



<b>Course Number</b> BIO 103	<b>Course Title</b> Anatomy & Physiology I	<b>Credits</b> 4
<b>Hours:</b> <b>Lecture/Lab/Other</b> 3 lec/3 lab	<b>Co- or Pre-requisite</b> Proficiency in basic algebra ENG 101	<b>Implementation</b> <b>Semester &amp; Year</b> Fall 2022

**Catalog description:**

Systemic approach to the structure and function of the human body; general terminology and organization; cells and tissues; integumentary, skeletal, muscular, and nervous systems. Laboratory includes use of microscope and the study of human anatomy via computer software and preserved specimens.

Does not fulfill any requirements in the Biology AS degree.

**General Education Category:**  
[Goal 3: Science](#)

**Course coordinator:**

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**Required texts & Other materials:**

Human Anatomy and Physiology, Erin Amerman, Pearson, 2<sup>nd</sup> edition, 2019  
ISBN: 9780134757520

**Course Student Learning Outcomes (SLO):**

***Upon successful completion of this course the student will be able to:***

1. Use working vocabulary of appropriate terminology in the integumentary, skeletal, muscular, and nervous systems. [Supports ILG #1, 3, 4, 8, 10, 11]
2. Identify structures of the integumentary, skeletal, muscular, and nervous systems. [Supports ILG #1, 3, 4, 8, 10, 11]
3. Differentiate among various histological body tissue samples. [Supports ILG #1, 3, 4, 8, 10, 11]
4. Explain the function of the organs within a particular system and their importance to that system's function and to maintaining homeostasis. [Supports ILG #1, 3, 4, 8, 10, 11]
5. Correlate structure and function relationships within each system. Integrate knowledge of anatomical and physiological functions of the entire body. [Supports ILG #1, 3, 4, 8, 10, 11]
6. Utilize concepts of the scientific method investigating laboratory/clinical data. [Supports ILG #1, 3, 4, 8, 10, 11]

**Course-specific Institutional Learning Goals (ILG):**

**Institutional Learning Goal 1. Written and Oral Communication in English.** Students will communicate effectively in both speech and writing.

**Institutional Learning Goal 3. Science.** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

**Institutional Learning Goal 4. Technology.** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

**Institutional Learning Goal 8. Diversity and Global Perspective:** Students will understand the importance of a global perspective and culturally diverse peoples

**Institutional Learning Goal 10. Information Literacy:** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

**Institutional Learning Goal 11. Critical Thinking:** Students will use critical thinking skills understand, analyze, or apply information or solve problems.

**Units of Study in Detail – Unit Student learning Outcomes:**

**Unit I** Introduction to A&P, Terminology, Homeostasis, Organic Molecules, Cells, Transport Mechanisms, Organelles, DNA, Protein synthesis, Cell Division [Supports Course SLO #1, 3, 4, 5, 6]  
Learning Objectives

*The student will be able to:*

- Define anatomy and physiology.
- Describe the major characteristics for living organisms and levels of organization.
- Identify the organ systems, the major components, and functions of each system.
- Explain the concept of homeostasis and feedback mechanisms.
- Define basic anatomical terminology including body cavities and membranes, directional, sectional, and regional terminology
- Discuss examples and basic functions of inorganic and organic compounds

- Describe the structure and function of a typical animal cell and its components including transport mechanisms, DNA, and protein synthesis.
- Compare and contrast the processes of cell division (mitosis and meiosis).
- Discuss control of cell division, tumors, and stem cells.
- Discuss selected clinical terminology and health-related situations.

## **Unit II** Tissues and the Integumentary System [Supports Course SLO #1, 2, 3, 4, 5]

### Learning Objectives

*The student will be able to:*

- Identify the four main tissue types and their general functions.
- Discuss specific examples and functions of epithelium and glandular tissues, connective, muscular, and nervous tissues.
- Discuss the four different types of membranes and their functions.
- Describe the structure and function of the regions of the skin, including the hypodermis.
- Describe the accessory structures (hair, nails, and glands) associated with the skin.
- Explain differences in skin pigmentation and effects of UV radiation on skin.
- Explain the regulation of body temperature.
- Identify the exteroceptors and their main functions.
- Discuss selected clinical terminology and health-related situations.

