



Biological Sciences

SOUTHEASTERN LOUISIANA UNIVERSITY

BIOL 2500-Human Anatomy and Physiology I

Southeastern Louisiana University Dual Enrollment 2024-2025 Academic Year

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Office Hours: Monday 10am-12pm; Tuesday 12-2pm; and Wednesday 10am-12pm & 1-2pm; **Online:** 9:30am-12:30pm

Office: Thelma Ryan Hall 421B

Course materials: Canvas via Southeastern Gmail

Rental Textbook: *Anatomy and Physiology: The Unity of Form and Function, 9th ed. Kenneth Saladin.*

Prerequisite: GBIO 151

BIOL 2500 is a hybrid course with all content delivered online through Canvas OR face-to-face by Southeastern faculty. The Southeastern instructor of record will develop course content and provide lectures, worksheets, and outlines that act as study guides through Canvas. Ungraded instructional assignments, ungraded quizzes that are similar to exams, and chapter outlines to help prepare students to complete the graded assignments in Connect and the exams in Canvas which are also provided by the Southeastern instructor of record. The high school teachers will act as a facilitator and assist with student registration and enrollment, proctor exams as necessary, and through supplemental instruction, serve as a daily learning resource for students as they assimilate course content. The students' final course grades are assigned by the instructor of record.

Connect (by McGraw-Hill) is the companion site to our textbook

Student Learning Course Outcomes: After the completion of this course, students will be able to:

CO1: Describe anatomy and physiology and the organization of the human body systems.

CO2: Describe the four major tissue types and three embryonic germ layers that produce them.

CO3: Identify the anatomical features and describe the physiology of those features in the Integumentary System.

CO4: Identify the anatomical features and describe the physiology of those features in the Skeletal System and Muscular System.

CO5: Identify the anatomical features and describe the physiology (functions) of those features in the Nervous System

Exams, 70% of Final Grade: There will be four 100-point exams in this course. The first three exams will cover each respective unit and 50 questions worth 2 points each. The final exam has 75 questions worth 1.3 points each; 30 Questions on the final exam come from the Unit 4 material while the remaining 45 questions will be comprehensive from the first three units. Exams will be administered via Canvas and grades will be posted in Canvas. There will be 400 total points from exams; 70% of your course grade is from exams.

Assignments and Chapter Checkouts: Assignments worth up to 10 points will be given at the instructor of record's discretion. Assignments are designed to test your understanding of material that has been presented. There is a Chapter Checkout for every chapter. You are required to complete these by the date of the respective exam. Assignments and Chapter Checkouts are available in Connect via Canvas. There are 200 points from Connect; 30% of your course grade is from work in Connect.

Grade scale: [90-100% = A] [80-89% = B] [70-79% = C] [60-69% = D] [< 60% = F]

Grades will be posted in Canvas at the completion of the unit. Final grades will be posted in WorkDay.

Make-ups: There will be no individual make-up exams given to students without a valid excuse. Students that possess a valid medical excuse or school excuse may be allowed to take a make-up exam (alternative assessment methods maybe used at my discretion). **Make-ups will only be allowed within 1 week of the excused absence.** There will be **no make-ups for in class work** and no extensions for outside class assignments without valid excuses or prior consent of the instructor. (You get to drop your lowest exam).

Academic Dishonesty: Schools agree that the first incident of academic dishonesty in any course by any student in any manner will result in a grade of 0 on the assessment in question. The second incident will result in the student's failing the Southeastern portion of the course. Southeastern's Academic Dishonesty Policy:

Students are expected to maintain the highest standards of academic integrity. Behavior that violates these standards is not acceptable. Examples are the use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student and similar behavior that defeats the intent of an examination or other class work. Cheating on examinations, plagiarism, improper acknowledgement of sources in essays, and the use of a single essay or paper in more than one course without permission are considered very serious offenses and shall be grounds for disciplinary action as outlined in the current General Catalogue of Southeastern Louisiana University
http://www.southeastern.edu/resources/policies/policy_detail/acad_integrity.html

Attendance: Students should refer to the University policy on attendance as stated in the current SLU catalogue. Attendance will be taken at the beginning of each class. If you cannot attend lectures regularly, you should consider dropping the class. **It is your responsibility to complete and file drop forms with you high school course coordinator if you wish to withdraw from the class.** The last day to withdraw from the class for Year-long and Spring semester classes is April 4, 2025.

