

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Human Anatomy Physiology

Board Approval Date: March 23, 2023	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 10, 11, 12	Subject Area: Life Science Elective Area (if applicable): "D" Lab Science
Prerequisite(s): LE Biology & Math 1	Corequisite(s): None
CTE Sector/Pathway:	
Intent to Pursue 'A-G' College Prep Status: Yes	
A-G Course Identifier: (d) Laboratory Science	
Graduation Requirement: No	
Course Intent: District Course Program (if applicable):	
<p>The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, race or ethnicity, religion, gender, gender identity or gender expression, immigration status, national origin, sex, sexual orientation, or association with a person or group with one or more of these actual or perceived characteristics. For concerns/questions or complaints, contact the Title IX Coordinator(s), Equity Compliance Officer(s) and Section 504 Coordinator(s) :</p> <p>Donald Ogden, Associate Superintendent – Human Resources kmorales@fcusd.org 916-294-9000 ext. 104410 Jim Huber, ED. D., Assistant Superintendent – Educational Services jhuber@fcusd.org 916-294-9000 ext. 104625 Shannon Diaz, Director of Compliance (Investigator) sdiaz@fcusd.org 916-294-9000 ext. 104620 1965 Birkmont Drive, Rancho Cordova, CA 95742</p>	

COURSE DESCRIPTION:

This course is a laboratory science class that covers human anatomy and physiology and is designed for the student intending to pursue a career in a medical or fitness-related field. The course will focus on the integration of the structure and function of body systems needed to maintain homeostasis. It will integrate topics related to health and fitness such as nutrition, exercise and kinesiology, and disease. Microscopy work is a component of all system laboratory activities in conjunction with dissections. Students are exposed to and engage in hands-on common clinical practices pertaining to diagnosis. Computers/laptops are utilized regularly for research, data input, and data analysis during laboratory work. Provides support for the life science NGSS curriculum by evaluating in depth the structure-function, interrelatedness of structures, and homeostasis of living organisms.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Introduction, Organization of the Body, and Body Systems & Biochemistry	Name the organ systems of the body and briefly state the major functions of each system. List the 6 levels of structural organization that make up the human body, and explain how they are related. Locate the major body cavities, and list the chief organs in each cavity. Use proper anatomical terminology to describe body directions, positions, surfaces and body planes. Define homeostasis, and explain its importance. Define negative and positive feedback, and describe its role in maintaining homeostasis and normal body function. Explain the importance of water to body homeostasis, and provide several examples of the roles of water. Explain the concept of pH, and state the pH of blood. Compare and contrast	*Anatomical Language Activity *Overview of Human Body Systems Activity	*Unit Project/Exam

	carbohydrates, lipids, proteins, and nucleic acids in terms of their building blocks, structure, and functions in the body.		
2. Cells and Tissues	<p>Identify the major parts of an animal cell.</p> <p>Describe the various types and functions of epithelial tissue.</p> <p>Explain the properties and functions of different types of connective tissue.</p> <p>Describe the basic types and functions of the nerve and muscle tissue.</p>	<p>*Histology Slides (Epithelial, Connective, Muscle, and Nervous)</p> <p>*Microscopy work</p>	*Unit Project/Exam
3. Membranes and the Integumentary System	<p>Describe the functions of the integumentary system.</p> <p>Identify the layers of the skin.</p> <p>Identify the differences among mucous, serous, and cutaneous membranes.</p> <p>Describe the structure and function of synovial membranes.</p> <p>Explain the purpose and functions of the appendages of the human skin.</p> <p>Describe the process of tissue repair (wound healing).</p> <p>Describe common injuries of the skin and how they are treated.</p> <p>List common viral, fungal, and bacterial infections of the skin.</p> <p>Explain the difference between benign and malignant tumors and basal cell, squamous cell, and malignant melanoma.</p>	<p>*Histology Slides (Skin, Hair Follicle, Nails)</p> <p>*Investigating Skin Properties</p> <p>*Labeling of Skin and Functions</p>	*Unit Project/Exam

