

AM5119 – Physiology for Engineers

Description: The objective of this course is to introduce the concepts in human physiology from an engineering view point, for (i) familiarity with anatomical and physiological terminology; (ii) understanding of the gross anatomy of the major systems in the human body and (iii) understanding of the major physiological principles governing the operation of the human body and their importance in designing biomedical systems and devices.

Course Content: Cell & molecular basis for medical physiology: Physiology of nerves and muscle cells. - Cardiovascular physiology: Electrical activity of the heart; Heart as a pump; Cardiovascular regulatory mechanics; Blood and hemodynamics - Respiratory physiology: Pulmonary function; Principles of gas exchange; Gas transport in blood & tissue fluids; Regulation of respiration - Renal physiology: Renal Function & Macturition; Regulation of extracellular fluid composition & volume; Acid-base regulation - Gastrointestinal physiology: General principles of functions such as motility, nervous control and blood circulation; Propulsion and mixing of food & secretions in alimentary tract; Digestion and absorption in GI tract; General disorders - Central and peripheral neurophysiology: Physiology of senses including pain, touch, vision, hearing & equilibrium, smell & taste; Electrical activity of brain; sleep-wake states; Control of posture and movement; Autonomous nervous system; Hormonal regulation; Learning, memory, language and speech - Endocrine & reproductive physiology:

Text Books: Ganong's Review of Medical Physiology (23rd Edition), KE Baret, SM Barman, S Boitano, HL Brooks, McGrawHill, 2010.

Reference Books: Textbook of Medical Physiology (12th Edition): Guyton & Hall, Elsevier, 2011.

Prerequisite: None