OBJECTIVES

Upon completion of this unit the student will:

1. Define terms relative to the study of body functions.
2. Identify which organs comprise the eleven major body systems.
3. Identify each organ with its system on a body model and chart on a diagram.
4. Identify, define and locate the directions in the body.
5. Name the two major groups of body cavities.
6. Name the major organs at the abdomen and thoracic cavities.

PLAN OF LESSON

I. Studies of the Human Body
   A. Anatomy
   B. Physiology
   C. Diseases
   D. Pathology
   E. Homeostasis
   F. Negative Feedback
   G. Cells
   H. Tissues
   I. Organs
   J. Systems

II. Organization of the Body
    A. Atoms
    B. Molecules
    C. Organelles
    D. Cells
    E. Tissues
    F. Organs
    G. Organ Systems
    H. Human Organism

III. Major Organ Systems
     A. Integumentary
     B. Skeletal
     C. Muscular
     D. Circulatory
     E. Digestive
     F. Respiratory
     G. Nervous/Sensory
     H. Endocrine
     I. Reproductive
     J. Lymphatic/Immune

IV. Anatomical Position
    A. Superior
    B. Inferior
    C. Ventral/Anterior
    D. Dorsal/Posterior
    E. Cranial/Caudal
    F. Medial/Lateral
    G. Proximal/Distal

V. Planes and Sections of Body
    A. Sagittal Plane
    B. Mid-sagittal Plane
    C. Frontal Plane/Coronal
    D. Traverse/Horizontal

VI. Cavities of the Body
    A. Dorsal/Ventral
    B. Cranial and Spinal Cavities
    C. Thoracic
       1. Mediastinum
       2. Pleural Cavity
    D. Abdominopelvic
       1. Abdominal Cavity
       2. Pelvic Cavity
Unit: Anatomy and Function  
Lesson: 1 (Cont’d)  
Title: Introduction to the Human Body (cont.)  
Time: Theory 3 Hours (Cont’d)

OBJECTIVES

Upon completion of this unit the student will:

9. Identify the organ that divides the thoracic and abdominal cavities.
10. Identify the nine regions of the abdominal cavity.
11. Identify the four quadrants of the abdomen.
12. Define and give examples of each structural organization of the human body.
14. Explain homeostatic regulation of body temperature.
15. Explain the difference between negative and positive feedback.

Implementation: Thompson, Ch. 1
Lecture/Discussion, Transparencies, and Charts
Evaluation: Written Test, Application in Patient Care, Class Participation
Integrated: N/A

PLAN OF LESSON

VII. Abdominal Regions/Quadrants
   A. Regions
      1. Right Hypochondric
      2. Right Lumbar
      3. Right Iliac
      4. Epigastric
      5. Umbilical
      6. Hypogastric
      7. Left Hypochondric
      8. Left Lumbar
      9. Left Iliac
   B. Quadrants
      1. Right Upper
      2. Right Lower
      3. Left Upper
      4. Left Lower

IX. Homeostasis
   A. Homeostatic Regulation
      1. Negative Feedback
      2. Positive Feedback
OBJECTIVES

Upon completion of this unit the student will:

1. Name the structures of a cell.
2. Describe the functions of the main organelles of a cell.
3. Describe the process of mitosis.
4. Describe the role and actions of chromosomes, DNA, RNA, and enzymes.
5. Define what is meant by semi permeable, diffusion, osmosis, and filtration.
6. Define tonicity and compare isotonic, hypotonic, and hypertonic.
7. Define metabolism, anabolism, and catabolism.
8. Name the activities performed by an individual cell.
9. List the four major classifications and functions of tissues in the body.
10. Differentiate between endocrine and exocrine glands.
11. Name and describe the different types of epithelial tissue.
12. Name the three types of connective tissue and describe the function of each.
13. Name the basic structure of nerve tissue.
14. Name and describe the type of muscle tissue.

