

Allied Health
ANATOMY & PHYSIOLOGY II

Level IV Unit Outline

Unit 1: Safety and School Rules

- Safety drills, first aid, classroom and shop rules.
- The importance of safety in the CTE environment.
- What to do in the case of an emergency.

Unit 2: Endocrine System

- Identify the functions of the endocrine system.
- Describe the secretions of the endocrine system.
- Distinguish between endocrine and exocrine glands.
- Compare the four chemical classes of hormones.
- Describe how hormones are transported in the blood and how they interact with target receptors.
- Explain how the secretion of each hormone is regulated.
- Describe the negative and positive feedback system and how it regulates hormonal secretions. Support with examples.
- Explain the role of the nervous system in control of the hormonal secretions.
- Discuss ways hormones promote body homeostasis.
- Describe the effect of stress on the endocrine system.
- Describe the major pathologic consequences of hyper-secretion and hypo-secretion of endocrine hormones.
- Define important terminology related to the endocrine system.
- Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
- Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms

Unit 3: Blood

- Describe the functions of the lymphatic system.
- Describe the composition of plasma and discussion its importance in the body.
- Distinguish between the formed elements found in the blood.
- Identify the stages involved in blood clotting and explain the various facets that promote and inhibit blood clotting.
- Explain the basis for blood typing.
- Describe how blood reactions may occur between the fetal and maternal tissues.

- Explain the basis of physiological jaundice seen in some newborn babies.
- List and describe disease/disorders associate with the blood.
- Define important terminology related to the blood.

Unit 4: Cardiovascular System

- List the structures of the cardiovascular system and describe their functions.
- Identify the major parts of the heart and describe their functions.
- Describe the flow of blood through the heart.
- Describe the coronary circulation.
- Compare the structures and function of arteries, capillaries, and veins.
- Explain the mechanism that helps in the return of venous blood to the heart.
- Give the physiological basis for arterial pulse, and describe how pulse is measured.
- Describe the factors which create and control blood pressure.
- Define blood pressure and give its relationship to blood flow and resistance.
- Explain and demonstrate how blood pressure is measured.
- Contrast the pulmonary and systemic circuits of the cardiovascular system.
- Trace a drop of blood through the pulmonary and systemic circulations.
- List and describe diseases/disorders associated with the cardiovascular system.
- Define important terminology of the cardiovascular system.

Unit 5: Lymphatic & Immunity

- Describe the functions of the lymphatic system.
- Explain how the lymphatic system is functionally related to the cardiovascular and lymphatic systems.
- Describe the location of the major lymphatic pathways.
- Describe the formation and composition of lymph and explain how it is transported through the lymphatic system.
- Describe a lymph node and its major functions.
- Locate the major chains of lymph nodes.
- Describe the functions of the thymus and the spleen.
- Explain the differences between specific and nonspecific body defenses and provide examples of each defense.
- Define immunity and describe how T and B cells arise.
- Explain the relationship between an antigen and an antibody.
- Explain how allergic reactions and tissue rejection reactions are related to immune mechanisms.
- List and describe disease/disorders associated with the lymphatic system.
- Define important terminology of the lymphatic system.

Unit 6: Digestive System

- Name, describe and locate the structures and organs of the digestive system.
- Describe the functions of the digestive system and the liver.
- Describe the composition and functions of saliva.
- Describe the basic anatomy of the teeth and oral cavity and explain their functions in the digestive system.
- Describe the mechanism of swallowing, vomiting, and defecation.
- Describe the mechanism peristalsis and its role in the G.I. tract.
- List the enzymes secreted by the various digestive organs and describe the function of each.
- Explain how gastric secretions are regulated.
- List and describe the four layers of the wall of the G.I. tract.
- Describe the structure and function of the liver and gall bladder.
- Describe the pancreatic structure.
- List and explain the digestive function of the pancreatic secretions.
- Describe the structure and function of the small intestine.
- Describe the structure and function of the large intestine and the rectum.
- Explain how the processes in the stomach, liver, pancreas, gall bladder, and small intestines are coordinated.
- Describe the absorption of nutrients in the small intestine.
- Define enzyme, metabolism, anabolism, and catabolism.
- List in sequence each structure through which a bite of food passes on its way through the digestive system.
- List and describe diseases/disorders associated with the digestive system.
- Define important terminology of the digestive system.

