

MICR 3103 - MICROBES: FRIENDS OR FOES

Fall 2024

Instructor: Dr. Reed Stubbendieck (he/him)
Email: stubbendieck@okstate.edu

Time: TR 03:00 PM – 04:15 PM
Place: Classroom Building Rm. 308.

Overall Course Objective and Philosophy: I have crafted this course with the intent to teach you about the rich history of microbiology, highlighting the impact of microbes on the evolution, development, and behavior of humans and other animals. In addition, we will learn about fundamentals of the microbiome and its association with diseases and explore methods to manipulate it to enhance our health. Finally, we will explore how to draw inspiration from microbes to shape the future of our lives and the planet. I aim to teach a course that appeals to anyone interested in biology or medicine, but does not necessarily have a background in microbiology. 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 and during review sessions.

Prerequisites: None.

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

Course Materials: All slides will be posted to Canvas, according to the schedule starting on pg. 4 of the syllabus. The texts contain more information than we will cover in one semester. Thus, the purpose of these books are to help explain this material more thoroughly. Any topics not covered in class will not appear on the exams. However, for topics covered in class, expect to learn the material as presented in lecture. Lectures provide the main points that you need to know as a “take-home” message, but the texts will fine tune this information, put it into a deeper context, and help you to get the best grade possible.

Texts:

- Ed Yong, *I Contain Multitudes: The Microbes Within Us and a Grander View of Life*, HarperCollins Publishers, 2016. ISBN: 9780062368607. **(required)**

The course content also draws from the below optional book and from academic publications, which will be cited in the lectures. The latter are made available for interested students, but are not required reading to complete the course.

- Jake M. Robinson, *Invisible Friends: How Microbes Shape Our Lives and the World Around Us*, Pelagic Publishing, 2023. ISBN: 9781784274337.

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 3103.

Office Hours: By appointment via Zoom or in person (Life Sciences East 314).

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 3103) 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.

Attendance Policy: I will not record attendance during this course. However, you are responsible for all material covered. Exams, quizzes, and writing assignments are mandatory and based on the content of lectures and corresponding chapters in the textbooks. If you miss class, do not contact me. I have no further materials beyond what is available on Canvas or the textbooks. Instead, I recommend meeting with fellow students and/or looking at the textbooks 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 Expectations: Each week, expect to spend approximately 150 minutes in class and an additional 4 hours for reviewing course materials (slides and texts). Every week throughout the semester, there will be either a quiz or an exam, each with a duration of 75 minutes. The course also includes four writing assignments. The time required for these writing assignments will vary.

If you have not completed Quiz 1 by September 2, 2024, then I will submit an academic alert or contact you directly to discuss options for continuing in the course.

Grading: Your learning of the objectives will be assessed with quizzes (12 total, 20 points each) [200 points*], writing assignments (4 total, 50 points each) [200 points] and three exams (3 total, 200 points each) [600 points]. There is no comprehensive final exam. Quizzes are open-note and will consist of multiple choice, true/false, and short written responses. Exams are open-note and will consist of multiple choice, short answer, and other applied questions. All quizzes and exams will be administered through Canvas and are open for multiple days. Once you begin a quiz or exam, you will have 75 minutes to complete it. You will run out of time if you look up every answer. Specific rubrics will be provided for all writing assignments. All grades are final, except in the case of mathematical errors. You will have **ONE WEEK** following posting of a grade for review. 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 ($< 60\%$)

Extra Credit: There will be 240 possible points on quizzes, but quizzes are only graded out of 200 points. Any points you earn above the 200, will be Extra Credit points. You will also earn 20 Extra Credit points for completing the anonymous course evaluation at the end of the semester. No other opportunities for additional points will be made available. Please do not ask.

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. Please note that Canvas records and tracks your movements, IP address, and location in an online exam. I will review electronic logs after each exam. 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.

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/>.

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. Appropriate uses may include generating ideas for writing assignments and assessing writing for grammatical errors. Such uses of the tool assist students in learning the content and will therefore be permitted. 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.

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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.

Date	Lecture Topic	Readings	Assignments
T-Aug 20	Introduction (virtual)		Quiz 1 (Open on Canvas from T-Aug 20) Writing Assignment 1 (Due W-Sep 04 11:59 PM)
R-Aug 22	Lecture 1: What Are Microbes? (virtual)	<u>Yong</u> – Ch. 1 pgs. 7-14 <u>Robinson</u> – Appendix pgs. 232-240	
T-Aug 27	Lecture 2: Who Were the First People to Look for Microbes? (Part 1)	<u>Yong</u> – Ch. 2 pgs. 27-33	
R-Aug 29	Lecture 3: Who Were the First People to Look for Microbes? (Part 2)	<u>Yong</u> – Ch. 2 pgs. 33-44	Quiz 2 (Opens on Canvas on R-Aug 29 until M-Sep 02 at 11:59 PM)
T-Sep 03	Lecture 4: How Do Microbes Control Animal Development? (Part 1)	<u>Yong</u> – Ch. 3 pgs. 49-53, 55-61	Writing Assignment 2 (Due W-Sep 18 11:59 PM)
R-Sep 05	Lecture 5: How Do Microbes Control Animal Development? (Part 2)	<u>Yong</u> – Ch. 3 pgs. 53-55, 62-65 <u>Robinson</u> – Ch. 2 pgs. 27-32	Quiz 3 (Opens on Canvas on R-Sep 05 until M-Sep 09 at 11:59 PM)
T-Sep 10	Lecture 6: How Do Microbes Influence Animal Behavior? (Part 1)	<u>Yong</u> – Ch. 3 pgs. 66-72	
R-Sep 12	Lecture 7: How Do Microbes Influence Animal Behavior? (Part 2)	<u>Yong</u> – Ch. 3 pgs. 72-76 <u>Robinson</u> – Ch. 5 pgs. 62-79	Quiz 4 (Opens on Canvas on R-Sep 12 until M-Sep 16 at 11:59 PM)
T-Sep 17	Lecture 8: How Do Animals Maintain Symbiotic Relationships With Microbes? (Part 1)	<u>Yong</u> – Ch. 4 pgs. 77-85	

