

SOUTHERN CALIFORNIA UNIVERSITY OF HEALTH SCIENCES
Accelerated Sciences Division

Syllabus Table of Contents

1. Course Information
2. Learning Outcomes, Objectives, & Alignment
3. Textbooks and Materials
4. Evaluation of Student Learning
5. University, Program, and Course Policies
6. Addendum and Other Course Details

COURSE INFORMATION

Course Number (Prefix Code): BIO231L

Course Name: Microbiology Laboratory

Course Description:

The course covers general concepts, methods, and applications of microbiology for health sciences. The role of microorganisms in the environment and in human disease is discussed. Topics include: immunology, bacteriology, virology, and mycology; the morphology, biochemistry, and physiology of microorganisms including bacteria, viruses, and fungi; the diseases caused by these microorganisms and their treatments. The laboratory course provides experiences that illustrate, expand, and reinforce major concepts discussed in the lecture.

Course Delivery Model(s): On-Ground, Online Interactive

Time Requirement:

Lecture Hours per term:	0
Laboratory Hours per term:	30
Total Hours per term:	30
Course Duration (weeks):	5
Credits:	1

Credit Hour Verification:

This list represents the average amount of time a student is expected to spend to successfully complete this course.

	Activity Type	On-Ground Hrs/wk	Online Interactive Hrs/wk
Course Time	Lab instruction	6	6
Academic Engagement	Lab Assignments	2	2
	Supplemental Videos	0	0
	Discussion Boards	0	0
	Lab Reports	0.5	0.5
	Post-lab Quizzes	0	0
	Exams (Midterm & Final)	0.5	0.5
Preparation and Study	Study & Reading	0	0
	Open lab or study	0	0
Total	Hours per week	9	9
	Hours per course	45	45

Prerequisites: None

Co-requisites: None

Recommended Prerequisites or Co-requisites: BIO231 - recommended co-requisite

This course may be taken again for credit the following number of times (repeatable): 5

LEARNING OUTCOMES, OBJECTIVES, & ALIGNMENT

Student/Course Learning Outcomes

In successfully completing this course, the student will be able to:

SLO/CLO
1. Describe the structure & functions of microorganisms.
2. List and Explain laboratory safety guidelines, biosafety levels, and aseptic techniques.
3. Classify various microorganisms by structure and function.
4. Apply various types of microorganism staining and basic microbiology testing techniques.
5. Demonstrate the effects of different growth factors on microbial growth processes.
6. Apply the use of appropriate culture media in microbiology testing and identification.
7. Explain the effects of chemicals and antibiotics on the growth of microorganisms.
8. Explain the importance of normal microbiota, pathogenic, and beneficial microorganisms to the environment and human health.

TEXTBOOKS & MATERIALS

Required Textbook(s): SCU Microbiology Laboratory Manual (provided in the Canvas course).

Required Materials:

Lab Notebook: Students will be required to keep a laboratory notebook, and the instructor will grade notebook entries. The notebook allows students to accurately record experiment procedures and data, so students should write it so that someone else could repeat the experiments and get the same results.

Among other things, this includes recording all analytical data obtained from the experimental procedure. Further information about the lab notebook will be provided in class.

Additional Required Materials: Working computer with a strong internet connection, camera, and a microphone. Scientific calculator.

Scientific Calculator**

*** Graphics or text-memory calculators are not allowed for use during quizzes or exams. If a student brings one, they will have to take the quiz without a calculator! Students are encouraged to obtain a scientific calculator with exponents and logarithms immediately, rather than the day before a quiz or an exam. It is important to be comfortable with the calculator being used, rather than to be struggling to locate the keys for certain mathematical operations. For example, a TI-30X IIS is acceptable.*

Required Attire for On-Ground Labs: Close-toed shoes, professional attire and lab coats are mandatory during all lab hours. No shorts, heels, or flip-flops will be allowed in the laboratory; hair longer than shoulder-length must be pulled back and held with a clip or hair tie. Gloves, goggles and additional safety equipment will be required for all in-person lab experiments.

Provided Materials for On-Ground labs: Flame resistant Lab Coat/Apron, Nitrile gloves, Safety Goggles. Only approved safety goggles must be worn. Approved safety goggles will be provided by the lab instructor during the first lab session.

Technology Requirements

[Click here to view the SCU technology requirements](#)

Learning Management System: Canvas. If a student is unfamiliar with the Canvas learning management system, please visit the manuals and learning guides available in the Canvas Student Guide. It is important that students are comfortable and competent in using this system, as all course material and communication will be done via Canvas.

Navigating Canvas – the Canvas site has a large set of [Canvas tutorials and videos for students.](#)

[Browser and Computer Requirements for Canvas:](#) This course requires that students have access to Google Chrome or Microsoft Edge.

Examination System: We will be using the Proctorio Online Exam Proctoring Service in this course. Proctorio is a software extension in Chrome that uses your computer's screen, web cam, and microphone to create a remote proctored environment, and enables you to take exams via Canvas in the location of your choice. You must have a strong and stable internet connection for Proctorio to work well. During the exam, you, your computer, and the environment you are taking the exam in may all be recorded.

