Microbiology for Non-Science Majors Lab (BIOL 2120)

CREDIT
1 semester credit hours (2 hours of lab)

MODE OF INSTRUCTION
Online

PREREQUISITE/CO-REQUISITE:
Must be enrolled in BIOL 2320 at the same time.

COURSE DESCRIPTION
Applying microbiological experiments to the study of the principle of microbiology, including structure, metabolism, and function of microbes. Development of microbiological methods including aseptic techniques, safely handling microbes, cultivating, and isolating bacteria, characterizing microbes by microscopy and biochemical tests, and determining antibiotic resistance.

COURSE OBJECTIVES
Upon completion of the course, the student will be able to:

1. Apply aseptic techniques to handle and culture microbes safely.
2. Identify bacteria and fungi by macroscopic and microscopic appearance.
3. Isolate pure cultures by using selective and differential media and the streak-plate method.
4. Perform biochemical tests to identify differences among bacteria.
5. Understand the effect of physical and chemical agents on microbial growth.
6. Perform and interpret antibiotic sensitivity and resistance tests.
7. Describe microbiological diagnostic techniques, as well as factors that may interfere with the interpretation of results.

INSTRUCTOR CONTACT INFORMATION

Instructor: Anna Cheng
Email: ycheng@lit.edu
Office Hours: Monday-Friday 9am-5pm
Please email me or message me on Blackboard.

REQUIRED TEXTBOOK AND MATERIALS:
Textbook: OpenStax Microbiology https://openstax.org/details/books/microbiology

McGraw Hill Connect Virtual Labs: register at McGraw Hill Connect to access Virtual Labs. Here is a tutorial on how to register: https://www.mheducation.com/highered/support/connect/first-day-of-class/ia-blackboard-ultra-ltia.html

ATTENDANCE POLICIES
1. Cheating of any type will not be tolerated. This includes copying and pasting information.
2. Late submissions of assignments/quizzes/exams will be accepted with a deduction of 10% for the

first two weeks after the due date. After two weeks, no late submissions will be accepted. Closed assignments/quizzes/exams will be reopened one time only when requested. The final exam cannot be reopened. To avoid late penalties, official documents such as doctor's notes are needed.

3. Students will receive a zero for assignments not completed.
4. Four quizzes, a midterm exam, and a final exam are required with 2 attempts given per quiz/exam using Respondus Lockdown Browser. The final score of the quiz/exam will be calculated by averaging all attempts.
5. Students will complete an individual project and a group project. Everyone needs to contribute to the group project. Please be attentive to your LIT email box and Blackboard messages for essential updates from your group member regarding your project. To ensure a collaborative and productive effort, we want to emphasize that every group member has the right to address any concerns about a lack of contribution from any team member. If necessary, **we can consider removing students who consistently do not contribute to the project**. We hope it won't come to that, and we encourage open communication to resolve any issues promptly. **Individual submission to the group project will have a penalty of 20% off and is by permit only.**
6. Internet usage- students are to use proper netiquette when participating in course email, assignment submissions, and online discussions.

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process by the specified drop date as listed on If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

COURSE CALENDAR

Week:	To Do:	Due Date:
Week 1 Aug 24th – 28th Lab Safety	1st Lab - Virtual Labs Tutorial Lab Safety – Hand Washing Procedure Lab Safety – Personal Safety Join a group for Group Project: Gram Stain by 9/6/26	08.30.26
Week 2-3 Aug 31st – Sep 4th Module 1 Quiz 1	Aseptic Technique – Broth Culture to Sterile Broth Aseptic Technique – Broth Culture to Sterile Agar Plate Aseptic Technique – Slant Culture to Sterile Agar Slant Microscopy – Operation of Brightfield Microscope Microscopy – Oil Immersion Join a group for Group Project: Gram Stain by 9/6/26 Quiz 1: Module 1 (09.11.26 – 09.12.26)	09.06.26 09.13.26
Week 4-6 Holiday Sep 7th Sep 8th – Oct 2nd Module 2 Quiz 2	Staining - Preparing a Smear Sample from a Bacterial Sample Staining – Gram Staining Staining – Acid-Fast Staining Staining – Capsule Staining Staining – Spore Staining Microscopy – Diversity of Microorganism Ubiquity of Microorganisms – Sampling Surfaces for Bacteria Microscopy – Euglena Wet Mount Microscopy – Pond Water Wet Mount Organismal Diversity – Fungi Quiz 2: Module 2 (10.02.26 – 10.03.26) Work on Group Project: Gram Staining due 11.08.26	10.04.26

