

# COMPETENCY PROFILE

## ANATOMY & PHYSIOLOGY

**BTC: BIO 105 Essentials of Anatomy & Physiology (60 clock hours / 5 credits)**

**WCC: MA 112 Basic Anatomy, Physiology & Pathology (3 credits)**

Medically focused course emphasizes the essential structure and function of the normal human body which will serve as a foundation of general understanding for future study in health occupations. Integration of body systems to the whole organism as well as application of key concepts to health and disease are emphasized; associated medical terminology is emphasized throughout the course.



**Outcome:** student will develop a basic knowledge of the structure & function of the human body with special emphasis placed on the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary & reproductive systems.

- Define anatomy, physiology & pathophysiology & use an example of each to explain how they are related.
  - √ Define homeostasis & explain how a negative feedback mechanism works.
  - √ Describe anatomical position.
  - √ Describe body cavities & some organs located within each.
- Define the terms element, compound, atom, molecule, ion, & isotope.
  - √ Describe the formation & purpose of ionic bonds, covalent bonds & hydrogen bonds.
  - √ Describe the pH scale & explain the importance of water to the normal functioning of the human body.
  - √ List the four major groups of organic compounds & list the primary functions of each.
- Describe the structure and function of the cell membrane & the various organelles found within the cell.
  - √ Explain what happens during cell division in mitosis & meiosis.
- Describe the general characteristics & primary functions of each of the four major categories of tissues.
  - √ Differentiate between the various types of body membranes & determine where they are located.
- Describe the structure & functions of the skin & the associated structures.
- Identify & locate the bones of the skeletal system.
  - √ Explain how bones are classified & give an example of each.
  - √ Name the nutrients & hormones necessary for bone growth & maintenance & explain their functions.
  - √ Compare the various types of joints & describe the movement possible for each.
- Describe the microscopic anatomy of muscle tissue & explain how it functions to produce movement.
  - √ Compare & contrast the three major types of muscle tissue.
  - √ Name & locate the major muscles of the muscular system & give their primary action.
- Differentiate between the structures & functions of the different types of nerve cells.
  - √ Explain how electrical & chemical impulses are generated & transmitted by nerve cells.
  - √ Identify all the major parts of the brain & list their primary functions.
  - √ Name the cranial nerves & major spinal nerves & list their functions.
  - √ Describe the primary functions of the sympathetic & parasympathetic divisions of the autonomic nervous system.
- Name the parts of the sensory pathway and explain the role of receptors.
  - √ Describe the characteristics of sensations.
  - √ Name the parts of the eye & ear & list their functions.
- Name the major endocrine glands, the primary hormones released from each & their main functions.
- Describe the difference between whole blood & blood plasma.
  - √ Identify the different types of blood cells including their functions.
  - √ Explain the basis of blood typing & the process of blood clotting.
- Name & locate the chambers of the heart, the vessels that enter or leave each & the path of blood flow through them.
  - √ Describe the cardiac cycle & explain how heart sounds are created.
  - √ Explain how cardiac output is determined.
- Describe the structure & function of the different types of blood vessels.
  - √ Identify the major blood vessels of pulmonary & systemic circulation.
  - √ Describe fetal circulation.
  - √ Explain how blood pressure is regulated.
- Identify the structures & functions of the lymphatic system.
  - √ Explain the difference between humoral & cell-mediated immunity.
- Identify the structures & functions of the respiratory system.
  - √ Explain the mechanism of breathing as well as the exchange & transport of gases.
  - √ Discuss how breathing rate is regulated & the net effect on acid-base balance due to respiration.
- Name & locate the organs & accessory organs of the digestive system & give the main function of each.
- Explain how cellular respiration produces heat & describe the mechanisms the body uses to conserve heat & to increase heat loss.
  - √ Define basal metabolic rate & list several factors that affect a person's metabolic rate.
- Describe the structure & functions of all urinary organs & explain how the kidneys produce urine.
  - √ Explain the major mechanisms of fluid & electrolyte balance.
- Identify the structures & functions of the male & female reproductive systems.
- Describe the process of fertilization & explain when, where & how implantation of the embryo occurs.

**College Textbooks:** Scanlon, Valerie & Sanders, Tina; Essentials of Anatomy & Physiology, 5<sup>th</sup> ed. (text and student workbook)