

MICR 4013/5013 - MICROBIAL DIVERSITY, ECOLOGY, AND EVOLUTION

Spring 2025

Instructor: Dr. Reed Stubbendieck, Ph.D. (he/him)	Time: 3:00 – 4:15 PM
Email: stubbendieck@okstate.edu	Place: Classroom Building Rm. 301

Overall Course Objective and Philosophy: I have designed this course to introduce microbiology students to the diversity of the microbial world and fundamental concepts of ecology and evolution, as they pertain to microbes. The course will encompass three main areas: 1) the application of evolutionary theory to microbes, 2) the principles of phylogenetics and the phylogenetic diversity of microbes, and 3) interactions between microbes and their biotic and abiotic environments. In addition, we will introduce the molecular tools and approaches used by microbial ecologists to characterize the structure and function of microbial communities in different environments. I believe that the course will be at its best when I do my part as a conscientious professor and you do your part as a diligent student. I will work hard to hold up my end of the bargain by trying to deliver interesting lectures, with clear learning objectives, and by reviewing important information in class.

Prerequisites: MICR 2123 & BIOL 3023, graduate status, or instructor permission.

Learning Objectives: I will provide learning objectives for each lecture. You will be assessed on these objectives through homework assignments and exams.

Course Materials: All lecture slides will be posted to Canvas, according to the schedule starting on pg. 4 of the syllabus.

Texts: There is no assigned textbook for MICR 4013/5013. The course is drawn from lecture material and academic publications, which will be cited in the lectures.

Technical Requirements: To complete this course, you will require access to Canvas. No additional software is required.

Additional Course Fees: There are no additional course fees for MICR 4013/5013.

Office Hours: After class or by appointment via Zoom or in-person (Life Sciences East 314). If you miss a scheduled appointment without providing adequate notice (3 hours), you will forfeit the opportunity to schedule future meetings.

Email: I will answer emails within 24 hours of receipt on weekdays. I will respond to emails received over the weekend by the end of the day Monday. I will only answer email sent from your Oklahoma State University email address that also contain the course number (MICR 4013 or MICR 5013) in the subject line. Kindly keep your emails concise and to the point. If further information is needed, I will follow up with additional questions. Note, not receiving an email response is not a valid excuse for submitting work late.

Please refrain from sending me messages via Canvas, as I do not check them regularly and cannot guarantee a response.

Attendance Policy: In class, we will review lecture slides, work through examples on the board, and participate in discussions. You are responsible for all material covered. Homework assignments and exams are mandatory and based on the lecture content. If you miss class, do not contact me. I have no further materials beyond what is available on Canvas or the cited publications. Instead, I recommend meeting with

fellow students and/or looking at the publications to obtain the missing information. I expect students to be actively engaged during class and kindly request that you do not spend the lecture on your phone or laptop.

Participation in class is required and constitutes an essential component of the course. Attendance and participation are collectively worth 50 points, accounting for 5% of your total grade (see below). If you have more than 3 unexcused absences, you will forfeit these points entirely.

Participation Expectations: Each week, expect to spend approximately 150 minutes in class and an additional 4 hours reviewing course materials (slides and texts). All homework assignments and exams are take-home. The time required for these assessments will vary.

Assessments and Grading: Your learning of the objectives will be assessed with homework assignments (5 total, 50 points each) [250 points], take-home exams (4 total, 175 points each) [700 points], and attendance and participation [50 points]. I will provide specific rubrics for all homework assignments. All assignments are due at 11:59 PM on the specified date. You must submit all assignments through Canvas. Assignments sent via email will not be graded. There is an automatic extension of 48 hours for each assignment. However, you must submit a request for each extension as a comment on the Canvas assignment page **before the due date**. No extensions will be given for exams without extenuating circumstances. You are responsible for ensuring that your assignments are submitted in the correct file format. File corruption or unreadable submissions will not be accepted as valid excuses for late work.

All grades are final, except in the case of mathematical errors. You will have **ONE WEEK** following posting of a grade for review. If you wish to request a reevaluation of your grade, you must submit a formal explanation, no longer than one page, outlining the credit you believe you should have received. I will typically not review these requests until the end of the term, and only if the outcome could affect your final letter grade. In the case of exams, the entire exam will be regraded. I do not grade on a curve and you are not in competition with your classmates for grades. Your final letter grade will be determined by the amount of points you earn as follows:

- A:** ≥ 900 Points ($\geq 90\%$)
- B:** 800-899 Points (80-89.99%)
- C:** 700-799 Points (70-79.99%)
- D:** 600-699 Points (60-69.99%)
- F:** < 600 Points ($< 60\%$)

Once the semester has ended, grades are considered final and will not be subject to negotiation. If you have concerns about your grade, please address them promptly during the semester to ensure they can be reviewed in a timely manner.

