

**J. Sargeant Reynolds Community College  
Course Content Summary**

**Course Prefix and Number: BIO 141 Credits: 4**

**Course Title: Human Anatomy & Physiology I**

**Course Description:**

Presents the study of anatomy & physiology including anatomical terminology, homeostasis, histology, integumentary system, skeletal system, muscular system, and nervous system. Assignments require college-level reading fluency, coherent written communication, and basic mathematical skills. Part I of II. Corequisite or Prerequisite: Demonstration of NAS 2 concepts of Chemical Concepts, Cytology, and Inheritance through NAS 2 completion; or assessment; or module completion; or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

4 credits

**General Course Purpose:**

The purpose of BIO 141 is to provide students with knowledge of human anatomy and how the major organ systems contribute to homeostasis.

**Course Prerequisites and Co-requisites:**

Corequisite or Prerequisite: Demonstration of NAS 2 concepts of Chemical Concepts, Cytology, and Inheritance through NAS 2 completion; or assessment; or module completion; or equivalent.

**Course Objectives:**

Upon completing the course, the student will be able to:

**Introduction to Anatomy & Physiology**

- Define anatomy and physiology and explain the interrelationship between them.
- Define and apply descriptive anatomical and directional terminology to the human body.
- List the major structures/organs and describe general functions of each organ system.

**Homeostasis**

- Describe the principle of homeostasis and the feedback mechanisms that are used to maintain internal balance.

**Histology**

- Describe the structure of the primary tissue classes, their functions, and representative locations in the human body and visually identify specific examples of each tissue type.
- Describe the structure, location, and function of cell junctions and body membranes.

## **Organ Systems**

- Describe the structure and functions of the integumentary system, to include the process of growth of the integument and repair following an injury.
- Describe the structure and functions of the skeletal system, to include development, growth, remodeling, and repair of bone.
- Explain the role of the skeletal system in the regulation of blood calcium levels.
- Classify articulations structurally and functionally and provide an example location for each.
- List and describe movements at synovial joints.
- Describe the structure and functions of the muscular system, to include a comparison of muscle tissue types and the process of skeletal muscle contraction and relaxation.
- Describe the structure and functions of the nervous system, to include anatomy of nervous tissue, as well as action potential generation and synaptic transmission. Topics include central and peripheral nervous systems, autonomic nervous system, and senses.
- Visually identify microscopic and macroscopic anatomical features of the integumentary, skeletal, muscular, and nervous systems.

NAS 2 Minimum recommendations for Student Learning Outcomes to support BIO 141:

### **Chemical Concepts**

- Describe atomic structure and relate it to chemical bonding and chemical reactions, to include the role of enzymes.
- Describe the physiological importance of pH and the following inorganic molecules: water, acids, bases and salts.
- Describe the composition and general properties of organic compounds and their physiological significance.
- Describe the processes of ATP synthesis and energy transfer within the cell.

### **Cytology**

- Identify and describe the functions of the components of a typical animal cell.
- Explain the mechanisms for movement of materials across cell membranes.

### **Inheritance**

- Briefly explain basic patterns of inheritance, to include definitions of chromosomes, genes, alleles, homologous, homozygous, heterozygous, genotype and phenotype, autosomal dominant, autosomal recessive, and sex-linked traits.

### **Major Topics to be Included:**

- Introduction to Anatomy & Physiology
- Homeostasis
- Histology
- Organ Systems

**Effective Date/Updated: June 6, 2023**

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