



Lakeshore Technical College

10-806-189 Basic Anatomy (WTCS)

Course Outcome Summary

Course Information

Description	Examines concepts of anatomy and physiology as they relate to health careers. Learners correlate anatomical and physiological terminology to all body systems.
Total Credits	3
Total Hours	54

Types of Instruction

Instruction Type	Credits/Hours
Blended/Online	54

Textbooks

Valerie C. Scanlon and Tina Sanders. *Essentials of Anatomy and Physiology*. F. A. Davis Company. 1999. **Edition:** Third Edition. **ISBN:** 0-8036-0407-6. Required.

Valerie C. Scanlon and Tina Sanders. *Essentials of Anatomy and Physiology Student Workbook*. F. A. Davis Company. 1999. **Edition:** Third. **ISBN:** 0-8036-0408-4. Required.

Core Abilities

1. Apply learning

Criteria

- 1.1. Learner transfers academic knowledge and principles to life and work situations
- 1.2. Learner incorporates prior learning
- 1.3. Learner knows when to ask for help
- 1.4. Learner demonstrates appropriate safety precautions
- 1.5. Learner identifies the need for lifelong learning
- 1.6. Learner develops the ability to research beyond the required work
- 1.7. Learner demonstrates a curiosity for learning about cultures, norms, and practices

2. Communicate effectively

Criteria

- 2.1. Learner comprehends written materials
- 2.2. Learner writes clearly, concisely, and accurately
- 2.3. Learner adjusts communication style in order to meet the needs of others
- 2.4. Learner demonstrates active listening skills
- 2.5. Learner uses culturally appropriate verbal and non-verbal communication methods

3. Demonstrate critical thinking

Criteria

- 3.1. Learner determines issues that merit action
- 3.2. Learner takes initiative in the problem solving processes
- 3.3. Learner makes decisions considering alternatives and consequences
- 3.4. Learner refines action plans based on evaluation of feedback
- 3.5. Learner identifies interdependencies of world issues & events

4. Demonstrate responsible and professional workplace behaviors

Criteria

- 4.1. Learner displays behavior consistent with the ethical standards within a discipline or profession
- 4.2. Learner follows policies and procedures
- 4.3. Learner attends class as mandated by the instructor
- 4.4. Learner completes assignments on time
- 4.5. Learner exhibits academic honesty
- 4.6. Learner accepts responsibility and accountability for his/her actions
- 4.7. Learner demonstrates time management and task prioritization
- 4.8. Learner demonstrates ability to handle ambiguity and unfamiliar situations

5. Integrate technology

Criteria

- 5.1. Learner determines which tasks can be performed more efficiently by using technology
- 5.2. Learner uses technology to perform tasks more efficiently
- 5.3. Learner adapts to changing/emerging technology
- 5.4. Learner selects culturally appropriate technology/tools to communicate with diverse groups

Course Competencies

1. Explain concept of homeostasis as it relates to anatomy and physiology.

Assessment Strategies

- 1.1. by active participation in group activities.
- 1.2. without the use of notes or textbooks on a written examination.
- 1.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 1.1. Comparison includes similarities and differences between anatomy and physiology.
- 1.2. Learner provides physiological and anatomical examples of homeostasis.
- 1.3. Correlation includes relationship between negative feedback mechanisms and homeostasis.

Learning Objectives

- 1.a. Define anatomy, physiology, and pathology
- 1.b. Illustrate the relationship between anatomy, physiology, and pathology
- 1.c. Provide physiological and anatomical examples of homeostasis
- 1.d. Explain the relationship between negative feedback mechanisms and homeostasis

2. Relate body structures to body systems and functions.

Assessment Strategies

- 2.1. by active participation in group activities.
- 2.2. without the use of notes or textbooks on a written examination.
- 2.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 2.1. Learner identifies organs and tissues within each body system.
- 2.2. Body's levels of organization are outlined.
- 2.3. Terminology associated with body's level of organization is examined.
- 2.4. Body functions and body systems are linked.

