

BIOL 0056L - BIOLOGY: A HUMAN PERSPECTIVE LABORATORY

Catalog Description

Corequisite: Concurrent enrollment in BIOL 56

Advisory: Eligibility for ENGL 11 strongly recommended

Hours: 54 laboratory

Description: Optional laboratory course to be taken with BIOL 56. Topics parallel lecture course, including anatomy, physiology, medicine, research, genetics, evolution, ecology and human impacts on the environment. Not recommended for students who have completed BIOL 11. (CSU, UC-with unit limitation)

Course Student Learning Outcomes

- CSLO #1: Apply processes of the scientific method and philosophy of science to design and carry out biological experiments.
- CSLO #2: Analyze experimental data and draw valid conclusions.
- CSLO #3: Demonstrate proper lab safety, dissecting techniques, and handling of models and lab equipment.

Effective Term

Fall 2022

Course Type

Credit - Degree-applicable

Contact Hours

54

Outside of Class Hours

0

Total Student Learning Hours

54

Course Objectives

1. apply processes of the scientific method to design and carry out biological experiments;
2. analyze experimental data and draw valid conclusions;
3. demonstrate proper lab safety, dissecting techniques, and handling of models and lab equipment;
4. use metric units of measurement for length, temperature, weight, and volume;
5. demonstrate the proper use of a compound light microscope;
6. outline the basic characteristics of prokaryotic and eukaryotic cells;
7. identify and state the function of plant and animal cell structures;
8. distinguish between passive and active transport across a plasma membrane;
9. predict the effects of isotonic, hypertonic, and hypotonic solutions on living;
10. determine the effects of temperature, molecular weight, and concentration gradient on the rate of diffusion and osmosis;

11. examine the characteristics of enzymes by constructing experiments to measure the affect of pH and temperature on enzyme activity;
12. determine experimentally the occurrence and rate of cellular respiration in animals;
13. identify and describe the phases of mitosis on models, whitefish blastula cells viewed under the microscope, or diagrams;
14. contrast mitotic and meiotic cell division using charts, diagrams, or models;
15. demonstrate techniques used in DNA technology, such as extracting DNA and/or DNA fingerprinting;
16. describe the organ systems of the human body, their general functions, and identify the organs that compose them on models, diagrams, or dissections;
17. identify the types of epithelial, connective, muscle, and nervous tissue when viewed microscopically, and give examples of their location and functions;
18. identify heart structures on models and/or a dissected sheep heart and describe their functions;
19. trace blood flow through the heart and the blood vessels carrying blood to and from the heart;
20. determine blood pressure and pulse rate on a subject;
21. identify the structures of the respiratory system on models or charts and describe the functions of each;
22. describe the mechanics of breathing;
23. determine lung volumes and capacities using a dry spirometer;
24. identify brain and spinal cord structures on models or sheep brain dissection and describe the function of each;
25. perform and measure reflex activities on a lab subject;
26. describe the basic structure and function of the eye and ear and identify the structures on models, a dissected sheep eye, or charts;
27. demonstrate the following visual, auditory, and equilibrium tests on a lab subject and assess if results are within normal ranges: accommodation, visual acuity, astigmatism, color blindness, convergence, Rinne test, and static balance;
28. use the rules of natural selection and Mendelian genetics to demonstrate how natural selection affects gene frequencies in populations;
29. critique the role of gene flow, genetic drift, and mutation in evolution;
30. evaluate the relationship between humans and the ecosystem using local examples or illustrations.

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 - B3 Lab Activity
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
 - IGETC - 5C Laboratory Science

Articulation Information

- CSU Transferable
- UC Transferable

Methods of Evaluation

- Classroom Discussions
 - Example: Some people advocate determining the DNA fingerprint of each newborn baby. Discuss the pros and cons of such a

practice. Students will receive points for this assignment based on their participation in the discussion and their analysis of their written pros and cons they turn in at the end of the discussion. Objective 15: "demonstrate techniques used in DNA technology, such as extracting DNA and/or DNA fingerprinting."

- Essay Examinations
 - Example: On an essay question students will be required to write all the blood vessels and structures blood would pass through to travel from the body through the heart and back to the body. Students will be graded on a traditional grading scale based on the percent of correct structures they identify in their essay response. Rubric grading. Objective 19: "trace blood flow through the heart and the blood vessels carrying blood to and from the heart."
- Objective Examinations
 - Example: Recalling the sheep heart dissection, which chamber of the heart had the thickest walls: a. right atrium b. left atrium c. right ventricle d. left ventricle Objective #18. identify heart structures on models and/or a dissected sheep heart and describe their functions
- Problem Solving Examinations
 - Example: Calculate the total magnification of a specimen that is viewed using the 45X objective lens. Students will be graded on a traditional grading scale based on accuracy of their calculation. Objective #5. demonstrate the proper use of a compound light microscope
- Skill Demonstrations
 - Example: On a lab exam, students will be required to identify tissues under the microscopes or on a micrograph image. Students will be graded on if they correctly identify the tissue or not. Pass or Fail grading. Objective 17: "identify the types of epithelial, connective, muscle, and nervous tissue when viewed microscopically, and give examples of their location and functions."

Repeatable

No

Methods of Instruction

- Laboratory
- Distance Learning

Lab:

1. The instructor will describe the characteristics of eukaryotic cells and review the use of the microscope. The instructor will then divide students into groups and hand out representative slides. Students will observe slides under the microscopes and record their observations.
2. Building on an assigned reading, the instructor will lead a discussion on the relationship between the cardiac cycle and blood pressure. Students will then be divided into pairs and measure blood pressure using a stethoscope and sphygmomanometer. Students will record these measurements on their laboratory report and assess if their values fall within normal ranges. The instructor will actively assist students with the equipment and lab techniques.
3. The instructor will demonstrate 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.

Distance Learning

1. Instructor will provide students with images of histological tissues online. Students will practice identify these tissues using their lab manual and introductory information provided by the instructor. Students will then complete a lab quiz to assess if they can correctly identify histological tissues based on tissue characteristics.

Typical Out of Class Assignments Reading Assignments

1. Prior to lab, read the assigned lab material found in the lab "Diffusion and Osmosis" to prepare for the upcoming lab. 2. In your lab manual, read the descriptions of the eleven human organ systems and then complete Assignment 1 on your laboratory report. Reading comprehension will be assessed through short answers questions in the lab report.

Writing, Problem Solving or Performance

1. In preparation for performing lab observations and experiments, students will summarize the background lab information and expectations of the upcoming lab activities in a written pre-lab report.
2. Students will record observations, analyze data and communicate their findings in written laboratory report format. 3. After performing the assigned lab exercises, students will calculate the basal metabolic rate of laboratory mice. 4. Students will draw and contrast the distribution of chloroplasts in a plant cell mounted in distilled water and in a salt solution.

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

- Biological Explorations A Human Approach
 - Author: Gunstream, Stanley E.
 - Publisher: Pearson
 - Publication Date: 2009
 - Text Edition: 6th
 - Classic Textbook?:
 - OER Link:
 - OER:
- Lab Manual for Human Biology
 - Author: Mader, Sylvia
 - Publisher: McGraw-Hill
 - Publication Date: 2020
 - Text Edition: 16th
 - Classic Textbook?:
 - OER Link:
 - OER:

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