PLAN OF LESSON

I. Elements
II. Atoms
III. Isotopes
IV. Chemical Bonds
   A. Ionic Bonds
   B. Covalent Bonds
   C. Hydrogen Bonds
V. Energy
VI. Metabolism
   A. Catabolism
   B. Anabolism
VII. Chemical Reactions
VIII. Inorganic Molecules
   A. Water
   B. Oxygen
   C. Carbon Dioxide
   D. Others
IX. Types of Mixtures
   A. Solution
   B. Colloid
   C. Suspension
X. Acids, Bases and pH
   A. Acids
   B. Bases
   C. pH Scale
XI. Organic Compounds
   A. Carbohydrates
   B. Lipids

C. Proteins
D. Nucleic Acids
OBJECTIVES

Upon completion of this unit the student will:

12. Define the term “membrane”
13. List the types of membranes.

PLAN OF LESSON

XII. Cell Structure
   A. Basic Structures of the Cell
      1. Plasma Membrane
      2. Nucleus
      3. Cytoplasm/Organelles
         a. golgi apparatus
         b. centrioles
         c. lysosomes
         d. mitochondria
      4. Cytoskeleton
         a. microvilli
         b. cilia
         c. flagella

XIII. Movement Through Cell Membrane
   A. Passive Transport
      a. diffusion
      b. osmosis
      c. filtration
      d. facilitated diffusion
   B. Active Transport
      a. transport by pumps
         i. Na/K pump
      b. transport by vesicles
         i. endocytosis
         ii. exocytosis

XIV. Nucleic Acids
XV. RNA Structure
XVI. Protein Synthesis
   A. Transcription
   B. Translation

XVII. The Cell Cycle
XVIII. Mitosis

XIX. Tissue Development
XX. Types of Tissue
   A. Epithelial Tissue
   B. Connective Tissue
   C. Nervous Tissue
   D. Muscle Tissue

XXI. Tissue Repair
XXII. Membranes
OBJECTIVES

Upon completion of this unit the student will:

1. Describe the two layers of skin: epidermis and dermis.
2. Define stratum germinativum and stratum corneum.
3. List the two major functions of the subcutaneous layer.
4. List the factors that influence the color of skin.
5. Describe the accessory structures of the skin: hair, nails, and glands.
6. List the six functions of the skin.
7. Describe how the skin helps to regulate temperature.
8. Explain four processes by which the body loses heat.
9. Describe the burn classifications.
10. Calculate % of skin damage using the Rule of Nines

PLAN OF LESSON

I. Layers
   A. Epidermis
      1. Stratum Basale
      2. Stratum Corneum
   B. Dermis
   C. Hypodermis

III. Skin Color
   A. Abnormalities

IV. Functions of the Skin

V. Appendages
   A. Hair
      1. Shaft
      2. Hair follicle
      3. Bulb
      4. Papilla
   B. Nails
      1. Cuticle
      2. Nail Body
      3. Lunula
      4. Nail Bed
      5. Nail Root
      6. Abnormal Changes
   C. Glands
      1. Sweat Glands
         a. Apocrine
         b. Eccrine
      2. Sebaceous Glands
      3. Ceruminous Glands

VI. Burns
   1. Rule of Nines

VII. Disorders
Unit: Anatomy and Functions
Lesson: 4
Title: Skeletal System
Time: Theory 3 Hours

Implementation: Thompson, Ch. 6, 7, & 8
Lecture/Discussion, Transparencies, Skeleton, Flash Cards, Games, CD Human Body Dynamic; Skeleton
Evaluation: Written Test; Student Application in patient care; Class participation.
Integrated: N/A

OBJECTIVES

Upon completion of this unit the student will:

1. List at least four functions of the skeletal system.
2. Differentiate between the axial and appendicular skeletal and give at least two example of the groups of bones located in each.
3. Label and diagram the skull; discuss the function of these bones.
4. Name the five regions of bones in the spinal column; give the number in each; describe each region briefly; name specifically the first two and last two bones of the vertebrae column.
5. Name the position of the primary and secondary curve of the vertebrae and discuss their purpose.
6. Differentiate between true ribs and false ribs; give the number of each; discuss their attachment and use.
7. Name the bones of the extremities and their specific location; include the shoulder girdle and pelvic grade.