Grade Appeals: Should a student have a concern about a final grade posted for a dual enrollment course, the Grade Appeals policy should be followed below. Please note that a student has 30 days to make a written appeal to the Southeastern Instructor of Record:

After a final course grade is recorded in the Records and Registration Office, a change of grade must be approved in sequence by the instructor of record, the instructor's department head, and the academic dean of the College of Science and Technology. In the event of a contested final course grade, a student's written appeal of the grade must be submitted to the instructor within **thirty (30)** calendar days of final grades for the term being due. The grade appeal should also be submitted to Dr. Jeffrey Temple, Assistant Vice President for Academic Programs. For more information about grade appeals, see
http://www.southeastern.edu/resources/policies/policy_detail/instruction_practices.html

Technology Requirements: This course requires a computer, a secure internet connection (do not use hotspots or wifi), use of Adobe Reader (for PDF files), Respondus Lockdown Browser (can be downloaded from Southeastern's website), a webcam and a location/room where the student can complete exams alone. IF Respondus Monitor is required there is a \$10-15 fee to be paid by the student upon the first assignment. Assistance with programs is provided within the on-campus labs and also virtually through the "Student Links" section of Moodle. ****Warning:** For online exams, make sure you have a secure internet connection utilizing an ethernet cable. Wifi strength can vary causing connection issues which may result in your answers not being saved

Computer and digital literacy expectations: Students should be able to use Moodle as well as the programs mentioned above in the Technology Requirements section. Additionally, students should understand proper "Netiquette" and remain respectful of classmates and the instructor at all times.

Netiquette: When participating in online discussions, as well as e-mail, and in class participation, you are expected to be respectful to fellow students and faculty members in tone and civility. Whether the communication be via electronic means, telephone, or face-to-face use of correct English is required, as opposed to net acronyms. Make sure to include your name, high school, and course and section number in all email communication. I will respond within 24 hours to email sent Monday-Friday at noon.

Important dates for the semester:

http://www.southeastern.edu/future_students/dual_enrollment/calendar/index.html

	Fall Only 2024	Year Long 2024-2025	Spring Only 2025
Last day to enroll		August 18	January 19
First day of class		August 16	January 16
Last day to DROP		August 25	January 26
Last day to confirm rosters		September 1	February 2
Exam 1		October 6	February 9
Exam 2		December 8	March 8
Last day to Withdraw		March 28	March 28
Exam 3		March 8	April 5
Exam 4		May 3	May 3
Final Exam		May 10	May 10

Material to be covered on exams given through Canvas:

Unit 1: Introduction to Anatomy and Physiology, Tissues, and the Skin

Chapter 1: Major Themes of Anatomy and Physiology

Atlas A: General Orientation of the Human Body

Chapter 5: Histology

Chapter 6: The Integumentary System

Unit 1 Exam: Ch 1, Atlas A, Ch 5-6

Unit 2: Bones, Joints, and Muscles

Chapter 7: Bone Tissue

Chapter 8: The Skeletal System

Chapter 9: Joints

Chapter 10: The Muscular System

Chapter 11: Muscular Tissue

Unit 2 Exam: Ch 7-11

Unit 3: The Nervous System

Chapter 12: Nervous Tissue

Chapter 13: The Spinal Cord, Spinal Nerves, and Somatic Reflexes

Chapter 14: The Brain and Cranial Nerves

Unit 3 Exam: Ch 12-14

Unit 4: The Autonomic Nervous System and Senses

Chapter 15: The Autonomic Nervous System and Visceral Reflexes

Chapter 16: Sense Organs

Final Exam: 40% Unit 4: Ch 15 & 16; 60% Atlas A, Ch 1, 5-14

Learning Objectives by Chapter and associated Course Outcomes:

