

## **#471 ANATOMY AND PHYSIOLOGY**

**GRADES: 11 & 12**

**LEVEL: 1**

**CREDITS: 5**

**PREREQUISITES:** A grade of “C+” or better in Course 411

**BASIC TEXT:** Essentials of Human Anatomy and Physiology, Elaine Marieb

**SUPPLEMENTAL READINGS:** Applications Manual , Martini

Anatomy and Physiology Coloring Workbook, Marieb

The Anatomy and Physiology Learning System, Applegate

**REQUIRED MATERIALS:** Colored pencils

**COURSE DESCRIPTION:** This semester course describes how the body maintains homeostasis through the interaction of the eleven body systems. To increase student engagement, various medical topics and/or applications will be discussed throughout the course. Students will examine how disease and disorder is manifested through the homeostatic imbalance of physiological systems to include nervous, skeletal, muscular, integumentary, circulatory, respiratory, urinary, digestive, and endocrine.

### **MISSION RELATED GOALS:**

1. Development of communication skills: Students write a essay, produce a poster and deliver an oral presentation on their selected neurological disorder research topic.
2. Solve Complex Problems: Students will apply their knowledge of the skeletal system in determining the identity of human remains during a forensic investigation.
3. Contribute to global community: Students will increase their awareness of medical and ethical issues through current events assignments and bioethical classroom debates.
4. Solve complex problems: Students will learn about anatomy and physiology by solving medical case studies. Students will apply deductive reasoning skills and their knowledge of each physiological system to determine the cause(s) of diseases.

### **STUDENT EXPECTATIONS ADDRESSED:**

1. Communicate effectively - Students will produce one a type IV research paper describing homeostatic imbalance at the molecular, cellular and organ level. Each student will explore medical research and new technology as it is applied to investigate a selected neurological disorder.
- 2: Communicate effectively – Students will carefully read and listen to dissection procedures as they are directed in various online (virtual) and physical dissections including frog, fetal pig, calf heart, sheep brain and ox eye. Students will also use these skills to identify/ label the gross anatomy features of each specimen.
3. Solve complex problems – Students will learn about anatomy and physiology by using case studies. Through these activities students must use deductive and reasoning skills to determine the causes of diseases.
4. Work with others toward a common goal – Students will work together on producing plays that demonstrate the physiology of the human body.
5. Contribute to the community and the global society – Students will be encouraged to seek volunteer activities that benefit members of the community afflicted with medical

disorders. Ex: Volunteer at the Tewksbury hospital in the neurological disease ward. volunteer activities related to diseases that we are studying.

6. Respect the rights of others – Students will abide by all school rules and treat each other with common courtesy.

7. Exercise life skills that promote personal growth – Students will work in cooperative groups in order to practice the communication skills necessary for social success.

#### **GENERAL PERFORMANCE OBJECTIVES:**

Students must be able to describe and recognize the four tissue types that are found in all eleven body systems.

Students must be able to describe the importance of all eleven systems' roles in maintaining homeostasis.

Students must be able to describe one major feedback system for each of the eleven body systems.

Students must be able to describe the roles of each of the body's organs.

Students must be able to use appropriate scientific terminology when locations of the body.

#### **MASSACHUSETTS FRAMEWORKS STRAND:**

##### **4. Human Anatomy and Physiology**

Broad Concept: There is a relationship between structure and function in organ systems of humans.

##### **CURRICULUM FRAMEWORK LEARNING STANDARDS:**

4.1 Explain how major organ systems in humans (e.g., kidney, muscle, lung) have functional

units (e.g., nephron, sarcome, alveoli) with specific anatomy that perform the function of that

organ system.

4.2 Describe how the function of individual systems within humans are integrated to maintain a homeostatic balance in the body.

##### **UNITS AND THEMES/ COURSE OUTLINE:**

Week 1: History of Anatomy

Week 2-3: Histology (study of tissues) (4.1, 4.2)

Week 4-6: Nervous system (4.1, 4.2)

Week 7-8: Endocrine System (4.1, 4.2)

Week 9-10: Muscular system (4.1, 4.2)

Week 11-12: Skeletal system (4.1, 4.2)

Week 13- 14: Respiratory System (4.1, 4.2)

Week 15- 16: Circulatory and lymphatic system (4.1, 4.2)

Week 17: Digestive system (4.1, 4.2)

Week 18-19: Integumentary and Urinary system (4.1, 4.2)

Week 20: Reproductive system (4.1, 4.2)

##### **SUGGESTED INSTRUCTIONAL STRATEGIES:**

- Role Plays
- Overhead transparencies of system overview
- Debates

**SUGGESTED INTEGRATED ACTIVITIES:**

- Discuss the relationship between the horror story genre and the explosion of anatomical research in the 1800's.
- Discuss the history of anatomy from blood letting to grave robbing
- Learn the Latin names given to anatomical structures
- Graph the results from student created experiments
- Debate the latest bills passed in Congress related to health care reform

**USE OF TECHNOLOGY:** Internet searches, webquests

**ASSESSMENTS:**

Case studies, exams, student created experiments, student created plays, debates

Revised: 03/20/08