

**MEDFORD HIGH SCHOOL  
COURSE SYLLABUS**

<b>Department:</b>	Science
<b>Course Title:</b>	Anatomy & Physiology
<b>Level and/or Grade:</b>	Honors; Grades 11-12
<b>Prerequisite:</b>	Grades of “B-” or better in Honors Biology and Honors Chemistry or “A-” or better in Standard Biology and Standard Chemistry

**Course Description:**

This course has been designed to meet the needs of those students who must acquire a firm grounding in human anatomy and physiology in order to prepare for medical, nursing or paramedical careers. Standards are similar to those in the standard level of the course, but are addressed in greater depth and with high levels of sophistication. Students will investigate the structure and function of the human body with an emphasis on laboratory work. This course studies the structure and function of the human body and the mechanisms for maintaining homeostasis within it. It includes the study of cells, tissues and the integumentary, skeletal, muscular and nervous systems. It also includes the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems, and the concepts of development, metabolism, fluid and electrolyte balance, and acid-base balance. This course uses dissection as an instructional activity. Students will be presented with alternatives as described in the district’s Dissection Policy.

**Learning Standards:** *Through inquiry, experimentation, labs, dissections, use of tools, discussion, presentation, and composition, students will be able to.....*

**Energy:**

- ◆ Understand that energy is needed to support all metabolic processes of the body, and that carbohydrates and lipids are primary sources of energy, while ATP provides a reservoir of energy for cellular metabolism.
- ◆ Explain the processes of respiration (intracellular, extracellular) by which energy is released.

**Scale & Structure:**

- ◆ Describe the hierarchy of molecular organization from biomolecules to complex organisms and how these levels result in progressively more complex function.
- ◆ Understand that organic and inorganic compounds are the basic materials that compose more complex units of the body.
- ◆ Describe the structure and function of DNA (as a genetic code that determines organisms’ structural and functional characteristics); understand that nucleic acid, DNA and RNA, along with amino acids and enzymes synthesize proteins that are important structural components at any level of organization.
- ◆ Understand that, as tissues combine to form organs and organs combine to form systems, certain functional properties emerge that are not observed in simpler components.
- ◆ Understand that growth in an organism is accomplished through division of cells.

**Stability:**

- ◆ Explain how the major organ systems in humans have functional units with specific anatomy that perform a function of that organ system.
- ◆ Be familiar with parts of several systems: generalize their functions; describe how the functions of individual systems within humans are integrated to maintain homeostatic balance in the body.
- ◆ Recognize that communication between cells is required for coordination of body functions.

**Systems & Interaction:**

- ◆ Describe how the processes necessary to sustain life involve the interaction of multiple systems such as:
  - ◆ Basic metabolism can be seen in all body systems.
  - ◆ Distribution of nutrients throughout the body involves digestive and circulatory system.
  - ◆ Nervous and endocrine systems control the interaction of other body systems as well as allow the organism to respond to environmental stimuli.
  - ◆ Support and movement involve interaction of skeletal, muscular, and nervous systems.
  - ◆ Respiratory gases are exchanged between the organism and the external environment by moving across membranes of the respiratory and circulatory systems.
  - ◆ Excretion of wastes may involve the digestive, urinary, respiratory, and integumentary systems.
  - ◆ Creation of new life involves the reproductive and endocrine systems.

**Structure & Function:**

- ◆ Understand that cells are the structural and functional units of the body.
- ◆ Identify, locate, define, dissect, and label parts of various systems of the body, and describe the functions of each system such as:
  - ◆ Membranes function as boundaries between diverse structure and function; membranes as well as various forms of integument define and protect the body from the external environment.
  - ◆ Skeletal structure provides an internal framework for the body, encloses vital organs, and provides attachment for skeletal muscle to cause movement.
  - ◆ Various muscles structures create a variety of movement.
  - ◆ Nervous system is structured to provide electrical signals to activate a variety of organ functions.
  - ◆ Endocrine system exerts chemical control over a variety of organ functions.
  - ◆ Circulatory system is related to the movement of molecules through the body.
  - ◆ Respiratory system is structured to exchange gas between the organism and its environment.
  - ◆ Digestive system breaks down ingested nutrients to a level that can be absorbed by the circulatory system.
  - ◆ Urinary system is structured to filter nitrogenous wastes and other substances from blood, thus contributing to homeostatic balance.
  - ◆ Male and female reproductive anatomy and physiology, as well as embryonic life involve the reproductive and endocrine systems.

***Standards for Literacy in History/Social Studies, Science, and Technical Subjects:******Key Ideas and Details***

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, or ideas develop and interact over the course of a

text.

### ***Craft and Structure***

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

### ***Integration of Knowledge and Ideas***

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

### ***Range of Reading and Level of Text Complexity***

10. Read and comprehend complex literary and informational texts independently and proficiently.

## ***Standards for Writing in History/Social Studies, Science, and Technical Subject:***

### ***Text Types and Purposes***

1. Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

### ***Production and Distribution of Writing***

4. Produce clear and coherent writing in which the development organization and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, and trying a new approach.
6. Use technology, including the internet, to produce and publish writing and to interact and collaborate with others.

### ***Research to Build and Present Knowledge***

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary and informational texts to support analysis, reflection, and research.

### ***Range of Writing***

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

***Course Alignment with 21<sup>st</sup> Century Learning Expectations:***

Students will...

- Become self-directed learners.
- Communicate effectively.
- Apply problem-solving skills and critical and creative thinking.
- Use technology appropriately as a tool for learning, collaboration, presentation, research, and design.
- Act with integrity, respect and responsibility toward themselves, others and the environment.
- Exhibit flexibility and adaptability.
- Collaborate in diverse groups to share knowledge, build consensus, and achieve goals.
- Practice leadership in and service to their community.

Become contributing citizens in a global society.

**Assessment:**

- ◆ See attached grading policy and dissection policy.