Learning Objectives

- 2.a. Outline the body's levels of organization from simplest to most complex

- 2.b. List body systems
- 2.c. Identify organs and tissues within each body system
- 2.d. Explain the function of each system

3. Relate anatomical terminology to body regions, body and organ planes, and body cavities.

Assessment Strategies

- 3.1. by active participation in group activities.
- 3.2. without the use of notes or textbooks on a written examination.
- 3.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 3.1. Learner demonstrates correct anatomical position.
- 3.2. Terminology associated with sections, planes, and body structure positional relationships is applied.
- 3.3. Abdominal organs are identified by abdominopelvic cavity regions.
- 3.4. Viscera are identified by their specific body cavities.

Learning Objectives

- 3.a. Describe the anatomical position
- 3.b. Use proper terminology when referring to body sections, planes, and positional relationships
- 3.c. Identify abdominal organs by their placement in abdominopelvic cavity regions
- 3.d. Identify viscera in their respective body cavities

4. Examine basic concepts of chemistry.

Assessment Strategies

- 4.1. by active participation in group activities.
- 4.2. without the use of notes or textbooks on a written examination.
- 4.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 4.1. Comparison includes similarities and differences between types of chemical bonds.
- 4.2. Examination includes the functions and body compartments of water.
- 4.3. Components of a solution are characterized by amount, consistency, and function.
- 4.4. Concept of homeostasis is applied to pH of body fluids.
- 4.5. Comparison includes similarities and differences between RNA and DNA.
- 4.6. Role of enzymes in body is examined.

Learning Objectives

- 4.a. Differentiate between ionic and covalent bonds
- 4.b. Identify the components of a solution
- 4.c. Explain the importance of water in the body
- 4.d. Apply the concept of homeostasis to the pH of body fluids
- 4.e. Compare similarities and differences between RNA and DNA
- 4.f. Describe how enzymes work in the body

5. Compare cellular transport mechanisms.

Assessment Strategies

- 5.1. by active participation in group activities.
- 5.2. without the use of notes or textbooks on a written examination.
- 5.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 5.1. Components of cell membrane are analyzed.
- 5.2. Learner identifies intracellular components.
- 5.3. Intracellular components of a cell are related to the functions of a cell.
- 5.4. Transport mechanisms of a cell are characterized by action and function.

Learning Objectives

- 5.a. Compare passive transport mechanisms: diffusion, osmosis, and filtration
- 5.b. Give an example of the role of each transport mechanism in the body

6. Examine major cellular functions.

Assessment Strategies

- 6.1. by active participation in group activities.
- 6.2. without the use of notes or textbooks on a written examination.
- 6.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 6.1. Steps of protein synthesis are identified.
- 6.2. Comparison includes similarities and differences between mitosis and meiosis.
- 6.3. Outcomes or consequences of mitosis and meiosis are compared.

Learning Objectives

- 6.a. Identify the basic parts of a cell
- 6.b. State the functions of the basic parts of a cell
- 6.c. Describe cell membranes
- 6.d. List the steps in protein synthesis
- 6.e. Compare mitosis and meiosis
- 6.f. Discuss the outcomes of mitosis and meiosis

7. Characterize primary tissue types of body.

Assessment Strategies

- 7.1. by active participation in group activities.
- 7.2. without the use of notes or textbooks on a written examination.
- 7.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 7.1. Identifies primary tissues of body according to location and function.
- 7.2. Components within each primary tissue type are compared.
- 7.3. Serous and mucous membranes of body are compared.
- 7.4. Comparison includes similarities and differences between epithelial tissues.

