

BIO 163
BASIC ANATOMY AND PHYSIOLOGY

COURSE DESCRIPTION:

Prerequisites: RED 090 or satisfactory score on placement test

Corequisites: None

This course provides a basic study of the structure and function of the human body. Topics include a basic study of the body systems as well as an introduction to homeostasis, cells, tissues, nutrition, acid-base balance, and electrolytes. Upon completion, students should be able to demonstrate a basic understanding of the fundamental principles of anatomy and physiology and their interrelationships. Laboratory exercises include specific organ dissections and observations of physiology. *This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement.*
Course Hours Per Week: Class, 4. Lab, 2. Semester Hours Credit, 5.

LEARNING OUTCOMES:

Upon completion of this course, the student will demonstrate basic knowledge in the following:

- a. Basic anatomical characteristics in each of the organ systems
- b. Basic functional characteristics in each of the organ systems
- c. Homeostatic and functional interrelationship between the organ systems

OUTLINE OF INSTRUCTION:

- I. Introduction: terminology
 - A. Anatomical positions
 - B. Directional planes
 - C. Body cavities
- II. Chemistry
 - A. Basic inorganic chemistry
 - B. Basic biochemistry
- III. Cells
 - A. Structure and function
 - B. Transport
 - C. Mitosis and meiosis
- IV. Primary tissues

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- A. Epithelial tissues
 - B. Connective tissues, cartilage and bone.
 - C. Glands - exocrine versus endocrine
 - D. Muscle tissues
 - E. Nervous tissues
- V. Integumentary system
- A. Dermis and epidermis
 - B. Functions of the integumentary system
- VI. Skeletal system
- A. Bone development and growth
 - B. Axial and appendicular skeletal bones
 - C. Articulations
- VII. Muscular system
- A. Characteristics of smooth, cardiac and skeletal muscles
 - B. Physiology of muscular contraction
 - C. Neuromuscular junction and chemotransmission
 - D. Types of movement
- VIII. Nervous system
- A. Mechanics of neural impulse; reflex arcs
 - B. Synaptic chemotransmission
 - C. Central nervous system
 - 1) Structure and function of the brain
 - 2) Structure and function of the spinal cord
 - D. Peripheral nervous system
 - 1) Cranial nerves
 - 2) Spinal nerves
 - 3) Neurosensory and neuromotor pathways
 - E. Autonomic nervous system
 - 1) Sympathetic division
 - 2) Parasympathetic division
- IX. Sensory organs
- A. Types of receptors
 - B. Eye
 - C. Ear
- X. Endocrine system
- A. Hypothalamus - negative feedback mechanisms
 - B. Pituitary hormones
 - C. Thyroid and parathyroid functions
 - D. Adrenal cortical and medullary hormones

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- E. Gonadal hormones
- F. Pancreatic hormones

- XI. Cardiovascular system
 - A. Cardiac structure and function
 - B. Systemic and pulmonary circulations
 - C. Blood and lymph
 - D. Cardiac control and vasomotor reflex mechanisms
 - E. Lymphatic system and reticulo-endothelial system

- XII. Immunity
 - A. Innate immunity
 - B. Adaptive immunity
 - C. Acquired immunity

- XIII. Respiratory system
 - A. Pulmonary anatomy
 - B. Ventilation, diffusion, perfusion and gas transport
 - C. Neural and chemical regulation

- XIV. Digestive system
 - A. Anatomy of the gastrointestinal tract
 - B. Physiology of digestion and absorption
 - C. Accessory digestive organs
 - D. Metabolism of carbohydrates, lipids, and proteins
 - E. Vitamins and minerals; nutrition

- XV. Excretory system
 - A. Nephron and renal anatomy
 - B. Urine formation and regulation - glomerular filtration, tubular reabsorption, and tubular secretion

- XVI. Homeostasis of body fluids
 - A. Regulation of fluid balance
 - B. Regulation of electrolyte balance
 - C. Regulation of pH - respiratory and urinary compensation

- XVII. Reproductive systems and embryology
 - A. Male reproductive system
 - B. Female reproductive system
 - C. Embryonic and fetal development
 - D. Genetics

REQUIRED TEXTBOOKS AND MATERIALS:

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Seeley, R. R., Stephens, T. D., and Tate, P. Essentials of Anatomy and Physiology. 7th ed. New York: McGraw-Hill Higher Education, 2007.

Patton, K. T. Laboratory Manual to Accompany Essentials of Anatomy and Physiology. 7th ed. New York: McGraw-Hill Higher Education, 2007.

SUGGESTED REFERENCES, PERIODICALS, AND VISUAL AIDS:

Numerous supplementary texts, programmed materials, and audiovisual packages are available in the Educational Resources Center. These materials may be utilized to reinforce the lecture and lab material or to provide material for independent study by the student.

STATEMENT OF STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 536-7207, ext 1418 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.