

# BIOL 2305: Microbiology for Health Sciences

Spring 2023 • CRN # 50384 • Lecture & Lab Syllabus



## Face to Face

**Lecture:** Mon. & Wed. 9:00am-10:15am

VAHS Rm. 101

**Lab:** Wed. 10:30am-1:15pm

VAHS Rm. 110



I love teaching Microbiology—the study of microorganisms. We will start by learning about the different types of microorganisms, bacteria, fungi, and viruses. We will focus most of the semester on bacteria—such interesting little organisms that have more helpful roles to humans than harmful. Can you imagine, we are each a planet to the bacteria on our bodies? First, we will learn about the bacterial cell components and how they grow- environmental requirements, nutrients, and metabolism. Next, we will discuss bacterial DNA- Yes, most microorganisms have it. We will observe that the process of DNA replication is universal, bacteria do have the same DNA components and proteins needed for replication. Have you ever thought about how bacterial cells dividing contribute to microbial pathogenicity? How does pathogenicity contribute to cause disease? These questions will be answered during our discussion of understanding the principles of pathogenicity, disease, and epidemiology. We will also discuss how our immune cells build and maintains a defense against microbial infections in our discussion of Innate and Adaptive Immunity. The last part of the semester we briefly study viruses, an acellular microorganism. Now, you know why I love teaching Microbiology— we learn about microorganisms that are too small to be seen with a naked eye, but can have huge impacts, more helpful than harmful, to humans and ecosystems everywhere on Earth.

## Course Description

This course introduces the basic principles of microbial structure, genetics and physiology, virology, parasitology, disease, pathogenicity, epidemiology, and immunology. Only some emphasis is given to basic biological principles. The course is designed for those obtaining a career in the health sciences.

Bring the knowledge that you have and take the journey with me as you continue reaching toward your educational goals.



Hand print on a large TSA plate from my 8 1/2 year old son after playing outside.

“I hope to continue to inspire our nation’s youth to pursue careers in science, technology, engineering, and math so they, too, may reach for the stars.”

--ELLEN OCHOA The First Hispanic Woman to Go to Space.



Dr. Tammi Duncan-Teller

### INSIDE THIS ISSUE

Course Learning Outcomes.....	2
Dr. T’s information .....	2
Grading Criteria.....	3
Course	
Policies/Information.....	4-6
COVID-19 .....	6
Lecture Course Schedule .....	7-8
Lab Section Policies .....	9
Lab Course Schedule.....	11-12
Peer Advice .....	13-14

# Course Learning Outcomes (CLOs)

At the completion of this course, students will be able to:

<b>Health-related Critical Thinking</b> CLO 1: Apply critical thinking and the information learned to problems encounter in Health-related professions
<b>Prokaryotic Cell Structure</b> CLO 2: Have a basic understanding of cell structure for different types of bacteria.
<b>Microbial Metabolism</b> CLO 3: Understand the metabolic mechanisms of prokaryotes and the use of these in classification systems
<b>Microbial Genetics and Mutations</b> CLO 4: Understand the genetic mechanisms of prokaryotes and the nature of mutations
<b>Acellular Pathogen</b> CLO 5: Have basic understanding of virus structure and function
<b>Immune system</b> CLO 6: Be able to describe the basic functions of the immune system with respect to infectious disease processes
<b>Microbial Pathogenicity and Epidemiology</b> CLO 7: Understand the principles of pathogenicity, disease, and epidemiology
<b>Antimicrobial Drugs</b> CLO 8: Be able to explain the basics of antimicrobial and antiviral chemotherapy.
<b>Lab skills</b> CLO 9: Be able to apply microbiological lab skills and evaluate results to discover an unknown microbe.

The overall goal of the course is to help you become literate in these scientific concepts and be able to apply them in your life as you move forward in reaching your educational goal.

## Dr. T's Contact Information

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Office: 505.925.8726  
Front office: 505.925.8600  
Office: Rm 132, Arts & Sciences Building



### Talk to Me Hours

- Mon. 11:15am-12:15pm
- Tues. 9:00am-10:30am & 12:30pm-2:30pm
- Wed. Available by appt.
- Thurs. 9:00am-10:30am
- Fri. Available by appt.

Zoom meets: Available by appt.

<https://unm.zoom.us/j/5736149969>

Password: **biology**

## Grading Criteria

**Exams:** Each of the three exams is worth 100 pts and their total is 300 pts. You will be given one hour and 15 min to complete each exam. You will not be able to use your notes, textbook, or online resources.