Learning Objectives

- 7.a. List the four main types of body tissue
- 7.b. Outline the general characteristics of each tissue type
- 7.c. Explain the differences among skeletal muscle, smooth muscle, and cardiac muscle
- 7.d. Give an example of each of the tissue types with respect to the organs or organ system in which they are found
- 7.e. State the location of mucus membranes
- 7.f. List the functions of mucus membranes
- 7.g. Compare the following serous membranes: pleura, pericardium, peritoneum
- 7.h. List the functions of serous membranes

8. Relate integumentary components to integumentary functions.

Assessment Strategies

- 8.1. by active participation in group activities.
- 8.2. without the use of notes or textbooks on a written examination.
- 8.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 8.1. Functions of integumentary system are identified.
- 8.2. Location, structure, and function of layers of skin are compared.
- 8.3. Hair is characterized by structure and location.
- 8.4. Tissues of integumentary system are identified according to location and function.

Learning Objectives

- 8.a. List the functions of the integumentary system
- 8.b. Name the two major layers of the skin
- 8.c. Name the tissue found in the subcutaneous layer of the skin
- 8.d. Discuss the glands found in the skin and their secretions
- 8.e. List the sensory receptors found in the dermis
- 8.f. Name the skin sensation that is not always lost when a local anesthetic is injected
- 8.g. Explain the effects of medication on the skin
- 8.h. Define keratin
- 8.i. Describe the function of melanocytes and melanin
- 8.j. State the skin layer in which melanin is produced
- 8.k. Locate sebaceous glands, sudoriferous glands, epidermal layer, dermal layer, subcutaneous layer, hair follicles, hair, nerve endings, pressure receptors, and adipose cells on a cross-section of skin diagram
- 8.l. Discuss the most effective method of preventing the spread of disease

9. Evaluate the inflammation process.

Assessment Strategies

- 9.1. by active participation in group activities.
- 9.2. without the use of notes or textbooks on a written examination.
- 9.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 9.1. Examination process includes the significance of inflammation.
- 9.2. Evaluation includes symptoms of both local and systemic inflammation.
- 9.3. Symptoms of inflammation are explained by anatomical and physiological changes.
- 9.4. Evaluation includes influence of chemical mediators in the inflammatory process.

Learning Objectives

- 9.a. State the significance of inflammation
- 9.b. List the four classic symptoms of the inflammatory process
- 9.c. Describe each step in the inflammatory process

10. Compare the axial and appendicular portions of human skeleton.

Assessment Strategies

- 10.1. by active participation in group activities.
- 10.2. without the use of notes or textbooks on a written examination.
- 10.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 10.1. Comparison includes differences between axial and appendicular skeleton.
- 10.2. Bones of axial and appendicular skeleton are identified correctly.
- 10.3. Comparison includes similarities and differences between bone shapes and gross anatomical characteristics.
- 10.4. Cells of bone are compared.
- 10.5. Composition of bone is examined.

Learning Objectives

- 10.a. Describe the functions of the skeletal system
- 10.b. Describe the two main divisions of the skeleton
- 10.c. Describe the basic structure of bone tissue
- 10.d. Explain how bones are classified
- 10.e. Locate and identify the bones of the human skeleton discussed in class
- 10.f. Discuss the disease process of osteoporosis

11. Assess growth of bone tissue.

Assessment Strategies

- 11.1. by active participation in group activities.

- 11.2. without the use of notes or textbooks on a written examination.
- 11.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 11.1. Steps in bone growth are characterized by anatomical and physiological changes.
- 11.2. Cells of bone growth are identified.
- 11.3. Analysis includes factors that affect bone growth and bone maintenance.
- 11.4. Disease process of osteoporosis is compared to normal bone maintenance.

Learning Objectives

- 11.a. Explain how bones grow in length and circumference

12. Summarize the muscular system.

Assessment Strategies

- 12.1. by active participation in group activities
- 12.2. without the use of notes or textbook on a written examination
- 12.3. by achieving a 76% or higher on a written examination

Criteria

- 12.1. Describe the functions of the muscular system.
- 12.2. List the characteristics of muscle tissue.
- 12.3. Differentiate the three basic types of muscle tissue.
- 12.4. Compare isotonic and isometric contractions.
- 12.5. Locate and identify the muscles of the body discussed in class.