Unit 7: Nutrition & Metabolism

- Differentiate between catabolism and anabolism.
- Differentiate between the anaerobic and aerobic phases of glucose catabolism, and give the end products and the relative amount of energy released by each.
- Define metabolic rate, and name six factors that affect it.
- Explain how carbohydrates, fats, and proteins are metabolized for energy.
- Compare the energy contents of carbohydrates, fats, and proteins.
- List the recommended percentages of carbohydrate, fat, and protein in the diet.
- Distinguish between simple and complex carbohydrates, giving examples of each.
- Compare saturated and unsaturated fats.
- Define essential amino acid.
- Explain the roles of minerals and vitamins in nutrition, and give examples of each.
- List six adverse effects of alcohol consumption.

- Describe four nutritional disorders.
- Explain how heat is produced and lost in the body.
- Describe the role of the hypothalamus in regulating body temperature.
- Explain the role of fever in disease.
- Describe responses to excessive heat and cold.
- Using the case study and the text, define anorexia nervosa, and list some of its adverse effects.
- Show how word parts are used to build words related to metabolism, nutrition, and body temperature.

Unit 8: Respiratory System

- Describe the general functions of the respiratory system.
- List and describe the structure and organs of the respiratory system.
- Describe the functions of the structures and organs of the respiratory system.
- Describe the protective mechanisms in the respiratory system.
- Describe the events involved in inspiration and preparation.
- List and describe each of the respiratory air volumes.
- Outline the types of non-respiratory air movements and describe how each occurs.
- Explain how the respiratory muscles cause volume changes that lead to air flow into and out of the lungs.
- Describe the process of gas exchanges in the lungs and tissues.
- Explain how respiratory gasses are carried by the blood.
- Name the main areas involved in the control of respiration.
- List three factors that influence respiratory rate.
- Explain the major events that occur during cellular respiration.
- Explain how oxygen is used by cells.
- Trace the breath of air through the respiratory system from nose to alveoli.
- Describe the symptoms and probable causes of Chronic Obstructive Pulmonary Disease and lung cancer.
- Describe diseases/disorders associated with the respiratory system.
- Define important terminology relate to the respiratory system.

Unit 9: Urinary System

- List the structures and organs of the urinary system and describe their general functions.
- Describe the location and the structure of the kidneys.
- Describe the pathway of blood through the major vessels within a kidney.
- Explain how a nephron works and describe how the major parts function.
- Describe the production of glomerular filtrate and its composition.
- Describe the factors which affect the rate of glomerular filtration and how it is regulated.
- Describe the role that tubular re absorption plays in urine formation.

- Describe the structure of the ureters, urinary bladder, and urethra.
- List and describe diseases/disorders associated with the urinary system.
- Define important terminology of the urinary system.

Unit 10: Water, Electrolytes, & Acid/Base Balance

- Describe the various fluid compartments of the body.
- Explain what is meant by water and electrolyte balance and discuss the importance of this balance.
- Explain how electrolytes enter and leave the body and how the input and output of electrolytes are regulated.
- Explain what is meant by acid/base balance.
- Explain the functions of sodium, chloride, potassium, calcium, phosphate, and magnesium and regulation of their concentrations.
- List the major sources of hydrogen used in the body.
- Compare the role of buffers, exhalation of carbon dioxide, and kidney excretion of H^+ in maintaining pH of body fluids.
- List and describe disease/disorders associated with fluid, acid/base and electrolyte balance.
- Define important terminology related to fluid, electrolyte, and acid/base homeostasis.

