The elements of human structure and function are described and related. Topics explored are: the body system, cell structure and function, the maintenance of physiological balance and equilibrium (e.g., fluid and electrolytes, blood pressure, acid base levels), and the physiology of nutrition and exercise. Designed for non-science majors (including some para-medical majors) and is recommended to meet the general education breadth requirement. UC Credit limitations: Maximum credit of two courses for Biology G220, G221 and G225.
COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Define homeostasis and give two examples of how homeostasis works to maintain balance of the physiological environment.
2. Demonstrate the ability to recognize and label the anatomical structures of the different organ systems.
3. Demonstrate the ability to relate anatomical structure to function.
4. Apply critical thinking and analytical skills to correctly interpret data.
5. Demonstrate an understanding of the core concepts and methods in science.

COURSE OBJECTIVES:

1. Describe the basic chemical and physical principles that govern human body function.
2. Understand the major inorganic and organic molecules that make up the human body.
3. Describe both the structure and function of all major organ systems and how they work together to maintain homeostasis.
4. Understand how every organ system is interrelated to each other.
5. Describe the anatomical structure of major tissues and organs of the human body.

COURSE CONTENT:

LECTURE CONTENT:

Course introduction and preview of basic concepts.
1. Understanding the Language of Anatomy and Physiology
   a. Structure vs. Function
   b. Levels of structural organization (atoms, molecules, cells, tissues, organs, systems and the individual)
   c. Concepts of homeostasis; feedback mechanisms
   d. Anatomical Position: directional terms, anatomical terms, body cavities

2. Chemistry
   a. Matter -- structure of atoms and elements
   b. Chemical bonds -- covalent, ionic and hydrogen bonds
   c. Inorganic and Organic Molecules

3. Cell structure and Function
   a. Organelles
   b. Mitosis and Cancer
   c. Plasma Membrane
   d. Membrane transport: diffusion, osmosis, filtration, active transport, endocytosis, exocytosis

4. Integumentary System
   a. Functions
   b. Accessory organs
   c. Skin cancer
   d. Burns

5. Skeletal Systems.
   A. Functions
   b. Bone -- structure and function
   c. Bone diseases
   d. Joints

6. Muscle System
   a. Functions
   b. Action Potential
c. Skeletal muscle anatomy
d. Sliding Filament Theory --skeletal muscle contraction
e. Muscle physiology --contraction at the organ level

7. Nervous System
   a. Functions
   b. CNS, PNS, ANS
   c. Special and General senses
   d. Nerve pathways

8. Cardiovascular System
   a. Functions
   b. Heart anatomy and physiology
   c. Blood Vessel anatomy and physiology
   d. Blood anatomy and physiology

9. Respiratory System
   a. Functions
   b. Respiratory anatomy and physiology

10. Digestive System
    a. Functions
    b. Digestive system anatomy and physiology
    c. Digestion physiology
    d. Aerobic respiration

11. Urinary system
    a. Functions
    b. Urinary anatomy and physiology

12. Reproductive System
    a. Functions
    b. Male and Female reproductive anatomy and physiology (meiosis, spermatogenesis, oogenesis, hormones, ovarian and menstrual cycle.

LABORATORY CONTENT:

Course introduction and preview of basic concepts.
1. Understanding the Language of Anatomy and Physiology
   a. Structure vs. Function
   b. Levels of structural organization (atoms, molecules, cells, tissues, organs, systems and the individual)
   c. Concepts of homeostasis; feedback mechanisms
   d. Anatomical Position: directional terms, anatomical terms, body cavities

2. Chemistry
   a. Mater -- structure of atoms and elements
   b. Chemical bonds -- covalent, ionic and hydrogen bonds
   c. Inorganic and Organic Molecules

3. Cell structure and Function
   a. Organelles
   b. Mitosis and Cancer
   c. Plasma Membrane
   d. Membrane transport: diffusion, osmosis, filtration, active transport, endocytosis, exocytosis

4. Integumentary System
   a. Functions
   b. Accessory organs
   c. Skin cancer
d. Burns

5. Skeletal systems.
   A. Functions
   b. Bone -- structure and function
   c. Bone diseases
   d. Joints

6. Muscle system
   a. Functions
   b. Action Potential
   c. Skeletal muscle anatomy
   d. Sliding Filament Theory --skeletal muscle contraction
   e. Muscle physiology --contraction at the organ level

7. Nervous System
   a. Functions
   b. CNS, PNS, ANS
   c. Special and General senses
   d. Nerve pathways

8. Cardiovascular System
   a. Functions
   b. Heart anatomy and physiology
   c. Blood Vessel anatomy and physiology
   d. Blood anatomy and physiology

9. Respiratory System
   a. Functions
   b. Respiratory anatomy and physiology

10. Digestive System
   a. Functions
   b. Digestive system anatomy and physiology
   c. Digestion physiology
   d. Aerobic respiration

11. Urinary system
   a. Functions
   b. Urinary anatomy and physiology

12. Reproductive System
   a. Functions
   b. Male and Female reproductive anatomy and physiology (meiosis, spermatogenesis, oogenesis, hormones, ovarian and menstrual cycle.

METHODS OF INSTRUCTION:

A. Lecture:
B. Lab:
C. Other simultaneous interactive:
D. Independent Study:

INSTRUCTIONAL TECHNIQUES:

COURSE ASSIGNMENTS:

Out-of-class Assignments

1. Quizzes
2. Practical Exams (2) - Laboratory Identification Tests
3. Group study sessions in lab
4. Lecture Exams (4)
5. Laboratory experiments and write-ups
6. Group presentation on anatomy/physiology topic of choice
7. Extra credit opportunities and study guide questions (optional assignment).

Reading Assignments

Textbook

Writing Assignments

3-hour lab once a week.
A. Lab includes hands-on experiments and questions that need to be completed during lab time for credit.
B. Lab quizzes given to ensure comprehension of lab material.

METHODS OF STUDENT EVALUATION:
Midterm Exam
Short Quizzes
Written Assignments
Objective Examinations
Report
Projects (ind/group)
Problem Solving Exercises
Oral Presentations
Skills Demonstration

Demonstration of Critical Thinking:
1. The weekly laboratory exercise write-ups (laboratory checks) involve questions requiring subjective answers, analysis and synthesis.

Required Writing, Problem Solving, Skills Demonstration:
3-hour lab once a week.
A. Lab includes hands-on experiments and questions that need to be completed during lab time for credit.
B. Lab quizzes given to ensure comprehension of lab material.

TEXTS, READINGS, AND RESOURCES:
TextBooks:

LIBRARY:
Adequate library resources include:

Comments:

Attachments:
Attached Files