Learning Objectives

- 12.a. Describe the functions of the muscular system
- 12.b. List the characteristics of muscle tissue
- 12.c. Differentiate the three basic types of muscle tissue

13. Correlate activities at neuromuscular junction with the sliding filament theory.

Assessment Strategies

- 13.1. by active participation in group activities.
- 13.2. without the use of notes or textbooks on a written examination.
- 13.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 13.1. Energy requirements of a contracting muscle are examined.
- 13.2. Phases of sliding filament theory are characterized by outcome and interaction between muscle filaments.
- 13.3. Comparison includes similarities and differences between isotonic and isometric contractions.
- 13.4. Comparison includes similarities and differences between a polarized muscle cell and a depolarized muscle cell.
- 13.5. Major muscles of body are identified.
- 13.6. Interaction between nerve tissue and muscle tissue is analyzed.
- 13.7. Structure of a normal muscle fiber is identified.
- 13.8. Anatomical and synergistic muscles are compared.

Learning Objectives

- 13.a. Define the neuromuscular junction
- 13.b. Explain how nerve impulses cause muscles to contract
- 13.c. Summarize the phases of the sliding filament theory
- 13.d. Compare isotonic and isometric contractions

14. Compare divisions of nervous system by location, structure, and functions.

Assessment Strategies

- 14.1. by active participation in group activities.
- 14.2. without the use of notes or textbooks on a written examination.

14.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 14.1. Divisions of nervous system are identified.
- 14.2. Comparison includes similarities and differences between cells of nerve tissue.
- 14.3. Actions at a synapse are characterized by anatomical and physiological changes.
- 14.4. Types of neurons and nerves are compared by structure, location, and function.
- 14.5. Components of a reflex arc are identified.
- 14.6. Comparison includes similarities and differences between brain structures.
- 14.7. Spinal and cranial nerves are compared by numbers, location, and function.
- 14.8. Divisions of autonomic nervous system are compared by function.

Learning Objectives

- 14.a. Discuss the structural divisions of the nervous system
- 14.b. Discuss the functional divisions of the nervous system
- 14.c. List the basic function of the nervous system
- 14.d. State the function of each part of the neuron
- 14.e. Describe the different types of neurons and nerves found in the body
- 14.f. Compare spinal and cranial nerves by numbers, location, and function
- 14.g. Describe the nerve impulse transmission at the synapse
- 14.h. Locate the parts of the brain
- 14.i. State the functions of the different parts of the brain

15. Compare sensory receptors of body tissues.

Assessment Strategies

- 15.1. by active participation in group activities.
- 15.2. without the use of notes or textbooks on a written examination.
- 15.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 15.1. Examination includes significance of referred pain.
- 15.2. Comparison includes similarities and differences between senses of hunger, thirst, and taste.
- 15.3. Examination includes structures and their functions in the sound pathway.
- 15.4. Physiology of vision is examined.
- 15.5. Structures of eye and ear are correlated to the functions of the eye and ear.
- 15.6. Tissue sensory receptors are identified according to location and function.

Learning Objectives

- 15.a. Discuss the role of sensory receptors in the body
- 15.b. Name the parts of the eye
- 15.c. Locate the parts of the eye
- 15.d. State the functions of each part of the eye
- 15.e. Describe the physiology of vision
- 15.f. Name the three principle divisions of the ear
- 15.g. Locate the structures of the ear
- 15.h. State the function of the structures of the ear
- 15.i. Describe the physiology of hearing
- 15.j. Describe the physiology of equilibrium

16. Relate hormone actions to tissues.

Assessment Strategies

- 16.1. by active participation in group activities.
- 16.2. without the use of notes or textbooks on a written examination.
- 16.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 16.1. Examination includes the role hormones play in maintaining homeostasis.
- 16.2. Hormones are classified by chemical structure.
- 16.3. Components of endocrine system are identified by location, structure, and function.
- 16.4. Actions of hormones are compared.
- 16.5. Comparison includes similarities and differences between the hormones secreted, functions of those hormones, structure and hypothalamus interaction between anterior and posterior pituitary.

