

Course Description for **Anatomy and Physiology (43601/2)**

Course Title: Anatomy & Physiology**Curricular Area:** Science**Course Number:** 43601-43602**Length:** One year**Grade Level:** 10-12

Prerequisites: Biology with a grade “C” or better *and* Algebra I with a grade “C” or better. Students who do not meet the prerequisites may petition for admission.

Course Description

Anatomy and Physiology is a rigorous second year Biology course for students interested in biology, medicine and its related professions. This course is a study of the structures and functions of the human body, and their interrelationships. Content is built around major biological concepts which include: historical perspectives, mathematical and analytical skills, and interdisciplinary approaches to discovery. Concepts are reinforced with a strong emphasis on laboratory experiences, outside research, and the integration of all sciences. Dissection of preserved organisms is part of the laboratory experience.

Cross Unit Objectives The following objectives are woven into the individuals units and are intended to develop students’ skills and proficiency as scientific investigators:

- Design and conduct scientific investigations
- Use technology and mathematics to improve investigations
- Identify a problem or design an opportunity, implement the design, evaluate, and communicate the problem
- Recognize the cumulative nature of scientific evidence

History of Course Development

This course was written to mirror the UC approved Anatomy and physiology course from Watsonville High School. The only significant changes to the content and rigor was the order in which the body systems are taught. The intent is to offer the same academically challenging UC preparatory course as offered at Watsonville High School.

Instructional Methods

- Primary: direct instruction (lectures), lab work
- Additional instructional strategies: Cornell note taking, reciprocal teaching, Socratic seminars, inquiry research, student presentations, peer editing of lab reports/lab journals, peer tutoring

Instructional Materials

1. Student text: *Essentials of Human Anatomy and Physiology*, 8th Edition, Marieb. Prentice Hall Publisher ISBN 0-13-193481-3
2. *Essentials of Anatomy and Physiology Lab Manual*, Marieb, Prentice Hall, 2006, ISBN-0-8053-7340-3
4. A.D.A.M. and Simulation CD ROMs- a visual dissection and virtual examination of the human body systems.
5. Dissection equipment and guides

Exit Criteria

<u>Activities</u>	<u>Percentage</u>
Homework	20%
Tests.....	30%
Quizzes.....	10%
Labs	30%
Final Examination	10%
Total:	100%

Course Description for Anatomy and Physiology (43601/2)

I. Introduction to Anatomy and Physiology

- A. Body planes and organization
- B. Body positions and descriptors
- C. Body systems and parts
- D. Review Cell structure and Chemistry
- E. Tissues
- F. Systems Organization
- G. Labs: Tissues Lab, A.D.A.M.
- H. Objectives:
 - 1. Define specified anatomical terms and body planes.
 - 2. Name and give the location of body cavities.
 - 3. Identify the organelles of an animal cell and list the functions of each organelle.
 - 4. Name and give the location of body cavities.
 - 5. Identify the chemical constituents of a cell and explain the methods of transport across a cell membrane.
 - 6. Identify the characteristics and function of epithelial, connective, muscle and nervous tissues.

II. Body Systems

- A. Integumentary System
 - 1. Structures and functions
 - 2. Mitosis
 - 3. Diseases
 - 4. Labs: A.D.A.M., Pregnant Cat Dissection, Histology Lab
 - 5. Objectives:
 - a) Relate the events that take place during mitosis and meiosis.
 - b) Describe the structure of the layers of skin.

- B. Skeletal System
 - 1. Structures and functions
 - 2. What makes up a bone?
 - 3. Articulations
 - 4. Diseases
 - 5. Labs: A.D.A.M., Axial Skeleton, Skeletal Tissue, Cat Dissection
 - 6. Objectives:
 - a) Name and classify the major bones of the skeleton.
 - b) Diagram and label the microscopic structure of bone.
 - c) Describe the two methods of ossification.
 - d) Identify specific bony markings.