Week 7–9 Oct 5th – 23rd Module 3 Midterm Exam	• Isolation Methods: Pour Plating • Isolation Methods: Quantification by Colony Counting • Isolation Methods: Quantitative Dilution of Bacteria • Isolation Methods: Quadrant Streak Plate Method • Isolation Methods: Subculturing of Bacteria • Isolation Methods: Optical Density • Microbial Growth: Effects of Osmotic Pressure • Microbial Growth: Effects of pH • Microbial Growth: Effects of Temperature • Microbial Growth: Oxygen Requirements and Anaerobic Jar • Microbial Growth: Oxygen Requirements and Fluid Thioglycolate Medium Tubes • Midterm Exam: Module 1-3 (10.23.26 – 10.24.26) • Work on Group Project: Gram Staining due 11.08.26	10.25.26
Week 10–11 Oct 26th – Nov 6th Module 4 Quiz 3 Group Project	• Bacterial Genetics – DNA Profiling • Bacterial Genetics – Bacterial Transformation • Bacterial Genetics – Polymerase Chain Reaction (PCR) • Quiz 3: Module 4 (11.06.26 – 11.07.26) • Due: Group Project: Gram Staining 11.08.26	11.08.26
Week 12 Nov 9th – 13th Module 5 Quiz 4	• Control of Microbial Growth – Antimicrobic Sensitivity Testing (Kirby-Bauer Method) • Control of Microbial Growth – Effect of Antiseptics and Disinfectants • Control of Microbial Growth – Effect of Ultraviolet Light • Quiz 4: Module 5 (11.13.26 – 11.14.26)	11.15.26
Week 13–15 Nov 16th – Dec 4th Module 6	• Unknown Bacterial Identification – Sample #1 • Unknown Bacterial Identification – Sample #2 • Unknown Bacterial Identification – Sample #3 • Unknown Bacterial Identification – Sample #4 • Unknown Bacterial Identification – Sample #5 • Unknown Bacterial Identification – Sample #6 • Unknown Bacterial Identification – Sample #7 • Unknown Bacterial Identification – Sample #8 • Unknown Bacterial Identification – Sample #9 • Unknown Bacterial Identification – Sample #10	12.06.26
Week 16 Dec 7th – 9th Final Exam	• Final Exam: Module 4-6 (12.08.25—12.09.25)	12.09.26

COURSE EVALUATION

1. Midterm and Final Exams	30%
2. Four Quizzes	25%
3. Lab Assignments	25%
4. Group Project	20%

GRADE SCALE

A 90 – 100 points
B 80 – 89 points
C 70 – 79 points
D 60 – 69 points
F 59 or below

TECHNICAL REQUIREMENTS

For the latest technical requirements, including hardware, compatible browsers, operating systems, etc., review the Minimum Computer and Equipment Requirements on the LIT Online Experience page. A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of online technology and resources.

DISABILITIES STATEMENT

The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)-951-5708 or email specialpopulations@lit.edu. You may also visit the online resource at Special Populations - Lamar Institute of Technology (lit.edu).

STUDENT CODE OF CONDUCT STATEMENT

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the LIT Catalog and Student Handbook. The LIT Catalog and Student Handbook may be accessed at www.lit.edu. Please note that the online version of the LIT Catalog and Student Handbook supersedes all other versions of the same document.

ARTIFICIAL INTELLIGENCE STATEMENT

Lamar Institute of Technology (LIT) recognizes the recent advances in Artificial Intelligence (AI), such as ChatGPT, have changed the landscape of many career disciplines and will impact many students in and out of the classroom. To prepare students for their selected careers, LIT desires to guide students in the ethical use of these technologies and incorporate AI into classroom instruction and assignments appropriately. Appropriate use of these technologies is at the discretion of the instructor. Students are reminded that all submitted work must be their own original work unless otherwise specified. Students should contact their instructor with any questions as to the acceptable use of AI/ChatGPT in their courses.

STARFISH

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the

responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.

ADDITIONAL COURSE POLICIES/INFORMATION

RESPONDUS ACADEMIC INTEGRITY POLICY

Lamar Institute of Technology
Healthcare and Sciences Courses
Lamar Institute of Technology expects every student to uphold honesty and integrity in all academic work. Academic dishonesty is a violation of the LIT Student Rights and Responsibilities policy and may result in disciplinary action. All online examinations that use Respondus LockDown Browser or similar proctoring tools are subject to these rules.

