Secondary Field of Study in Human Anatomy

Department of Anatomy and Cell Biology

The major goal of the program is to have students obtain a broad understanding of human morphology as it relates to function, ranging from embryologic development through adulthood. After completing the Embryology, Microscopic Anatomy, Human Gross Anatomy, and Functional Neuroanatomy courses, students will be able to demonstrate comprehension of a) the stages of human development, b) the structure and cellular components of the tissues and organs and their physical and functional interrelationships, c) the regional organization of the musculoskeletal system and major organs, and d) the functional and internal/external organization of the central and peripheral nervous systems, by taking multiple choice and short answer examinations.

The program consists of the following courses:

1. ANAT 2130 Human Embryology (3 credit hours)
2. ANAT 2150 Human Microscopic Anatomy (3 credit hours)
3. ANAT 2181 Human Gross Anatomy (3 credit hours)
4. ANAT 2160 Human Functional Neuroanatomy (3 credit hours)

The secondary field is constituted of 12 credits of these Anatomy courses with a prerequisite of BISC 1111 (4 credits) and BISC 1112 (4 credits). In order to remain in the program, students must earn letter grades of C- or better in the required courses.

ANAT 2130 Human Embryology: This survey course will describe the mechanisms and morphology of early embryology of the human embryo. The first half of the course will focus on developmental mechanisms and early development. The second half of the course will focus on development of organ systems in the human body.

The learning objectives are:

1) Describe early human development.
2) Understand developmental control mechanisms.
3) Describe the development of selected organ systems in the human body.

ANAT 2150 Human Microscopic Anatomy: This course is designed to provide a basic background in the normal structure of cells, tissues, and organs of the human body. Because there is an inseparable relationship between structure and function, emphasis is on structural-functional correlates at both the light and electron microscopic levels. Descriptions of alterations in normal histology through disease or injury provide an understanding of the etiology of various disease states. Histological terms and concepts are taught for the purpose of identification and precise communication.

The learning objectives are:

1) Describe the basic structure of a cell and the function of membranes and organelles.
2) Describe how the type and histological arrangement of the cells present within tissues and organs of each major body system relate to the function of those tissues and organs.
3) Recognize how histological structure and function relate to the etiology of various disease states.

ANAT 2181 Human Gross Anatomy: Throughout the duration of this course, students will: a) Learn structural organization of the human body and the relationship of that organization to regional and systems-related functions and b) Apply normal anatomic structural & functional relationships to understand clinical implications of common diseases and injuries.

The learning objectives are:

1) Explain the structure and function of each of the organ systems (e.g., musculoskeletal, cardiovascular) in relation to the anatomical regions of the human body.
2) Compare and contrast differences between each region of the human body and the functional significance within and between those differences.
3) Apply anatomical knowledge of the structure and function of the organ systems in the human body to common injuries and illnesses.

ANAT 2160 Human Functional Neuroanatomy: This course is designed to provide foundational knowledge about the anatomy and function of the human central and peripheral nervous systems with a strong emphasis on clinical relevance. Neuroanatomy topics will include the gross and microscopic structure, embryology, and neurophysiology of the brain, spinal cord, and nerves with descriptions of alterations in normal anatomy through disease or injury. The availability of real human cadaveric brain specimens for demonstrations in laboratory sessions in the School of Medicine adds a unique and enriching dimension to the course content.

The learning objectives are:

1) Identify the structures of the adult and developing central (CNS) and peripheral nervous system (PNS), including neurons.
2) Describe the supporting structures of the CNS and PNS, including the glial cells, blood supply, meninges, and the ventricular system.
3) Describe the major pathways and connections of the sensory and motor system.
4) Describe normal functions of cortical areas, basal ganglia, cerebellum, brainstem, and the spinal cord, including their influence on one another.
5) Compare and contrast the symptoms resulting from discrete lesions or injury to the CNS or PNS.