Learning Objectives

- 16.a. Discuss the role hormones play in maintaining homeostasis
- 16.b. Differentiate between endocrine and exocrine glands
- 16.c. List examples of endocrine glands
- 16.d. List examples of exocrine glands
- 16.e. Name the hormones secreted by each endocrine gland
- 16.f. State the function of each hormone
- 16.g. Explain the negative feedback mechanism

17. Analyze composition and functions of blood.

Assessment Strategies

- 17.1. by active participation in group activities.
- 17.2. without the use of notes or textbooks on a written examination.
- 17.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 17.1. Learner identifies characteristics and normal values of blood.
- 17.2. Plasma proteins are compared by abundance and functions.
- 17.3. Structure of an erythrocyte is correlated to its functions.
- 17.4. Examination includes steps of erythropoiesis.
- 17.5. Types of anemia are correlated to anatomical and physiological changes of an erythrocyte.
- 17.6. Explanation includes what happens to an erythrocyte when its lifespan expires.
- 17.7. Blood types are compared by antigen and antibody arrangement.
- 17.8. Leukocytes are classified by functions.
- 17.9. Functions of platelets are identified.
- 17.10. Assessment includes stages of hemostasis.

Learning Objectives

- 17.a. Identify characteristics and normal values of blood.
- 17.b. Compare plasma proteins.
- 17.c. Correlate structure of erythrocytes to erythrocyte functions.
- 17.d. Examine erythropoiesis.
- 17.e. Correlate pathology of erythrocytes to types of anemia.
- 17.f. Explain what happens to an erythrocyte when its life span is expired.
- 17.g. Compare blood types.
- 17.h. Classify leukocytes by functions.
- 17.i. Identify functions of platelets.
- 17.j. Assess stages of hemostasis.

18. Analyze regulation of blood flow.

Assessment Strategies

- 18.1. by active participation in group activities.
- 18.2. without the use of notes or textbooks on a written examination.
- 18.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 18.1. Structure and function of types of blood vessels are contrasted.
- 18.2. Pulmonary and systemic circulation are compared.
- 18.3. Major blood vessels of body are identified according to location.
- 18.4. Relationship between blood vessel type and blood pressure are correlated.
- 18.5. Body systems and tissues involved in regulating blood pressure are identified according to actions.

Learning Objectives

- 18.a. Contrast arteries, veins and capillaries.
- 18.b. Compare pulmonary and systemic circulation.
- 18.c. Identify major blood vessels of body.
- 18.d. Correlate blood pressure to types of blood vessels.
- 18.e. Identify body systems involved in maintaining and regulating blood pressure.

19. Evaluate mechanisms that regulate heart rate.

Assessment Strategies

- 19.1. by active participation in group activities.
- 19.2. without the use of notes or textbooks on a written examination.
- 19.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 19.1. Relationship between heart chambers and their respective blood vessels are established.
- 19.2. Relationship between heart chambers and their respective heart valves are established.
- 19.3. Blood flow through heart is demonstrated.
- 19.4. Blood flow to and within myocardium is identified.
- 19.5. Events of cardiac cycle are characterized by sequence and outcome.
- 19.6. Normal heart rate values are identified.
- 19.7. Terminology associated with heart functions is contrasted by action and outcome.
- 19.8. Brain centers involved in regulating blood pressure are examined.

Learning Objectives

- 19.a. Correlate chambers of heart to their respective blood vessels.
- 19.b. Correlate chambers of heart with their respective heart valves.
- 19.c. Map blood flow through heart.
- 19.d. Identify blood vessels of myocardium.
- 19.e. Characterize sequence of events in the cardiac cycle.
- 19.f. Analyze cardiac conduction pathway.
- 19.g. Contrast terminology associated with heart functions (e.g. stroke volume, venous return).
- 19.h. Examine brain centers involved in regulating blood pressure.

