

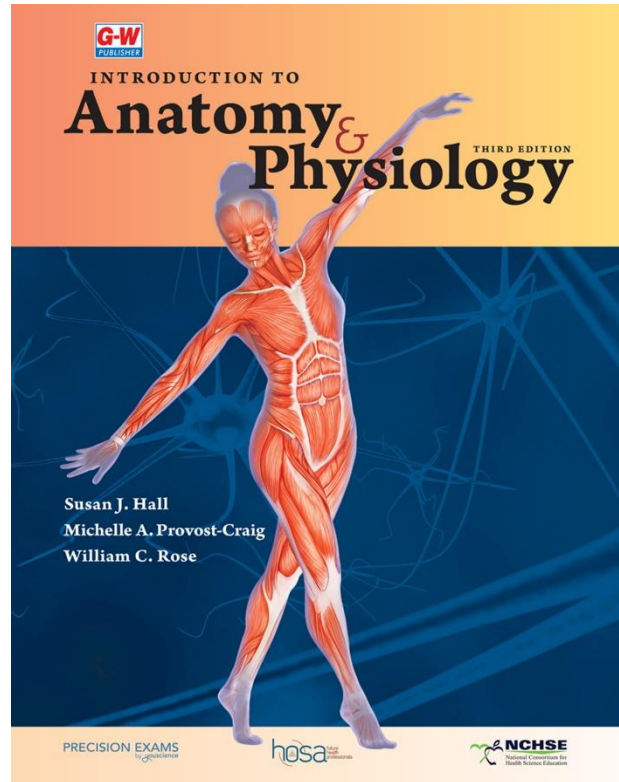


**Correlation of
Introduction to Anatomy and Physiology
(Goodheart-Willcox Publisher ©2024)**

to

Tennessee CTE Anatomy and Physiology Standards (pub. May 2021)

Introduction to Anatomy and Physiology covers all body systems using a student-friendly writing style that makes complex subjects easier to understand. Written specifically for the high school market, the chapters in this textbook are divided into lessons, providing content in a manageable format for the student. To add realism, clinical case studies and real-world applications enhance student interest and involvement. An abundance of study aids, such as learning objectives, lesson summaries, and extensive assessment opportunities increase students' ability to succeed in this challenging course.



Standards / Objectives / Indicators	Textbook Pages
Organization of the Body	
1) Review the relationship between anatomy and physiology (A&P) from previous courses differentiating the major organ systems of the human body by their anatomy and physiology and engage in an argument about defined boundaries due to their functional connectivity. Characterize the organizational levels of the human body and observe patterns in cell types and tissue types across organ systems.	Review: 4-5 Patterns in cells and tissues: 46-95
2) Use a human model to differentiate the major body cavities and organs located within them. Describe the model using proper anatomical and directional terminology for body regions, planes, and cavities.	5-9, 11 (In the Lab), 45 (Lab Investigations #1, 2)
3) Evaluate how organisms use positive and negative feedback mechanisms to maintain their internal environment and	15-18, 19 (Analyze and Apply #1, In the Lab #2, 3), 320-323, 330, 341, 399, 638, 640 (Analyze and Apply #2)

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<p>respond to external environmental changes. Investigate possible consequences that can occur if the body does not maintain homeostasis. Summarize how cellular metabolism can affect the body's homeostatic state.</p>	
Support and Movement	
<p>4) Analyze the anatomical structures of the integumentary system and investigate their role in the physiological processes of protection, temperature homeostasis, and sensation. Assess the microscopic components of the skin layers in a cross-sectional image summarizing potential diseases, disorders, and syndromes possible for each layer.</p>	101-123
<p>5) Summarize the processes of bone formation, growth, and repair. Diagram microscopic bone structures, identifying regions that participate in hematopoiesis and storage of minerals and fat. Discuss diseases and disorders of the skeletal system as they relate to bone formation, growth, repair, hematopoiesis, and storage of minerals and fat.</p>	133, 135-140, 141 (Know and Understand #2-4; Analyze and Apply #1, 3), 165-173, 183 (Lab Investigations #1), 406-407
<p>6) Label on a skeleton, the major bones within the axial and appendicular divisions, relating their physiological roles in creating a body scaffold, internal organ protection, and anchor points for skeletal muscles participating in movement. Demonstrate the generation of movement of bones through antagonistic muscle groups.</p>	142-160, 189-190, 191 (In the Lab #5)
<p>7) Classify joints based on their structure and function. Compare and contrast the three types of joints and provide an example of each including the involvement of tendons, ligaments, bursae, and cartilage where applicable. Determine the effects of various types of arthritis on each category of joint.</p>	161-164
<p>8) Differentiate visceral, cardiac, and skeletal muscle tissues based on anatomical criteria and their physiological role in the movement of body parts and/or substances. Model the gross and microscopic anatomy of skeletal muscle and muscle fibers and provide examples of possible pathophysiology. Use the model to highlight major muscle groups and explain the physiology of skeletal muscle contraction.</p>	186-188, 191 (In the Lab #1), 192-194
Communication, Control and Integration	
<p>9) Relate the hormones produced by the endocrine system to the glands that produce them and their effects on target organs using the concept of negative feedback. Explain the relationship between receptors and ligands and differentiate between steroid and non-steroid hormones as ligands.</p>	318-324
<p>10) Compare and contrast the anatomy of the central nervous system and the peripheral nervous system including possible diseases and disorders of each. Link structures to their physiological roles and include the structure and function of the somatic and autonomic nervous systems in the</p>	230-279