Review your homework, Reviews, OneNote class notes to prepare for your exam.

**Homework (HW):** Homework are question sets that are each worth 8 pts. Homework is due to UNM Canvas at 11:59pm on the due date. Bring a printed copy to class. *Failure to submit to UNM Canvas by due date will result in an automatic deduction of 4pts. Submitted HW with no name will be deducted 1 pt.*

**Case studies:** Three case studies, each worth 12 pts each, will help you build your critical thinking and self-assessment skills. Due to UNM Canvas by due date.

**Reflections:** Three Reflections on what and how you're learning and your approach/adjustments to learning the material will be issued. This is a practice of metacognition, (the process of "thinking about thinking," or reflecting on personal habits, knowledge, and approaches to learning) in order to help you adjust your learning. These Reflections are due to UNM Canvas by due date.


**Reviews:** There are four Reviews. The total is 40 pts. The goal of the review is to be used as one tool to help you start/prepare for your exams. Be sure to review homework and lectures notes too.

**Attendance/Participation:** You must be in the class on time to get the most out of this course and participate. You are responsible for "signing-in" to document your attendance in class. If you are missing more than 15 minutes of class, it will count as an absence. 0.5pt/class or 1pt/week.

**Cumulative Final:** The Final is worth 125pts and given at the end of the semester. You will have 2 hr to take the final face to face.

**Lab Activities:** See page 12 for details.

*In summary, every point counts. There is no extra credit. The due dates are firm. Communicate. Be on time. Study every day. Ask questions. Try your best. -Dr. T*

	Points per assignment:	Total Points:	Percentage of overall Biol 2305 grade (out of 850pts):
Intro. to Homework	5 pts	5 pts	1%
Intro. to Quiz	5 pts	5 pts	1%
Homework (11)	8 pts each	88 pts	10%
Case Studies (3)	12 pts each	36 pts	4%
Reflections (3)	5 pts each	15 pts	2%
Attendance/Participation (16)	1 pt/week	16 pts	2%
Reviews (4)	10 pts each	40 pts	5%
Exams (3)	100 pts each	300 pts	35%
Cumulative Final Exam (1)	125 pts each	125pts	15%
Lecture total		630pts	
Lab Activities	(see page 11 for assignments)	220pts	26%
<b>TOTAL</b>		850 pts	100 %
<b>A+</b> 100% or higher <b>A</b> 91-99% <b>A-</b> 90%	<b>B+</b> 88-89% <b>B</b> 81-87% <b>B-</b> 80%	<b>C+</b> 78-79% <b>C</b> 71-77% <b>C-</b> 70%	<b>D+</b> 68-69% <b>D</b> 61-67% <b>D-</b> 60% <b>F</b> <60%

## Required Learning Resources



canvas

**1. Electronic Textbook: *Microbiology*** by N. Parker, M. Schneegurt, A. Tu, B. Forster, and P. Lister, 2018, OpenStax Rice University. **REQUIRED.** Free download [https://assets.openstax.org/oscms-prod/cms/media/documents/Microbiology-OP\\_C34GvqP.pdf](https://assets.openstax.org/oscms-prod/cms/media/documents/Microbiology-OP_C34GvqP.pdf)

**2. UNM Canvas:** <http://canvas.unm.edu> The webpage contains resources you need to succeed in the course. Login using your UNM username and password. ***You are responsible for all announcements, assignments, tests and/or any changes to the syllabus that will be posted on the webpage. Announcements are sent every Friday. Please check email regularly.***

**3. Technology and computer:** In this course, you will need a dependable computer, reliable internet connection, computer speakers, Microsoft PowerPoint and Word, and Adobe Flash Player.

**This is a 4 credit-hour Face to Face course.** Class meets face to face for two 75-minute sessions of direct instruction for sixteen weeks during the Spring 2023 semester. Students are expected to complete a *minimum* of six hours of out-of-class work (readings, homework, study, assignment completion, and class preparation) each week.

**Attendance.** You must be in the class on time to get the most out of this course, participate in class discussions, and to get a good grade. You are responsible for "signing-in" to document your attendance in class. If you are missing more than 15 min. of class, it will count as an absence. The student will be held responsible for all material and information regardless of whether the student was in class. Exception will be made per student basis dependent on emergency.