20. Analyze components of lymphatic system.

Assessment Strategies

- 20.1. by active participation in group activities.
- 20.2. without the use of notes or textbooks on a written examination.
- 20.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 20.1. Composition of lymph is characterized by amount, origin, and function.
- 20.2. Comparison includes similarities and differences between types of lymphatic vessels.
- 20.3. Locations of lymphatic nodes and nodules are identified.
- 20.4. Relationship between spleen structure and function are established.
- 20.5. Relationship between thymus structure and function are established.

Learning Objectives

- 20.a. Characterize composition of lymph.
- 20.b. Compare types of lymphatic vessels.
- 20.c. Identify areas of lymphatic nodes and lymphatic nodules.
- 20.d. Correlate structure of spleen with its functions.
- 20.e. Correlate structure of thymus with its functions.

21. Compare types of immunity.

Assessment Strategies

- 21.1. by active participation in group activities.
- 21.2. without the use of notes or textbooks on a written examination.

21.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 21.1. Cells of immunity are identified according to origin and function.
- 21.2. Comparison includes similarities and differences between antigens and antibodies.
- 21.3. Comparison includes similarities and differences between acquired and genetic immunity.
- 21.4. Analysis includes actions of cell-mediated and humoral immunity.

Learning Objectives

- 21.a. Identify cells of immunity.
- 21.b. Compare antigens and antibodies.
- 21.c. Compare acquired and genetic immunity.
- 21.d. Analyze actions of cell-mediated and humoral immunity.

22. Evaluate ventilation.

Assessment Strategies

- 22.1. by active participation in group activities.
- 22.2. without the use of notes or textbooks on a written examination.
- 22.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 22.1. Components of upper and lower respiratory tract are compared by location, structure, and function.
- 22.2. Lung serous and mucous membranes are identified according to location and function.
- 22.3. Mechanisms of inspiration and expiration are characterized.
- 22.4. Assessment includes location and process of gas exchange.
- 22.5. Transportation of oxygen and carbon dioxide in body are compared.
- 22.6. Various measurements of pulmonary volumes are analyzed.
- 22.7. Interactions between chemoreceptors and nerve tissue in maintaining homeostasis of respiration are established.
- 22.8. Relationship between blood pH and respiration is established.

Learning Objectives

- 22.a. Compare structures of upper and lower respiratory tracts.
- 22.b. Identify location and functions of lung serous membranes.
- 22.c. Characterize mechanisms of air movement during inspiration and expiration.
- 22.d. Assess gas exchange.
- 22.e. Compare oxygen and carbon dioxide transportation.
- 22.f. Analyze terminology associated with measuring pulmonary volumes.
- 22.g. Correlate actions of chemoreceptors with nervous system regulation of ventilation.
- 22.h. Relate ventilation with pH balance of blood.

23. Analyze digestion and absorption.

Assessment Strategies

- 23.1. by active participation in group activities.
- 23.2. without the use of notes or textbooks on a written examination.
- 23.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 23.1. Learner maps food pathway from oral cavity to rectum.
- 23.2. Divisions of digestive system are compared by structures included, location, and overall function.
- 23.3. Digestive system structures and their respective functions are compared.
- 23.4. Layers of alimentary canal wall are identified.
- 23.5. Functions of liver are compared.
- 23.6. Functions of small and large intestine are compared.
- 23.7. Examination includes structures and process of defecation reflex.

Learning Objectives

- 23.a. Map pathway food products take from the oral cavity to the rectum.
- 23.b. Compare divisions of digestive system.
- 23.c. Compare functions of structures within the digestive system.
- 23.d. Identify layers of alimentary canal wall.
- 23.e. Compare functions of liver.
- 23.f. Compare functions of large and small intestines.
- 23.g. Examine defecation reflex.

