

**BIO 415/515 MICROBIAL ECOLOGY**

**Tuesday/Thursday 9:30 - 10:45 am**  
**We will meet via zoom for the first week!**  
**Then... Location: Payson-Smith 305**

<b>Instructor:</b> Dr. Rachel Larsen	<b>Office Location:</b> Science Building 477
<b>Email:</b> rachel.larsen@maine.edu	<b>Office Phone:</b> 207-780-4273
<b>Office hours:</b> TBD (via zoom)	<b>Zoom meeting ID:</b> 966 617 3813

**Course Materials & Books:**

Textbook: The required text is *PROCESSES IN MICROBIAL ECOLOGY* By Kirchman. This book can be purchased through eCampus, USM's textbook provider, or any other source.

It could also be helpful to have a basic microbiology text as a reference and there are some decent online resources available for free. Here is one source:

<https://bio.libretexts.org/Bookshelves/Microbiology>

Other readings will be provided.

**Technology Requirements:**

Brightspace, USM email, Zoom, and Google Drive

Word processing (Word, Google doc, or similar) and other Google suite programs; A reference manager like Zotero is also very helpful

**Course Description, including format:**

This course is aimed at biology undergraduates and graduate students and is designed to be a deep dive into the interactions between microbes and their environments/communities.

**Learning Outcomes:**

The objectives you should establish for yourself for this class include (but are not limited to):

- ❖ To learn about microbes in their natural environments
- ❖ To learn about techniques used to investigate microbial ecology
- ❖ To learn to read and critique research studies

**Grading Criteria:**

Exams (2)                      50%      (25% each)

Focus project	25%
<i>Bibliography</i>	5%
<i>Outline</i>	5%
<i>Presentation</i>	5%
<i>Paper</i>	10%
Paper discussions	15%
Assignments (12)	10%

**Grading Scale:** Final grades will be awarded using a typical scale: 93-100 = A, 90-92 = A-, 87-89 = B+, 83-86 = B, 80-82 = B-, 77-79 = C+, 73-76 = C, 70-72 = C-, 67-69 = D+, 63-66 = D, 60-62 = D-, <60 = F

## **Assessments:**

### **Exams**

There will be two exams, each consisting of both multiple-choice and short answer questions. **Exams will be in person on campus unless USM halts in-person meetings.** The final exam is not technically cumulative, but I will expect you to apply knowledge from throughout the course to the later material. Questions may include short-answer or essay questions. Make a note of these dates because make-up exams will only be given if you have an extreme and dire emergency.

Past students have found it very useful to study by drawing, teaching each other, making concept maps, and other creative methods. Simply making flashcards and/or passively reading the book/notes is **NOT** the best way to study for this class! Talk with me or the LAs to discuss the best study techniques.

### **Focus project:**

Throughout the semester, you will explore a topic of your choice related to how microbes influence and interact with their environment. This semester-long project will culminate in a research paper and a short slide presentation. Detailed instructions will be provided.

Scores on assignments that are turned in late will be lowered by 10% per day for each day (24 hours) beyond the due date. However, you have four floating “grace days” (a total of four days for the semester) that you may use as needed to avoid a penalty (this does not include the presentation). For example, you may use all four grace days to extend the first due date without penalty, but then the remaining assignments must be on time; or you may use two grace days for one assignment and two for another. How (or if) you use these is up to you, but the goal is to give you a little bit of flexibility with due dates. Because you have this flexibility, no other late excuses (with the exception of those most extreme and dire) will be accepted.

**Assignments/ Discussions:** These may include group work, debates, questions for our class guest (if we can lure in a guest!), etc. Detailed instructions for each assignment will be shared in advance.

### **Paper Discussions:**

Several times throughout the semester we will dive deeply into papers from the scientific literature. You (with a partner) will be responsible for leading the discussion which means

you guide the class through the paper. Everyone is expected to come to class prepared for each and every one of these discussions, which means careful reading of the paper and answering assigned questions. Part of your score will be based on your preparation as a leader and part will be based on your participation when others are the leader.

### **Communications and Citizenship**

I make every effort to respond to emails in a timely manner but please be mindful that I am not available 24/7. I treat you with respect in class and via email and expect respect in return. In general, email is the best way for us to communicate with each other so it is important that you check your email and keep up with Brightspace routinely.

Classroom etiquette: The same level of professional etiquette is important both in the physical classroom and in the online environment. Following these simple rules will ensure a constructive learning environment for all of us:

- ❖ Respect the classroom environment (whether in person or online) and never forward in-class communications or posts by people in this class to others outside this class.
- ❖ Refrain from inappropriate language and derogatory or personal attacks
- ❖ Do not dominate any discussion. Give other students the opportunity to join in the discussion
- ❖ You may disagree with ideas, but avoid statements that may be interpreted as a personal attack

In any setting where you are interacting with us or your classmates **it is very important to be civil and respectful**. Any language or behavior that is deemed disrespectful or non-inclusive will not be tolerated.