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<p>explanation. Interpret the importance of cerebrospinal fluid and its connection to circulation including the phenomenon of the blood-brain barrier within the brain in the explanation.</p>	
<p>11) Label the cellular and subcellular structures of neurons and explain the molecular neurophysiology of membrane potentials and the conduction of information through synaptic transmission. Evaluate the process of action potentials of the nervous system and name the factors that affect the speed at which a nerve impulse travels.</p>	<p>234-236, 237 (Know and Understand #4-7, Analyze and Apply #1-5), 238-243, 243 (Check Your Understanding #1), 244 (Know and Understand #6, 7, Analyze and Apply #1, 2)</p>
<p>12) Model the major parts of the brain and spinal cord relating each to its source of sensory information and/or its primary target of regulation. Identify and describe the types of sensory receptors found in the human body and explain the structures, functions, and limitations of the human sensory systems: hearing, balance/proprioception, sight, touch, smell, and taste.</p>	<p>245-251, 253-258, 279 (Lab Investigations #1), 280-315</p>
<p>Respiration, Transportation, and Defense</p>	
<p>13) Create an artifact to outline the structure and functions of the cardiovascular system, paying special attention to the musculature of the walls, the chambers, and the valves of the heart and blood vessels. Demonstrate the circulation of blood through the heart comparing and contrasting systemic and pulmonary circulation.</p>	<p>432-439, 440 (In the Lab #1, 2, 3), 446-456, 481 (Lab Investigations #2)</p>
<p>14) Describe the phases of the cardiac cycle and the heart’s internal and external control mechanisms involved in producing the heartbeat. Discuss how heart rate and cardiac output relate to one another. Listen to heart sounds, either digitally or with a stethoscope, to identify the normal and abnormal sounds made during the cardiac cycle. Give reasons for the abnormal sounds encountered.</p>	<p>436-440, 456-459</p>
<p>15) Create or use a model of the human heart to clarify systole and diastole related to blood pressure and the factors affecting blood pressure’s role in homeostasis. Discuss the heart’s intrinsic and extrinsic control mechanisms involved in producing a heartbeat.</p>	<p>432, 458-459, 481 (Lab Investigations #2, 3)</p>
<p>16) Examine how the anatomy of the respiratory system functions to provide oxygen and carbon dioxide transport mechanisms between the lungs and the circulatory system, considering capillary structures, red blood cell structures, diffusion and affinity. Discuss pathophysiology of the cardiorespiratory system and its effects on the human body.</p>	<p>358-393, 462-472</p>
<p>17) Identify the liquid and cellular components of blood using appropriate medical terminology. Summarize the structural characteristics, normal levels, function and life span of each. Analyze how and where each component is manufactured (i.e., as with hematopoiesis and erythropoiesis) and the possible complications with the development of cellular components.</p>	<p>133, 394-429</p>

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18) Breakdown the roles of antigens and antibodies in the blood while explaining the ABO system and Rh classification system. In a lab setting with simulated blood, determine the ABO and Rh of samples with an explanation of results including a description of cross-matching and the causes and possible outcomes of a transfusion reaction.	409-411, 412 (Analyze and Apply #4), 427 (Thinking Critically #1, 3), 429 (Lab Investigations #2)
19) Assess the relationship between the structure and function of the lymphatic system. Differentiate between innate and adaptive immunity, the cells involved, and how each functions to maintain homeostasis in the body.	482-527
20) Interpret the relationship between the integumentary, muscular, and cardiovascular systems in temperature homeostasis. Relate how malfunctions in any of the three systems can affect temperature regulation.	15-18, 64, 101-102, 109 (Analyze and Apply #4, 5), 128 (Thinking Critically #1), 190, 248, 318, 322-323, 396, 399, 432, 500
Nutrition, and Excretion	
21) Model the sequential organization of the alimentary canal and its accessory organs in order to describe the physiological role of each including a discussion of the major digestive enzymes and hormones produced along with their functions. Outline how the hepatic portal system couples the digestive and cardiovascular systems.	541-555, 556 (In the Lab #2)
22) Analyze gastrointestinal wall histology and interpret how the anatomical architecture supports the efficient absorption and transport of molecules into the cardiovascular or lymphatic circulation. Discuss possible outcomes of a disruption of this process.	539-541, 545-548, 556 (Analyze and Apply #1), 557-565, 570 (Thinking Critically #2), 571 (Lab Investigations #2)
23) Demonstrate the progression of lipid transport from the digestive system, through the lymphatic system, and into the cardiovascular circulation.	52-53, 399, 460, 484, 543, 549
24) Design a concept map of the structures of the urinary system in order to establish the physiological role of blood filtration and waste excretion from the body. Include a detailed description of the parts of a nephron and how they assist in homeostatic mechanisms through urine formation. Clarify how disorders of the urinary system affect homeostasis.	572-609
Reproduction, Growth, and Development	
25) Outline the structure and function of the male and female reproductive systems that provide the physiological functions of gametogenesis, fertilization, and embryogenesis, based on the secretion of hormones. Correlate the endocrine tissues of reproductive system with their roles in regulation of secondary sex characteristics, the female menstrual cycle, pregnancy, fetal development, and parturition.	618-632
26) Examine the microscopic structures of the human egg and sperm and determine how those structures relate to their function. Evaluate the process of fertilization then create a timeline of the phases of fetal development from fertilization	633-640

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until birth. Describe the abnormalities that can occur at each phase.	