<p>4. Skeletal System</p>	<p>State the functions of the skeletal system. State the four main classifications of bones. Describe the microscopic structure of compact bone. Discuss bone remodeling, including the cells responsible and the practices and environments that can dramatically influence remodeling. Identify the bones of the cranium and face and describe their locations. Describe the structure of a typical vertebra and explain how the atlas, axis, and other cervical, thoracic, and lumbar vertebrae are specialized for their specific functions. Identify all the bones in the human skeleton. Identify the different types of bone. Describe the general structures and functions of the three major categories of joints. Explain the functions of articular tissues such as cartilage, tendons, and ligaments. Discuss osteoporosis, including contributing factors, groups at risk, consequences, and prevention strategies. Describe the common types of joint, bone and epiphyseal injuries, including the structure affected and symptoms. Describe specific types of arthritis, including symptoms.</p>	<ul style="list-style-type: none"> *Bone Identification *Histology slides (which include compact bone, red marrow, spongy bone and the periosteum) *X-ray Fracture Samples *Labeling of Skeletal System and Functions *Case Study- Osteoporosis 	<p>*Unit Project/Exam</p>
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<p>5. Muscular System</p>	<p>Define muscular system Discuss the structural and functional characteristics of each of the three categories of muscle. Describe the behavioral characteristics common to all muscle tissue and the additional functional roles of skeletal muscle. Describe the events of muscle cell contraction Identify the locations and functions of the muscles of the head, neck, trunk, and upper and lower limbs. Describe and give examples of the types of body motions that occur in the sagittal, frontal, and transverse planes. Define oxygen deficit and muscle fatigue, and list possible causes of muscle fatigue. Describe the changes that occur in aging muscles.</p>	<p>*Body Movements *Histology slides (which include smooth, cardiac, and skeletal muscle) *Muscle Fatigue/Manual Muscle Testing Activity *Labeling of Muscular System and Functions</p>	<p>*Unit Project/Exam</p>
<p>6. Nervous System</p>	<p>List the general functions of the nervous system. Define the central and peripheral nervous system and list the major parts of each. Describe the structure and functions of neurons and neuroglia. Describe the general structure of the neuron, and name its important anatomical regions. Describe the composition of gray and white matter. Describe the events that lead to the generation of a nerve impulse and its</p>	<p>*Histology slides (which include brain tissue, spinal cord tissue, peripheral nerves, and the neuromuscular junction) *Reaction Time Activity *Labeling of Neuron & the Nervous System and Functions *Reflex Lab</p>	<p>*Unit Project/Exam</p>

	<p>conduction from one neuron to another.</p> <p>Describe the location and functions of the brain and its supporting structures. Identify the location and functions of the spinal cord.</p> <p>Explain the organization of the cranial nerves, the spinal nerves, the dorsal and ventral rami, and the plexuses.</p> <p>Differentiate between the functions of the sympathetic and parasympathetic branches of the autonomic nervous system.</p>		
<p>7. Endocrine</p>	<p>Define hormones and target organ.</p> <p>Explain how the endocrine and nervous systems work together to regulate bodily functions.</p> <p>Describe how hormones bring about their effects in the body.</p> <p>Explain how various endocrine glands are stimulated to release their hormonal products.</p> <p>Describe the difference between endocrine and exocrine glands.</p> <p>On an appropriate diagram, identify the major endocrine glands and tissues.</p> <p>List hormones produced by the endocrine glands, and discuss their general functions.</p> <p>Describe major pathological consequences of hypersecretion and hyposecretion of hormones</p>	<p>*Endocrine Gland Poster Activity</p> <p>*Labeling of Endocrine System and Functions</p> <p>*Endocrine Disorder Project</p>	<p>*Unit Project/Exam</p>

	considered in this chapter.		
8. Respiratory System	<p>Name the organs forming the respiratory passageway from the nasal cavity to the alveoli of the lungs (or identify them on a diagram or model), and describe the function of each.</p> <p>Describe the structure and function of the lungs and the pleural coverings.</p> <p>Describe the structure of the respiratory membrane.</p> <p>Define cellular respiration, external and internal respiration, pulmonary ventilation, expiration, and inspiration.</p> <p>Explain how the respiratory muscles cause volume changes that lead to air flow into and out of the lungs (breathing).</p>	<p>*Respiratory Distress Activity</p> <p>*Histology slides (which include Alveoli, Bronchus, Trachea, and Tracheal Cross-Section)</p> <p>*Lung Sounds & Respiratory Rate</p> <p>*Labeling of the Respiratory System and Functions</p>	*Unit Project/Exam
9. Blood Cardiovascular System	<p>Describe the composition and volume of whole blood.</p> <p>Describe the composition of plasma, and discuss its importance in the body.</p> <p>List the cell types making up the formed elements, and describe the major functions of each type.</p> <p>Describe hematopoiesis.</p> <p>Describe the blood-clotting process.</p> <p>Describe the location of the heart in the body, and identify its major anatomical areas on an appropriate model or diagram.</p> <p>Trace the pathway of blood through the heart.</p>	<p>*CBC - Complete Blood Count</p> <p>*Pulse & Blood Pressure Activity</p> <p>*Histology slides (which include Blood, Cardiac Muscle, The Heart Wall, and Arteries & Veins)</p> <p>*Hematocrit Levels</p> <p>*Labeling of the Human Heart and Functions</p>	*Unit Project/Exam