Extra Credit: You will also earn 20 Extra Credit points for completing the anonymous course evaluation (SSI) at the end of the semester and uploading proof of submission to Canvas. No other opportunities for additional points will be made available.

Academic Integrity: Oklahoma State University is committed to the maintenance of the highest standards of integrity and ethical conduct of its members. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating, fabrication, and fraudulently altering academic records) will result in your being sanctioned. Violations may subject you to disciplinary action including the following: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity on your transcript, and being suspended or dismissed from the University. If any work is found to be in violation of the academic integrity policy, all work will be reassessed and regraded accordingly.

Students have the right to appeal the charge. If you have any questions, contact the instructor and/or the

Office of Academic Affairs (101 Whitehurst, 405-744-5627, provost@okstate.edu). The complete Academic Integrity Policy and Procedures can be accessed here: <http://academicintegrity.okstate.edu/>.

Accommodations: All accommodations must be approved through Student Accessibility Services (SAS). Please visit their website at <https://accessibility.okstate.edu/> and follow the process to obtain your official Accommodation Letter. For your convenience, there will be an optional assignment on Canvas where you can securely upload a copy of your Accommodation Letter. Please do not email your Accommodation Letter to me.

Material Upload Policy: Students are strictly prohibited from uploading any course materials, including lecture notes, slides, assignments, and exams, to any online platform. This action constitutes a violation of copyright law and the Academic Integrity Policy at Oklahoma State University, and will result in disciplinary action.

Use of Generative AI: Students may access and use generative AI tools, such as ChatGPT, to assist them in their learning of the course content. However, students are prohibited from using generative AI tools to completely produce, reproduce, and/or manufacture assignments without using any personal effort devoted to the learning process. Before using generative AI tools, students should check to ensure they do not conflict with copyright laws or other's proprietary information. Students are expected to provide attribution for any text created using generative AI tools, as appropriate.

Course Schedule: I may alter the schedule in the event of unexpected circumstances or if the university closes on a class day due to severe weather conditions. Any modifications I make will be communicated through Canvas and email. I will adjust assessments, as needed.

Week	Tuesday	Thursday	Assignments
1	<u>14 January</u> Course Introduction & Origin of Life	<u>16 January</u> Phylogenetics (Part 1)	Assignment 1 (Due 17 January at 11:59 PM)
2	<u>21 January</u> Phylogenetics (Part 2)	<u>23 January</u> Natural Selection (Part 1)	Assignment 2 (Due 24 January at 11:59 PM)
3	<u>28 January</u> Natural Selection (Part 2)	<u>30 January</u> Microbial Speciation	
4	<u>04 February</u> Exam 1	<u>06 February</u> Diversity Overview	
5	<u>11 February</u> Bacterial Diversity (Part 1)	<u>13 February</u> Bacterial Diversity (Part 2)	
6	<u>18 February</u> Canceled Due to Weather	<u>20 February</u> Canceled Due to Weather	
7	<u>25 February</u> Archaeal Diversity	<u>27 February</u> Viral Diversity (Dr. Paul Kirchberger)	Assignment 3 (Due 24 February at 11:59 PM)

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Week	Tuesday	Thursday	Assignments
8	<u>04 March</u> Protist Diversity (Video Lecture)	<u>06 March</u> Fungal Diversity	
9	<u>11 March</u> Exam 2	<u>13 March</u> Characterizing Communities (Part 1)	
10	<u>25 March</u> Characterizing Communities (Part 1)	<u>27 March</u> Population Ecology	
11	<u>01 April</u> Ecosystem Concepts & Ecology	<u>03 April</u> Biogeochemical Cycles (Part 1)	Assignment 4 (Due 04 April at 11:59 PM)
12	<u>08 April</u> Biogeochemical Cycles (Part 2)	<u>10 April</u> Exam 3	
13	<u>15 April</u> Interactions	<u>17 April</u> Symbiosis (Part 1)	
14	<u>22 April</u> Symbiosis (Part 2)	<u>24 April</u> Microbiomes (Part 1)	Assignment 5 (Due 25 April at 11:59 PM)
15	<u>29 April</u> Microbiomes (Part 2)	<u>01 May</u> Exam 4	