

# MICR 3103 - MICROBES: FRIENDS OR FOES

Fall 2024

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

**Time:** TR 03:00 PM – 04:15 PM  
**Place:** TK.

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**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.

**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:** I will post slides to Canvas before class. In the event that slides are not posted before the day of class, I will provide hardcopies for all students. 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:** The course content draws from the below optional books and from academic publications, which will be cited on the slides. The latter are made available for interested students, but are not required reading to complete the course.

- Ed Yong, *I Contain Multitudes: The Microbes Within Us and a Grander View of Life*, HarperCollins Publishers, 2016. ISBN: 9780062368607. (**highly recommended**)
- Jake M. Robinson, *Invisible Friends: How Microbes Shape Our Lives and the World Around Us*, Pelagic Publishing, 2023. ISBN: 9781784274337.

**Office Hours:** After class, or by appointment via Zoom or in person (Life Science East 314).

**Instructor Response Time:** 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.

**Attendance Policy:** I will not record attendance during this course. 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 textbook. Nevertheless, attendance is strongly recommended to succeed in this 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:**  $\geq 900$  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 exam 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](mailto: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, Bing AI, or Gemini, 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.

**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 ( <b>virtual</b> )		
R-Aug 22	Lecture 1: What are Microbes? ( <b>virtual</b> )	<u>Yong</u> - Ch. 1, pgs. 7-14 <u>Robinson</u> - Appendix, pgs. 232-240	Quiz 1 (Open on Canvas from F-Aug 23 at 08:00 AM until M-Aug 26 at 11:59 PM)
T-Aug 27	Lectures 2 & 3: Who Were the First People to Look for Microbes?	<u>Yong</u> - Ch. 2, pgs. 27-44	Quiz 2 (Open on Canvas from F-Aug 30 at 08:00 AM until M-Sep 02 at 11:59 PM)
R-Aug 29			
T-Sep 03	Lectures 4 & 5: How Do Microbes Control Animal Development?	<u>Yong</u> - Ch. 3, pgs. 49-65 <u>Robinson</u> - Ch. 2, pgs. 18 - 37	Quiz 3 (Open on Canvas from F-Sep 06 at 08:00 AM until M-Sep 09 at 11:59 PM)  Writing Assignment 1 (W-Sep 04, 11:59 PM)
R-Sep 05			
T-Sep 10	Lectures 6 & 7: How Do Microbes Influence Animal Behavior?	<u>Yong</u> - Ch. 3, pgs. 66-76 <u>Robison</u> - Ch. 5, pgs. 62-79	Quiz 4 (Open on Canvas from F-Sep 11 at 08:00 AM until M-Sep 16 at 11:59 PM)
R-Sep 12			

Date	Lecture Topic	Readings	Assignments
T-Sep 17          R-Sep 19	Lectures 8 & 9: How Do Animals Maintain Symbiotic Relationships With Microbes?	<u>Yong</u> - Ch. 4, pgs. 77-102	Quiz 5 (Open on Canvas from F-Sep 20 at 08:00 AM until M-Sep 23 at 11:59 PM)  Writing Assignment 2 (W-Sep 18, 11:59 PM)
T-Sep 24	Exam 1 Review ( <b>virtual</b> )		
R-Sep 26	<b>Exam 1</b> (Opens on Canvas from R-Sep 26 at 12:00 AM until F-Sep 27 at 11:59 PM)		
T-Oct 01       R-Oct 03	Lectures 10 & 11: Can We Reframe Disease as an Ecological Problem?	<u>Yong</u> - Ch. 5, pgs. 103-121	Quiz 6 (Open on Canvas from F-Oct 04 at 08:00 AM 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. 4, pgs. 121-125 <u>Robison</u> - Ch. 2, pgs. 24-27; Ch. 4, pgs. 50-61	
R-Oct 10	Lecture 13: What are Antibiotics and How Do They Affect Our Microbiomes?	<u>Yong</u> - Ch. 5, pgs. 125-41 <u>Robison</u> - Ch. 3, pgs. 40-49	Quiz 7 (Open on Canvas from F-Oct 11 at 08:00 AM until M-Oct 14 at 11:59 PM)
T-Oct 15       R-Oct 17	Lectures 14 & 15: How Do Symbioses Begin?	<u>Yong</u> - Ch. 6, pgs. 143-164	Quiz 8 (Open on Canvas from F-Oct 18 at 08:00 AM until M-Oct 21 at 11:59 PM)

Date	Lecture Topic	Readings	Assignments
T-Oct 22	Lectures 16 & 17: How Do Microbial Symbionts Ensure Success of Their Hosts?	<u>Yong</u> - Ch. 7, pgs. 165-189	Quiz 9 (Open on Canvas from F-Oct 25 at 08:00 AM until M-Oct 28 at 11:59 PM)  Writing Assignment 3 (W-Oct 23, 11:59 PM)
R-Oct 24			
T-Oct 29	Exam 2 Review ( <b>virtual</b> )		
R-Oct 31	<b>Exam 2</b> (Opens on Canvas from R-Oct 31 at 12:00 AM until F-Nov 01 at 11:59 PM)		
T-Nov 05	Lectures 18 & 19: Do We Swap Genes With Our Microbes?	<u>Yong</u> - Ch. 8, pgs. 191-210	Quiz 10 (Open on Canvas from F-Nov 08 at 08:00 AM until M-Nov 11 at 11:59 PM)
R-Nov 07			
T-Nov 12	Lectures 20-23: How Can We Engineer Microbiomes to Improve Our Health?	<u>Yong</u> - Ch. 9, pgs. 211-249	
R-Nov 14			Quiz 11 (Open on Canvas from F-Nov 15 at 08:00 AM until M-Nov 18 at 11:59 PM)  Writing Assignment 4 (W-Nov 13, 11:59 PM)
T-Nov 19			
R-Nov 21	Lecture 24: 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 (Open on Canvas from F-Nov 22 at 08:00 AM until M-Dec 02 at 11:59 PM)

Date	Lecture Topic	Readings	Assignments
T-Dec 03	Exam 3 Review ( <b>virtual</b> )		
R-Dec 05	<b>Exam 3</b> (Opens on Canvas from R-Dec 05 at 12:00 AM until T-Dec 10 at 03:50 PM)		

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