**Make-up Exams.** Make-up exams will be given to students with a documented emergency. You must notify the instructor prior to the day of the missed exam.

**Homework.** These will be assigned weekly to help you master the concepts presented. They are due to UNM Canvas at 11:59pm the evening before class. Be sure to include your name on each submitted homework assignment. A deduction of one point will be given if not. Be sure to answer each question before submission. A deduction of one point will be given if not.

**Review.** There will be four Reviews. These will help you apply the knowledge that you have gained. One will be due before each regular exam. Be sure to include your name on your Review. One point will be deducted if not.

**Late assignment/homework.** Late assignments/homework will only be accepted within the first week following the due date. There will be a 50% reduction in grade. I will not accept assignments after the first week.

## Course Policy/Information Continue

**Withdrawal.** Last day to withdraw from class without a “W” on your transcript is **Feb. 3, 2023** at 5:00pm using UNM Canvas. Last day to withdraw from class with out Dean’s signature/permission on LoboWEB is **Apr. 14, 2023**. See <https://registrar.unm.edu/semester-deadline-dates/index.html>. Click on –Spring 2023. \*Note- I don’t submit “W” after the 12<sup>th</sup> week of classes.

**Cell phones.** As a courtesy to the class, please silence any cell phones. Any sight of a cell phone during exams or quizzes will result in an automatic fail for that assignment. If you need a to step out during a test/quiz, please leave your phone on your table.

**Disruptive behavior.** Please avoid any disruptive behaviors in the classroom and online communications. For class, this includes going in and out of the class, texting, talking. For online communication and interactions follow netiquette.

**Plagiarism.** Only submit work that is yours. Always cite any work used using APA format. <https://libguides.unm.edu/c.php?g=326014&p=2187071> Copy and Paste from Google, your classmates, or your book is considered plagiarism. Write answers in your own words. *You will receive two warnings with the assignment given a zero. A third time you will be dropped from the course and the UNM Science & Wellness Department Chair notified.*

**Netiquette.** The rationale of providing **Rules of Netiquette** for students is to provide guidelines for online behavior and communication between you and your classmates. We (myself included) are all held to the following guidelines that will provide a safe and respectful online classroom space for constructive critiques, discussion, and scholarly reports between you and your classmates. These guidelines are expected to be upheld in any online communications (Email, Discussion Board Forums, Messaging, and Blogs) between all of us.

### **Rules of Netiquette continue.**

1. Your online behavior and communication should be similar to how you would treat and speak to a person in standing in front of you.
2. Be mindful of different backgrounds, which include cultural, linguistic, political, and religious differences.
3. Be respectful of other’s views and opinions and try to remain open minded. You can have respectful disagreements. Avoid flaming, which is publicly attacking or insulting another person’s view.
4. Provide constructive and concise responses to the subject of the posts in Discussion Forums and Blogs. Stay on topic, read all comments/viewpoints in discussion before contributing to discussion, avoid slang and profanity, be prepared to correct information if your comment is misunderstood or misinterpreted, and avoid using personal identifying information.
5. Practice good grammar and spelling skills. Use 12 pt. font Times New Roman or Calibri, avoid text shortcuts, define acronyms, use correct spelling, limit use of emoticons, and use clear and concise language.
6. Avoid the use of all CAPITAL LETTERS. It suggests shouting, impoliteness, or can be aggressive. Reread you post, checking for sarcasm, slang or anger, before submitting it. Avoid sending a message out of anger or written if you are angry.
7. Call your instructor if you are in conflict with them or another student.
8. In relation to security, protect your passwords and don’t send confidential information through email. If you suspect your password has been used, change your password.
9. There are specific listings of practices for email netiquette and message board netiquette below.

## Email Netiquette

- Write a concise email to @unm.edu accounts.
- Include "Biol 2305" in your subject line to me.
- Ask for permission of author before forwarding an email to classmate.
- Include a formal salutation to your recipient.



## Discussion Forum and Journal Netiquette

- Include "topic-your name" in subject line.
- Write concise paragraph on the topic.
- Paraphrase and cite your references with APA and credit classmates work if appropriate.
- Read all messages in thread before replying.
- Don't repeat another person's post.

