

AOHS Foundations of Anatomy and Physiology I

Course Scope and Sequence

July 2016

Foundations of Anatomy and Physiology I is the first in a set of two semester-long lab courses that introduce students to basic anatomy and physiology. The first unit covers directional terminology and those aspects of chemistry and cellular biology that students must master in order to study anatomy and physiology. It also teaches students how to use lab equipment safely. Then students learn about the following body systems: integumentary, skeletal, muscular, nervous, and endocrine, with separate lessons on the brain and the senses. Students make connections to their personal health and the prevention of disease for each body system studied. As they conduct research, complete wet labs, participate in a wide range of group activities, and take quizzes and exams, students develop the skills they need for college-level work and careers in the health professions.

The project for this course requires students to work in small groups to develop public service announcements (PSAs) that inform the public about a condition affecting a body system that they have studied. First they work together to write a research report, which forms the basis of the information presented in the PSA. Students present their PSAs to an invited audience at a health care PSA showcase. The driving question for the project is, "How can we, as health professionals, make best use of a PSA to inform the public about a condition affecting a body system?"

This course is expected to take a total of 73 50-minute class periods.

Lesson 1: Course Introduction

Estimated # of Class Periods: 6

Learning Objectives:

- Define the terms *anatomy* and *physiology*
- Describe the relationship between structure and function
- Identify the 12 human body systems
- Describe the hierarchy of organization within body systems
- Summarize basic properties of cells
- Demonstrate the ability to use a microscope and identify its parts
- Explain the concept of homeostasis and feedback mechanisms

Lesson 2: Surfaces, Planes, and Directions

Estimated # of Class Periods: 3

Learning Objectives:

- Label body surfaces, planes, cavities, and directions
- Differentiate between anterior and posterior body surfaces
- Demonstrate the ability to use directional terminology to describe body parts and organs in relation to one another

Lesson 3: Biochemistry

Estimated # of Class Periods: 5

Learning Objectives:

- Identify the parts of atoms
- Describe the ways that atoms can combine to form molecules
- Define the basic organic chemistry terms necessary for the understanding of anatomy and physiology
- Explain ways that substances can be transported across the cell membrane, including diffusion, osmosis, and active transport
- Define pH and electrolytes and describe their relationship to homeostasis

Lesson 4: The Integumentary System

Estimated # of Class Periods: 6

Learning Objectives:

- Label the anatomical structures that make up the integumentary system, including the main substructures of skin and hair
- Describe the basic functions of the integumentary system and its organs; specifically, explain the steps involved in perspiration, hair growth, and exfoliation
- Describe common diseases and disorders of the integumentary system
- Summarize key aspects of maintaining the health of the integumentary system

Lesson 5: The Skeletal System

Estimated # of Class Periods: 5

Learning Objectives:

- Identify and label the major bones of the skeleton
- Categorize the bones of the skeleton as axial or appendicular
- Compare and contrast compact bone and spongy bone with respect to anatomical features and functions
- Identify the anatomic features of cartilage and describe its functions
- Explain the role of calcium in the structural integrity of bone
- Classify joints based on their structural characteristics or their degree of movement
- Explain how the structure of a joint contributes to its function
- Explain how skeletal injuries and disorders affect the functioning of bones and joints

Lesson 6: The Muscular System

Estimated # of Class Periods: 6

Learning Objectives:

AOHS Foundations of Anatomy and Physiology I

Course Scope and Sequence

- Compare and contrast the three types of muscle tissue (skeletal, smooth, and cardiac) in regard to locations in the body, anatomical features, and functions
- Label the major skeletal muscles
- Demonstrate the ability to use terminology associated with the muscular system
- Explain how muscular disorders and diseases affect the functioning of skeletal muscle
- Explain the relationship between muscle strength and overall physical health

Lesson 7: Midterm Exam

Estimated # of Class Periods: 2

Learning Objectives:

- Describe effective ways to prepare for taking exams
- Identify the personal importance of specific test-preparation strategies
- Demonstrate the ability to take a midterm exam

Lesson 8: The Nervous System

Estimated # of Class Periods: 4

Learning Objectives:

- Identify and describe the parts of a neuron
- Describe the basic structure of a synapse
- Explain how nerve signals travel along and between neurons
- List the characteristics of a reflex and provide examples of common reflexes
- Distinguish between the different divisions of the nervous system

Lesson 9: The Brain

Estimated # of Class Periods: 7

Learning Objectives:

- Identify the major brain regions and their corresponding functions
- Display understanding of current theories of learning and memory
- Explain the effects of different drugs on brain function
- Summarize the ways in which common conditions and diseases affect the brain, including Alzheimer's disease

Lesson 10: The Senses

Estimated # of Class Periods: 7

Learning Objectives:

- Identify the anatomical structures involved in the senses of smell (olfaction) and taste (gustation); describe how these structures respond to the environment to create neuronal signals

AOHS Foundations of Anatomy and Physiology I

Course Scope and Sequence

- Describe the structures necessary for the sensation of sound and their functions
- Define equilibrium and explain how the body senses its orientation
- Describe the most important factors known to cause permanent hearing loss
- Describe the structures of the eye, including the functions of each
- Describe the anatomical changes that are responsible for nearsightedness, farsightedness, and astigmatism
- Decide how best to monitor vision for changes that might be an indication for treatment or intervention
- Summarize important diseases and abnormalities associated with the five senses

Lesson 11: The Endocrine System

Estimated # of Class Periods: 6

Learning Objectives:

- Describe the general role of hormones in the process of homeostasis
- Identify the major glands and provide an example of a process that each one regulates
- Describe how hormones contribute to human growth and development
- Summarize how common endocrine disorders lead to the interruption of homeostasis
- Display understanding of the mechanisms of diabetes and how diet can help prevent type 2 diabetes

Lesson 12: The Course Project

Estimated # of Class Periods: 13

Learning Objectives:

- Demonstrate the ability to conduct informational research on a specific health condition
- Demonstrate the ability to write an informational report about a specific health condition
- Create a multimedia PSA about a health condition

Lesson 13: Final Exam

Estimated # of Class Periods: 3

Learning Objectives:

- Identify the personal importance of the content learned in this course
- Demonstrate the ability to take a final exam