Curriculum Guide

Course 526: Enriched Anatomy and Physiology **Level:** Grades 11 & 12

1. Course Structure

This is a full year course, which meets five periods each week.

2. Intended Audience

Anatomy and Physiology is an elective course intended for junior/senior students who have completed Biology and Chemistry, and those who have been recommended for the program by their present science teacher. It is a course for students interested in learning about the human body as a whole and those pursuing a career in the health sciences.

3. Course Goals

Students will learn about anatomy and physiology in individual units.

Students should understand human function by learning the mechanisms of action and control for each major system of the body, the coordination of these systems and the consequences when homeostasis is disrupted.

The students should develop and practice learning and critical thinking skills, which will enable them to apply their knowledge. Student must go beyond memorization to analyze relationships and solve problems in each unit of the course. Becoming more effective learners and problem solvers is critical for students to succeed in advanced courses, college, and their career.

Students should develop competence and comfort in using computers and other technology for learning.

Students should develop public speaking skills.

Students should develop dissecting skills.

Students should develop skills for working effectively with others on learning tasks in laboratories. For individual learners in anatomy and physiology, other students can be extremely valuable resources.

4. Course Objectives

Content:

I. Organization of the Body
II. Covering, Support and Movement
III. Regulation and Integration
IV. Fluids and Transport
V. Environmental Exchange
VI. Continuity of Life

Skills:

- To provide students with the knowledge and ability to identify and describe the anatomical components of the major systems of the body and explain their functional roles.
- To provide the students the opportunity to develop and practice learning and critical thinking skills which will enable to apply their knowledge.
- To provide the students with the opportunity to develop competence and comfort in using computers and other technology for learning.
- To provide the opportunity for students to develop skills for working effectively with others on learning tasks.
- To provide the opportunity for students to develop public speaking skills.

5. **Essential Questions**

I. Levels of Organization
- How do anatomical structures and physiological processes display levels of organization?
- How are these levels related to each other?
- How does the body maintain homeostasis?

II. Covering, Support and Movement
- How do the skeletal and muscular systems together provide structural support and mobility?
- What are the functions of the skin and how are these functions accomplished?

III. Regulation and Integration
- Since homeostasis is continually threatened, how do several organ systems cooperate to perform the necessary adjustments?
- How does the nervous system function to monitor, process and respond to internal and environmental changes?
- How do neurons function?

IV. Fluids and Transport
- How does the living body maintain a constant chemical communication with its external environment?
- How does the cardiovascular system transport nutrients and oxygen to cells and remove waste?

V. Environmental Exchange
- How is the living body able to carry out the constant environmental exchanges of oxygen and nutrients, and carbon dioxide and wastes, in order to stabilize the homeostatic maintenance of the cellular environment?
- How does the digestive system convert macromolecules from food into smaller molecules that can be used b cells for energy?
- How does the urinary system perform the excretory function of removing waste from the blood?

VI. The Continuity of Life
- How has the human species been able to survive for hundreds of thousands of years?

6. Course Outline/ Curriculum Map

Quarter 1

I. Organization of the Body
- Introduction to Anatomy and Physiology
- Orientation of the Human Body
- Chemical Level of Organization
- Cellular Level of Organization
- Tissue Level of Organization

Quarter 2

II. Covering, Support and Movement
- The Integument: Tissues in Combination
- The Skeletal System: Axial Division
- The Skeletal System: Appendicular Division
- Osseous Tissue
- The Muscular System: Superficial Muscles of the Body
- Muscle Tissue**:** Structure and Physiology (Contraction)

Quarter 3

III. Fluids and Transport
- The Cardiovascular System: The Blood
- The Cardiovascular System: The Heart
- The Cardiovascular System: Vessels and Circulation
- The Lymphatic System and Immunity

IV. Regulation and Integration
- The Nervous System: Nervous Tissue
- The Nervous System: The Central Nervous System
- The Nervous System: The Brain and Cranial Nerves
- The Nervous System: The Peripheral and Autonomic Divisions
- Sensory Function
- The Endocrine System

Quarter 4

V. Environmental Exchange
- The Respiratory System
- The Digestive System
- Metabolism and Nutrition
- The Urinary System

VI. The Continuity of Life
- The Reproductive System
- Development and Inheritance

7. Course Text and Other Materials

The text for this course is:

Marieb, Elaine N., *Human Anatomy and Physiology*, 6th ed. Benjamin Cummings (2004).

Support materials include:

- Hutchinson, M., Mallatt, J., Marieb, E.N. *A Brief Atlas of the Human Body*. Benjamin Cummings (2003).
- Bohensky, Fred. *Photo Manual and Dissection Guide of the Cat*. Avery Publishing Group, Inc. (2003).
- Videos and DVD's
- Articles from Scientific American

8. Instructional Methods and Course Activities

Content will be conveyed through:

- Class lecture and discussion
- Laboratory investigations and dissections
- Demonstrations
- Student presentations

9. Learning Strategies

- The primary instructional mode will include class lecture/discussion and problem solving accompanied by laboratory experiences selected to complement classroom work and to ensure the mastery of essential laboratory skills.
- Students will be encouraged to approach each learning experience with an objective, critical, and analytical attitude.

10. Assessment

The assessment of students will occur through:

- Laboratory performance including analysis, reporting of observations/data
- Formal testing
- Quizzes
- Lab practicals
- Presentations

11. Course Evaluation

The assessment of this course will occur through:

- On-going feedback from current students
- Formal student questionnaire