

# BIOL 0005 - HUMAN ANATOMY

## Catalog Description

Prerequisite: Eligibility for ENGL 11

Advisory: Completion of BIOL 55, 56, HSCI 03, or previous science course with grade of "C" or better, or experience in health care field; completion of MATH D with grade of "C" or better; eligibility for ENGL 1A

Hours: 162 (54 lecture, 108 laboratory)

Description: Structural organization, relationships among structures, and histology of the human body: gross and microscopic structure of the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems, from cellular to organ system levels of organization. This is a rigorous course in human anatomy primarily intended for nursing, allied health, kinesiology, and other health related majors. Cadaver dissections used for instruction. Nonmajors see BIOL 55, 56, and 56L. Students enrolling in BIOL 5 after having taken BIOL 7A will lose credit for BIOL 7A. (C-ID BIOL 110B) (CSU, UC-with unit limitation)

## Course Student Learning Outcomes

- CSLO #1: Describe and categorize the key structural features of different human cells, major tissue types and subtypes, and identify locations in the body where each is located.
- CSLO #2: Identify, describe and compare the anatomical location, histology and gross anatomical structure of all human body systems in appropriate detail for a major anatomy course.
- CSLO #3: Identify the anatomical structures of the human body by systems utilizing anatomical models, organ specimens, cadavers and visual media.
- CSLO #4: Compare structure and function of all human body systems from the cellular through system levels of organization.
- CSLO #5: Explain structural or anatomical changes that occur in disease, injury or aging of the human body systems.

## Effective Term

Fall 2022

## Course Type

Credit - Degree-applicable

## Contact Hours

162

## Outside of Class Hours

108

## Total Student Learning Hours

270

## Course Objectives

Lecture Objectives:

1. Name the different levels of structural organization that make up the human body, classify them according to relative and actual sizes and explain their relationships;
2. List the organ systems of the body and briefly state the main functions of each system;
3. Explain homeostasis, the systems responsible for homeostasis and the significance of positive and negative feedback systems in maintaining homeostasis;
4. Define the anatomical position and explain its significance;
5. Use correct anatomical terminology to describe body directions, regions, planes, body cavities, and subdivisions;
6. Use surface anatomy where applicable;
7. Define a cell, explain its basic activities and contents as well as that of the plasma membrane and cross membrane traffic;
8. Name and describe the four tissue types including their attributes and locations;
9. Distinguish between endocrine and exocrine glands, describing each with their respective functions and locations;
10. Explain the structure and function of the four membrane types;
11. Name the tissue types that compose the dermis and epidermis, list the major layers of each, and describe the functions and describe the functions and appendages/gland, etc. of each layer;
12. Describe the main functions and regions of the bony and cartilaginous skeletons;
13. Describe the gross and microscopic anatomy of bone relating this composition to the development, growth, and characteristics of specific bones;
14. Relate markings on bones to their usage, location and muscle attachments;
15. Name and describe any specific bone in the body as to its characteristics, size, location, and features;
16. Explain characteristics of joints in general as well as specifics of each individual joint;
17. Describe the types of muscle tissue as well as locations and attributes of each type;
18. Explain the contractile mechanisms of muscle;
19. Describe and name the fascial layers associated with muscles;
20. Describe the lever systems by which muscles act and explain the mechanical advantage of each type;
21. Explain agonist, antagonist, fixator, and synergist in terms of muscle action;
22. Name and identify the major muscles of the body and state the origin, insertion, and action of each;
23. List the main functions of the nervous system;
24. Explain the structural and functional divisions of the nervous system;
25. Define and categorize neurons, explaining the structure, functions and conduction of neurons;
26. Define reflexes and give examples of types of reflexes;
27. Name and discuss the major structural and functional regions and organization of the brain and spinal cord including tracts and peripheral nerves arising from the central nervous system;
28. Describe each of the special sense organs, the significant structures of each and the relationship of each to the central nervous system;
29. Describe and name the rami and roots of spinal nerves as well as the plexuses arising from them;
30. Identify the interrelationships among the cerebrospinal fluid, meninges and ventricles;
31. Discuss and explain the divisions, anatomy, and functions of the autonomic nervous system;
32. List the major endocrine organs and describe each gland's gross anatomy, location and function;

33. Describe the interactions between endocrine secretions and their target organs/tissues;
  34. Name and explain the origins and the significance of each of the major components of blood including blood types;
  35. Name, describe and explain the functions of the parts of the heart including the layers, valves, conduction system and cardiac cycle;
  36. Identify, describe and explain the major blood vessels of the body by name, location and internal anatomy;
  37. Trace a drop of blood from one part of the body to any other;
  38. Describe the fetal circulation and the changes that occur at birth;
  39. Describe the structure and function of the lymphatic system and its components;
  40. Describe the organs and function of the respiratory system;
  41. List in order the organs through which air passes, describing the histology, gross anatomy, and function of each;
  42. Explain the mechanisms and control of breathing;
  43. Describe the respiratory membrane and its role in gas exchange;
  44. Name and describe the microscopic and gross anatomy of each of the digestive organs in the order in which food passes;
  45. Describe a typical section of the alimentary canal wall;
  46. Explain the relationships among the liver, gallbladder, pancreas, and duodenum;
  47. Explain the functions of the urinary system;
  48. Name and describe the histology and gross anatomy of all parts of the urinary system relating each to its functions;
  49. Name and describe the histology, gross anatomy and function of all parts of the female reproductive system;
  50. Relate each structure to the reproductive cycle in the female;
  51. Describe and explain the major events in early embryonic development including neural tube formation;
  52. Name and describe the histology, gross anatomy and function of all parts of the male reproductive system;
  53. Explain the relationship between any of the above items and homeostasis;
  54. Describe structural or anatomical changes that occur in disease, injury or aging of the human body systems.
- Laboratory Objectives:
1. Use anatomical terminology to describe body landmarks and direction;
  2. Identify and describe cell structures and examples of the four primary tissue types using histological specimens and models;
  3. Identify and describe the layers of the epidermis, dermis, and accessory organs of the integumentary system on histological specimens and models;
  4. Identify the components of compact bone, individual bones and bone markings on osteological specimens;
  5. Name and identify the major muscles of the body and state the origin, insertion, and action of each using models and cadaver;
  6. Identify and describe the types of muscle tissue as well as locations and attributes of each type;
  7. Identify and describe structures of the peripheral and central nervous system on histological specimens, models, and sheep brain dissection;
  8. Identify and describe structures of special sense organs using histological specimens, models, and calf eye dissection;
  9. Identify individual cells in a blood smear and explain each of their functions;
  10. Identify and describe the parts of the heart including the layers and valves using models and calf heart dissection;
  11. Identify and describe the major blood vessels of the body by name and location;
  12. Name and identify the parts of lymphatic system and its components;
  13. Identify the major endocrine organs on the models and histological slides;