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Revised: 03/95; 03/99; 03/03; 03/05; 03/07; 03/11; 01/13; 10/15; 12/18

PLAN OF LESSON

I. Functions
   A. Body Framework
   B. Protect Delicate Structures
   C. Levers (Movement)
   D. Storehouse for Calcium
   E. Produce red cells

II. Classifications of Bones
   A. Long bones
      a. Parts
   B. Short bones
   C. Flat bones
   D. Irregular bones

III. Bone Tissue
   A. Osteoblasts
   B. Osteoclasts
   C. Osteocytes
   D. Types of strength

IV. Types of Bone Tissue
   A. Compact bone
   B. Spongy bone

V. Bone Marrow
   A. Red
   B. Yellow

VI. Bone Development
   A. Intramembranous ossification
   B. Endochondral ossification

VII. Bone Remodeling
VIII. Bone Fractures
   A. Types of Fractures
IX. Fracture Repair

X. Skeletal System
   A. Surface Features
   B. Skeleton
      a. appendicular
      b. axial
   C. Skull
      a. Cranium
      b. Suture Lines
      c. Foramen Magnum
      d. Facial Bones
      e. Bones Associated
      f. Sinuses
      g. Infant Skull
   D. Vertebral Column
      a. Cervical
      b. Thoracic
      c. Lumbar
      d. Sacrum
      e. Coccyx
   E. Thoracic Cage
   F. Pectoral Girdle
   G. Upper Limbs
   H. Pelvic Girdle
   I. Lower Limbs
OBJECTIVES

Upon completion of this unit the student will:

8. List four general types of bones and give examples of each.
9. Given a diagram of a long bone, label the diaphysis, epiphysis, red and yellow marrows, periosteum, and endosteum; and list the function of each.
10. Define process, projection, fossa, tuberosity, foramen, meatus, suture, and fontanel.
11. Name and locate the major divisions of the skeleton and name the major bones in each division.
12. Identify 32 of the major bones of a human skeleton and landmarks.
13. Name the three major kinds of joints and give an example of each.
14. Briefly describe a joint; label a diagram of the cross section of the hip joints.
15. Name and describe the movements of the freely moveable joints.

PLAN OF LESSON

XI. Classification of Joints
   A. Fibrous
   B. Cartilaginous
   C. Synovial
      a. types
      b. movement of
      c. key synovial joints
         i. shoulder
         ii. elbow
         iii. knee
         iv. hip

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OBJECTIVES

Upon completion of this unit the student will:

1. Give a general description of skeletal muscles with respect to its structure, junction, attachment and nerve connection.
2. Locate and name on a chart the major muscles in the human body.
3. Name the major muscles of that which produces expression and chewing.
4. Name the muscles of the lateral walls of the abdomen. Discuss the reason for their necessity.
5. Explain how muscle contraction and relaxation occur.

PLAN OF LESSON

I. Types of Muscle
   A. Cardiac
   B. Smooth
   C. Skeletal
II. Skeletal Muscle Structure
    A. Types of attachment
III. Structure of Muscle Fibers
     A. Thick Filaments
     B. Thin Filaments
     C. Structure of Myofibril
        1. z-disc
        2. sarcomere
IV. Muscle Contraction & Relaxation
    A. Muscle Tone
    B. Contraction of Muscle
       a. motor unit
       b. threshold
       c. twitch
    C. Strength of Contraction
       a. Frequency
       b. Intensity
    D. Isotonic/Isometric Contraction
    E. Energy Sources
       a. aerobic resp of fatty acids
       b. creatine phos.
       c. anaerobic resp
       d. aerobic resp of glucose
V. Muscle Function
   A. Origin
   B. Belly
   C. Insertion
   D. Prime Mover
   E. Synergists
   F. Antagonists
VI. Muscles
    A. Head & Neck
    B. Trunk
    C. Shoulder & Upper Arm
    D. Forearm
    E. Wrist & Hand
    F. Hip & Thigh
    G. Foot
OBJECTIVES

Upon completion of this unit the student will:

1. State the main function of the nervous system.
2. Name the three divisions of the nervous system.
3. Describe a neuron and name its parts. Label the diagram of sensory neurons.
4. Diagram a motor neuron. Indicate the direction of the impulse through these neurons.
5. Diagram the human brain, indicating the four lobes. Cerebellum pons, midbrain, medulla; Discuss the major functions of these.
6. Name and describe the four communication centers.
7. Describe the thalamus; give its location and function.
8. Describe the hypothalamus; give it location and function.
9. Describe the ventricles, list these functions.
10. Diagram a cross section of the spinal cord; list three functions.
11. Diagram the location of the meninges; the dura mater, the pia mater, and the arachnoid; locate the cerebrospinal fluid and describe the functions.

PLAN OF LESSON

I. Nervous System
II. Function
III. Divisions
   A. CNS-Brain, Spinal Cord
   B. Peripheral-Cranial and Spinal
   C. Autonomic
IV. Neuron
   A. Cell Body
   B. Dendrite
   C. Axons
   D. Synapses
   E. Receptors
V. Motor Neurons
   A. Cell Body
   B. Nucleus
   C. Nerve Fiber
   D. Neurilemma
   E. Myelium
   F. Dendrite
   G. Motor End Plate
   H. Muscle
VI. Brain
   A. Parts
   B. Functions
VII. Speech
   A. Auditory
   B. Visual
   C. Motor
   D. Written
VIII. Thalamus
   A. Location
   B. Function
IX. Hypothalamus
   A. Location
   B. Function
X. Ventricle
   A. Description
   B. Function
XI. Spinal Cord
   A. Reflex Activities
   B. Conducting Sensory Impulses
   C. Conducting motor impulses
XII. Meninges
   A. Dura mater
   B. Pia mater
   C. Arachnoid
   D. Cerebrospinal
      1. Location
      2. Function
XIII. Peripheral Nervous System

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OBJECTIVES

Upon completion of this unit the student will:

12. Briefly describe the peripheral nervous system.
13. Name five general functions of the cranial nerves.
14. Name and describe the functions of the twelve cranial nerves.
15. Locate the spinal nerves and locate 3 main branches of each.
16. Name the two divisions of the autonomic nervous system.

PLAN OF LESSON

XVI. Functions of cranial nerves
   A. Special Sense Impulses
   B. General Sense Impulses
   C. Voluntary Muscle Control
   D. Involuntary Control of Smooth Muscles

XV. Cranial nerves
   A. Olfactory
   B. Optic
   C. Oculomotor
   D. Trochlear
   E. Trigeminal
   F. Abducens
   G. Facial
   H. Glossopharyngeal
   I. Bagus
   J. Accessory
   K. Hypoglossal

XVI. Spinal Nerves
   A. Cervical Plexus
   B. Branchial Plexus
   C. Lumbosacral Plexus

XVII. Autonomic Nervous System
   A. Sympathetic
   B. Parasympathetic
OBJECTIVES:

Upon completion of this unit the student will:

1. Give a general definition of a sense and name 7 of the senses.
2. Define the five types of sensory receptors.
3. Describe the four components involved in the perception of a sensation.
4. Discuss the function of the eye and identify the major structures of the eye.
5. Differentiate between the 3 layers of the eye.
6. Describe how the eyeball moves.
7. Trace in a written paragraph the path of light ray from the outside of the eye to the brain.
8. Name and differentiate the function of the 2 cranial nerves that supply the eye.
9. Identify the major structures of the ear.
10. Discuss the function of each structure of the ear.
11. Identify the boundaries of the outer, middle, and inner ear.
12. Describe the process that ensures from the time a sound wave activates the ear drum to the registration of the sound in the brain.