While the faculty do not presume or accuse students of academic misconduct, certain behaviors and system flagged events have historically been associated with violations of academic integrity. Based on institutional experience and best practices, it is necessary to provide students with a clear list of responsible actions that are expected during all proctored online assessments.

Expectations During Respondus Exams
Respondus LockDown Browser records a continuous video from the required environment check through exam submission. This recording includes your webcam video, screen activity, and mouse movement. The system flags may include (not an exhaustive list): missing from or obstructed camera view, background noise, or technical concerns. Instructors are able to review each flagged incident as well as the full exam recording. Students are expected to comply with the following requirements during all online examinations that use Respondus LockDown Browser or similar proctoring tools.

- Students must show their driver's license or LIT student badge when required at the beginning of the quiz/exams.
- Students must remain fully visible within the webcam frame for the entire exam period. The full face and upper torso must be visible at all times.
- Students must not obstruct, cover, mute, disable, or otherwise interfere with webcam or audio monitoring.
- Students must be seated at a desk or table in a well-lit room and may not lie down during the exam. If a laptop is placed on the student's lap, the student is responsible for proper camera positioning.
- Students must complete the exam alone. No other individuals may be present in the room.
- There must be no television, radio, or other background noise. While occasional uncontrollable sounds may occur, the exam may not be paused, and the student may not leave the camera view.
- A required environment check must include a complete 360-degree view of the surrounding area and a clear view of the entire desktop or table surface being used. If a fixed camera cannot be moved, a mirror may be used.
- Students may not use cell phones, smart watches, headphones, earbuds, meta glasses, second monitors, recording devices, or any other unauthorized materials.
- Hats, sunglasses, and face coverings are not permitted. Hooded garments may not be pulled over the forehead or obscure the face.
- Students may not look off screen, out of view, or downward for extended periods unless an approved calculator, textbook, or notes are permitted and clearly displayed during the environment check.

- If a textbook or notes are permitted, evidence must be provided during the environment check that no additional materials are accessible.
- If scrap paper is permitted, all written work related to exam questions must be shown to the camera as directed. Required uploads of written work must be submitted to Blackboard within 24 hours of exam completion, unless otherwise instructed.
- Students may not talk, whisper, mouth words, or read questions aloud during the exam.
- Students may not attempt to open new browser windows, external websites, or outside applications.
- Repeated or extended absence of the student's face from the camera view, particularly after an on screen warning, is not permitted.
- Movements or behaviors consistent with the use of a phone, second device, or outside assistance are not permitted.
- Audio or visual indicators suggesting outside assistance are not permitted.
- Copying, recording, photographing, or sharing exam questions or answers before, during, or after the exam is prohibited.

Any action that violates the rules listed above or that shows an attempt to obtain an unfair advantage will be treated as academic misconduct. The instructor will review all Respondus recordings and reports. If concerning behavior is found, the instructor will determine the appropriate level of action based on the strength of the evidence. The instructor may request a meeting, either in-person or via Teams, to review the exam content with you to ascertain your level of knowledge. You must schedule a meeting with the instructor within 5 business days if you wish to refute their findings. If you do not respond within 5 business days, the grade will not be changed.

Level One: Minor Irregularity
Examples:
Lingering off screen glances (in directions other than a calculator or scratch worksheet), minor webcam glitch, light noise (examples include baby crying, dog barking, doorbell ringing) or audio interference
Result:
Warning and no point deduction

Level Two: Moderate Concern
Examples:
Extended off-screen glances, unclear hand movements, failure to show ID, failure to complete an environment check, other people or voices heard within the room, scrap work that is not consistent with the exam questions and/or behavior that raises reasonable suspicion
Result:
20% percent deduction on the exam for each violation

Level Three: Confirmed Academic Misconduct
Examples:
Blatant use of an unauthorized device, receiving outside assistance, attempting to open new applications, use of unauthorized notes or materials
Result:
A grade of Zero (0) on the exam

Level Four: Severe or Repeated Violations
Examples:
Multiple incidents within the course, deliberate attempts to avoid monitoring

Result:
Zero (0) on the exam and referral to Student Services for disciplinary review

All cases of academic dishonesty may result in additional actions as permitted by the LIT Student Rights and Responsibilities policy, which may include course failure, notification sent to all selective programs, or other institutional sanctions depending on severity and recurrence.