**BIOL 4501/5501: Bacterial Diversity and Physiology**

Fall 2022   TR 12:30 – 1:50 pm ● LIFE A419

**Professor:** Dr. Calvin A. Henard

**Contact Information:**
- **Email:** Calvin.Henard@unt.edu
- **Office:** Science Research Building (SRB), Room 132
- **Office Phone:** (940) 565-3280
- **Office Hours:** Friday 9am-10am (or by scheduled appointment)

**Course Description and Objectives:** Comparative survey of bacteria and archaea. Growth, metabolism, energy transformations, adaptive mechanisms, ecology, and role of bacteria and archaea in biogeochemical cycles.

The objectives of this course are to provide (i) a basic understanding of bacterial physiology, (ii) an in-depth survey of the structure and metabolic diversity of bacteria, (iii) a framework for thinking about microbial interactions in pathogenicity and ecology, and (iv) the benefits of bacterial diversity to ecology, biotechnology, and agriculture.

**Course Pre-requisites, Co-requisites, and/or Other Restrictions:** BIOL 1710 or BIOL 1711; BIOL 1720 or BIOL 1722; BIOL 1760 or BIOL 1761; BIOL 2041/BIOL 2042; CHEM 2370; or consent of department.

**Suggested Textbooks:** The following are excellent resources for this course, but are not required:
- **Principles of Microbial Diversity** by James W. Brown, ISBN 9781555814427
- **The Physiology and Biochemistry of Prokaryotes** by David White et al., ISBN 019539304X

**Weekly Topic Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Subject</th>
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<tbody>
<tr>
<td>Aug. 30</td>
<td>Bacterial cell structure and growth</td>
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<tr>
<td>Sept. 6</td>
<td>Carbon Metabolism and Energetics</td>
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<td>13 Bacterial Transcription and Two-component Regulatory Systems/Ecoli syn.bio.</td>
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<td>20 Secretion Systems/Salmonella SPI1 and SPI2</td>
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<td>27 Quorum Sensing/Allivibrio Lux</td>
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<td>Oct. 4</td>
<td>Chemotaxis/Helicobacter pylori</td>
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<td></td>
<td>11 Mid-Term Exam <em>Due by 11:59 PM Monday 10/17</em></td>
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<td>18 Molecular Phylogeny and the Tree of Life</td>
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<td></td>
<td>25 Archaea</td>
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<td>Nov. 1</td>
<td>Chemolithotrophic Bacteria/Identification of uncultivated microbes</td>
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<td></td>
<td>8 Phototrophic Bacteria/Fluorescence In Situ Hybridization</td>
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<tr>
<td></td>
<td>15 METHYLOTROPHIC BACTERIA/Stable Isotope Probing</td>
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<td></td>
<td>22 Diazotrophic Bacteria NO CLASS 11/24 for Thanksgiving</td>
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<tr>
<td></td>
<td>29 Other Cool Bacteria/Sequence-based Microbial Surveys</td>
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<tr>
<td>Dec. 8</td>
<td>Final Exam<em>Due by 12:30 PM Thursday 12/15</em></td>
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Please note this schedule is tentative and subject to change by the instructor. Weekly topics may vary, but exam dates are set and will not change. Exam due dates in bold; must be uploaded to Canvas by indicated time on the due date.)
**Assignments:** One of the primary goals of this course is to introduce you to reading and evaluating primary scientific literature. To this end, I will be uploading review articles and/or primary literature associated with certain topics. [https://unt.instructure.com/login/canvas](https://unt.instructure.com/login/canvas). Assignments (questions) related to these readings will be available in CANVAS and will be a primary focus of class on certain Thursday class meetings (indicated in italics in course schedule). **Assignments will be completed in class. You must be present to receive credit.** There will be 8 assignments worth 20 pts each.

**Exams:** There will be 2 take home exams that will consist of data interpretation and essay-style questions. Exams will be available on the indicated dates within Canvas and must be uploaded to Canvas by the indicated time on the due date. **You DO NOT need to come to class Exam weeks (no class 10/11; 10/13; 12/8; and 12/10).** Exam responses will be checked for plagiarism using advanced detection software.

- **There will be no make-up exams** given the ample time given to complete the exam.
- Any student found cheating on any exam or assignment will receive a grade of zero (0) for that exam and may face other disciplinary action(s).
- **The exam dates are fixed and will not change;** however, the content included on each exam may be different than what is listed in the tentative course schedule. If there are changes to the topics covered on an exam, it will be announced in class and on Canvas.
- Students will have one week following the return of graded exams to raise concerns or dispute potential grading errors related to the exam. **After the one week period, the grade is set and can no longer be disputed.**

**Grading:**
Your final course grade will include 2 take home exams, reading assignments, and attendance/class participation:

- **Exams:** 200pts
- **Assignments:** 120pts
- **Participation:** 80pts

Grading will follow a standard scale:

- (358 – 400 points) A
- (318 – 357 points) B
- (278 – 317 points) C
- (238 – 277 points) D
- (< 237 points) F

**Attendance:** Class participation is 20% of your grade. I will deduct 10 pts for every absence. Thus, four (4) unexcused absences will result in an overall one letter grade drop, eight (8) absences in a two letter grade drop. **Excused absences include medical or family emergency with a doctor’s note (medical) or note from an appropriate person (family emergency).** Attendance will be taken based on log-in information into iClicker. Please remember to mark yourself present on the iClicker app as you come into the classroom. Sign up for an iClicker account via the link provided on the course’s page on Canvas.

While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important. If you are experiencing symptoms of illness, DO NOT COME TO CLASS.
Laptop and tablet-style computers are allowed during class as long as they are being used appropriately (i.e., taking notes). You will be asked to put your device away if you are using it for something other than class. **Please make sure that your phone is on silent when class is in session.** You are not allowed to text, play games, or surf the web on your phone during lecture.

I value the many perspectives students bring to our campus. Please work with me to create a classroom culture of open communication, mutual respect, and inclusion. All discussions should be respectful and civil. Although disagreements and debates are encouraged, personal attacks are unacceptable. Together, we can ensure a safe and welcoming classroom for all. If you ever feel like this is not the case, please stop by my office and let me know. We are all learning together.

**Technical Assistance**
Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

**UIT Help Desk:** [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm)
**Email:** helpdesk@unt.edu
**Phone:** 940-565-2324
**In Person:** Sage Hall, Room 130
**Walk-In Availability:** 8am-9pm

**Telephone Availability:**
- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

**Laptop Checkout:** 8am-7pm
For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328)

**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. **If I identify plagiarism on an Exam, you will get an automatic 50 unless the violation is particular egregious, then you will receive a 0.**

**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) to learn more.