PLAN OF LESSON:

I. Sensory Receptors
   A. Classification of Receptors
II. General Senses
   A. Pain
   B. Temperature
   C. Touch
   D. Taste
   E. Smell
   F. Hearing
   G. Balance
   H. Vision
III. The Eye
   A. Structure
   B. Function
   C. Layers
IV. Light Ray
V. Cranial Nerves
   A. Optic-2nd
   B. Ophthalmic-Branch of the 5th
VI. The Ear
   A. Structure
   B. Function
   C. Boundaries
VII. Sound Wave

Implementation: Thompson, Ch. 11
Lecture/Discussion/Transparencies, Quizing, Eye and Ear Models
Evaluation: Class Participation, Written Test, Student Application in Patient Care
Integrated: N/A

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Unit: Anatomy and Functions
Lesson: 7 (Cont'd)
Title: Sensory System
Time: Theory 3 Hours (Cont'd)

Implementation: Thompson, Ch. 11
Lecture/Discussion/Transparencies, Quizzing, Eye & Ear Models
Evaluation: Class Participation, Written Test, Student Application in Patient Care
Integrated: N/A

OBJECTIVES

Upon completion of this unit the student will:

13. Name the 4 sensations that are transmitted by the organ of taste, locate the receptors.
14. Describe the olfactory apparatus.
15. Differentiate between special and general senses.
16. Discuss the concept of equilibrium and how it is maintained.
OBJECTIVES

Upon completion of this unit the student will:

1. Discuss the purpose of the endocrine system.
2. Name the 2 groups of glands in the body; Discuss their functions and main differences.
3. List 2 specifics of the structure of glands.
4. List the location of each gland in the endocrine system.
5. Name the hormone secreted by the thyroid gland; list its functions and needs.
6. Name tests for function of the thyroid gland.
7. Discuss the importance of the parathyroid gland; describe its location and the hormone it produces.
8. Describe the location and size of the “Master Gland”, Name the major hormones secreted by its two lobes And list their functions.
9. Name and locate the glands that secreted insulin; Briefly describe the function of this hormone.
10. Name the hormones secreted by the adrenals and list their functions

PLAN OF LESSON

I. Comparison of Endo & Nervous

II. Hormones
   A. Steroid
   B. Nonsteroid

III. Pituitary & Hypothalamus
   A. Anterior Pituitary
      1. thyroid-stimulating hormone
      2. prolactin
      3. adrenocorticotropic hormone
      4. growth hormone
      5. luteinizing hormone
      6. follicle-stimulating hormone
   B. Posterior Pituitary
      1. oxytocin
      2. antidiuretic hormone
   C. Control of Pituitary Secretion

IV. Pineal Gland
   A. Melatonin

V. Thymus
   A. Thymosin
   B. Thymopoietin

VI. Thyroid Gland
   A. T3 (triiodothyronine)
   B. T4 (thyroxine)

VII. Parathyroid Glands
   A. Parathyroid hormone (PTH)
   B. Calcium Homeostasis

IX. Adrenal Glands
   A. Adrenal Medulla
      1. catecholamines
         a. epinephrine
         b. norepinephrine
   B. Adrenal Cortex

       1. Mineralocorticoids
       2. Glucocorticoids
       3. Sex Steroids

X. Pancreas
   A. Endocrine cells
      1. Alpha Cells
      2. Beta Cells
      3. Delta Cells
   B. Regulation of Blood Glucose
      C. Diabetes

XI. Gonads
   A. Ovaries
      1. estrogen
      2. progesterone
   B. Testes
      1. testosterone

XII. Other Endocrine Cells/Chemicals

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OBJECTIVES

Upon completion of this unit the student will:

11. Name the hormones secreted by the gonads and list their functions.

12. Name the 4 remaining endocrine glands, the hormone it secretes and the function of this hormone.
OBJECTIVES

Upon completion of this unit the student will:

1. List the major components of blood.
2. Explain how blood cells are produced.
3. Describe the structure and function of red blood cells.
4. Describe the structure and function of hemoglobin.
5. List the characteristics, ration and origins of each element.
6. Identify the steps of hemostasis.
7. List the four blood groups.
8. Name the universal donor and the universal recipient and describe their meanings.
9. Describe the Rh factor.

