



## Course Descriptions

**BIOL 111 BIOLOGICAL SCIENCE (3 units)** - (design for the non-biology majors -three lecture hours per week) – is an introduction to the study of living organisms, classification of the five different kingdoms, their basic structures and related functions are emphasized. An overview of human body functions and biological applications in today’s society is integrated.

**BIOL 113 GENERAL ZOOLOGY (5 units)** - (three lecture hours and six laboratory hours per week) – is an introduction to the principles of animal study and the classification of animal life. Emphasis is placed on characteristic features of each taxonomical group, their life cycles and biogeography.

**BIOL 121 HUMAN ANATOMY AND PHYSIOLOGY (5 UNITS)** – (three lecture hours and six laboratory hours per week, design for the non-biology majors) – a foundation course for all general courses so designed as to provide the student a broad knowledge of the structures and functions of the human body and sound physiological understanding of clinical situations as a basis for care of self, the family, and members of the community.

**BIOL 123 GENERAL BOTANY (5 units)** - (three lecture hours and six laboratory hours per week) - is an introduction and overview on the different aspects of plant forms, structures, and development as it affects life, people and the environment. Studies on tissues and functions of higher vascular plants in relation to their environmental principles of variation, heredity and ecology are included.

**BIOL 211 COMPARATIVE VERTEBRATE ANATOMY (5 units)** – (three lecture hours and six laboratory hours per week) – is a study of the similarities and differences in vertebrate morphology and physiology in the different classes of vertebrates. It includes the study of the variation in morphology of representative vertebrates in relation to the roles and structural variation for survival, as well as the historical background and embryogenesis of vertebrate organs and systems.

**BIOL 213 ENTOMOLOGY (3 units)** - (three lecture hours per week)- the course deals with the anatomical and physiological characteristics of insects and their economic importance to humans. Identification of common species is attempted.

**BIOL 215 PLANT ANATOMY (3 units)** - (two lecture hours and three laboratory hours per week) deals with the structures of flowering and lower plants in relation to classification, growth and development.

**BIOL 223 MICROBIOLOGY & PARASITOLOGY (4 units)** - (three lecture hours and three laboratory hours per week) a general study of microorganisms and common parasites of human, their life cycle, control and prevention are studied. Theories of infection and spread of disease and principles of immunity are covered.315

**BIOL 226 PLANT PHYSIOLOGY (3 units)** - (two lecture hours and three laboratory hours per week) deals with the fundamental process of plant functions such as photosynthesis, mineral metabolism, nitrogen metabolism, vernalization, hormones and heredity. Normal phenomenon in living things, process and function, responses of plants to changes in environment, growth and development are included.

**BIOL 228 ENVIRONMENTAL SCIENCE AND MANAGEMENT (3 units)** - (three lecture hours per week) the course focuses on the external factors affecting an organism which may be caused by other living organisms (biotic factors) or nonliving variables (abiotic factors) and their interactions.

**BIOL 311 HUMAN ANATOMY(3 units)** - (two lecture hours and three laboratory hours per week) - a detailed study of the anatomical structure of the human body. Body structure will be studied by organ systems and will involve a balance between gross anatomy and histology.

**BIOL 314 TAXONOMY AND ECONOMIC BOTANY (3 units)** - (two lecture hours and three hours every two weeks) this course tackles the principles, criteria for classification, purposes and methods of taxonomy. Monitoring and preserving biodiversity in different environments, phylogenetic system of classification, preparing identification keys and checklists of economic species are emphasized. Plants as sources or components of foods, medicines, drinks, flavorings, spices, oils, fibers, dyes, resins etc. are discussed.

**BIOL 316 MICROBIOLOGY (3 units)** - (two lecture hours and three laboratory hours per week) designed for biology majors who want to expand their knowledge of the microscopic world, in general, or for use in professional or graduate school. The course' concepts that are basic to viruses, prokaryotic and eukaryotic cells are discussed, including epidemiology, ubiquity, control and identification of microorganisms.

**BIOL 318 PARASITOLOGY (3units)** - (two lecture hours and three laboratory hours per week) is an introduction to the general biology of the parasitic protozoans, helminths, and arthropods of humans and domestic animals. Lectures will emphasize the morphology, form and function, life cycles, symptomatology, and pathogenesis of representative taxa from these major parasitic groups.

**BIOL 322 HUMAN PHYSIOLOGY (4 units)** - (two lecture hours and three laboratory hours per week) - designed to provide students with a deeper understanding of the function & regulation of the human body and physiological integration of the organ systems to maintain homeostasis.

**BIOL 323 ORNITHOLOGY (3 units)** - classification and importance of birds with emphasis on local birds. The anatomy and physiology of avians are studied in relation to their activities and behavior.

**BIOL 324 DEVELOPMENTAL BIOLOGY (3 units)** - (two lecture hours and three laboratory hours per week)- a study of different development of the invertebrate and vertebrate with emphasis on the genetic controls involved in the differentiation of tissues and the formation of organs.