Chapter 1: Major Themes of Anatomy and Physiology

1.1 Define *anatomy* and *physiology* and relate them to each other. (CO1)

1.2 List and describe the levels of human structure from the most complex to the simplest. (CO1)

1.3 State the characteristics that distinguish living organisms from nonliving objects; (CO1)

1.4 Define *homeostasis*, *negative feedback*, and *positive feedback* and explain why these concepts are central to physiology. (CO1)

1.5 Define *gradient*, describe the variety of gradients in human physiology, and identify some forms of matter and energy that flow down gradients. (CO1)

Atlas A: General Orientation to Human Anatomy

A.1 Define *anatomical position*, *anatomical planes*, and the *directional terms*, use directional terms to describe the location of anatomical structures. (CO1)

A.2 List and define the major body cavities and their membranous linings. (CO1)

A.3 List eleven organ systems in the human body, their principal organs and basic functions. (CO1)

Chapter 5: The Human Tissues

5.1 Describe the four primary tissue classes in adults and the three embryonic germ layers and some adult tissues derived from each. (CO2)

5.2 Describe the properties that distinguish epithelial tissue from other tissue classes, the eight types of epithelium, and state where each type can be found in the body. (CO2)

5.3 Describe the properties that most connective tissues have in common, types of cells found in connective tissue, and the matrix of a connective tissue its components. (CO2)

5.4 Name and classify 10 types of connective tissue, describe their cellular components and matrix, and explain what distinguishes them from each other. (CO2)

5.5 Explain what distinguishes excitable tissues from other tissues. (CO2)

5.6 Name the cell types that compose nervous tissue and identify the major parts of a nerve cell. (CO2)

5.7 Name the three kinds of muscular tissue and describe the differences between them. (CO2)

5.8 Describe the junctions that hold cells and tissues together. (CO2)

Chapter 6: The Integumentary System

6.1 List the functions of the skin and relate them to its structure. (CO3)

6.2 Describe the histological structure of the epidermis, dermis, and subcutaneous tissue. (CO3)

6.3 Distinguish between three types of hair and their functions. (CO3)

6.4 Describe the histology of a hair and its follicle. (CO3)

6.5 Describe the structure and function of nails. (CO3)

6.6 Name two types of sweat glands, and describe the structure and function of each. (CO3)

6.7 Describe the location, structure, and function of sebaceous, ceruminous, and mammary glands. (CO3)

Chapter 7: Bone Tissue

- 7.1 Name the cells, tissues, and organs that compose the skeletal system.
- 7.2 State several functions of the skeletal system.
- 7.3 Compare the histology of the two types of bone tissue and two types of bone marrow.
- 7.4 Describe two mechanisms of bone formation and how mature bone continues to grow.
- 7.5 Describe the processes by which minerals are added to and removed from bone tissue and the role of bone tissue and hormones in mineral homeostasis.

Chapter 8: The Skeletal System

- 8.1 Describe the two subdivisions of the skeleton and the number of bones in the adult skeleton.
- 8.2 Define terms that denote surface features of bones.
- 8.3 Name the bones of the skull and their anatomical features including cavities and sutures, distinguish between cranial and facial bones.
- 8.4 Describe the development of the skull from infancy through childhood.
- 8.5 Describe the general features of the vertebral column including those of a typical vertebra, special features of regions within the vertebral column, and intervertebral discs.
- 8.6 Describe the thoracic cage including the anatomy of the sternum, ribs, and how the ribs articulate with the thoracic vertebrae.
- 8.7 Identify and describe the features of the clavicle, scapula, humerus, radius, ulna, and bones of the wrist and hand.
- 8.8 Identify and describe the features of the pelvic girdle, femur, patella, tibia, fibula, and bones of the foot.