**Accommodations:** UNM-Valencia is committed to providing courses that are inclusive and accessible for all participants. As your instructor, it is my objective to facilitate an accessible classroom setting, in which students have full access and opportunity. If you are experiencing physical or academic barriers, or concerns related to mental health, physical health and/or COVID-19, please consult with me after class, via email [tammid31@unm.edu](mailto:tammid31@unm.edu) or during talk-to-me hours. I am not legally permitted to inquire about the need for accommodations. We can meet your needs by collaborating with the Director of Student Affairs, Hank Vigil, by email [vigilh@unm.edu](mailto:vigilh@unm.edu) or by phone (505) 925-8581.

**Academic Dishonesty:** Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course. *Academic dishonesty includes, but not limited to, dishonesty in quizzes, tests, or assignments; Copying and pasting answers from Google; claiming credit for work not done or done by others, hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.*

**COVID-19 Health and Awareness.** UNM is a mask friendly, but not a mask required, community. To be registered or employed at UNM, Students, faculty, and staff must all meet UNM's [Administrative Mandate on Required COVID-19 vaccination](#). If you are experiencing COVID-19 symptoms, please do not come to class. If you have a positive COVID-19 test, please stay home for five days and isolate yourself from others, per the [Centers for Disease Control \(CDC\) guidelines](#). If you do need to stay home, please communicate with me at [tammid31@unm.edu](mailto:tammid31@unm.edu); I can work with you to provide alternatives for course participation and completion. UNM faculty and staff know that these are challenging times. Please let me, an advisor, or another UNM staff member know that you need support so that we can connect you to the right resources. Please be aware that UNM will publish information on websites and email about any changes to our public health status and community response.

**Protocol as of 1/17/2022** for vaccinated individuals testing positive (No quarantine for exposure).

1. Upload your information to the Self-Reporting of Positive Covid-19 Diagnosis ([https://lobowebapp.unm.edu/apex\\_ods/f?p=135:LOGIN\\_DESKTOP:16863389260097:::](https://lobowebapp.unm.edu/apex_ods/f?p=135:LOGIN_DESKTOP:16863389260097:::)).
2. Provide documentation (The Covid PCR Test) to me via email (you are not exempt from assignments or exams).
3. Isolate for 5 days- Day 0 is the onset of symptoms or positive viral test (The Covid PCR Test).

## Lecture Course Schedule Continue

Week	Date	Chapter: Topic	Items Due	Due Date @ 11:59pm
1	Jan. 16 Mon.	<b>Holiday-No Class</b>		
	Jan. 18 Wed.	Overview of Microbiology	Intro. Online Homework Intro. Online Quiz	Fri. 1/20 Fri. 1/20
2	Jan. 23 Mon.	1: Invisible World.	Homework 1: Ch 1 & Ch 3	Sun. 1/22
	Jan. 25 Wed.	3: The Cell <b>Case Study 1</b>		
3	Jan. 30 Mon.	3: The Cell		
	Feb. 1 Wed.	4.1: Prokaryotic Diversity <i>(Feb. 3 Last day to drop class without "W" with 100% tuition refund on LoboWeb)</i>	Homework 2: Ch 4.1 & 9	Tues. 1/31
4	Feb. 6 Mon.	9: Microbial Growth	<b>Case Study 1</b>	<b>Fri. 2/10</b>
	Feb. 8 Wed.	9: Microbial Growth		
5	Feb. 13 Mon.	Review 1 (Ch. 1, 3, 4.1, 9)		
	Feb. 15 Wed.	<b>Exam 1 (Ch. 1, 3, 4.1, 9)</b>	Review 1	Wed. 2/15
6	Feb. 20 Mon.	8: Microbial Metabolism <b>Case Study 2</b>	Homework 3: Ch 8	Sun. 2/19
	Feb. 22 Wed.	8: Microbial Metabolism		
7	Feb. 27 Mon.	11: Mechanisms of Microbial Genetics Part 1	Homework 4: Ch 11 Part 1	Tues. 2/28
	Mar. 1 Wed.	11: Mechanisms of Microbial Genetics Part 1	<b>Reflection 1</b>	<b>Fri. 3/3</b>
8	Mar. 6 Mon.	11: Mechanisms of Microbial Genetics Part 2	Homework 5: Ch 11 Part 2	Sun. 3/5
	Mar. 8 Wed.	11: Mechanisms of Microbial Genetics Part 2	<b>Case Study 2</b>	<b>Fri. 3/10</b>
9	Mar. 13 Mon.	<b>Spring Break-No Class</b>		
	Mar. 15 Wed.	<b>Spring Break-No Class</b>		