	<p>Compare the pulmonary and systemic circuits. Explain the operation of the heart valves. Name the elements of the intrinsic conduction system of the heart, and describe the pathway of impulses through this system. Explain what information can be gained from an electrocardiogram. Define systole, diastole, stroke volume, cardiac cycle, heart sounds, and heart murmur. Identify the body's major arteries and veins, and name the body region supplied by each. Define pulse, blood pressure, and list factors affecting and/or determining blood pressure. Describe the exchanges that occur across capillary walls.</p>		
<p>10. Lymphatic/Immune System</p>	<p>Explain how the lymphatic system is functionally related to the cardiovascular system and immune defense. Name the 2 major types of structures composing the lymphatic system. Describe the source of lymph, and explain its formation and transport. Describe the function(s) of lymph nodes, tonsils, the thymus, Peyer's patches, and the spleen. Describe the protective functions of skin and mucous membranes.</p>	<p>*Article (HER2 protein and Herceptin)documentary *Autoimmune Disease project *Immune system comic strip</p>	<p>*Unit Project/Exam *Autoimmune Disease Project</p>

	<p>Describe the inflammatory response and how fever helps protect the body. State the roles of B and T cells.</p> <p>Distinguish between active and passive immunity.</p>		
<p>11. Digestive System</p>	<p>Name the organs of the alimentary canal and accessory digestive organs, and identify each on an appropriate diagram or model.</p> <p>Identify the overall function of the digestive system as digestion and absorption of foodstuffs, and describe the general activities of each digestive system organ.</p> <p>Explain how villi aid digestive processes in the small intestine.</p> <p>List the accessory digestive organs, and describe the general function of each.</p> <p>Name the main digestive products of the pancreas and of the liver.</p> <p>List the major enzymes involved in digestion, and name the foodstuffs on which they act.</p>	<p>*Histology slides (which includes Esophagus, Stomach, Small Intestine, and Large Intestine)</p> <p>*Labeling of the Digestive System and Functions</p> <p>*Diet Project</p>	<p>*Unit Project/Exam</p>
<p>12. Urinary System</p>	<p>Describe the location of the kidneys in the body.</p> <p>Describe the function of the kidneys in excretion of nitrogen-containing wastes.</p> <p>Describe the composition of normal and abnormal urine.</p> <p>What is the structural and</p>	<p>*Labeling of the Kidney and Nephron and Function</p>	<p>*Unit Project/Exam</p>

	functional unit of the kidney?		
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ESSENTIAL STANDARDS:

HS-LS1-1 Systems of specialized cells within organisms help them perform the essential functions of life

HS-LS1-2 Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

HS-LS1-3 Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and function even as external conditions change within the range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system

HS-LS1-4 In multicellular organisms, individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism.

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

<https://www.cde.ca.gov/be/st/ss/documents/finalelaccsstandards.pdf>

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
<i>This is the updated text for the course. With the approval of this outline, this text will be board approved.</i>		<i>Introduction to Anatomy & Physiology</i>	Susan J. Hall Michelle A. Provost-Craig William C. Rose	Goodyear-Wilcox	2nd edition	1/1/2021

Other Resource Materials

Dissection Tools Dissection Specimens (Consumables) Suturing Kits & Consumable Sutures Prepared Slides - Histology; Microscopes Models of Joints, Heart, Lungs, Skin, Eye, and Human Skeleton, Rubber Gloves

Supplemental Materials

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, Programs (Pebble Creek, DBQ, etc.):
N/A