

Revised: Fall 2016

# **PNE 155**

## **Body Structure and Function**

**Course Outline**

**Prerequisites:**

None

**Course Description:**

Studies the structure and function of the body.

**Semester Credits: 4 Lecture Hours: 4 Lab/Recitation Hours: 0**

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### **Course Outcomes**

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

1. Discuss the structural foundation of the body and its ability to function, integrating the levels of organization.
2. Discuss the organizational and functional aspects of cell and tissue organization.
3. List the major organs of the body and discuss how they function within each system.
4. 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

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### Required Materials:

Buchholz, Susan. (2011). *Henke's Med-Math Dosage calculation, Preparation and Administration* (7<sup>th</sup> Ed). Philadelphia: PA. Lippincott, Williams, & Wilkins. ISBN 978-1-60831-799-8

### Textbook:

McConnell, Thomas H. & Hull, Kelly L. (2011). *Human Form/Human Function*. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins. ISBN 978-0-7817-8020-9

McConnell, Thomas H. & Hull, Kelly L. (2011). *Study Guide to Accompany Human Form/Human Function*. Philadelphia, PA: Wolters Kluwer/Lippincott Williams, & Wilkins. ISBN 978-0-7817-8020-9

The following supplementary materials are available:

The Point  
PrepU

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

- I. Form, Function, and Life
  - A. Form, Function, and Life
  - B. The Building Blocks of Life
  - C. Life and the External Environment
  - D. Life and Gradients
  - E. Homeostasis
  - F. The Language of Form and Function
  - G. The Language of Disease
- II. Chemistry of Context: The Molecules of Life
  - A. The Elements of Life
  - B. The Form and Function of Atoms
  - C. Chemical Bonds
  - D. The Chemistry of Living Things
- III. Cells and Tissues
  - A. The Cell Membrane
  - B. Cell Organelles
  - C. Cell Reproduction and Differentiation
  - D. Cell Specialization
  - E. Exchange of Substances Across the Cell Membrane
  - F. Tissue Types
- IV. Communication: Chemical and Electrical Signaling
  - A. The Nature of Communication
  - B. Chemical Signaling
  - C. Electrical Signaling
- V. Skin, Membranes, and Other Barriers to the Environment
  - A. The Function of Skin
  - B. The Anatomy of Skin and Associated Structures
  - C. Healing of Skin Wounds
  - D. Environmental Barriers Other than Skin
- VI. Bones and Joints
  - A. Bones and Bone Tissues

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- B. Joints
- C. The Anatomy of Bones and Joints: The Axial Skeleton
- D. The Anatomy of Bones and Joints: The Appendicular Skeleton
- VII. Muscles
  - A. Overview of Muscles
  - B. Structure of Skeletal Muscle Tissue
  - C. Skeletal Muscle Contraction
  - D. Muscle Energy
  - E. The Mechanics of Muscle Contraction
  - F. Smooth Muscle
  - G. Skeletal Muscle Actions
  - H. The Major Skeletal Muscles
- VIII. Nervous System
  - A. Overview of the Nervous System
  - B. Nervous System Cells and Tissues
  - C. Protection of the Nervous System
  - D. The Brain and Cranial Nerves
  - E. The Spinal Cord and Spinal Nerves
  - F. The Autonomic Nervous System
  - G. Pathways of Neural Function
- IX. Sensations: The Somatic and Special Senses
  - A. Sensing and Sensation
  - B. Somatic Senses
  - C. Taste
  - D. Smell
  - D. The Ear and Hearing
  - D. The Inner Ear and Equilibrium
  - E. Vision
- X. Blood
  - A. Overview of Blood
  - B. Leukocytes, Inflammation, and Immunity
  - C. Erythrocytes and Oxygen Transport
  - D. Platelets
  - E. Hemostasis
  - F. Blood Groups and Transfusion
- XI. The Cardiovascular System
  - A. The Organization of the Cardiovascular System
  - B. Structure and Function of the Heart
  - C. The Heartbeat
  - D. Cardiac Output



- E. Structure and Function of Blood Vessels
- F. Blood Flow and Blood Pressure
- G. The Major Blood Vessels
- XII. The Immune and Lymphatic Systems
  - A. Functions of the Immune and Lymphatic Systems
    - B. Cells of the Immune System
    - C. Vessels and Organs of the Lymphatic System
    - D. Overview of the Immune Response
    - E. Innate Immunity
    - F. Adaptive Immunity
  - G. An Integrated View of Body Defenses
- XIII. The Respiratory System
  - A. Overview of Respiration
  - B. The Anatomy of the Air Pathway
  - C. Pulmonary Ventilation
  - D. Gas Exchange and Transport
  - E. The Control of Respiration
- XIV. The Digestive System
  - A. Nutrients
  - B. Overview of the Digestive System
  - C. The Mouth and Associated Structures
  - D. The Pharynx and Esophagus
  - E. The Stomach
  - F. The Small Intestine, Liver, and Pancreas
  - G. The Large Intestine
  - H. Regulation of Gastrointestinal Function
- XV. Metabolism and Endocrine Control
  - A. The Generation of Energy
  - B. The Role of the Liver in Metabolism
  - C. Energy Balance
  - D. Regulation of Body Temperature
  - E. The Endocrine Pancreas
- XVI. The Urinary System and Body Fluids
  - A. Body Fluid Compartments and Electrolytes
  - B. Overview of the Urinary System
  - C. The Production of Urine
  - D. Electrolyte and Water Balance
  - E. Acid-Base Balance
- XVII. The Reproductive System
  - A. Anatomy of the Male Reproductive System



- B. Testicular Function
  - C. Anatomy of the Female Reproductive System
  - D. The Female Reproductive Cycle
  - E. Sexual Behavior
  - F. The Breasts
  - G. Fertilization and Embryonic and Fetal Development
  - H. Pregnancy Changes Maternal Form and Function
  - I. Parturition
  - J. Abortion and Contraception
- XVIII. Life
- A. Genetics, Inheritance, and Life
  - B. Stages of Life
  - C. Aging and the Decline of Body Function
  - D. Stress
  - E. Exercise
  - F. Life and Death

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Notes to Instructors  
(List information about optional topics, departmental exams, etc)

None

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