Chapter 9: Joints

- 9.1 Explain what joints are, how they are named, and what functions they serve.
- 9.2 Name and describe the four major categories of joints.
- 9.3 Describe the three types of fibrous joints and give an example of each.
- 9.4 Distinguish between the three types of sutures.
- 9.5 Describe the two types of cartilaginous joints and give an example of each.
- 9.6 Identify the anatomical components of a typical synovial joints.
- 9.7 Describe six classes of synovial joints, the primary axes of rotation that a bone can have, and relate this to a joint's degrees of freedom.
- 9.8 Define movements that occur at synovial joints
- 9.9 Identify the major anatomical features of the shoulder, elbow, hip, knee, and ankle joints.

Chapter 10: The Muscular System

- 10.1 Describe the various functions of muscular tissue;
- 10.2 Describe the connective tissue components of a muscle and their relationship to the internal organization of a muscle.
- 10.3 Relate muscle fascicles to the shapes and relative strengths of muscles;
- 10.4 Name the types of muscle–bone attachments.
- 10.5 Distinguish between intrinsic and extrinsic muscles.
- 10.6 Describe the ways muscles work in groups to aid, oppose, and moderate each other's actions.
- 10.7 Name and locate the muscles that produce facial expressions, muscles used for chewing and swallowing, the neck muscles that move the head; and identify the attachments and action of these muscles.
- 10.8 Name and locate the muscles of the abdominal wall and back, and identify their skeletal attachments and actions.
- 10.9 Name and locate the muscles that act on the pectoral girdle, shoulder, elbow, wrist, and hand; relate the actions of these muscles to the joint movements described in chapter 9; and describe their skeletal attachments and actions.
- 10.10 Name and locate the muscles that act on the hip, knee, ankle, and toe joints; relate the actions of these muscles to the joint movements described in chapter 9; and describe their skeletal attachments and actions.

Chapter 11: Muscular Tissue

- 11.1 Describe the physiological properties that all muscle types have in common.
- 11.2 List the defining characteristics of skeletal muscle.
- 11.3 Describe the structural components of a muscle fiber.
- 11.4 Relate the striations of a muscle fiber to the overlapping arrangement of its protein filaments.
- 11.5 Name the major proteins of a muscle fiber and state the function of each.
- 11.6 Explain what a motor unit is and how it relates to muscle contraction.
- 11.7 Describe the structure of the junction where a nerve fiber meets a muscle fiber.
- 11.8 Explain why a cell has an electrical charge difference across its plasma membrane and, in general terms, how this relates to muscle contraction.
- 11.9 Explain how a nerve fiber stimulates a skeletal muscle fiber, how stimulation of a muscle fiber activates its contractile mechanism, the mechanism of muscle contraction, and how a muscle fiber relaxes.
- 11.10 Explain how skeletal muscle meets its energy demands during rest and exercise.
- 11.11 Describe the structural and physiological differences between cardiac muscle, smooth muscle, and skeletal muscle.

Chapter 12: Nervous Tissue

- 12.1 Describe the overall function of the nervous system and the major anatomical and functional subdivisions.
- 12.2 Describe three functional properties found in all neurons and the three most basic functional categories of neurons.
- 12.3 Identify the parts of a neuron.
- 12.4 Name the six types of cells that aid neurons, and state their respective functions.
- 12.5 Describe the myelin sheath that is found around certain nerve fibers, and explain its importance.
- 12.6 Explain why a cell has an electrical charge difference (voltage) across its membrane.
- 12.7 Explain how stimulation of a neuron causes a local electrical response in its membrane.
- 12.8 Explain how local responses generate a nerve signal and how the nerve signal is conducted down an axon.
- 12.9 Explain how messages are transmitted from one neuron to another.
- 12.10 Give examples of neurotransmitters and neuromodulators and describe their actions.
- 12.11 Explain how stimulation of a postsynaptic cell is stopped.
- 12.12 Explain how a neuron “decides” whether or not to generate action potentials.
- 12.13 Explain how the nervous system translates complex information into a simple code

