

Virginia Western Community College

PNE 155

Body Structure and Function

Prerequisites

None

Course Description

Studies the structure and function of the body.

Semester Credits: 4

Lecture Hours: 4

Lab/Clinical/Internship Hours: 0

Required Materials

Textbook:

Henke's Med-Math Dosage Calculation, Preparation and Administration. Buchholz, Susan. (2016). 8th Edition. Lippincott, Williams, & Wilkins. ISBN: 9781496302847

Human Form/Human Function. McConnell, Thomas H. & Hull, Kelly L. (2011). Wolters Kluwer / Lippincott Williams & Wilkins. ISBN: 9780781780209

Study Guide to Accompany Human Form/Human Function. McConnell, Thomas H. & Hull, Kelly L. (2011). Wolters Kluwer/Lippincott Williams, & Wilkins. ISBN: 9780781780209

Supplementary Materials:

The Point

PrepU

Course Outcomes

At the completion of this course, the student should be able to:

- Discuss the structural foundation of the body and its ability to function, integrating the levels of organization
- Discuss the organizational and functional aspects of cell and tissue organization

- List the major organs of the body and discuss how they function within each system.
- Discuss the structure and function of each of the following body systems:
 - Integumentary System and Body Membranes
 - Skeletal System
 - Muscular System
 - Nervous System and the Senses
 - Endocrine System
 - Blood and Lymphatic Systems
 - Cardiovascular System
 - Respiratory System
 - Digestive System
 - Urinary System
 - Reproductive System

Topical Description

I: Form, Function and Life

- Form, Function, and Life
- The Building Blocks of Life
- Life and the External Environment
- Life and Gradients
- Homeostasis
- The Language of Form and Function
- The Language of Disease

II: Chemistry of Context: The Molecules of Life

- The Elements of Life
- The Form and Function of Atoms
- Chemical Bonds
- The Chemistry of Living Things

III: Cells and Tissues

- The Cell Membrane
- Cell Organelles
- Cell Reproduction and Differentiation
- Cell Specialization
- Exchange of Substances across the Cell Membrane
- Tissue Types

IV: Communication: Chemical and Electrical Signaling

- The Nature of Communication
- Chemical Signaling
- Electrical Signaling

V: Skin, Membranes and Other Barriers to the Environment

- The Function of Skin
- The Anatomy of Skin and Associated Structures
- Healing of Skin Wounds
- Environmental Barriers Other than Skin

VI: Bones and Joints

- Bones and Bone Tissues
- Joints
- The Anatomy of Bones and Joints: The Axial Skeleton
- The Anatomy of Bones and Joints: The Appendicular Skeleton

VII: Muscles

- Overview of Muscles
- Structure of Skeletal Muscle Tissue
- Skeletal Muscle Contraction
- Muscle Energy
- The Mechanics of Muscle Contraction
- Smooth Muscle
- Skeletal Muscle Actions
- The Major Skeletal Muscles

VIII: Nervous System

- Overview of the Nervous System
- Nervous System Cells and Tissues
- Protection of the Nervous System
- The Brain and Cranial Nerves
- The Spinal Cord and Spinal Nerves
- The Autonomic Nervous System
- Pathways of Neural Function

IX: Sensations: The Somatic and Special Senses

- Sensing and Sensation
- Somatic Senses
- Taste
- Smell
- The Ear and Hearing
- The Inner Ear and Equilibrium
- Vision

X: Blood

- Overview of Blood
- Leukocytes, Inflammation, and Immunity
- Erythrocytes and Oxygen Transport
- Platelets
- Hemostasis
- Blood Groups and Transfusion

XI: The Cardiovascular System

- The Organization of the Cardiovascular System
- Structure and Function of the Heart
- The Heartbeat
- Cardiac Output
- Structure and Function of Blood Vessels
- Blood Flow and Blood Pressure
- The Major Blood Vessels

XII: The Immune and Lymphatic Systems

- Functions of the Immune and Lymphatic Systems
- An Integrated View of Body Defenses

XIII: The Respiratory System

- Overview of Respiration
- The Anatomy of the Air Pathway
- Pulmonary Ventilation
- Gas Exchange and Transport
- The Control of Respiration

XIV: The Digestive System

- Nutrients
- Overview of the Digestive System
- The Mouth and Associated Structures
- The Pharynx and Esophagus
- The Stomach
- The Small Intestine, Liver, and Pancreas
- The Large Intestine
- Regulation of Gastrointestinal Function

XV: Metabolism and Endocrine Control

- The Generation of Energy
- The Role of the Liver in Metabolism
- Energy Balance
- Regulation of Body Temperature
- The Endocrine Pancreas

XVI: The Urinary System and Body Fluids

- Body Fluid Compartments and Electrolytes
- Overview of the Urinary System
- The Production of Urine
- Electrolyte and Water Balance
- Acid-Base Balance

XVII: The Reproductive System

- Anatomy of the Male Reproductive System
- Testicular Function
- Anatomy of the Female Reproductive System
- The Female Reproductive Cycle
- Sexual Behavior
- The Breasts
- Fertilization and Embryonic and Fetal Development
- Pregnancy Changes Maternal Form and Function
- Parturition
- Abortion and Contraception

XVIII: Life

- Genetics, Inheritance, and Life
- Stages of Life
- Aging and the Decline of Body Function
- Stress
- Exercise
- Life and Death

Note to Instructors