PLAN OF LESSON

I. Components
   A. Plasma
   B. Formed Elements

II. Blood Cell Formation
   A. Hemopoisis

III. Formed Elements
   A. Red Blood Cells
      1. Hemoglobin
      2. Life Cycle
      3. Breakdown of RBC
   B. White Blood Cell
      1. Granulocyte
         a. neutrophils
         b. eosinophils
         c. basophils
      2. Agranulocyte
         a. lymphocytes
         b. monocytes
   C. Platelets
      1. Hemostasis

IV. Blood Types
OBJECTIVES

Upon completion of this unit the student will:

1. List the functions of the circulatory system.
2. Describe the location of the heart.
3. Identify the anatomical structure of the heart.
4. Name each of the chambers of the heart; discuss the function of each.
5. Name the valves of the heart and explain the purposes of each.
6. Describe the blood flow through the heart.
7. Identify the major components of the heart’s conduction system.
8. Define cardiac cycle with respect to systole and diastole.
9. Define cardiac output and explain how change in heart rate and/or stroke volume change cardiac output.
10. Describe the autonomic innervation of the heart.
11. Define preload and explain how it affects cardiac output.
12. Define afterload and explain how it affects cardiac output.
13. Define special clinical vocabulary used to describe cardiac function.

I. Functions
   A. Carries O₂ to Cells
   B. Carried CO₂ to Lungs
   C. Food Carried to Cells
   D. Waste Carried to Kidneys
   E. Help Regulate Body Temperature
   F. Assist in Maintaining Acid-Base Balance
   G. Helps to Maintain Fluid Destination
   H. Hormones are Delivered to Destination
   I. Defends the Body Against Disease

II. Anatomical Structure of the Heart
   A. Chambers
   B. Valves
   C. 3 Layers of Muscle

III. Chambers
   A. Left Atria
   B. Left Ventricle
   C. Right Atria
   D. Right Ventricle

IV. Valves
   A. Tricuspid
   B. Pulmonary
   C. Mitral
   D. Aortic

V. Circulation
   A. Heart
   B. Coronary

VI. Conduction System

VII. Cardiac Cycle
   A. Systole
   B. Diastole

VIII. Cardiac Output
   A. Heart Rate
   B. Stroke Volume
   C. Preload
   D. Ejection Fraction
   E. Afterload

IX. Clinical Vocabulary
   A. Receptor Activation
      1. Beta-1 Adrenergic Activation
      2. Beta-1-Adrenergic Blockade
      3. Muscarinic Activation
      4. Muscarinic Blockade

X. Heart Failure
   A. Right-Sided
   B. Left-Sided
OBJECTIVES

Upon completion of this unit the student will:

1. Differentiate between arteries, arterioles, veins, venules and capillaries with regard to the structure and function of each.
2. Describe the two circuits of blood vessel circulation.
3. In writing trace the circulation of blood throughout the body indicating by name the major blood vessels and the area they serve.
4. Describe the portal circulation.
5. Explain the function of and the differences in portal circulation.

PLAN OF LESSON

I. Blood Vessels Structure & Function
   A. Arteries
   B. Arterioles
   C. Veins
   D. Venules
   E. Capillaries

II. Circuits
   A. Pulmonary
   B. Systemic

III. Circulation
   A. Aorta and Branches
   B. Principal Arteries
   C. Principal Veins

IV. Portal Circulation

V. Blood Pressure

VI. Venous Return

Implementation Thompson, Ch. 15
Lecture/Discussion, Transparencies, Quizzing, Games,
CD Human Body Dynamics

Evaluation: Written Test, Student Application in Care
Integrated: N/A
OBJECTIVES

Upon completion of this unit, the student will be able to:

1. List three functions of the lymphatic system.
2. Describe the composition and flow of lymph.
3. Describe the four lymphoid organs: lymph node, tonsils, thymus gland, and spleen.
4. State the location of the following lymph nodes: cervical nodes, axillary nodes, and inguinal nodes.
5. Differentiate between specific and nonspecific immunity.
6. Describe the process of phagocytosis.
7. Explain the causes of the signs of inflammation.
8. Explain the role of fever in fighting infection.
9. Explain the role of T cells in cell-mediated immunity.
10. Explain the role of B cells in antibody-mediated immunity.