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Date	Lecture Topic	Readings	Assignments
R-Sep 19	Lecture 9: How Do Animals Maintain Symbiotic Relationships With Microbes? (Part 2)	<u>Yong</u> – Ch. 4 pgs. 85-99	Quiz 5 (Opens on Canvas on R-Sep 19 until M-Sep 23 at 11:59 PM)
T-Sep 24	Exam 1 Review Q&A (virtual)		
R-Sep 26	Exam 1 (Opens on Canvas from R-Sep 26 at 12:01 AM to F-Sep 27 at 11:59 PM)		
T-Oct 01	Lecture 10: Can We Reframe Disease as an Ecological Problem? (Part 1)	<u>Yong</u> – Ch. 5 pgs. 103-111	
R-Oct 03	Lecture 11: Can We Reframe Disease as an Ecological Problem? (Part 2)	<u>Yong</u> – Ch. 5 pgs. 111-121	Quiz 6 (Opens on Canvas on R-Oct 03 until M-Oct 07 at 11:59 PM)
T-Oct 08	Lecture 12: How Do Microbes Relate to Hygiene and Health?	<u>Yong</u> – Ch. 5 pgs. 121-125 <u>Robinson</u> – Ch. 2 pgs. 24-27; Ch. 4 pgs. 50-61	Writing Assignment 3 (Due W-Oct 23 11:59 PM)
R-Oct 10	Lecture 13: What Are Antibiotics and How Do They Affect Our Microbiomes?	<u>Yong</u> – Ch. 5 pgs. 125-141 <u>Robinson</u> – Ch. 3 pgs. 40-49	Quiz 7 (Opens on Canvas on R-Oct 10 until M-Oct 14 at 11:59 PM)
T-Oct 15	Lecture 14: How Do Symbioses Begin? (Part 1)	<u>Yong</u> – Ch. 6 pgs. 143-152	
R-Oct 17	Lecture 15: How Do Symbioses Begin? (Part 2)	<u>Yong</u> – Ch. 4 pgs. 99-102, Ch. 6 pgs. 152-156	Quiz 8 (Opens on Canvas on R-Oct 17 until M-Oct 21 at 11:59 PM)
T-Oct 22	Lecture 16: How Do Microbial Symbionts Ensure Success of Their Hosts? (Part 1)	<u>Yong</u> – Ch. 6 pgs. 156-164, Ch. 7 pgs. 165-170	
R-Oct 24	Lecture 17: How Do Microbial Symbionts Ensure Success of Their Hosts? (Part 2)	<u>Yong</u> – Ch. 7 pgs. 170-183	Quiz 9 (Opens on Canvas on R-Oct 24 until M-Oct 28 at 11:59 PM)

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Date	Lecture Topic	Readings	Assignments
T-Oct 29	Exam 2 Review Q&A (virtual)		
R-Oct 31	Exam 2 (Opens on Canvas from R-Oct 31 at 12:01 AM to F-Nov 01 at 11:59 PM)		
T-Nov 05	Lecture 18: How Do Microbial Symbionts Ensure Success of Their Hosts? (Part 3)	<u>Yong</u> – Ch. 7 pgs. 183-189	Writing Assignment 4 (Due W-Nov 20 11:59 PM)
R-Nov 07	Lecture 19: Do Microbes Swap Their Genes and Selves Horizontally?	<u>Yong</u> – Ch. 8 pgs. 191-208	Quiz 10 (Opens on Canvas on R-Nov 07 until M-Nov 11 at 11:59 PM)
T-Nov 12	Lecture 20: How Can We Engineer Microbiomes to Improve Our Health? (Part 1)	<u>Yong</u> – Ch. 9 pgs. 211-221	
R-Nov 14	Lecture 21: How Can We Engineer Microbiomes to Improve Our Health? (Part 2)	<u>Yong</u> – Ch. 9 pgs. 225-235	Quiz 11 (Opens on Canvas on R-Nov 14 until M-Nov 18 at 11:59 PM)
T-Nov 19	Lecture 22: How Can We Engineer Microbiomes to Improve Our Health? (Part 3)	<u>Yong</u> – Ch. 9 pgs. 235-249	
R-Nov 21	Lecture 23: What Are Probiotics and How Do Microbes Make Our Favorite Foods?	<u>Yong</u> – Ch. 9 pgs. 221-225 <u>Robinson</u> – Ch. 15 pgs. 193-209	Quiz 12 (Opens on Canvas on R-Nov 21 until M-Dec 02 at 11:59 PM)
T-Dec 03	Exam 3 Review Q&A (virtual)		
R-Dec 05	Exam 3 (Opens on Canvas from R-Dec 05 at 12:01 AM to T-Dec 10 at 11:59 PM)		