In addition to the instructor(s) and Teaching Assistants(s) of this course, Proctorio and SCU Proctorio administrators are the only ones who will have access to the recordings. The Chrome browser extension must be installed before students can take any exam, and it can be removed once an exam is complete. There will be a practice exam to become familiar with using Proctorio, and surface any issues you may encounter with Proctorio.

Suggestions for completing online coursework: Save work often; this includes backing it up on multiple devices or cloud applications. When submitting final papers on the Canvas learning management system (LMS), ensure that all files have been uploaded properly. Also make sure to keep a hard copy of all papers/projects in case of an unforeseen technological failure or outage.

EVALUATION OF STUDENT LEARNING

Grading scale:

Letter grade

A = 90% - 100%

B = 80% - 89.99%

C = 70% - 79.99%

D = 60% - 69.99%

F = 0.0% - 59.99%

Assessments:

Assessment Name	#	Pts each	Weight	SLO Linkage
Participation	10	5	15%	1-8
Lab Exercise	30	20	25%	1-8
Lab Notebook	9	20	20%	1-8
Exams	2	50	40%	1-8
Total			100%	

Course Topics:

Module	Title	Topics	Assessments	SLOs
1	Handling Microbes in the Lab	<ul style="list-style-type: none"> • Lab Safety and Biosafety • Media and Sterilization • Aseptic Technique and Culture Transfers • Streaking for Isolation 	Labs: Virtual Lab Tutorial, Personal Safety, Hand Washing Lab Notebook Labs: Broth to Broth Transfer, Slant to Slant Transfer, Broth to Plate Transfer, Four Quadrant Streaking Lab Notebook Participation	1,2,6

Module	Title	Topics	Assessments	SLOs
2	Staining and Microscopy	<ul style="list-style-type: none"> • Brightfield and Phase Contrast Microscopy • Wet Mounts • Smears • Gram Staining • Endospore Staining • Acid-Fast Staining • Capsule Staining 	<p>Labs: Operation of a Brightfield Microscope, Using a microscope to 100X with oil, Wet Mounts Lab Notebook Participation</p> <p>Labs: Preparing a Bacterial Smear, Gram Stain, Endospore Stain, Acid Fast Stain, Capsule Stain Lab Notebook Participation</p>	1-3
3	Counting Microbes and Microbial Growth	<ul style="list-style-type: none"> • Dilutions, Serial Dilutions • Pour Plating • Spread Plating • Bacterial Growth Curves • Temperature and Oxygen Growth Requirements • pH and Salinity Growth Requirements 	<p>Labs: Pour Plate Method, Spread Plate Method, Using a Plate Counter, Bacterial Growth Curves Lab Notebook Participation</p> <p>Labs: Effects of Temperature, Oxygen Requirements, Fluid Thioglycolate Tubes, Effects of pH, Effects of Salinity Lab Notebook Participation</p>	4-6
• Exam 1 (Modules 1-3)				
4	Biochemical Tests, Bacterial Unknowns, and the Microbiota	<ul style="list-style-type: none"> • Biochemical Tests for Gram Negative Bacteria: MacConkey, Eosin Methylene Blue, Oxidase, Phenol Red Fermentation, Nitrate Reduction, IMViC, SIM • Dichotomous Keys • Biochemical Tests for Gram Positive Bacteria: Mannitol Salt Agar, Blood Agar, Catalase, Coagulase • The Microbiota: Skin, Mouth, and Gut 	<p>Lab: Unknown Bacterial Identification Sample #1 (Gram Negative Unknown) Lab Notebook Participation</p> <p>Lab: Unknown Bacterial Identification Sample #2 (Gram Positive Unknown), Sampling Surfaces for Bacteria Lab Notebook Participation</p>	4-6, 8
5	Control of Microorganisms	<ul style="list-style-type: none"> • Antibiotic Resistance and Antibiotic Sensitivity Testing • Antiseptics and Disinfectants • UV Light 	<p>Labs: Antibiotic Resistance and Natural Selection, Antimicrobial Susceptibility Testing, Effect of Antiseptics and Disinfectants, Effect of Ultraviolet Light Lab Notebook Participation</p>	7
Exam 2 (Modules 4-5)				

UNIVERSITY POLICIES

All university policies apply to this course and all others. For full policy information please consult the SCU Catalog. Additionally, program policies apply to students in each program as described in the Catalog and in SCU Health Handbook for clinical courses.

Drop Date: It is a student's responsibility to understand when to consider unenrolling from a course. Refer to the [SCU Academic Calendar](#) for dates and deadlines for registration. Also refer to SCU Academic Policies for information about the drop period.