Unit 11: Reproductive Systems

Female Reproductive

- State the functions of the female reproductive system.
- List the parts of the female reproductive system and describe the functions of each part.
- Describe the structure of the ovary and how egg cells and follicles are formed,
- Describe the role that hormones play in control of the female reproductive system and in the development of secondary sexual characteristics.
- List the major events that occur during the menstrual cycle.
- Describe the process of fertilization and identify the time of the menstrual cycle at which sexual intercourse is most likely to result in pregnancy.
- Describe the major events of pregnancy.
- Describe the functions of the amnion and placenta.
- Describe the stages of birth and role that hormones play in this process.
- Describe the structure and function of mammary glands.
- Identify several methods of birth control and evaluate the effectiveness of each method.
- Explain the symptoms and causes of sexually transmitted diseases.
- List and describe diseases/disorders associated with the female reproductive system.
- Define important terminology of the female reproductive system.
- State the function of the male reproductive system.

Male Reproductive

- List the parts of the male reproductive system and describe the function of each part.
- Name the endocrine and exocrine products of the testes.

- Discuss the importance of semen and name the glands that produce it.
- Describe the structure of sperm and relate the structure to its function.
- Trace the pathway followed by sperm from the testes to the exterior of the body.
- Explain the symptoms and causes of sexually transmitted diseases.
- List and describe diseases/disorders associated with the male reproductive system.
- Define important terminology related to the male reproductive system.

Unit 12: Pregnancy, Growth, & Development

- Describe fertilization and the early development of the fertilized egg.
- Describe the structure and function of the placenta.
- Describe how fetal circulation differs from adult circulation
- Name five hormones active during pregnancy, and describe the function of each.
- Briefly describe changes that occur in the embryo, fetus, and mother during pregnancy.
- Briefly describe the four stages of labor.
- Name the hormones active in lactation, and describe the action of each.
- Cite the advantages of breast-feeding.
- Describe four disorders associated with the placenta.
- Explain how breast cancer is diagnosed and treated.
- Cite four possible causes of lactation disturbances.
- Referring to the case study and the text, discuss possible causes of high-risk pregnancies.
- Show how word parts are used to build words related to development and birth.

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ANATOMY & PHYSIOLOGY II
New Jersey Student Learning Standards (NJSLS)

NJSLS: CTE.9.3

CONTENT AREA:	9.3 CAREER AND TECHNICAL EDUCATION
HEALTH SCIENCE CAREER CLUSTER	
Number	Standard Statement
<i>By the end of Grade 12, Career and Technical Education Program completers will be able to:</i>	
CAREER CLUSTER®:	HEALTH SCIENCE (HL)
9.3.HL.1	Determine academic subject matter, in addition to high school graduation requirements, necessary for pursuing a health science career.
9.3.HL.2	Explain the healthcare workers' role within their department, their organization and the overall healthcare system
9.3.HL.3	Identify existing and potential hazards to clients, coworkers, visitors and self in the healthcare workplace
9.3.HL.4	Evaluate the roles and responsibilities of individual members as part of the healthcare team and explain their role in promoting the delivery of quality health care.
9.3.HL.5	Analyze the legal and ethical responsibilities, limitations and implications of actions within the healthcare workplace.
9.3.HL.6	Evaluate accepted ethical practices with respect to cultural, social and ethnic differences within the healthcare workplace.
CAREER CLUSTER®:	HEALTH SCIENCE (HL)
PATHWAY	HEALTH INFORMATICS (HL-HI)
9.3.HL-HI.1	Communicate health information accurately and within legal and regulatory guidelines, upholding the strictest standards of confidentiality.
9.3.HL-HI.2	Describe the content and diverse uses of health information.
9.3.HL-HI.3	Demonstrate the use of systems used to capture, retrieve and maintain confidential health information from internal and external sources.
CAREER CLUSTER®:	HEALTH SCIENCE (HL)
PATHWAY	THERAPEUTIC SERVICES HL-THR

9.3.HL-THR.1	Utilize communication strategies to answer patient/client questions and concerns on planned procedures and goals.
9.3.HL-THR.2	Communicate patient/client information among healthcare team members to facilitate a team approach to patient care.
9.3.HL-THR.3	Utilize processes for assessing, monitoring and reporting patient's/clients' health status to the treatment team within protocol and scope of practice.
9.3.HL-THR.4	Evaluate patient/client needs, strengths and problems in order to determine if treatment goals are being met.