) *Co-requisite: BIOL 112L.* Three hours lecture. Understanding of organismal structure and function is based on knowledge of the underlying cellular and molecular structure and function. These in turn are controlled by the genetic mechanisms that determine cellular structure and behavior. The relationships among cells, molecules, and their genetic controls are the focus of this course.

BIOL 112L CELLS: GENETIC AND MOLECULAR PERSPECTIVES (1) *Co-requisite: BIOL 112.* Three hours laboratory to accompany BIOL 112.

BIOL 205 PLANT BIOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L.* Three hours lecture and three hours laboratory. This is a study of the morphology, anatomy, life histories, function, evolutionary relationships, ecological, and economic aspects of selected plant groups including algae, mosses, ferns and fern allies, gymnosperms, and flowering plants.

BIOL 210 ANIMAL BIOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L* Three hours lecture and three hours laboratory. This course examines the major groups of protists and animals regarding their structure, function, adaptation, ecology, and the evolutionary relationships among the groups.

BIOL 214 HUMAN ANATOMY (3) Three hours lecture. This course is a study of the structures of the body with emphasis on the organ systems involved in movement. Introductory material focuses on terminology, examining the hierarchical organization of the body and study of the four major tissues of the body. Subsequently, the interrelationships among the bones, joints, muscles, nerves, and blood supply of each body region are examined using a regional approach. This course is designed to meet the outcomes expected for pursuing upper-level courses in the HMSR majors.

BIOL 214L HUMAN ANATOMY LABORATORY (1) *Prerequisite or co-requisite: BIOL 214.* Three hours laboratory. The primary goal of the laboratory course is to provide a hands-on opportunity for students to apply the terminology and concepts covered during lecture. Accaccordingly, physical models, dissection, computer software, and Internet resources are used as part of a problem-solving pedagogy in which collaborative learning is emphasized.

BIOL 215 HUMAN PHYSIOLOGY (3) Three hours lecture. This course is a study of the function, integration, and interaction of various organ systems in the body. Introductory material focuses on an overview of organ systems, the concepts of homeostasis and negative feedback, and fundamental chemical, physical, and cellular concepts. Subsequently, the physiology of the systems involved in movement and exercise, particularly the nervous, endocrine, muscular, cardiovascular, pulmonary, digestive, and urinary systems are emphasized. This course is designed to meet the outcomes expected for pursuing upper-level HMSR major courses.

BIOL 215L HUMAN PHYSIOLOGY LABORATORY (1) *Prerequisite or co-requisite: BIOL 215.* Three hours laboratory. The primary goal of the laboratory course is to provide a hands-on opportunity for students to apply the principles and concepts covered during lecture. Accordingly, physiological experiments, physical models, computer software, and Internet resources are used as part of inquiry-based, problem-solving pedagogies in which collaborative learning is emphasized.

BIOL 222 HUMAN ANATOMY AND PHYSIOLOGY I (3) Three hours lecture. This course explores the fundamental structure and function of the human body, beginning at the cellular and molecular level of organization and progressing through integumentary, skeletal, nervous, and endocrine systems.

BIOL 222L HUMAN ANATOMY AND PHYSIOLOGY LABORATORY I (1) *Prerequisite or corequisite: BIOL 222.* Three-hour laboratory to accompany BIOL 222.

BIOL 223 HUMAN ANATOMY AND PHYSIOLOGY II (3) *Prerequisite: BIOL 222.* Three hours lecture. This course explores fundamental structure and function of muscular, cardiovascular, pulmonary, digestive, renal, and reproductive systems in human beings. Emphasis is placed on interrelatedness of organ systems and applications to allied health professions.

BIOL 223L HUMAN ANATOMY AND PHYSIOLOGY LABORATORY II (1) *Prerequisite or corequisite: BIOL 223.* Three-hour laboratory to accompany BIOL 223.

BIOL 233 TROPICAL BIOLOGY (1-3) *Prerequisites: BIOL 111/111L-112/112L, ENVS 101/101L-102/102L or equivalent.* This course examines extremely diverse ecosystems of the tropical forests which provide excellent opportunities to study several basic concepts of biological and environmental science. Students also study the unique fauna and flora of the tropical forest and learn how and why this ecosystem is threatened.

BIOL 240 INTRODUCTION TO BIOLOGICAL RESEARCH (1-3) *Prerequisite: BIOL 111/111L-112/112L and approval of the sponsoring instructor.* This course provides an independent opportunity to conduct literary research on a biological topic of interest. Credit is dependent upon the scope of the work but may not exceed three credit hours.

BIOL 305 PLANT ECOLOGY (4) *Prerequisite: BIOL 205/205L.* Three hours lecture and three hours laboratory. This course focuses on ecological constraints that plants experience by virtue of their predominantly sessile lifestyle. Populations dynamics, competition, plant-animal interactions, community structure, function, succession, and the influence of abiotic factors will be considered. Lab exercises emphasize problem-solving approaches to a series of field investigations. A small additional fee will be incurred for two field trips.

BIOL 309 INSECTS AND THE ENVIRONMENT (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L, or by consent of instructor.* Three hours lecture and three hours laboratory. An introduction to insect structure, function, adaptation, and ecology, with an emphasis on insect interactions with their natural environments and with humans. Students will be trained in insect, sampling, curation, and identification during labs, lectures, and field trips. The utility of insects in assessing the health of terrestrial and aquatic ecosystems (biomonitoring) will be a key component of the course.