PLAN OF LESSON

I. Functions of the Lymphatic System

II. Lymph Fluid
   A. Composition
   B. Flow of Fluid

III. Lymphoid Organs
   A. Lymph Nodes
   B. Tonsils
   C. Thymus Gland
   D. Spleen

IV. Location of Lymph Nodes
   A. Cervical Nodes

V. Nonspecific Immunity
   A. First Line of Defense
   B. Second Line of Defense

VI. Specific Immunity
   A. Third Line of Defense
      1. Natural Active Immunity
      2. Artificial Active Immunity
      3. Natural Passive Immunity
      4. Artificial Passive Immunity

VII. Cellular Immunity
   A. T-Cell Function

VII. Humoral Immunity
   A. B-Cell Function
   B. Antibodies
      1. Primary Response
      2. Secondary Response

VIII. Immune System Disorders
   A. Hypersensitivity
   B. Autoimmune Diseases
   C. Immunodeficiency Diseases
OBJECTIVES

Upon completion of this unit the student will:
1. Describe the structure and functions of the organs of the respiratory system.
2. Trace the movement of air from the nostrils to the alveoli.
3. Describe the role of pulmonary surfactants.
4. Describe the relationship of Boyle’s law to ventilation.
5. Explain how respiratory muscles affect thoracic volume.
6. List three conditions that make the alveoli well suited for the exchange of oxygen and carbon dioxide.
7. List lung volumes and capacities.
8. Describe common variations and abnormalities of breathing.
9. Explain the neural and chemical control of respirations.

PLAN OF LESSON

I. Upper Respiratory System
   A. Nose
      1. Structure
         a. Nostril
         b. Nasal Septum
         c. Nasal Cavities
         d. Mucus Membrane
         e. Sinuses
         f. Nasolacrimal duct
      2. Function
         a. Warms, Moistens, and Filters
         b. Sense Organs of Smell
   B. Larynx
      1. Structure
      2. Functions

II. Lower Respiratory System
   A. Trachea
      1. Structures
      2. Functions
         a. Passageway-Air to and From Lungs
   B. Bronchi, Bronchioles, and Alveoli
      1. Structure
         a. Trachea Branches into Right and Left Bronchi
         b. Each Bronchus is broken into Bronchioles
         c. Hilum is Found a Junction
         d. Bronchioles End in Alveolar Sacs
         e. Cilia
      2. Functions
         a. External Respirations
         b. Internal Respirations
         c. Filters

II. Pulmonary Ventilation
   1. Respiratory Muscles
   2. Neural Control of Breathing
   3. Factor Influencing Breathing

III. Pressure and Airflow

IV. Measurements of Ventilation

V. Gas Exchange

VI. Transportation of Gases
OBJECTIVES

Upon completion of this unit the student will:

1. List four functions of the digestive system.
2. Describe the four layers of the digestive tract.
3. Describe the structure and functions of the organs of the digestive tract.
4. Describe the structure and functions of the accessory organs of the digestive tract.
5. Explain the physiology of digestion and absorption.
6. Describe the effects of amylases, proteases, and lipases.
7. Describe the role of bile in the digestion of fats.
8. Describe five categories of nutrients.

PLAN OF LESSON

I. Digestive System
   A. Digestive Tract
   B. Accessory Organs

II. Digestion
   A. Mechanical
   B. Chemical

III. Layers of Digestive Tract
   A. Mucosa
   B. Submucosa
   C. Muscle

IV. Peritoneum
V. Teeth
   A. Deciduous
   B. Permanent

VI. Salivary
   A. Parotid
   B. Submaxillary
   C. Sublingual

VII. Swallowing Tubes
   A. Throat
   B. Tonsils
   C. Soft Palate
   D. Uvula
   E. Esophagus

VIII. Stomach
   A. Cardiac Valve
   B. Pyloric Sphincter
   C. Rugae
   D. Fundus
   E. Lesser Curvature

IX. Small Intestines
   A. Duodenum
   B. Jejunum
   C. Ileum
   D. Villi

X. Enzymes

XI. Large Intestines
   A. Ileocele Valve
   B. Appendix
   C. Cecum
   D. Colon
   E. Sigmoid
   F. Rectum
   G. Anus
   H. Internal and External Sphincter

