

A. CATALOG DESCRIPTION (include prerequisites)

Course Title: Principles of Anatomy & Physiology I
Credits: 4
Hours/Week: 3 hours lecture and 2 hours lab per week
Semester Offered: Fall
Prerequisites: Enrollment in Radiography Program

This course meets the requirements for the Minnesota Transfer Curriculum in CT (Critical Thinking) and NS (Natural Sciences).

Part 1 of the 2-semester anatomy and physiology sequence covers cell structure and function, tissues, chemistry as it relates to biological sciences, the integumentary, musculoskeletal and nervous systems. This course also includes a special emphasis on understanding medical terminology. Appropriate combining forms, prefixes, and suffixes will be learned for each of the body systems. This sequence is designed for students who have been admitted to the Mayo Clinic Radiography Program.

B. DATE LAST REVISED (use current date): October 2003**C. RECOMMENDED ENTRY SKILLS/KNOWLEDGE:**

College-level reading and writing skills and working knowledge of elementary algebra

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Introduction to Human Anatomy and Physiology
 - a. Characteristics of life
 - b. Maintenance of life - homeostasis
 - c. Levels of organization
 - d. Anatomical terminology
 - e. Clinical applications
 - f. Terms pertaining to the body as a whole
 - g. Combining forms, Suffixes, and Prefixes
2. Chemical Basis of Life
 - a. Structure of matter
 - b. Chemical constituents of cells - inorganic/organic
 - c. Clinical terms/use of radioactive isotopes
 - d. Clinical applications
3. Cells
 - a. Composite cell
 - b. Movement through cell membranes
 - c. Life cycle of a cell
 - d. Control of cell reproduction
 - e. Clinical applications

D. OUTLINE OF MAJOR CONTENT AREAS (continued):

4. Cellular Metabolism
 - a. Metabolic processes
 - b. Control of metabolic reactions
 - c. Energy for metabolic reactions
 - d. Metabolic pathways
 - e. Nucleic acids and protein synthesis
 - f. Changes in genetic information
 - g. Clinical applications

5. Tissues
 - a. Epithelial tissues
 - b. Connective tissues
 - c. Muscle tissues
 - d. Nervous tissue
 - e. Clinical application

6. Skin and the Integumentary System
 - a. Introduction
 - b. Types of membranes
 - c. Skin and its tissues
 - d. Accessory organs of skin
 - e. Regulation of body temperature
 - f. Skin color
 - g. Common skin disorders
 - h. Clinical application

7. Skeletal System
 - a. Introduction
 - b. Bone structure
 - c. Bone development and growth
 - d. Functions of bone
 - e. Organization of skeleton
 - f. Specific bone details
 - g. Clinical terms related to skeletal system
 - h. Clinical application

8. Joints of Skeletal System
 - a. Classification of joints
 - b. Structure and types of synovial joints
 - c. Types of joint movement
 - d. Specific examples of synovial joints
 - e. Clinical terms related to joints
 - f. Clinical application

D. OUTLINE OF MAJOR CONTENT AREAS (continued):

9. Muscular System
 - a. Structure of a skeletal muscle
 - b. Muscle contraction
 - c. Muscular responses to stimulation
 - d. Smooth muscles
 - e. Cardiac muscle
 - f. Skeletal muscle actions
 - g. Major skeletal muscles
 - h. Clinical terms related to the muscular system
 - i. Clinical application

10. Nervous System I Basic Structure and Function
 - a. General function of nervous system
 - b. Nervous tissue
 - c. Cell membrane potential
 - d. The synapse
 - e. Processing of impulses
 - f. Classification of neurons and nerve fibers
 - g. Nerve pathways - reflex arcs and behavior
 - h. Clinical application

11. Nervous System II, Divisions of Nervous System
 - a. Meninges
 - b. Spinal cord - structure and function
 - c. Brain - structure and function
 - d. Peripheral nervous system (PNS)
 - e. Autonomic nervous system (ANS)
 - f. Clinical terms related to the nervous system
 - g. Clinical application

Students will be introduced to the microscope's use, view and identify tissues and study mitosis, follow experimental procedures to learn about cellular transport mechanisms, learn to identify and classify bones and their processes and become familiar with surface muscle anatomy.

E. LEARNING OUTCOMES (GENERAL):

1. Vocabulary
2. Anatomy and histology of these body systems
3. Physiological principles
4. Complementarity of anatomy and physiology of the systems studied
5. Application of the knowledge to human conditions
6. Application of their basic knowledge of the skeletal system as applied to X-rays for their future careers

F. LEARNING OUTCOMES (MNTC):

Critical Thinking

- a. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
- b. Imagine and seek out a variety of possible goals, assumptions, interpretations or perspectives which can give alternative meanings or solutions to given situations or problems.
- c. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
- d. Recognize and articulate the value assumptions which underlie and affect decisions, interpretations, analyses and evaluations made by ourselves and others.

Natural Sciences

- a. Demonstrate understanding of scientific theories.
- b. Formulate and test hypotheses by performing laboratory experiments requiring the collection of data, its statistical and graphical analysis and an appreciation of its sources of error and uncertainty.
- c. Communicate their experimental findings, analysis and interpretations both orally and in writing.
- d. Evaluate society issues from a natural science perspective, ask questions about the evidence presented and make informed judgments about science-related topics and policies.

G. METHODS FOR EVALUATION OF STUDENT LEARNING:

Methods may include any of the following:

1. Laboratory reports and/or quizzes
2. Objective and/or subjective tests
3. Laboratory practical tests
4. Assignments
5. Essay tasks
6. Group work/projects
7. Attendance (especially laboratory attendance)

H. SPECIAL INFORMATION (fees, directives on hazardous materials, etc.):

The initial lab session explains and familiarizes the student with general safety hazards and safety equipment in the lab. During the pre-lab discussion, the hazardous characteristics of any materials used during the lab are discussed. In addition, if the lab involves any potentially infectious material, the students will be instructed on the proper use and disposal. The instructor will direct all students to wear necessary protective equipment while working with any hazardous chemicals. A copy of Material Safety Data Sheets for chemicals used is available in the lab.