

BME 105 - Introduction to Human Physiology I

2 Credits, 2 Contact hours

Instructor: Dr. Bruno Mantilla

Textbook(s)/Materials Required:

Fundamentals of Human Physiology, 4th Edition Lauralee Sherwood - West Virginia University
ISBN-10: 0840062257 ISBN-13: 9780840062253 720 Pages Paperback ©2012 Published

Description:

One of the core elements of this discipline is being able to understand the biological world and the engineering world at the same time. In addition biomedical engineers need to prepare their minds for analyzing, quantifying, thinking, and solving problems at the interface of engineering, medicine and biology. This course sets the basic concepts for future interfacing between engineering and physiology. BME 105 offers an overview and the fundamental concepts of homeostasis, and how the interactions between cells, tissues and different human body systems achieve it. This is the first of two parts in which the student is introduced to the complex field of neurophysiology. By the end of the semester the student should understand and know the essentials of the nervous system.

Prerequisites: NONE

Objectives:

1. **Cell differentiation, cell specialization & Homeostasis :** Cell differentiation & specialization. Cell to cell interaction, tissues, organs and systems. Homeostasis, feedback system as a fundamental mechanism in physiology.
2. **Neuron & Glial Cell Structure:** Identify the fundamental components and structure of each of the Nervous system cells.
3. **Neuron & Glial Cell Physiology:**
4. **Nervous System Structure and Function:** Understand the brain and spinal cord as complex organs composed of numerous regions and nuclei. The students should understand the intricate and complex associations between the different areas of the brain, as well as the hierarchical structure and functioning of the Peripheral, and Central Nervous System.
5. **Nervous System Physiology:** Understand the general organization of the central and peripheral nervous system(NS), into autonomic and somatic branches, as well as the afferent and efferent connections of each portion. Special emphasis is given to vision, hearing and vestibular systems as specialized functions of the NS.

Topics: Cell Structure; Cell Physiology; Nervous System Structure; Nervous System Physiology

Professional Component: Medical / Biological Topics

Outcome # 1. Students will understand the fundamental structure of the cell and its components.			
Strategies & Actions	Program Outcomes	Prog. Object	Assessment Methods
The cell structure and functioning are covered in class lectures, class discussions, and assigned presentations.	L	1	Tests
Outcome # 2. Students will understand the basic anatomy , histology and physiology of the central and peripheral nervous system			
Strategies & Actions	Program Outcomes	Prog. Object	Assessment Methods
Macro and micro structure of the brain and spinal cord are explained at the class.	L	1	Tests