**\*I reserve the right to make necessary changes.**

## Lecture Course Schedule Continue

Week	Date	Chapter: Topic	Items Due	Due Date @ 11:59pm
10	Mar. 20 Mon.	Review 2 ( Ch. 8, 11 Part 1 &2)		
	Mar. 22 Wed.	<b>Exam 2 (Ch. 8, 11 Part 1&amp;2)</b>	Review 2	Wed. 3/22
11	Mar. 27 Mon.	13: Control of Microbial Growth	Homework 6: Ch 13	Sun. 3/26
	Mar. 29 Wed.	14: Antimicrobial Drugs	Homework 7: Ch 14	Sun. 4/2
12	Apr. 3 Mon.	14: Antimicrobial Drugs	<b>Reflection 2</b>	<b>Fri. 4/7</b>
	Apr. 5 Wed.	15: Microbial Mechanisms of Pathogenicity <b>Case Study 3</b>	Homework 8: Ch 15	Sun. 4/9
13	Apr. 10 Mon.	15: Microbial Mechanisms of Pathogenicity <b>Apr. 14 Last day to drop class without Deans Permission)</b>		
	Apr. 12 Wed.	16: Disease and Epidemiology	Homework 9: Ch 16	Sun. 4/16
14	Apr. 17 Mon.	Review 3 (Ch. 13, 14, 15&16)		
	Apr. 19 Wed.	<b>Exam 3 (Ch. 13, 14, 15&amp;16)</b>	Review 3	Wed. 4/19
15	Apr. 24 Mon.	Host Defenses 17: Innate Nonspecific	Homework 10: Ch 17 &18	Sun. 4/23
	Apr. 26 Wed.	Host Defenses 18: Adaptive Specific	<b>Case Study 3</b>	<b>Fri. 4/28</b>
16	May 1 Mon.	6: Acellular Pathogens  5/1 Course Feedback open UNM Canvas	Homework 11: Ch 6	Sun. 4/30
	May 3 Wed.	6: Acellular Pathogens Semester Final Review (Review 4) 5/5 Course Feedback close at 5pm	<b>Reflection 3</b>	<b>Fri. 5/5</b>
<b>Final</b>	<b>May 10 Wed.</b>	<b>Cumulative Final Exam Due 9:00-11:00am</b>	<b>Final Exam Review 4</b>	<b>Wed. 5/10</b> Wed. 5/10

**\*I reserve the right to make necessary changes.**



# Microbiology for Health Sciences Lab

**Meeting time:** Wed. 10:30am-1:15pm VAHS Rm. 110

**Lab coat or lab apron is required.**



canvas

**There is no lab manual for this class. Handouts will be provided via in class or Canvas.**

## Course-based Undergraduate Research Experience (CURE) Description:

For the microbiology lab, we will be completing a CURE. The goal of this program is to increase exposure of research to more undergraduate students within the classroom, rather than a traditional research experience. Conducting research has shown many benefits to students, which include improved retention, increased sense of belonging, and an increased interest in science. During this semester your research team will complete a research project that will aim to uncover novel information in the field of microbiology. This project will be composed of four phases:

- 1.) **Preparation:** Background research to understand the research question, **“Is the overall health of an individual affected by their oral microbial diversity?”**
- 2.) **Application:** Culture and Identify an oral microbe from an individual’s toothbrush using microbiological research methods.
- 3.) **Analyze:** Interpret the data that you collect in your experiment and discuss the implications of oral microbial roles to health.
- 4.) **Presentation:** Share your findings with the class and a broader population of students and faculty.

During the semester, you will be guided by your instructor in carrying out each phase so that you are managing your time well, and that you are using proper means to address your problem and analyze your data.

### CURE Learning Map:

Learning Goals	Learning Objectives	Evidence from key learning activities
By the end of the course, students will be able to:	By the end of the course, students will be able to:	
1. Develop an understanding of scientific research in health-related fields.	i. Find relevant literature for a given topic.	i. Literature scavenger hunt ii. Prepare a bibliography for their research posters.
2. Gain appreciation for current microbiological research methods.	i. Complete sample collection using aseptic techniques. ii. Complete the preparation of samples for sequencing. iii. Analyze and interpret results of sequencing of samples to environment collected from.	i. Preparation of agar plates and liquid broth cultures. ii. Isolation of sample from a toothbrush. iii. Description and preparation of the processes (culturing, DNA extraction, PCR amplification, PCR Clean Up, Electrophoresis, BLAST usage) of identifying Unknown Bacterium.
3. Appreciate the value of research by sharing knowledge gained to the broader population.	i. Create and organize a research poster of their project. ii. Clearly describe their research project.	i. Research Poster Session ii. Peer assessment iii. Team assessment

## Lab Grade Criteria

**Learning Log:** At the beginning of each lab, you'll have an opportunity to start/complete your Learning Log prompt for the day. There will be 15 total for the semester. You'll have to upload to Learn Log on UNM Canvas.