Incomplete Policy: Under emergency/special circumstances, students may petition for an incomplete grade. See the SCU Catalog for Policies about Incomplete Grades

Academic Integrity: Students at this university are expected to maintain the highest degrees of professionalism, a commitment to active learning, and display integrity both in and out of the classroom. See the SCU Academic Integrity Code.

Accessibility Services and Accommodations: The Office of Student Services provides support to students with disabilities requiring accommodation in concert with the lead faculty for this course. All students are encouraged to request accommodation as far in advance of when the accommodation will be required to allow the University to process the request and provide approved accommodation. To begin the process please request a consultation with the designated Accessibility Services Officer as soon as possible. Once the Office of Student Services approves the request, the letter of accommodation will be provided to the student and lead faculty member via email. The student should be certain to follow-up with the lead faculty member to plan for the specific accommodation needs for the course. Program requirements cannot be modified to accommodate a disability. Please see the catalog for details regarding [Accessibility Services and Accommodations](#).

[A complete list of University Services](#) is available through MySCU, including:

- Tech Support information
- Veterans Support Services
- Resources for Title IX support through the Campus Safety tab
- Student Advocacy and Accountability resources

Learning Resource Center: Students can use the library's resources which provide students with an excellent collection of books, journals, electronic databases, and websites as well as consult with the librarian to help with the course.

Online Etiquette: In general, behavior in an online classroom should emulate the professional behavior expected in an on-ground classroom with a few additional requirements:

- Avoid using text slang and abbreviations such as "u" (instead of "you"), "TLDR" (Too Long, Didn't Read) or "TBH" (To Be Honest) - not everyone knows what they are. Do not use ALL CAPS for entire sentences or posts - this is seen as yelling at someone.
- Any form of personal attack or inappropriate response with other students or faculty is unacceptable. We will remove any discussion posts showing this and warn the author.
- If a student disagrees with someone's comments, they should do so respectfully and collegially and provide legitimate examples to support their side.
- Before pressing the submit button review comments, making sure nothing is coming across as

defensive, too “know-it-all” or critical, or academically inappropriate. It is easy for someone to misinterpret the meaning when they cannot see facial expressions or hear the tone of voice.

- Avoid short, generic replies such as "I agree!", "I like it!" or "Funny!" – explain why, add another point in support of the idea, or raise a question to continue constructive dialogue.

Attendance: SCU policy defines attendance for all courses and specifies online courses as active, weekly participation in the course as described in the syllabus. Examples of activities could include, but are not limited to:

- Participating in weekly online chats or discussions
- Submitting or completing assignments
- Commenting on other student contributions
- Actively logged on and participating in class at least three times per week

See the Academic Policies page in the [SCU Catalog](#) for more details on Attendance Policy.

Accelerated Sciences Course Recommendations

- Read before and after each class. Skim the chapter before it is covered in lecture to become comfortable with some of the terms associated with each topic. Review each chapter after it is covered in class to enhance understanding of the material.
- Do not wait until the night before homework is due to start the assignment. Understanding of concepts will be enhanced if the time is taken to learn them beforehand and later review the material without being rushed.
- Stay focused by finding an environment to study with few distractions.
- Participate during class by taking notes and looking over them afterwards.
- Any topics covered in the course could be presented in subsequent examinations, so it is critical to prepare and learn all presented material.
- Remember that procrastination in an accelerated course can quickly prove disastrous! Failure to learn foundational principles can make all future material seem nearly incomprehensible, so make sure to budget time wisely over the next five weeks.

Specifically for synchronous courses:

- Ask questions for clarification when not understanding the material being covered.
- *Do not skip class, arrive late, or leave early.* Given the accelerated nature of our courses, every minute of class missed can have a real impact on student success in a course.
- Work on assigned problems as close to the time as when the topic is covered in class to increase understanding of specific concepts.
- Find a group of students to study with. This makes studying more fun and helps learning of the material by teaching to and learning from peers. Explaining these concepts to other students aids in mastery of what is covered.

Teaching Methods & Instruction

In classes with scheduled class time, virtual labs will be conducted in real time/live by the instructor. Students must adhere to the attendance policy set out by the instructor for the class. Due to the individualized nature of learning, students should expect to spend as much time as needed based on individual attainment of prerequisite knowledge.

- **Lab Introduction:** A brief lab introduction will be conducted by the class instructor, reviewing the topic of the specific lab session, according to the syllabus.
- **Lab Assignments:** Will be performed in collaboration with other classmates in small groups and in break-out Zoom rooms during the lab sessions.
- **Attendance and Participation:** Because experiments are the main point of this class, attendance and participation are mandatory and will be incentivized through grades. For each lab period students will receive points for participation grade. Showing up prepared and on time is one part of this grade, the other is doing the lab work. Students should check with the lab instructor before leaving the laboratory after completing each experiment. Students are expected to attend all scheduled lab meetings.
- **Exams:** There are two multiple choice exams. Please pay attention to the due dates as due dates on final exams will not be extended. Exams are located on the Canvas platform. Students must use proctoring methods required by the instructor. All exams are proctored via Proctorio.