

MICR 3103 - MICROBES: FRIENDS OR FOES

Fall 2023

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

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

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 delve into the 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 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.
- 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 Sciences 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 (with the exception of exam days). You are responsible for all material covered. Exams, quizzes, and term papers 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 (13 total, 20 points each) [200 points*], writing assignments (4 total, 50 points each) [200 points], two midterm exams (2 total, 200 points

each) [400 points], and a non-comprehensive final exam [200 points]. 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 260 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). 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 Bard, 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, and I will adjust assessments, as needed.

Date	Lecture Topic	Readings	Assignments
T-Aug 22	Course Introduction & a Brief History of Earth from a Microbial Perspective	<u>Yong</u> - Ch. 1, pgs. 7-14 <u>Robinson</u> - Appendix, pgs. 232-240	
R-Aug 24	The Dutch Haberdasher, the French Chemist, and the German Physician	<u>Yong</u> - Ch. 2, pgs. 27-33	Canvas Quiz 1
T-Aug 29	Can Microbes be more than Pathogens?	<u>Yong</u> - Ch. 2, pgs. 33-44	
R-Sep 01	How do Microbes Control Animal Development?	<u>Yong</u> - Ch. 3, pgs. 49-65 <u>Robinson</u> - Ch. 2, pgs. 18-37	Canvas Quiz 2
T-Sep 05			
R-Sep 07	How do Microbes Control Animal Behavior?	<u>Yong</u> - Ch. 3, pgs. 66-76 <u>Robinson</u> - Ch. 5, pgs. 62-79	Canvas Quiz 3 Writing Assignment 1
T-Sep 12			
R-Sep 14	How do Animals Maintain Symbiotic Relationships with their Microbes?	<u>Yong</u> - Ch. 4, pgs. 77-102	Canvas Quiz 4
T-Sep 19			
R-Sep 21	Midterm Exam 1		
T-Sep 26	Can we Reframe Disease as an Ecological Problem?	<u>Yong</u> - Ch. 5, pgs. 103-121	
R-Sep 28			Canvas Quiz 5
T-Oct 03	How do our "Old Friends" 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	
R-Oct 05			Canvas Quiz 6

Date	Lecture Topic	Readings	Assignments
T-Oct 10	How do Antibiotics Affect our Microbiomes?	<u>Yong</u> - Ch. 5, pgs. 125-141 <u>Robinson</u> - Ch. 3, pgs. 40-49	
R-Oct 12			Canvas Quiz 7 Writing Assignment 2
T-Oct 17	How do Symbioses Begin?	<u>Yong</u> - Ch. 6, pgs. 143-156	
R-Oct 19			Canvas Quiz 8
T-Oct 24	Should we Consider Ourselves Holobionts?	<u>Yong</u> - Ch. 6, pgs. 156-164 <u>Robinson</u> - Ch. 7, pgs. 90-101	
R-Oct 26	Midterm Exam 2		
T-Oct 31	How do Microbes Ensure Success of their Hosts?	<u>Yong</u> - Ch. 7, pgs. 165-189	
R-Nov 02			Canvas Quiz 9
T-Nov 07			
R-Nov 09	Do we Swap Genes with our Microbes?	<u>Yong</u> - Ch. 8, pgs. 191-210	Canvas Quiz 10 Writing Assignment 3
T-Nov 11			
R-Nov 16	How do Microbes make our Favorite Foods?	<u>Yong</u> - Ch. 9, pgs. 221-225 <u>Robinson</u> - Ch. 15, pgs. 193-209	Canvas Quiz 11
R-Nov 21	Fall Break		
T-Nov 23			

Date	Lecture Topic	Readings	Assignments
T-Nov 28	Can we Modify Microbiomes to Improve our Health?	<u>Yong</u> - Ch. 9, pgs. 211-249	
R-Nov 30			Canvas Quiz 12 Writing Assignment 4
T-Dec 05			
R-Dec 07	Can we take Inspiration from Microbes to Engineer the Future?	<u>Yong</u> - Ch. 10, pgs. 251-264 <u>Robinson</u> - Ch. 11, pgs. 141-156; Ch. 12, pgs. 157-171	Canvas Quiz 13
T-Dec 12	Final Exam [non-comprehensive] (2:00-3:50 PM)		