

Advanced Biology

Text:	<u>Essentials of Human Anatomy and Physiology</u> , Elaine N. Marieb (2006); Eighth Edition, Pearson-Benjamin Cummings.
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Supplemental Materials:	Videos and laboratory manuals.
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Course Description:	Advanced biology is a year long course covering human anatomy and physiology. The class takes a systems approach beginning with the biology of the cell, the organization of the cells into different tissues and the tissues organizing into the organ systems that make up the body. This course includes a surgical observation a Saint Joseph's-Candler Hospital.
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Methods of Evaluation:	Evaluation is based on tests, labs, projects, periodic quizzes and homework assignments.
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Course Objectives:	<p>At the end of each of the following chapters, students should be able to:</p> <p><u>Chapter 1.</u></p> <ol style="list-style-type: none"> 1. Explain how anatomy and physiology are related. 2. Name the structural levels of organization that make up the human body, and explain how they are related. 3. Name the organ systems of the body, and briefly state the major functions of each systems. 4. Define negative feedback, and describe its role in maintaining homeostasis and normal body function. 5. Use proper anatomical terminology to describe anatomical position, body directions, surfaces and body planes. <p><u>Chapter 2.</u></p> <ol style="list-style-type: none"> 1. List the major energy forms and explain how each is used in the human body. 2. Explain how elements and atoms are related. 3. Describe how radioisotopes are used in the diagnosis and treatment of disease. 4. Compare and contrast inorganic and organic compounds. 5. Compare and contrast carbohydrates, lipids, proteins and nucleic acids. 6. Compare and contrast the structure and functions of DNA and RNA. <p><u>Chapter 3.</u></p> <ol style="list-style-type: none"> 1. Identify the parts of a cell and discuss the major function of each. 2. Describe the process of DNA replication and of mitosis. 3. Name the four major tissue types and their chief subcategories.
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<p>Course Objectives (Cont):</p>	<p>Explain how the four major tissue types differ structurally and functionally.</p> <ol style="list-style-type: none"> 4. Describe the process of tissue repair. 5. Distinguish between benign and malignant neoplasms. 6. Explain the significance of the fact that some tissue types are largely amitotic after the growth stages are over. <p><u>Chapter 4.</u></p> <ol style="list-style-type: none"> 1. Describe the structure and functions of the major membrane types. 2. Describe the structure and functions of the integumentary system. 3. Name the factors that determine skin color and describe the function of melanin. 4. Differentiate between first, second and third degree burns and explain the "rule of nines." 5. Describe the major diseases and disorders of the integumentary system. <p><u>Chapter 5.</u></p> <ol style="list-style-type: none"> 1. List the major functions of the skeleton and identify the subdivisions of the skeleton. 2. Name the four main classifications of bones and the major anatomical areas of a long bone. 3. Name and describe the various types of fractures, and describe the process of bone repair and formation. 4. Name the bones of the skull, ribs and vertebral column. 5. Name the bones of the pectoral girdle, the pelvic girdle and the limbs. 6. Name the major categories of joints, and compare the amount of movement allowed by each. 7. Describe the major diseases and disorders of the skeletal system. <p><u>Chapter 6.</u></p> <ol style="list-style-type: none"> 1. Compare and contrast the structure and function of the three types of muscle tissue. 2. Describe the microscopic structure of skeletal muscle, and explain the role of actin and myosin containing myofilaments. 3. Describe the events of muscle cell contraction. 4. Describe the effects of aerobic and resistance exercise on skeletal muscles and other body organs. 5. Describe the different types of body movements. 6. Discuss the criteria used in naming muscles. 7. Identify the major muscles of the human body and state the action of each. 8. Describe the major diseases and disorders of the muscular system.
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<p>Course Objectives (Cont.):</p>	<p><u>Chapter 7.</u></p> <ol style="list-style-type: none"> 1. Describe the structure and function of the nervous system. 2. Define the central nervous system and peripheral nervous system, and list the major parts of each. 3. Describe the general structure, function and classification of neurons. 4. List the types of general sensory receptors, and describe their functions. 5. Describe the generation and conduction of a nerve impulse. 6. Define reflex arc and describe its parts. 7. Identify the major regions of the brain and describe their functions. 8. Describe the structure and functions of the spinal cord. 9. Compare and contrast the sympathetic and parasympathetic divisions of the nervous system. 10. Describe the major diseases and disorders of the nervous system. <p><u>Chapter 9.</u></p> <ol style="list-style-type: none"> 1. Describe the structure, location and functions of the major endocrine organs. 2. Define hormone and target organ and describe how hormones bring about their effects in the body. 3. Compare and contrast endocrine and exocrine glands. 4. List the hormones produced by the endocrine glands and discuss their general functions. 5. Describe the major pathological consequences of hypersecretion and hyposecretion of hormones. 6. Describe the major diseases and disorders of the endocrine system. <p><u>Chapter 10.</u></p> <ol style="list-style-type: none"> 1. Describe the composition and volume of whole blood. 2. Describe the composition of plasma and discuss its importance in the body. 3. List the cell types making up the formed elements and describe the major functions of each type. 4. Describe the blood clotting process. 5. Describe the ABO and Rh blood groups and explain the basis for a transfusion reaction. 6. Describe the major diseases and disorders that involve the blood. <p><u>Chapter 11.</u></p> <ol style="list-style-type: none"> 1. Describe the location of the heart in the body and identify its major anatomical areas. 2. Trace the pathway of blood through the heart. 3. Discuss the operation of the heart valves. 4. Name the elements of the intrinsic conduction system of the
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<p>Course Objectives (Cont.):</p>	<p>heart, and describe the pathway of impulses.</p> <ol style="list-style-type: none"> 5. Define heart sounds and murmurs. 6. Compare and contrast the structure and function of arteries, veins and capillaries. 7. Identify the major arteries and veins of the body and name the body regions supplied by each. 8. Define blood pressure and pulse, and describe the factors that affect blood pressure. 9. Describe the major diseases and disorders of the cardiovascular system. <p><u>Chapter 13.</u></p> <ol style="list-style-type: none"> 1. Name the organs forming the respiratory pathway, and describe the functions of each. 2. Describe the protective mechanisms of the respiratory system. 3. Describe all of the events associated with respiration. 4. Name the non-respiratory air movements and explain how they modify or differ from normal respiratory air movements. 5. Describe how oxygen and carbon dioxide are transported in the blood. 6. Name the physical factors that influence respiratory rate. 7. Describe the major diseases and disorders of the respiratory system. <p><u>Chapter 14.</u></p> <ol style="list-style-type: none"> 1. Name the organs of the alimentary canal and accessory digestive organs and describe their functions. 2. Describe the composition and functions of saliva. 3. Name the deciduous and permanent teeth, and describe the basic anatomy of a tooth. 4. List the major enzymes produced by the digestive system, and name the foodstuffs on which they act. 5. Discuss the six major nutrient categories. 6. List several factors that influence metabolic rate, and indicate the effect of each. 7. Describe the major diseases and disorders of the digestive system.
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