**Research Poster Drafts/Complete:** At 5 times during the semester your team will turn in an updated Research Poster Draft that begins with an outline and drafts will be updated as the semester progresses.

**Team Assessments:** These assessments will be completed by two other teams on your research poster at the end of the semester.

**Peer Assessments:** These assessments will be completed anonymously and the average score from your peers will be given as your score.

**Instructor Assessments:** One assessment will be given at the end of the semester of your team's presentation on your team research poster.

**Attendance and Participation:** It's important that you attend each lab course, due to the practical nature of the lab, it might be difficult to catch up if you fall behind. Additionally, research methods are set up to be completed during the lab hour. Students may be dropped from the class after 3 absences.

Lab Activities	Points per assignment:	Total Points:	Percentage of overall Biol 2305 grade (out of 850pts):
Sign Team Contract (1)	5 pts each	5pts	~.5%
Learning Log (15)	6 pts each	90pts	~10.5%
Research Poster Drafts/Complete (5)	11 pts	55pts	~6.5%
Team Assessment (2)	13.5 pts	27pts	~3%
Instructor Assessment (1)	13.5pts	13.5pts	~1.5%
Peer Assessment (1)	13.5pts	13.5pts	~1.5%
Attendance and Participation (16)	1pt/week	16pts	~2%
<b>TOTAL</b>		220 pts	~26%

## Lab Policies



1.) Attendance is **Required**. These are practical, hands-on activities and cannot be made up. Students may be dropped from the class after 3 absences. Attendance will be taken via a daily sign-in sheet. Excessive tardiness (greater than 10 minutes) will be counted as an absence.



- 2.) No food, drink or chewing gum is allowed in the lab.
- 3.) You must wear a **lab coat or apron** during lab.
- 4.) Wash your hands before leaving the lab for the day.
- 5.) You must tie your hair back.
- 6.) Treat all lab equipment carefully and with respect.



# CURE Lab Course Schedule

The goals of the first half of the semester are to familiarized yourself with the molecular techniques and to start outlining/designing/writing for your Research Poster.

Week	Wed. 10:30am -1:15pm	Lab Activity	Assignments	Due Dates at 11:59pm or in class
1	Jan. 18	Lab Introduction of Team-based Research Lab 1: Lab Safety Exercise 1-1/1.2: Glo Germ Hand Wash/Hand Cleansing Agents <i>Learning Log 1: Why is Lab Safety important? How can teams work effectively? Results of Exercise 1-1 Table Q1&amp;2</i> Early Semester ECURE Survey <a href="https://esurvey.unm.edu/opinio/s?s=150507">https://esurvey.unm.edu/opinio/s?s=150507</a>	Sign Team Contract Learning Log 1	Fri. 1/20 Fri. 1/20
2	Jan. 25	Lab 2: Preparation of Tryptic Soy Agar (TSA) plates and TSB using Aseptic Technique CURE Activity 1: What is a Research Poster? <i>Learning Log 2: What are the ingredients of Tryptic Soy Broth? What is TSB used for in the microbiological laboratory? What was the clearest point for TSB media Prep? What was the foggiest point? Results of Exercise 1-2 Table &amp; Q1-Q2 One question you have about your Research Poster.</i>	Research Poster Draft 1- Outline  Learning Log 2	Fri. 1/27  Fri. 1/27
3	Feb. 1	Lab 3: Spread Toothbrush onto Blood Agar plates and practice Isolation Streak with <i>E.coli</i> CURE Activity 2: Literature Scavenger Hunt for Primary Literature <i>Learning Log 3: What is one overall indicator that a research paper is primary literature? Compare and contrast a a primary literature article and a research poster. Draw out your practice Quadrant streak method. How will you use the Quadrant streak method in your Research Project?</i>	Learning Log 3	Fri. 2/3
4	Feb. 8	Lab 4: Class Annotated Bibliography/ Complete Quadrant streak of one of your Unknown colonies. Practice Gram stain with <i>E.coli</i> and <i>Streptococcus epidermis</i> . CURE Activity 3: Annotated Bibliography 1 (Class) for your Research Poster <i>Learning Log 4: From the title of the paper, write 2-3 sentences about what you expect to learn about? Include a picture of your E.coli Quadrant streak result. How can you improve or maintain getting isolated colonies? Why did you complete the gram stain method at the same time for E.coli and S. epidermidis. List the results for each.</i>	Learning Log 4  Early Semester ECURE Survey	Fri. 2/10  Fri. 2/10
5	Feb. 15	Lab 5: Complete Gram Stain on Unknown Microbe and controls. Inoculate TSB with Unknown Microbe and complete Gram Stain of Unknown Microbe using pure culture from Isolation streak. CURE Activity 3: Annotated Bibliography 1 continue. <i>Learning Log 5: What is the objective of the Gram stain? How will Gram stain be used in your research project? Draw the figure of your Gram Stain Results. Include your draft of Figure Legends/images.</i>	Learning Log 5	Fri. 2/17

