

Anatomy & Physiology, Part 2

Course Outline & Objectives

Course Description:

In Anatomy & Physiology Part 2, students investigate the major body systems responsible for movement, communication, regulation, transport, and reproduction. Students study the muscular, nervous, endocrine, cardiovascular, respiratory, digestive, urinary, reproductive, immune, and lymphatic systems, examining how each contributes to maintaining homeostasis. They explore the structure and function of organs, tissues, and physiological processes while analyzing common diseases and disorders that affect human health. Through scientific inquiry, laboratory investigations, data analysis, and real-world applications, students develop a deeper understanding of how body systems interact to support life and maintain the body's internal balance.

Credits - One Semester (0.5 Carnegie unit / CA: 5 credits) | Prerequisites: Biology; Anatomy & Physiology Pt 1

Course Outline

Unit 1: Muscular System

- 1.1 Muscle Functions & Properties
- 1.2 Types of Muscle Tissue
- 1.3 Sarcomeres & the Sliding Filament Theory
- 1.4 Neuromuscular Junctions
- 1.5 Muscle Actions & Movement Terminology
- 1.6 Major Skeletal Muscles
- 1.7 Muscular Disorders

Next Generation Science Standards (NGSS)

National Health Science Standards

In this unit, students will:

Describe the functions and properties of muscle tissue and compare skeletal, smooth, and cardiac muscles.

Explain how the sarcomere and sliding filament theory produce muscle contraction.

Describe how the neuromuscular junction initiates muscle contraction.

Apply movement terminology and identify the roles of agonists, antagonists, synergists, and fixators.

Identify major skeletal muscles and explain how muscular disorders affect movement and homeostasis.

[HS-LS1-2, HS-LS1-3]

[HN.1, HN.3, HN.8, HN.11]

Unit 2: Nervous System & Special Senses

- 2.1 Organization of the Nervous System
- 2.2 Neurons & Neuroglia
- 2.3 Brain & Spinal Cord
- 2.4 Nerve Impulses & Reflexes
- 2.5 Protection of the Central Nervous System
- 2.6 Special Senses
- 2.7 Nervous System & Special Senses Disorders

In this unit, students will:

Describe the organization and functions of the central and peripheral nervous systems.

Explain how neurons generate and transmit nerve impulses and how reflex arcs produce rapid responses.

Identify the major structures of the brain and spinal cord and explain how they are protected.

Describe the anatomy and function of the special senses, including vision, hearing, taste, smell, and balance.

Explain how disorders of the nervous system and special senses affect communication and body regulation.

[HS-LS1-2, HS-LS1-3, HS-LS1-5]

[HN.1, HN.2, HN.3, HN.11]

Course Outline

Unit 3: Endocrine, Blood & Immunity

- 3.1 Endocrine Functions & Hormones
- 3.2 Endocrine Glands
- 3.3 Endocrine Disorders
- 3.4 Blood Composition & Hemostasis
- 3.5 Blood Typing & Blood Disorders
- 3.6 Lymphatic System & Immunity
- 3.7 Immune & Lymphatic Disorders

Next Generation Science Standards (NGSS) National Health Science Standards

In this unit, students will:

Explain how hormones and endocrine glands regulate body functions and maintain homeostasis.

Describe the composition and functions of blood, including hemostasis and blood typing.

Explain the roles of the lymphatic system and immune system in protecting the body from disease.

Compare innate and adaptive immunity, including active and passive forms of immunity.

Analyze disorders of the endocrine, blood, and immune systems and explain their effects on normal body function.

[HS-LS1-2, HS-LS1-3, HS-LS1-5, HS-LS1-6]

[HN.1, HN.3, HN.8, HN.11]

Unit 4: Cardiovascular & Respiratory Systems

- 4.1 Functions of the Cardiovascular System
- 4.2 Heart Structure & Blood Flow
- 4.3 Blood Vessels & Circulation
- 4.4 Cardiac Function & Blood Pressure
- 4.5 Cardiovascular Disorders
- 4.6 Respiratory System Structure & Function
- 4.7 Respiratory Disorders & Gas Exchange

In this unit, students will:

Describe the structure of the heart and trace the pathway of blood through the cardiovascular system.

Explain how blood vessels, cardiac rhythm, and blood pressure support circulation.

Identify the major structures of the respiratory system and trace the pathway of air through the body.

Explain how ventilation and gas exchange maintain oxygen delivery and carbon dioxide removal.

Analyze cardiovascular and respiratory disorders and explain how they disrupt homeostasis.

[HS-LS1-2, HS-LS1-3, HS-LS1-6, HS-LS1-7]

[HN.1, HN.3, HN.8, HN.11]

Unit 5: Digestive, Urinary & Reproductive Systems

- 5.1 Digestive System Structure & Processes
- 5.2 Digestive Organs & Enzymes
- 5.3 Digestive Disorders
- 5.4 Urinary System & Urine Formation
- 5.5 Urinary Regulation & Disorders
- 5.6 Reproductive Anatomy & Hormones
- 5.7 Human Development & Reproductive Disorders

In this unit, students will:

Describe the structures and functions of the digestive system and explain how nutrients are digested and absorbed.

Explain how the urinary system filters blood, removes wastes, and regulates fluid and electrolyte balance.

Describe the anatomy and physiology of the male and female reproductive systems.

Explain the processes of fertilization, human development, and hormone regulation in reproduction.

Analyze disorders of the digestive, urinary, and reproductive systems and explain how they affect overall homeostasis.

[HS-LS1-2, HS-LS1-3, HS-LS1-5, HS-LS1-6, HS-LS3-1]

[HN.1, HN.3, HN.8, HN.11]