Course Description for Anatomy and Physiology (43601/2)

C. Nervous System

1. Central Nervous System
2. Peripheral Nervous System
 - a) Nerves
 - b) Reflexes
3. Neurons
 - a) Cell structure and function
 - b) Neurotransmitters
 - c) Nerve Impulses; Action Potential
4. Mental Health Disorders
5. Labs: Reflexes and Neurons, Reaction Time Lab, Sheep Brain Dissection, A.D.A.M., Sheep Eye Dissection
6. Objectives:
 - a) Diagram and label a neuron.
 - b) Label the parts of a reflex arc and describe their functions.
 - c) Classify the neurons.
 - d) Explain the transmission of a nerve impulse.
 - e) Diagram the structure of the spinal cord.
 - f) Name the major parts of the brain and the function of each part.
 - g) Distinguish between the parts of the peripheral nervous system.
 - h) Name and list the functions of the cranial nerves.
 - i) Dissect a sheep brain, eye, kidney, and lung.

D. Endocrine System

1. Glands
2. Hormones
3. Negative Feedback
4. Endocrine Diseases
5. Labs: A.D.A.M., Cat Dissection, Stress Test
6. Objectives:
 - a) Identify the endocrine glands and list the hormones they secrete.
 - b) Describe the actions of hormones.
 - c) Discuss how the secretion of hormones is regulated by the negative feedback mechanism.

E. Lymphatic System

1. Structures and Functions
2. Body's defense mechanisms
3. Immunity
4. Labs: A.D.A.M., AIDS Project, Immunity Simulation, Cat Dissection
5. Objectives:
 - a) Identify the major parts of the lymphatic system and explain their functions.
 - b) Describe the characteristics of the body's defenses.
 - c) Compare the different types of immunity.

Course Description for **Anatomy and Physiology (43601/2)**

F. Circulatory System

1. Composition of Blood
2. Heart
3. Blood Vessels
4. Pathway of circulation
5. Making Exchanges
6. Diseases
7. Labs: A.D.A.M., Sheep Heart Dissection, Blood Pressure Lab, Blood Typing Lab
8. Objectives:
 - a) Describe the physical and chemical composition of blood.
 - b) Identify the blood cells and their functions.
 - c) Explain the process of blood clotting.
 - d) Discuss the basis and inheritance of blood types.
 - e) Name the major arteries and veins of the human body.
 - f) Diagram and label the parts of the heart.
 - g) Describe the pathway of blood through the heart.
 - h) List 10 factors that influence blood pressure.

G. Respiratory System

1. Structures and Functions
2. Respiratory volumes
3. Coordination of Systems
4. Diseases
5. Labs: A.D.A.M., Breathing Rate Lab
6. Objectives:
 - a) Identify the organs of the respiratory system and explain the functions of each.
 - b) Define the respiratory air volumes and capacities.
 - c) Dissect a sheep brain, eye, kidney, and lung.

H. Digestive System

1. Energy in Matter
2. Dietary Analysis
3. Structures and Functions
4. Enzymes
5. Labs: What is in the Food You Eat?, A.D.A.M., Cat Dissection
6. Objectives:
 - a) Label the digestive system and describe its functions.
 - b) List the enzymes secreted and their functions.
 - c) All matter tends toward more disorganized states. Living systems require a continuous input of energy.
 - d) The chemical bonds of food molecules contain energy.
 - e) The complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating matter and energy used to sustain the organism.

Course Description for **Anatomy and Physiology (43601/2)**

I. Muscular System

1. Tissue types
2. Structures and Functions
3. Muscle Movement at Molecular Level
4. Diseases and Disorders
5. Labs: A.D.A.M, Human Performance Indicators, Levers, Cat Dissection
6. Objectives:
 - a) Name the major muscles of the muscular system.
 - b) List the general function of the muscular system.
 - c) Explain the physiology of muscular contraction.
 - d) Identify the classes of muscle tissue.
 - e) Describe the physical and chemical characteristics of muscle tissue.

J. Reproductive System

1. Structures and Functions
2. Menstrual Cycle
3. Birth control technology
4. Meiosis
5. Diseases
6. Labs: A.D.A.M., Meiosis lab, Cat Dissection
7. Objectives:
 - a) Label diagrams of the male and female reproductive systems.
 - b) List the functions of each reproductive structure in males and females.
 - c) Describe the hormonal changes and influences during the menstrual cycle.

K. Urinary System

1. Structures and Functions
2. Nephron Filtration
3. Regulation in the Urinary System
4. Disposing of Wastes
5. Diabetes Project
6. Labs: A.D.A.M., Cow Kidney Dissection
7. Objectives:
 - a) Label the urinary system and describe the function of each part.
 - b) Explain the formation of urine and the changes that occur as the filtrate progresses through the nephron.
 - c) Dissect a sheep kidney.

<end>