\*I reserve the right to make necessary changes.

# CURE Lab Course Schedule

The goals of the second half of the semester is to apply the molecular techniques, analyze and create figures/tables of your results, and write and present your Team Research Poster.

6	Feb. 22	Lab 6: Presentations of Team Annotated Bibliography 2— <i>Learning Log 6: What diseases can be caused by oral microbes? How will your Annotated Bibliography 2 be used in your research poster?</i>	Team Assessment 1: Team Annotated bibliography Team assessments  Learning Log 6	Fri. 2/22    Fri. 2/22
7	Mar. 1	Lab 7: DNA Extraction- <i>E.coli</i> /PCR Amplification- <i>E.coli</i> <i>Learning Log 7: Why is studying oral microbes important? How will DNA Extraction be used in your research project?</i>	Learning Log 7	Fri. 3/3
8	Mar. 8	Lab 8: PCR Clean up/Gel Electrophoresis- <i>E.coli</i> /BLAST results of <i>E.coli</i> <i>Preparation of Gel Cast and TSA Buffer</i> <i>Learning Log 8: What is known about human oral bacteria? What is the purpose of Gel Electrophoresis? Peer assessment-Quadrant Streak</i>	Research Poster Draft 2 Updated  Learning Log 8	Fri. 3/8   Fri. 3/8
9	Mar. 15	<b>SPRING BREAK No Classes</b>		
10	Mar. 22	Review process of Techniques Lab 9: DNA Extraction Unknown Microbe (Fresh O/N of Unknown Microbe-broth) <i>Learning Log 9: How have you contributed to your team's poster Draft 2? List two parts with priority to complete this week.</i>	Learning Log 9	Fri. 3/24
11	Mar. 29	Lab 10: PCR Amplification of Unknown Microbes (Outside of class: Gel Electrophoresis of PCR product) <i>Learning Log 10: Draw out your Table that list DNA quantification number for Unknown Toothbrush, Draw Figure Drafts for Gram stain and PCR Gel Picture. CURE Activity 4: Analyze and Interpret the data your group has collected for results</i>	Learning Log 10	Fri. 4/1
12	Apr. 5	Lab 11: PCR Cleanup <i>E.coli</i> control/Unknown Microbe Research Poster-Introduction <i>Gram Stain of Unknown Bacteria (R2-R3)</i> <i>Learning Log 11: What do you still not understand about in completing this research poster? What are you worried about in completing this research poster?</i>	Poster Draft 3 to Dr. T  Learning Log 11	Fri. 4/7  Fri. 4/7
13	Apr. 12	Lab 12: Research Poster- Materials & Methods <i>Learning Log 12: Peer Evaluation of Gram Stain What questions do you have about your research project? End of Semester ECURE Survey</i>	Learning Log 12	Fri. 4/24
14	Apr. 19	Lab 13: BLAST of Unknown Bacteria <i>Learning Log 13: What is known about your Identified microbe related to health? Describe how your microbe made a living in its environment. CURE Activity 5: Let's Piece together the Introduction</i>	Draft 4 of Research Poster  Learning Log 13	Fri. 4/24  Fri. 4/31

\*I reserve the right to make necessary changes.

## CURE Lab Course Schedule

The goals of the second half of the semester is to apply the molecular techniques, analyze and create figures/tables of your results, and write and present your Team Research Poster.

