

# BIOMEDICAL SCIENCES (BIOM)

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## **BIOM 500 Introduction to Biomedical Sciences 3 Credit Hour(s)**

This course employs the exploration of the molecular, genetic, biochemical and cellular basis of human oncogenesis, tumor metastasis, cancer detection and therapeutic advances as a comprehensive background for understanding and engaging the field of biomedicine. It provides a solid foundation in the basic biomedical principles that serve as the framework for advancing medical science including genetics, cellular anatomy, metabolism and cell signaling.

**Offered:** Online

## **BIOM 503 Human Genetics 3 Credit Hour(s)**

**Prerequisite:** (BIOM 513 and BIOM 515) or (BIOM 523 and BIOM 524 and BIOM 525 and BIOM 526)

A study of the molecular causes of human disease with an emphasis on the specific gene perturbations that influence human health. Specific modes of genetic assault (e.g. mutations, epigenetic mechanisms, nutritional factors, and viral infections) will be discussed.

**Offered:** Resident and Online

## **BIOM 513 Human Gross Anatomy 5 Credit Hour(s)**

This is an intensive course that covers all aspects of human anatomy through lectures, followed by practical application using cadavers. In addition, imaging techniques including CT scans and x-ray radiography are used to introduce the student to the physician's perspective.

**Offered:** Resident

## **BIOM 515 Human Physiology 5 Credit Hour(s)**

A concentrated, comprehensive course that provides the student with a high level of understanding of the physiological basis of medicine. The essential concepts of mechanisms of body function are presented at various levels of organization, ranging from cellular and molecular to tissue and organ system levels. Emphasis is placed on understanding the integrated regulation of various body processes among the major systems.

**Offered:** Resident

## **BIOM 523 Human Gross Anatomy Lecture 4 Credit Hour(s)**

This is an intensive course that covers all aspects of human anatomy through lectures. Students will be shown how imaging techniques including CT scans and x-ray radiography are viewed from the physician's perspective. This course precedes BIOM 524 Human Anatomy Cadaver Lab which includes the use of human cadavers. (BIOM 523 and BIOM 524 are equivalent to BIOM 513)

**Offered:** Online

## **BIOM 524 Human Anatomy Cadaver Lab 1-2 Credit Hour(s)**

**Prerequisite:** BIOM 523

A laboratory study of the structure and function of the human body using a regional approach with emphasis on the detailed osteology, musculature, vasculature, and innervation of each region along with an understanding of the interrelationship between organ systems. This course follows BIOM 523 Human Gross Anatomy Lecture. (BIOM 523 and BIOM 524 are equivalent to BIOM 513).

**Offered:** Resident and Online

## **BIOM 525 Human Physiology Lecture 4 Credit Hour(s)**

This is a concentrated, comprehensive course that provides the student with a high level of understanding of the physiological basis of medicine. The essential concepts of physiology and mechanisms of body function are presented at various levels of organization ranging from cellular and molecular to tissue and organ system levels. Emphasis is placed on understanding the integrated regulation of various body processes among the major systems. This course precedes BIOM 526 Human Physiology Lab. (BIOM 525 and BIOM 526 are equivalent to BIOM 515).

**Offered:** Online

## **BIOM 526 Human Physiology Lab 1 Credit Hour(s)**

**Prerequisite:** BIOM 525

Human physiology is the study of the functions of the body and how it maintains homeostasis. This lab course practically examines systemic functions using human subjects and simulated case studies. It also allows students to independently develop and test hypotheses about homeostatic control mechanisms in health and disease. Special attention is placed on medically vital systems including the nervous, cardiovascular, respiratory, digestive, endocrine systems and the effects of exercise, altitude and depth on these. (BIOM 525 and BIOM 526 are equivalent to BIOM 515).

**Offered:** Resident and Online

## **BIOM 600 Biomedical Ethics 3 Credit Hour(s)**

An in-depth ethical analysis and evaluation of present and emerging biomedical technologies in the 21st century. While not ignoring other ethical schools of thought, the focus of this course will be on the Hippocratic and Judeo-Christian traditions with their emphasis on the inherent dignity and worth of humanity as a whole, as well as the individual patient. This ethical foundation will serve as the primary framework for discussing medical decision making and practice.

**Offered:** Resident and Online

## **BIOM 610 Human Neurology and Neuroanatomy 3 Credit Hour(s)**

**Prerequisite:** (BIOM 513 and BIOM 515) or (BIOM 523 and BIOM 524 and BIOM 525 and BIOM 526)

This course will provide an introduction to the structural and functional features of the nervous system. Topics covered will include the gross anatomy of the brain and spinal cord, cellular and molecular neurobiology, sensory and motor systems, the major neurotransmitter systems, and brain regulation of behavior and body physiology.

**Offered:** Resident and Online

## **BIOM 613 Human Gross Anatomy II 3 Credit Hour(s)**

**Prerequisite:** BIOM 513

A continuation of BIOM 513 with additional and more advanced dissections of human cadavers.

**Offered:** Resident

## **BIOM 615 Advanced Cell Biology 4 Credit Hour(s)**

**Prerequisite:** (BIOM 513 and BIOM 515) or (BIOM 523 and BIOM 524)

Advanced study on the structure, function and organization of the cell. Major topics include structure and function of cellular organelles, the cytoskeleton and extracellular matrix; cell signaling; membrane transport; protein targeting, vesicular transport, and cell division.

**Offered:** Resident and Online

**BIOM 620 Advanced Immunology 3 Credit Hour(s)**

**Prerequisite:** (BIOM 513 and BIOM 515) or (BIOM 523 and BIOM 524 and BIOM 525 and BIOM 526)

A detailed study of the cells and molecules that result from an immune response to disease. The course will include antigen presentation, cytokine networks, vaccines and vaccine development, immunodeficiency diseases, tumor immunity, tolerance, autoimmunity and contemporary topics in immunology.

**Offered:** Resident and Online

**BIOM 623 Human Developmental Biology 3 Credit Hour(s)**

**Prerequisite:** BIOM 513 and BIOM 515

Advanced study of the major events of normal and abnormal human embryonic development. Major topics include gametogenesis, fertilization, axis formation, molecular pathways involved in tissue formation, and development of organ systems.

**Offered:** Resident

**BIOM 625 Microbial Pathogenesis and Virology 3 Credit Hour(s)**

A comprehensive study of the viruses that cause human disease and the basic principles of microbial pathogenesis, including the molecular basis of infectious disease, how microbes establish infections, gain nutrients, cause damage to the host and disease, evade host defense mechanisms. The course will also include case studies.

**Offered:** Resident and Online

**BIOM 630 Principles of Pathology 3 Credit Hour(s)**

**Prerequisite:** (BIOM 513 and BIOM 515) or (BIOM 523 and BIOM 524 and BIOM 525 and BIOM 526)

This course reviews basic pathology principles including: Inflammation, Infection, Repair, Thrombosis, Hemostasis, Hyperplasia, Hypertrophy, Neoplasia, and Apoptosis. In addition, the pathophysiology of disease applied to various organ systems is covered in depth. Correlations with appropriate laboratory results and physical findings will elucidate the basis for signs and symptoms of various common diseases. Both diagnostic features of diseases and critical thinking skills will be stressed.

**Offered:** Resident and Online

**BIOM 633 Advanced Histology 4 Credit Hour(s)**

**Prerequisite:** BIOM 513

This course provides a detailed orientation to the structure and organization of cells and tissues. Students will learn a variety of techniques involved in the preparation of histological slides (including use of the microtome, vibratome, and cryostat) and staining specimens. Students will assist undergraduate students in tissue preparation.

**Offered:** Resident