**BIOL 326 CELL, MOLECULAR BIOLOGY & BIOTECHNOLOGY (4 units)** (three lecture hours and three laboratory hours per week) this course focuses on the molecular and structural components of the cell. Topics on cellular organization, genetic mechanisms, catabolism and biosynthesis, signaling and energetics will be emphasized. Principles and applications of various molecular techniques like genetic engineering, vaccines, cloning, and stem cell technology will be tackled. Ethical and legal issues associated with biotechnology are also discussed. Students are expected to analyze and discuss relevant peer-reviewed articles on the cell, molecular biology and biotechnology.

**BIOL 328 METHODS OF RESEARCH (3 Units)** – (three lecture hours per week) is focused on various research methods. Specifically, fundamental guidelines on how to write, publish and present an

effective scientific paper are emphasized. At the end of the course, students must be able to prepare a manuscript following the generally accepted scientific guidelines and present a scientific paper.

**BIOL 411 FUNDAMENTALS OF GENETICS (5 units)** – (Three lecture hours and six lab hours per week) - is a major course to inspire and equip students of the basic concepts and applications of Genetics. Wide array of topics include classical Genetics, chromosomal and molecular basis of inheritance, mutations, organization and regulation of eukaryotic genomes, genetics of bacteria, transposons, and overview of quantitative, developmental, human, population, and conservation Genetics. Applied topics like genetic engineering and DNA forensics are emphasized in this course through the use of models and simulations. At the end of the course, the student should be able to learn, understand, and discuss intelligently the genetic principles and associated applications. Students are required to present an oral report on any Genetics topics published in an ISI peer-reviewed journal.

**BIOL 413 MICROTECHNIQUE (3 units)** - (Five hours per week including laboratory) - This course focuses on the science and art of preparing, preserving and visualizing biological specimens. It covers topics on conventional microscopy, electron microscopy, digital imaging, histochemistry, cytochemistry, immunolocalization and localization of molecular targets such as tissue printing, *In situ* hybridization, autoradiography, tyramide signal amplification and TUNEL Assay for detecting DNA degradation and programmed cell death. Chemical fixation, tissue dehydration, infiltration and embedding of tissues, sectioning, mounting, and staining of tissues are discussed

**BIOL 414 ANIMAL BEHAVIOR (3 units)** - (three hours per week) - treatment of the environmental, genetic and physiological determinants of animal behavior is covered. The characteristic behavior pattern of representative groups of animal are identified and analyzed in reference to their physiological and other biological requirements.

**BIOL 416 HISTOLOGY (3units)** - (two lecture hours and three laboratory hours per week) – is a study of vertebrate tissues with emphasis on human. The characteristics of normal tissues, cellular structures, organ-system organization, and their identification are covered.

**BIOL 418 THESIS WRITING (3 units)** - (three hours per week) in this course, students is advised and mentored in choosing a researchable topic in the realm of life science. Students are guided by their mentors in conceptualizing a research topic, executing their researches and in preparing their research manuscript. The course aims to help students acquire the essential research skills needed in their current and future research endeavors.

**BIOL 421 ECOLOGY (3 units)** - (two lecture hours and six laboratory hours every two weeks)- a study of plant and animal ecosystem and their relationship to human needs. The ecological impact of expanding human population is discussed. The course includes frequent field trips.

**BIOL 423 MARINE BIOLOGY (3 units)** - (three hours per week) the study deals with ecology of marine organisms in the context of the physical, chemical, and geological characteristics of the ocean environment in which they live.

**BIOL 425 PHILOSOPHICAL BIOLOGY (3 units)** –(three hours per week) an investigation of science as an approach to truth, its methodology and limitations. The course focuses on the impact of science on educational institutions, health, culture, technology and social institutions including religion. Relevant research articles, review and notes pertaining to different philosophical, time, biological, geological and origin questions is discussed.

**BIOL 427 INTRODUCTION TO BIOINFORMATICS WITH SYSTEMS BIOLOGY\* (3 units)** - (three hours per week with laboratory) Prerequisites: Genetics Molecular Biology and Basic Computer Science. Focuses on the utilization of sequenced information of nucleic acids and proteins. It will cover topics

on general search methods, statistical theory in probability, scoring systems and comparison of two sequences, local and global multiple alignment, fragment assembly of DNA, physical mapping of DNA, construction of phylogenetic trees, search in biological databases, pattern discovery in set of sequences and protein secondary structure prediction. This course also tackles the components of biological systems, their biochemical properties and function. Students enrolled in the course are required to understand and critically evaluate bioinformatics-related articles from peer-reviewed journals. Prerequisite: Genetics or Molecular Biology and Basic Computer Science course.\*  
*preferably taught with the Computer Science Department (Basic Programming)*

**BIOL 428 TEACHING STRATEGIES FOR LABORATORY (3 units)** (Five hours per week including practice teaching in lab) is the development of instructional materials as well as a study of teaching strategies for laboratory classes. A review of the principles of teaching science, concepts in biology and their practical application in instruction is included.