15	Apr. 26	Practice Research Poster <i>Learning Log 14: Why is understanding microbial health important?</i>	Poster pdf due  Learning Log 14	TBD  Fri. 4/31
16	May 3	Research Poster Session <i>Learning Log 15: Describe in 5-6 sentences, what your research poster is about? How did you contribute to its completion? What remaining questions do you have about your research project?</i>  <b>End of Semester ECURE Survey</b>	Teams Assessment Peer Assessment 2:Research Poster Instructor Assessment 2:Research Poster Learning Log 15	TBD  Fri. 5/5

\*I reserve the right to make necessary changes.

## Advice from your Biol 2305 Microbiology Peers

### *o If you could take Biol 2305 Microbiology again, what would you do differently?*

"I'd probably set up a study schedule and practice it before I started the class so that I could develop those study habits early on."

"Probably [I would] get a tutor and prioritize better."

"I could take Microbiology 2305 again I would study and put more time into my assignments. I would also try to remind myself that it's okay to stress but to not overwhelm myself and that it will be okay. I have always tried to thrive for As, this semester taught that I don't need perfect grades as long as I am trying my best."

"If I took Microbiology 2305 again, I would probably investigate the details of every chapter more. I seem to only grasp on the broad points of a chapter and not really the details. I know that learning the details helped me understand the whole topic more."

"I would work harder to stay organized and try not to miss any assignments. Other than that, it was a great course and I really enjoyed it."

"If I could take Microbiology 2305 again, I would take more time to study before an exam or quiz. I feel like I studied but didn't study enough to where I felt 100% confident before taking the test. I would also try to focus on all material equally instead of on one topic more than the other. I made this mistake a lot in past exams and during the exam I noticed it myself. Therefore, studying everything at a certain pace would really help."

"I think I would find a study group outside my normal class."

### *o What advice regarding course work, preparation for exams, homework, completing lab material, or preparing for lecture would you like to share with next semester's students?*

"Make time to go over the material (even if it's just a little bit) every day so that you really try to understand what you are learning and how it can be applied to your career field."

"The advice I would give is read and study the material before coming to class. Do not wait until last minute to do homework."

"I would give other students advice to follow the learning objectives from the PowerPoints and take the time to understand them. The learning objectives are what helped me prepare for the exams."

Continue to next page....

## Advice from your Biol 2305 Microbiology Peers

“Some advice I would share with next semester's students would be to always try your best and to remember that it will be okay as long as you thrive for your goal. As far as homework and exams, I would study as much as you can [and] really put effort into the class.”

“Do not stress too much even if it seems to get hard. Use all the resources such as CAPS or even the instructor's office hours/email for help. Always copy board notes and do your best on the homework. Use past work and notes to help study for tests and exams. The PowerPoints are also good sources to use for studying. What ever happens, do your best and just keep going.”

“My biggest piece of advice – focus on the learning objectives when studying for the exams. If you know the learning objectives and understand them well – you'll do great on the exams.”

“Make sure to read and understand what the question are asking! That is with just about any class. I have missed so many questions because I mis-read them! Take the time to answer questions completely and don't be afraid to write longer explanations on assignments. Take really good lecture notes and study those because most of the test question come from them. Makes sure to use and review corrections for future exams.”

“I would say buy the book. It's not that expensive and makes a huge difference in completing the homework and just learning in general. For some reason, its easier to learn with the physical copy.”

“Pay attention in class and make sure to take good notes. Use those to study [from], they will do you wonders in this class.”



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Contest <https://asm.org/Events/ASM-Agar-Art-Contest/Home>

“The advice that I would give future students regarding preparing the material issued thoroughly and class notes. Another tip would be to make sure to stay on top of it. I say this because if you fall behind it'll be difficult to catch up and you'll end up falling behind in other assignments. Another tip of advice regarding preparing for lecture would be to print the slides from the PowerPoint chapters. It comes in handy when studying and saves time instead of having to go back to UNM learn (Now called UNM Canvas) and look at the slides.”

“Advice I would give to future students of this class would be to take notes! Even if you miss a class get notes from a classmate or make sure you get them from canvas. Notes in this class are your best friend. Make sure if you don't understand something ask, whether it's directed to Dr. T or another student, it brings up a conversation and honestly helps everyone in the room, if you don't understand it I guarantee another student wants to ask the same question.”

“...Stay organized.” & “Stay on top of homework rather than leaving it to the last minute...”