

BIOL/BIOC 4502/5502-501:
Bacterial Diversity and Physiology Laboratory
Fall 2026 LIFE A217; Thursday 2:25-5:15PM

Professor: Dr. Calvin A. Henard

TA: Spencer Lee, BMB Ph.D. candidate

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Office Hours: by scheduled appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions: Previous or current enrollment in BIOL/BIOC 4501.

Course Description and Objectives: Microbial diversity laboratory is largely focused on microbe isolation techniques, including the use of selective and differential growth medium, and molecular-based microbial profiling. Over the semester, we will quantify, isolate, and identify the methylotrophic bacteria found in the turtle pond outside the ESAT building. During this process students will learn:

- Techniques used to isolate microbes from mixed cultures using differential/selective growth medium
- Targeted metagenomic workflows
- DNA isolation and PCR
- BLAST analysis
- 16s microbial profiling

Topic Schedule

<u>Week of:</u>	<u>Weekly Topic/Activity</u>
Sept	3 Lab Safety/Lab objectives/Establish lab groups
	10 Selective;Differential Medium/Streaking/Dilutions (methylotroph)
	17 Oxford Nanopore Technologies Metagenomics pipeline overview/Pond sampling (by TA) and dilution (A#1)
	24 Pond sampling; Microcosm set-up (CH ₃ OH +/- CO ₂ scrub) and DNA extraction of t=0; restreak isolates
Oct.	1 qPCR of t=0 with 16s/mxaF primers
	8 qPCR data analysis (A#2)
	15 Microcosm DNA extraction
	22 16s amplification from microcosm DNA; cPCR of isolates with 16s primers-send for sequencing
	29 BLAST overview; ONT/EPI2ME data analysis overview
Nov.	5 BLAST and Phylogenetic analysis of 16s amplicon (REMOTE; A#3)
	12 16s Metagenomics data analysis (REMOTE)
	19 16s Metagenomics data analysis; A217 clean-up (A#4)
	26 THANKSGIVING/FALL BREAK

*Please note this schedule is tentative and subject to change by the instructor.

Lab Notebook: Students need to purchase a composition book to take notes and document observations and results related to lab activities. The analog notebook will be periodically checked by the TA. You will also need to keep an electronic lab notebook to be turned in at the end of the semester. The electronic notebook should be a single word document. Each week create a new entry in the document that *includes 1) the purpose of the lab, 2) experimental protocol(s) and materials, if applicable, 3) results, and 4) a brief interpretation of the results.* Results will include images/cfu calculations, and/or videos and may need to be added retroactively due to colony formation taking weeks. Make sure to include weekly observations (microcosm color, water turbidity, biomass or colony color/morphology and cfu/mL calculations). By the end of the semester, you should be able to describe the primary bacteria found in the pond and the metabolic processes they mediate. The electronic notebook should reflect activities through the week of November 19th. *The notebook is 40% of your grade, so your effort should reflect this significance.* **Electronic lab notebooks should be uploaded to Canvas by 11:59PM on Sunday 11/22/2026. No late lab notebooks will be accepted.**

Assignments/quizzes: You will have 6 assignments/quizzes throughout the semester. These will be available via Canvas and due the week (by 11:59PM Sunday) indicated in the course schedule above. ***There are no make-up quizzes.***

Attendance:

This is a practical lab course. As such, you must be present to perform the experiments and participate in lab activities. 25pts will be deducted from your participation/attendance for each absence up to 4 absences. **More than four absences will result in an automatic F for the overall course grade.** The lab will be computational in nature throughout November and are indicated as “REMOTE” in the schedule. The class WILL NOT meet virtually during this time. Rather, you should use this time to complete the lab assignments ***independently***. If questions arise during the remote period, do not hesitate to reach out to Mr. Grinffiel for assistance.

Grading:

Your final course grade will include the lab notebook, 6 assignments, and participation:

Electronic Lab Notebook: 200pts

Assignments/Quizzes (6): 200pts

Lab participation/attendance: 100pts

Grading will follow a standard scale:

(448 – 500 points)	A
(398 – 447 points)	B
(348 – 397 points)	C
(298 – 347 points)	D
(< 297 points)	F

Safety procedures and guidelines: While working in laboratory sessions, students are required to follow proper safety procedures and guidelines in all activities requiring lifting, climbing, walking on slippery surfaces, using equipment and tools, handling chemical solutions and hot and cold products. Students should be aware that UNT is not liable for injuries incurred while students are participating in class activities. All students are encouraged to secure adequate insurance coverage in the event of accidental injury. Students who do not have insurance coverage should consider obtaining Student Health Insurance. Brochures for student insurance are available in the UNT Student Health and Wellness Center. Students who are injured during class activities may seek medical attention at the Student Health and Wellness Center at rates that are reduced compared to other medical facilities. If students have an insurance plan other than Student Health Insurance at UNT, they should be sure that the plan covers treatment at this facility. If students choose not to go to the UNT Student Health and Wellness Center, they may be transported to an emergency room at a local hospital. Students are responsible for expenses incurred there.

Academic Integrity: Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

In this course, I want you to engage deeply with the materials and develop your own critical thinking and writing skills. For this reason, the use of Generative AI (GenAI) tools like ChatGPT is not permitted. While these tools can be helpful in some contexts, they do not align with our goal of fostering the development of your independent thinking. Using GenAI to complete any part of an assignment, exam, or coursework will be considered a violation of academic integrity, as it prevents the development of your own skills, and will be addressed according to the [Student Academic Integrity policy](https://policy.unt.edu/policy/06-003) (<https://policy.unt.edu/policy/06-003>).

ADA accommodation statement: The University of North Texas makes reasonable accommodations for students with disabilities. To request accommodations, you must first register with the Office of Disability Access (ODA) by completing an application for services and providing documentation to verify your eligibility each semester. Once your eligibility is confirmed, you may request your letter of accommodation. ODA will then email your faculty a letter of reasonable accommodation, initiating a private discussion about your specific needs in the course. You can request accommodations at any time, but it's important to provide ODA notice to your faculty as early as possible in the semester to avoid delays in implementation. Keep in mind that you must obtain a new letter of accommodation for each semester and meet with each faculty member before accommodations can be implemented in each class. You are strongly encouraged to meet with faculty regarding your accommodations during office hours or by appointment. Faculty have the authority to ask you to discuss your letter during their designated office hours to protect your privacy. For more information and to access resources that can support your needs, refer to the [Office of Disability Access](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>).

Emergency Notification & Procedures:

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). [Campus Closures Policy](https://policy.unt.edu/policy/15-006) (<https://policy.unt.edu/policy/15-006>). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (<https://deanofstudents.unt.edu/conduct>) to learn more.