

MB 513 Microbial Systems 3 credits, CRN 40244

Winter Quarter 2018; Tuesday & Thursdays 10-11:30 am, Shepard Hall 101

Instructor: Rebecca Vega Thurber

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Course Syllabus

Week	Date	Topic	Reading	Notes
1	Jan 9	<b>The Microbial Tree of Life</b>		
	Jan 11	Discussion: <i>Characterizing microbial diversity</i>	Parks et al., <i>Nature Micro</i> 2017 Hug et al., <i>Nature Micro</i> 2016	<b>Review due</b>
2	Jan 16	<b>Viral &amp; Eukaryotic Microbes</b>		
	Jan 18	Discussion	Martinez-Hernandez et al. 2016 <i>Nat Comm.</i> Burki et al. 2017 <i>Proceedings of the Royal Society</i>	<b>Review due</b>
3	Jan 23	<b>Modern Methods in Microbiology</b>		<b>Annotated bibliography due</b>
	Jan 25	Discussion: <i>Synthetic Biology</i>	Pike et al., 2017 <i>Science</i> Wang et al., 2017 <i>Science</i>	<b>Review due</b>
4	Jan 30	<b>No class</b>		

	Feb 1	<b>No class</b>		
5	Feb 6	<b>Microbial Behavior</b>		<b>First term paper draft due;</b>
	Feb 8		Liu et al., <i>Science</i> 2017 Humphries et al., <i>Cell</i> 2017	<b>Review due</b>
6	Feb 13	<b>Health, Disease, and Immunity</b>		
	Feb 15	Discussion: <i>Viruses and Public Health</i>	Olival et al., <i>Nature</i> 2017 Jurado et al. <i>Nature</i> 2017	<b>Review due</b>
7	Feb 20	<b>Human Microbiome</b>		
	Feb 22	Discussion: <i>Human microbiome and health</i>	Duvallet et al., <i>Nat Comm</i> Surana & Kasper 2017 <i>Nature</i>	<b>Review due</b>
8	Feb 27	<b>Microbes &amp; the Environment</b>		
	Mar 1	Discussion: <i>Microbes and Climate Change</i>	Campbell et al., 2015 <i>Philosophical Transactions</i> Ali et al., 2017 <i>Plos Neglected Tropical Diseases</i>	<b>Review due</b>
9	Mar 6	<b>Symbiosis</b>		
	Mar 8	Discussion	Spribille et al., <i>Science</i> 2016 Buck et al., <i>Nat Comm</i> 2017	<b>Review due</b>
10	Mar 13	Final Presentations	4 speakers	
	Mar 15	Final Presentations	4 speakers	

## **Course Description**

This graduate level course aims to give students a modern view of microbiology through the lens of microorganism's influence on our planet's habitats and inhabitants. This course will discuss advanced techniques used in current research in order to illustrate the fundamentals of modern microbiology. The value of connections between microbiology and varied other disciplines (medicine, environmental science, ecology, engineering, mathematics, sociology, pharmacy, etc.) in addressing key questions facing society will be emphasized.

## **Course Format** Tuesday and Thursday; 1.5 hours

-Tuesdays will be composed of two parts. The first portion will be a 30 minute lecture on the weekly topic. The core faculty will present this lecture on the topic of the week and discuss methodological background useful in evaluating the weekly paper. After the lecture we will split into two groups and discuss the assigned readings for the week. This team-based approach will allow the students to discuss their assigned reading and come together to formulate a group opinion and review of the work. The students will generate team-based reviews and present them to the class on Thursday. We will also post these reviews on our class' Canvas site.

-Thursdays will be a discussion of student-selected readings. After the Tuesday lecture and discussion students will be required to survey the primary literature and discuss the assigned paper in regards to the bigger topic at hand. Students will then be responsible for accessing, reading, presenting, and discussing the paper in class. The faculty can help guide the selection of papers; we strongly encourage the students to bring us a selection of papers for which we can give feedback.

## **Assessment**

Student performance will be evaluated by four measures: a) a weekly written review/evaluation of the group paper and its connection to the topic, b) an 8 page review (double spaced) on a topic of your choice in the format of a *Trends in Microbiology* paper, c) an annotated bibliography for the final paper, d) a final presentation of the student's paper, and e) your weekly class participation and engagement.

1. Weekly reviews due each Thursday before the discussion (24%). Reviews will consist of a 1 page overview and assessment of the group paper and its relationship with the student's individually selected paper. Students will be required to demonstrate that they have read and critically evaluated both manuscripts.
2. The class final paper (28%). The focus of the paper should be on a specific topic within any sub-discipline in microbiology today. The final paper for the class will be a short review paper in the format of a *Trends in Microbiology* opinion piece, on a topic of your choosing. This is a shorter format - ~2000 words (equivalent to about 8 pages double-spaced) and 20-60 references. Text boxes, figures, and outstanding questions can be included (no more than 4 display items). The guidelines for authors are here: <http://www.cell.com/trends/microbiology/authors> (Links to an external site.)Links to an external site.. This is intended to be a focused review synthesizing literature on a topic of interest within microbiology, that can draw on the perspective gained through student's reviews of group and individual papers from throughout the course.
3. Annotated bibliography for final paper (5%). Students will be required to provide a short summary of the preliminary paper along with a properly annotated bibliography (no fewer than 20 peer reviewed references) of your literature survey early in the quarter for assessment. This will allow us to give feedback on the scope and direction of the paper.
4. Final presentation on course paper topic (25%).

5. Class participation will be assessed on student involvement in weekly team discussions and student presentations (18%).

### **Student Learning Outcomes:**

At the completion of the course, you should be able to:

1. Evaluate current research on the structure and function of microbial systems.
2. Review current research on microbial systems, and the role of this research in addressing the big issues facing human society and the conservation of Earth's habitats.
3. Understand current trends and recent breakthroughs in methodology for microbial research.
4. Integrate ideas and concepts from several areas of microbiology (e.g. from biomedical to environmental) that will advance and inform your own research, perhaps through cross-discipline collaboration.

### **University, College and Departmental Policies:**

**Please note for students with documented disabilities:** Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Please note:** The Department of Microbiology follows the university rules on civility and honesty. These can be found

at <http://oregonstate.edu/studentconduct/http://%252Foregonstate.edu/studentconduct/code/index.php>

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action. Cheating or plagiarism by students is subject to the disciplinary process outline in the Student Conduct Regulations.

At Oregon State University academic dishonesty is defined by the Oregon Administrative Rules 576-015-0020.1.a-c as: a) Academic or Scholarly Dishonesty is defined as "an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another."

(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) TAMPERING - altering or interfering with evaluation instruments or documents.

(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

Academic dishonesty cases are handled initially by the academic units (collection of evidence and documentation of incident, meeting with student regarding the situation, determination of responsibility and academic penalty) but will also be referred to the Student Conduct Coordinator for action under the rules.

Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

*"The goal of Oregon State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning will not be tolerated, and will be referred to the Student Conduct Program for disciplinary action. Behaviors that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office."*