Course Information Form (CIF)

Course Code: BIO 166

Course Title: Microbiology Laboratory Principles

Department: Natural Sciences
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 26.0502
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 0-3-1
Credit Hour Distribution:

Lecture: 0	Lab: 3	Clinical: 0	**Total: 1**

General Course Information

Catalog Description

Directed laboratory experience designed to enhance general microbiological laboratory techniques in culturing, identifying, and experimentally manipulating microorganisms.

General Course Objectives

To provide laboratory experience for students who have had a lecture course with no lab component at other institutions. To serve the needs of students enrolled in the various Allied Health Programs. To provide an optional elective for prospective Life Science transfer students.

Minimum Placement Levels

English	Reading	Math
None	Placement out of CCS 098	None

Prerequisites

Approval of department chair

Methods of Evaluation

2-5 practical exams including a final paper evaluating data from a primary literature article, 10-14 pre-lab quizzes, and 10-14 laboratory reports.

Instructional Materials and Additional Supplies

Microbiology, Nina Parker, Mark Schneegurt, Anh-Hue Thi Tu, Philip Lister, Brian M. Forster; OpenStax; Houston, TX; 2022.
Lab Manual: Laboratory Techniques in Microbiology, Chelsea Lloyd.

Course Content

General Learning Outcomes (GLOs)

- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.
- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Unknowns	1. Identify unknown organisms based on their morphology and biochemical activity.	0	4	0
Applied Microbiology	1. Safely handle and culture live microorganisms. 2. Isolate and characterize antibiotic-producing bacteria in soil samples and test them for activity against pathogens.	0	5	0
Microscopy	1. Name the parts of a microscope and explain their functions. 2. Use a bright field microscope correctly to characterize and/or identify microorganisms.	0	2	0
Aseptic Technique, Cultivation	1. Cultivate and isolate microorganisms and maintain a pure culture using aseptic technique. 2. Explain contamination and how to identify and mitigate it. 3. Culture microbes using broth, agar slants, and agar plates; describe when to use each type of medium; compare and contrast selective and differential media.	0	6	0
Staining Technique	1. Prepare a smear and do a gram stain correctly to view bacteria using a microscope.	0	6	0
Eukaryotes	1. Differentiate and identify eukaryotic parasites (fungi, protozoa, and helminths) via microscopy.	0	8	0
Metabolic Activities: Biochemistry and Metabolism	1. Perform and interpret various biochemical tests to characterize and identify bacteria based on their metabolic and enzymatic activities. 2. Describe why these microbes perform these activities.	0	14	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
0	45	0