14. Identify and describe the microscopic and gross anatomy of each of the respiratory organs in the order in which air travels; and
15. Identify and describe the microscopic and gross anatomy of each of the digestive organs in the order in which food passes.
16. Name and identify the histology and gross anatomy of all parts of the urinary system relating each to its functions;
17. Name and identify the histology and gross anatomy of all parts of the male and female reproductive system.

## General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Life Sciences
  - AS - Life Science Lab
- CSU GE Applicability (Recommended-requires CSU approval)
  - CSUGE - B2 Life Science
  - CSUGE - B3 Lab Activity
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
  - IGETC - 5B Biological Science
  - IGETC - 5C Laboratory Science

## Articulation Information

- CSU Transferable
- UC Transferable

## Methods of Evaluation

- Classroom Discussions
  - Example: Students will be posting weekly about the topics that they were most confused on for that week(for example, the pathway of airflow through the respiratory system). Students will then be required to respond to classmates and provide helpful tips in studying the difficult topics. Students will be graded on participation.
- Essay Examinations
  - Example: Objective: "Trace a drop of blood from one part of the body to any other." On an essay question, students will be required to write all the blood vessels and structures blood would pass through to travel from the lower left limb to the right hand. Students will be graded on a traditional grading scale based on the percent of correct structures they identify in their essay response. Objective Examinations: Objective: "Distinguish between endocrine and exocrine glands." Students will take a multiple choice test on the endocrine system. The tests will be scored and assigned a grade on a traditional grading scale. Example question: Which of the following is FALSE about endocrine glands? a. They secrete hormones b. Their products travel through local ducts c. The chemical messengers travel through the bloodstream
- Problem Solving Examinations
  - Example: "Using a standard set of clinical tests, students will determine the root problem, based on symptoms presented by a hypothetical patient, such as loss of taste." Students will be graded on a rubric. Rubric will be based on accurate "diagnosis" as well as accurate reasoning from symptom to diagnosis.
- Skill Demonstrations
  - Example: Objective: "Name and describe the four tissue types including their attributes and locations." On a lab exam, students will be required to identify tissues under the microscopes.

Students will be graded on if they correctly identify the tissue or not.

## Repeatable

No

## Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. The instructor will identify the structures of the brain using a brain model. Students will then be asked to work in lab groups to dissect and identify these same structures on a sheep's brain. (Lecture Objective 26 & 27, Lab Objective 7)
2. The instructor will demonstrate the chambers of the heart, valves, and major blood vessels associated with the heart using a heart model. Students will then be asked to work in lab groups to dissect and identify these same structures on a sheep's heart.

Lecture:

1. Instructor will lecture using a lecture slide presentation to introduce the new concept of fractures of the skeletal system. Students then will be asked how they would react to specific scenarios; for example, how would they treat a simple fracture versus a compound fracture?

Distance Learning

1. Instructor will lecture using lecture slide presentations to introduce the new concept of muscle contraction. Students then will be asked how they would describe the contractile mechanism in a discussion group where they will also provide feedback to other student's descriptions; for example, some students describe it as a tug of war between thick and thin filaments.

## Typical Out of Class Assignments

### Reading Assignments

1. Read the textbook chapter on tissues of the body and answer the review questions at the end of the chapter. 2. Prepare for the lab exam on bones by reading the chapter on axial skeletal anatomy and answer the self-quizz questions in the back of the textbook.

### Writing, Problem Solving or Performance

1. List the characteristics that distinguish the different types of epithelial tissues and describe them to your lab partners. 2. In a 100-word essay, compare and contrast the skeletal, cardiac, and smooth muscle tissues. 3. In a short essay, describe the path a red blood cell would take once it passed through the aortic semilunar valve and traveled through the brain by way of a carotid artery and returned to the right atrium. Include any named arteries, sinuses and veins along the way.

## Other (Term projects, research papers, portfolios, etc.) Required Materials

- Human Anatomy
  - Author: Martini
  - Publisher: Pearson
  - Publication Date: 2018
  - Text Edition: 9th
  - Classic Textbook?:
  - OER Link:
  - OER:
- Biological Science 5, 7A, 7B Human Anatomy Laboratory Manual
  - Author: Sierra College Biology Department (Gunhan, Thomaw-Late and Muma)
  - Publisher: Xanadu
  - Publication Date: 2019
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:

## Other materials and-or supplies required of students that contribute to the cost of the course.