XII. Accessory Digestive Organs
   A. Liver
   B. Gallbladder
   C. Pancreas

XIII. Enzymes
IXV. Nutrition Concepts
OBJECTIVES

Upon completion of this unit the student will:

1. Give the location of the kidneys.
2. Name the three structures that make up the kidney and give a brief explanation of each.
3. List the three structures that make up nephron.
4. Discuss/list the functions of the kidneys.
5. Describe the location of the ureters.
6. Discuss the structure of the ureters.
7. Describe the location and structure of the bladder.
8. List two functions of the urinary bladder;
9. State the amount of urine normally contained in the bladder before distention occurs.
10. Describe the structure of the urethra.
11. Describe the function of the urethra.
12. Explain the process of urination
13. Describe how the structure of the urethra varies between males and females.

PLAN OF LESSON

I. Overview
   A. Excretion
      1. Four Organ Systems
II. Structure of the Kidney
   A. Cortex
   B. Medulla
   C. Renal Pelvis
   D. Renal Circulation
III. Nephron
   A. Renal Corpuscle
   B. Renal Tubule
IV. Urine Formation
   A. Glomerular Filtration
   B. Tubular Reabsorption & Secretion
      a. Hormones affecting
V. Composition of Urine
VI. Storage & Elimination of Urine
   A. Ureters
   B. Urinary Bladder
   C. Urethra
   D. Urination
OBJECTIVES

Upon completion of this unit the student will:

1. Differentiate between primary & secondary sex organs.
2. Describe the structure and function of the testes and the male accessory glands.
3. Describe the structure and functions of the penis.
4. Explain the process of male puberty and identify the hormones that play a role in puberty.
5. Explain the process of spermatogenesis.
6. Describe the components of semen.
7. Trace the path taken by sperm from formation to ejaculation.
8. Describe the four phases of the male sexual response.
9. Describe the structure and function of the ovaries.
10. Describe the structure and function of the fallopian tubes, uterus, and vagina.
11. Identify the structures of the female external genitalia
12. Describe the structures of the female breast.
13. Explain the process of female puberty and identify the hormones that play a role in puberty.
14. Identify the two interrelated cycles of the female reproductive cycle.
15. Discuss the events of the ovarian cycle.
16. Discuss the phases of the menstrual cycle.
17. Describe the four phases of the female sexual response.

PLAN OF LESSON

I. Overview
   A. Primary Sex Organs
   B. Secondary Sex Organs

II. Male Reproductive System
   A. Testes
   B. Accessory Glands
   C. Penis
   D. Sperm
      1. Spermatogenesis
      2. Spermatozoa
      3. Semen

III. Male Sexual Response

IV. Female Reproductive System
   A. Ovalies
   B. Internal Genitalia
   C. External Genitalia
   D. Breasts

V. Female Reproductive Cycle
   A. Ovarian Cycle
   B. Menstrual Cycle
   C. Menopause

VI. Female Sexual Response

VII. Methods of Birth Control
OBJECTIVES

Upon completion of this unit the student will:

1. Differentiate between congenital and hereditary.
2. List the three types of traits that are produced by genes.
3. Identify how sex chromosomes differ from other chromosomes.
4. Differentiate between the dominant and recessive genes.
5. Discuss the effect of gene mutation on a population.
6. Define the meaning of disease.

PLAN OF LESSON

I. Definition
   A. Congenital
   B. Hereditary

II. Type of Traits Produced by Genes
   A. Physical
   B. Biochemical
   C. Psychological

III. Sex Chromosomes
   A. Male
   B. Female
   C. Union

IV. Gene
   A. Dominant
   B. Recessive

V. Mutation

VI. Disease
   A. Disease Producing Organisms
   B. Malnutrition
   C. Physical Agent
   D. Chemicals
   E. Birth Defect
   F. Degeneration
   G. Neoplasm