Chapter 13: The Spinal Cord, Spinal Nerves, and Somatic Reflexes

- 13.1 State the three principal functions of the spinal cord.
- 13.2 Describe the gross and microscopic structure of the spinal cord.
- 13.3 Trace the pathways followed by nerve signals traveling up and down the spinal cord.
- 13.4 Describe the anatomy of nerves and ganglia in general.
- 13.5 Describe the attachments of a spinal nerve to the spinal cord.
- 13.6 Trace the branches of a spinal nerve distal to its attachments.
- 13.7 Name the five plexuses of spinal nerves and describe their general anatomy.
- 13.8 Name some major nerves that arise from each plexus and identify what they innervate and explain the relationship of dermatomes to the spinal nerves.
- 13.9 Define *reflex*, explain how reflexes differ from other motor actions, and describe the general components of a typical reflex arc.

Chapter 14: The Brain and Cranial Nerves

- 14.1 Describe the major subdivisions and anatomical landmarks of the brain.
- 14.2 Describe the locations of the gray and white matter in the brain.
- 14.3 Describe the embryonic development of the CNS and relate this to adult brain anatomy.
- 14.4 Describe the meninges of the brain.
- 14.5 Describe the fluid-filled chambers within the brain.
- 14.6 Discuss the production, circulation, and function of the cerebrospinal fluid that fills these chambers.
- 14.7 Explain the significance of the brain barrier system.
- 14.8 List the components of the hindbrain, midbrain, and reticular formation and their functions.
- 14.9 Name the three major components of the diencephalon and describe their locations and functions
- 14.10 Identify the five lobes of the cerebrum and their functions
- 14.11 Describe the three types of tracts in the cerebral white matter
- 14.12 Describe the location and functions of the basal nuclei and limbic system
- 14.13 Describe the stages of sleep, their relationship to the brain waves, and the neural mechanisms of sleep
- 14.14 Identify the brain regions concerned with consciousness and thought, memory, emotion, sensation, motor control, and language
- 14.15 List the 12 cranial nerves by name and number and state the functions of each cranial nerve.

Chapter 15: The Autonomic Nervous System and Visceral Reflexes

- 15.1 Explain how the autonomic and somatic nervous systems differ in form and function.
- 15.2 Explain how the two divisions of the autonomic nervous system differ in general function.
- 15.3 Identify the anatomical components and nerve pathways of the sympathetic and parasympathetic divisions
- 15.4 Discuss the relationship of the adrenal glands to the sympathetic nervous system
- 15.5 Describe the enteric nervous system of the digestive tract and explain its significance.
- 15.6 Name the neurotransmitters employed at different synapses of the ANS
- 15.7 Name the receptors for these neurotransmitters and explain how they relate to autonomic effects
- 15.8 Explain how the ANS controls many target organs through dual innervation

Chapter 16: Sense Organs

- 16.1 Define *receptor* and *sense organ*
- 16.2 List the four kinds of information obtained from sensory receptors, and describe how the nervous system encodes each type
- 16.3 Outline three ways of classifying receptors.
- 16.4 List several types of somatosensory receptors and the projection pathways for the general senses

- 16.5 Describe the types and mechanisms of pain; and explain how the brain modulates one's sensitivity to pain.
- 16.6 Describe how taste and smell receptors are stimulated and the receptors and projection pathways for these senses.
- 16.7 Identify the properties of sound waves that account for pitch and loudness
- 16.8 Describe the gross and microscopic anatomy of the ear
- 16.9 Explain how the ear converts vibrations to nerve signals and discriminates between sounds of different intensity and pitch
- 16.10 Explain how the vestibular apparatus enables the brain to interpret the body's position and movements
- 16.11 Describe the pathways taken by auditory and vestibular signals to the brain.
- 16.12 Describe the anatomy of the eye and its accessory structures
- 16.13 Discuss the structure of the retina and its receptor cells and how the retina converts this image to nerve signals
- 16.14 Explain why different types of receptor cells and neural circuits are required for day and night vision
- 16.15 Describe the mechanism of color vision
- 16.16 Trace the visual projection pathways in the brain.