24. Assess the urinary system's role in maintaining homeostasis of blood volume, blood pressure, and blood pH.

Assessment Strategies

- 24.1. by active participation in group activities.
- 24.2. without the use of notes or textbooks on a written examination.
- 24.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 24.1. Functions of urinary system are identified.
- 24.2. Components of urinary system are identified by microscopic and gross anatomical appearance.
- 24.3. Urine formation is analyzed by process and regulation.
- 24.4. Examination includes process by which kidneys regulation blood pH.
- 24.5. Urination reflex is evaluated.
- 24.6. Comparison includes similarities and differences between mechanisms of water intake and water output.
- 24.7. Analysis includes clinical relevance of electrolyte concentrations in body fluids.
- 24.8. Types of acidosis and alkalosis are compared.

Learning Objectives

- 24.a. Identify functions of urinary system.
- 24.b. Identify gross anatomical and microscopic appearance of urinary system components.
- 24.c. Analyze urine formation.
- 24.d. Compare mechanisms that regulate urine formation.
- 24.e. Examine how kidneys balance pH of body fluids (particularly blood).
- 24.f. Analyze clinical relevance of urine composition.
- 24.g. Evaluate urination reflex.
- 24.h. Compare mechanisms that regulate water intake and output.
- 24.i. Analyze electrolyte concentrations in body fluids and the clinical relevance.
- 24.j. Compare respiratory acidosis and alkalosis.
- 24.k. Compare metabolic acidosis and alkalosis.

25. Differentiate between stages of menstrual cycle.

Assessment Strategies

- 25.1. by active participation in group activities.
- 25.2. without the use of notes or textbooks on a written examination.
- 25.3. by achieving a 76% or higher on a written examination.

Criteria

Criteria:

- 25.1. Structures of female reproductive system are identified.
- 25.2. Interactions between pituitary hormones and ovaries and mammary glands are compared.
- 25.3. Analysis includes follicular changes during menstrual cycle.

Learning Objectives

- 25.a. Identify structures of female reproductive system.
- 25.b. Compare interactions between pituitary hormones and the ovaries and mammary glands.
- 25.c. Relate changes in endometrium to ovarian cycle.
- 25.d. Analyze follicular changes during menstrual cycle.

26. Analyze stages of spermatogenesis.

Assessment Strategies

- 26.1. by active participation in group activities.
- 26.2. without the use of notes or textbooks on a written examination.
- 26.3. by achieving a 76% or higher on a written examination.

Criteria*Criteria:*

- 26.1. Learner maps route sperm take through male reproductive system.
- 26.2. Structures of male reproductive system are identified.
- 26.3. Relationship between accessory reproductive glands and spermatogenesis is established.
- 26.4. Cells of spermatogenesis are identified according to location and function.

Learning Objectives

- 26.a. Map spermatozoa movement through male reproductive system.
- 26.b. Identify structures of male reproductive system.
- 26.c. Relate accessory reproductive glands to spermatogenesis.
- 26.d. Identify cells of spermatogenesis.

27. Correlate microbiology terminology with human disease processes.**Assessment Strategies**

- 27.1. by active participation in group activities.
- 27.2. without the use of notes or textbooks on a written examination.
- 27.3. by achieving a 76% or higher on a written examination.

Criteria*Criteria:*

- 27.1. Comparison includes similarities and differences between common microorganisms.
- 27.2. Terminology associated with reservoirs and spread of infection are classified.
- 27.3. Portals of microorganism entry and exit are compared.
- 27.4. Relationship between disease and specific types of microorganisms is examined.

Learning Objectives

- 27.a. Compare different types of microorganisms.
- 27.b. Classify terminology associated with reservoirs of infection and spread of infection.
- 27.c. Compare portals of entry and portals of exit.
- 27.d. Examine relationship between disease and specific types of microorganisms.