## **Unit III** Skeletal and Muscular Systems [Supports Course SLO #1, 2, 3, 4, 5]

### Learning Objectives

*The student will be able to:*

- Describe the components and functions of the skeletal system.
- Classify the bones according to shape including the parts of long bone.
- Compare and contrast spongy bone and compact bone, and the differences between the various bone cells and their function in remodeling.
- Distinguish between intramembranous and endochondral ossification.
- Discuss the effects of hormones, diet, exercise, and aging on the skeletal system.
- Identify major surface features of bones.
- Identify bones of the axial and appendicular skeleton and their surface features
- Identify the characteristics of the vertebral regions and the vertebral column curvatures.
- Identify the bones that form the pectoral and pelvic girdles, the thoracic cage, and the upper and lower limbs.
- Discuss the skeletal differences between females and males.
- Describe the major classifications of joints based on structure and functions and give examples of each.
- Discuss selected clinical terminology and health-related situations.
- Describe the characteristics and functions of the 3 muscle tissues.
- Describe the organization of skeletal muscle at the tissue level.
- Describe the microanatomy of skeletal muscle fibers.
- Explain the sliding filament model of muscle contraction.
- Describe the parts of the neuromuscular junction (NMJ).
- Explain the series of events that take place at the NMJ and key steps in contraction and relaxation of skeletal muscle fibers.
- Give definitions for the different types of muscle contractions (twitch, summation, recruitment, muscle tone, isometric, and isotonic).
- Describe how muscle fibers obtain and utilize energy for contraction.
- Define origin, insertion, and action and the naming of muscles.
- Discuss selected clinical terminology and health-related situations.

## **Unit IV** Nervous System [Supports Course SLO #1, 2, 3, 4, 5]

### Learning Objectives

*The student will be able to:*

- Name the 2 major anatomical divisions of the nervous system and describe the organization and characteristics of each
- Discuss the classification and functions of neurons and neuroglia.
- Describe the resting potential and the events in the generation and propagation of an action potential (AP)
- Describe the synapse, sequence of events in synaptic transmission, and various neurotransmitters.
- Describe the difference between white matter and gray matter.
- Describe the structure and function of the major regions of the brain.
- Discuss the blood supply to the brain and the importance of the blood brain barrier (BBB).
- Discuss the formation, circulation, and functions of CSF.
- Identify the cranial nerves and important individual functions.
- Discuss the structure and functions of the spinal cord and spinal nerves.
- Compare and contrast the structures and functions of the sympathetic and parasympathetic divisions of the autonomic nervous system (ANS).
- Discuss selected clinical and health-related situations.

### **Evaluation of student learning:**

Questions on exams are from lecture, lecture assignments, reading assignments, handouts, or other material presented. It is the student's responsibility to be present and on time for all exams. There are NO MAKEUP EXAMS. If you miss a lecture exam for any reason, your final exam grade will be counted twice. If you miss a second lecture exam, you will receive a zero for that exam. Students will complete a Lecture quiz each week on Bb. Additional lecture or laboratory assignments may be added at the instructor discretion. Mastering A&P assignments may be used as maximum of 20 extra credit points.

The laboratory grade consists of lab practical exams and weekly lab quizzes on Bb. The lecture and laboratory grades are calculated together as one course grade. The lecture grade is 5/9 and the lab grade is approximately 4/9 of the final grade for the course.

Assignment	Number @ point value	Total Point Value
Lecture Quizzes	10 @ 10 points	100 points
Lecture Tests	4 @ 100 points each	400 points
Lab Quizzes	10 @ 10 points each	100 points
Lab Practicals	3 @ 100 points each	300 points
TOTAL POINTS		900 points
Final Grade =	(Total points / 9)	

<b>A</b>	<b>93-100%</b>	<b>B+</b>	<b>87-89%</b>	<b>C+</b>	<b>77-79%</b>	<b>D</b>	<b>60-69%</b>
<b>A-</b>	<b>90-92</b>	<b>B</b>	<b>83-86</b>	<b>C</b>	<b>70-76</b>	<b>F</b>	<b>&lt;60%</b>
		<b>B-</b>	<b>80-82</b>				