

BIOL/BIOC 4502-501: Bacterial Diversity and Physiology Laboratory

Fall 2025 LIFE A217; Tuesday 2:00-4:50PM

Professor: Dr. Calvin A. Henard

TA: Daniel Grinffiel, BMB Ph.D. student

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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 cyanobacteria 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	2	Lab Safety/Lab objectives/Establish lab groups
	9	Selective;Differential Medium/Streaking/Dilutions (RFP-expressing <i>E.coli</i>)
	16	Oxford Nanopore Technologies Metagenomics pipeline overview/Pond sampling and dilution
	23	Pond sampling and dilution
	30	Pond sampling and dilution
Oct.	7	Pond DNA extraction
	14	PCR with 16s primers
	21	PCR with 16s primers (redo)/cPCR with cyano 16s primers
	28	ONT/EPI2ME data analysis example/A217 CLEAN UP
Nov.	4	BLAST and Phylogenetic analysis of Cyano 16s amplicon (REMOTE; A#3)
	11	16s Metagenomics data analysis (REMOTE;)
	18	16s Metagenomics data analysis cont. (REMOTE; A#4)
	25	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 (pond 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 18th. *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 Friday 11/21/2024. 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 Friday) 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, 4 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

UNT Policies

Academic Integrity Policy

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

ADA Policy

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to

verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (<http://www.unt.edu/oda>). You may also contact ODA by phone at (940) 565-4323.

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). 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.