BIOL 313 MARINE BIOLOGY (4) *Prerequisite: BIOL 111/111L-112/ 112L or ENVS 101/101L-102/102L.* Three hours lecture and three hours laboratory. This introduction to the marine environment emphasizes the occurrence and distribution of marine organisms. Oceanographic principles are discussed, and special consideration is given to the biology of common plants inhabiting beaches, estuaries, and near-ocean waters in Atlantic, Caribbean, and Bahamian biota. The laboratory is conducted at a selected site on the ocean and in the estuary. A small additional cost will be incurred for a field trip.

BIOL 314 BIOLOGY OF WEST INDIAN CORAL REEF ORGANISMS (3) (Winter Term) *Prerequisite: BIOL 111/111L or ENVS 101/101L or consent of instructor.* This course covers the organisms inhabiting the coral reefs of the West Indies and will be taught on San Salvador Island in the Bahamas. Field work is intensive, and skin diving and optional scuba techniques are employed. Limited collections are made, and a paper on a topic of special interest is required. An additional fee will be charged to cover expenses.

BIOL 321 GENERAL ECOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L; Junior standing or higher.* Three hours lecture and three hours laboratory. This course is a survey of general ecological principles from the evolutionary perspective, incorporating multiple levels of analysis (e.g. population, community, etc.). Primary emphasis is placed on framing ecological theory in perspective with field models of ecological principles from historical and current research.

BIOL 323 GENETICS (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L; Junior standing or higher.* Three hours lecture and three hours laboratory. Basic concepts and principles of prokaryotic and eukaryotic genetics are discussed, including Mendelian inheritance, polygenic inheritance, linkage and mapping chromosome aberrations, population genetics, DNA structure and replication, gene expression, mutation, gene regulation, recombinant DNA technology, and the molecular basis of disease. Lab exercises utilize bacteria, plants, and animals as model systems.

BIOL 332 VERTEBRATE ANATOMY (4) *Prerequisite: BIOL 111/111L-112/112L.* Three hours lecture and three hours laboratory. This course provides a comparative study of the development, structure, and relationships of different organ systems in various vertebrate groups. Recommended for pre-medical, pre-dental, and medical technology students.

BIOL 333 VERTEBRATE PHYSIOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L, CHEM 103-104, CHEM 105L-106L.* Three hours lecture and three hours laboratory. This course is a study of the cellular and molecular bases of organ system function in vertebrates, primarily humans. Emphasis is placed on nervous and endocrine control systems and the coordination of body functions. Clinical examples are frequently used.

BIOL 345 ANIMAL BEHAVIOR (4) *Prerequisite: BIOL 111/111L-112/112L or ENVS 101/101L-102/102L; Junior standing or permission of the instructor.* Three hours lecture and three hours laboratory. This course includes a review of concepts of animal behavior and the methods employed to study behavior including an analysis of mechanistic and adaptive aspects of behavior in a variety of animal taxa. Emphasis is placed on analysis of current primary literature and development of critical tests of behavior.

BIOL 356 NEUROBIOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L.* Three hours lecture and three hours laboratory. This course serves primarily as a companion course to *Physiological Psychology* (PSYC 355) but can also serve as a stand-alone course for anyone interested in the biology of the human nervous system. Introductory material focuses on an overview of the organization of the nervous system and on cellular aspects of neural function. Subsequent emphasis is on reflexes, sensory function, motor function, and sensorimotor integration.

BIOL 399 INTERNSHIP IN BIOLOGY (1-6) *Prerequisites: Juniors or seniors with a 2.25 minimum QPA; approval of written proposal by internship coordinator, and supervising faculty prior to registration.* This course is offered to qualified students allowing them to gain personal and practical experience in various areas of the biological sciences. Internships include but are not limited to research projects with professionals, laboratory analysis and management, conservation management, statewide or regional conservation, fisheries, wildlife or botanical projects, and a variety of other possible on-site experiences. (See "Internships.")

BIOL 424 MICROBIOLOGY (4) *Prerequisite: Junior standing or higher.* Three hours lecture and three hours laboratory. This course focuses on morphology, taxonomy, physiology, and ecology of bacteria and viruses and the theory and techniques of gene transfer. Immunology includes the mechanisms of pathogenicity, host defense, and humoral and cellular responses. The laboratory includes techniques for the culturing, isolation, and identification of microorganisms.

BIOL 430 MOLECULAR CELL BIOLOGY (4) *Prerequisite: BIOL 111/111L-112/112L; CHEM 103-104, CHEM 105L-106L, 251-253L.* Three hours lecture and three hours laboratory. This course introduces the student to the complex events occurring in the nucleus of the cell, resulting in cell division and the continuation of species. It also examines the molecular processes of cell differentiation, cell signaling, cancer, and events that cause DNA mutations.

BIOL 440 INDIVIDUAL RESEARCH (3-6) *Prerequisite: Approval of the sponsoring instructor.* This independent opportunity to conduct a field or laboratory project culminates in a research paper and presentation. Credit is dependent on the nature of the work but may not exceed three credit hours per semester.

BIOL 480 CASE STUDIES IN BIOLOGY (3) *Prerequisite: Senior standing.* Three hours lecture. This course is intended as a capstone course and is designed to allow students to study specific topics in biology in depth. It utilizes case studies in biology and draws upon previous coursework in the biology major. Emphasis is placed on critical thinking and problem solving skills.

BIOL 490 BIOLOGY SEMINAR (1) *Prerequisite: Senior standing.* This seminar is intended as a capstone course and provides an opportunity for students to study a range of biological questions presented by outside speakers. Additionally, students' communication skills are assessed through oral presentations on internships or individual research projects, as well as other topics.