### **Class Schedule:**

*Note: This schedule is subject to change if necessary! Changes will be updated here and announced on Brightspace. Exam dates will not change unless there is a significant disruption in the schedule.*

<b>Date</b>	<b>Topic</b>	<b>Textbook Chapters (other resources will be provided)</b>	<b>Quiz and Assignment due dates</b>
<b>Week 1</b> 1/26	Definition of microbial ecology/ brief history of microbiology research	Ch. 1	
1/28	Architecture of bacteria and archaea	Ch. 2	
<b>Week 2</b> 2/2	Architecture of bacteria and archaea	Ch. 2	
2/4	Physical-chemical environment	Ch. 3	<b>Paper topic (due Sat 2/6)</b>
<b>Week 3</b> 2/9	Methods of study	Ch. 1, 5	
2/11	<i>Paper discussion 1</i>		
<b>Week 4</b>	<i>President's Day (No class)</i>		

<b>2/16</b>			
<b>2/18</b>	Energetics Primary production	Ch. 6	<b>Bibliography (due Sat 2/20)</b>
<b>Week 5 2/23</b>	Metabolic diversity	Ch. 4, 7, 8	
<b>2/25</b>	Metabolic diversity	Ch. 7, 11, 12	
<b>Week 6 3/2</b>	Metabolic diversity	Ch. 11, 12	
<b>3/4</b>	Habitats and diversity	Ch. 4, 5	
<b>Week 7 3/9</b>	<b>EXAM 1</b>		
<b>3/11</b>	<i>(no class)</i>		
<b>Week 8 3/16</b>	Insect-microbe interactions	Ch. 11, 14	
<b>3/18</b>	Insect-microbe interactions	Ch. 11, 14	
<b>Week 9 3/23</b>	<b><i>Paper discussion 2</i></b>		
<b>3/25</b>	<i>Spring Break Day (no class)</i>		<b>Outline (due 3/27)</b>
<b>Week 10 3/30</b>	Plant-microbe interactions	Ch. 12, 14	
<b>4/1</b>	Plant-microbe interactions	Ch. 12, 14	
<b>Week 11 4/6</b>	Animal-microbe interactions	Ch. 9, 14	
<b>4/8</b>	Animal-microbe interactions	Ch. 9, 14	
<b>Week 12 4/13</b>	<b><i>Paper discussion 3</i></b>		
<b>4/15</b>	Animal-microbe interactions (disease ecology)	Ch. 9, 14 (10)	
<b>Week 13 4/20</b>	<i>(work on papers)</i>		
<b>4/22</b>	<i>(work on papers)</i>		
<b>Week 14 4/27</b>	<b><i>Presentations</i></b>		
<b>4/29</b>	<b><i>Presentations</i></b>		<b>Final paper (due 5/1)</b>
<b>Tuesday 5/4</b>	<b>EXAM 2</b> 8:00 - 10:00 am in Payson 304		

## **COURSE POLICIES**

### **ATTENDANCE POLICY**

There is a direct correlation between student success and engagement with the class and the instructor. My first goal is to help you succeed. We will generally meet in person this semester unless it seems prudent to hold some of our meetings via zoom, or unless USM decides to close the campus to in-person class meetings.

### **CLASS CANCELLATION AND TECHNOLOGY CHALLENGES**

In the event that class must be cancelled or materials cannot be posted as scheduled, an announcement will be posted in Brightspace. When short notice, this announcement will also be sent as an email. In the event of snow cancellations, please check your email and/or Brightspace for an update. In general we can meet via zoom to avoid missing any class days, but if it is a particularly big storm then cancelling class completely might be the best choice.

If any challenges arise as a result of issues including (but not limited to) power outages or technology malfunctions, it is your responsibility to contact me as soon as possible to arrange an alternative plan.

### **ACADEMIC INTEGRITY / PLAGIARISM**

Everyone associated with the University of Southern Maine is expected to adhere to the principles of academic integrity central to the academic function of the University. Any breach of academic integrity represents a serious offense. Each student has a responsibility to know the standards of conduct and expectations of academic integrity that apply to academic tasks. Violations of academic integrity include any actions that attempt to promote or enhance the academic standing of any student by dishonest means. Cheating on an examination, stealing the words or ideas of another (i.e., plagiarism), making statements known to be false or misleading, falsifying the results of one's research, improperly using library materials or computer files, or altering or forging academic records are examples of violations of this policy which are contrary to the academic purposes for which the University exists. Acts that violate academic integrity disrupt the educational process and are not acceptable.

Evidence of a violation of the academic integrity policy will normally result in disciplinary action. A copy of the complete policy may be obtained from the office of Community Standards and Mediation, online at [usm.maine.edu/community-standards-mediation/academic-integrity](https://usm.maine.edu/community-standards-mediation/academic-integrity) or by calling and requesting a copy at (207) 780-5242.

### **FINAL EXAMINATIONS/FINAL PROJECT**

The final exam in this class (which is not fully cumulative) will be an in-person exam administered at our scheduled day and time during final exam week. It is a USM academic policy that no tests or exams may be scheduled during the last week of classes.

## **UNIVERSITY POLICIES AND RESOURCES**

### **DISABILITY ACCOMMODATIONS**

The university is committed to providing students with documented disabilities equal access to all university programs and services. If you think you have a disability and would like to request accommodations, you must register with the Disability Services Center. Timely notification is essential. The Disability Services Center can be reached by calling 207-780-4706 or by email [dscusm@maine.edu](mailto:dscusm@maine.edu). If you have already received a faculty accommodation letter from the Disability Services Center, please provide me with that information as soon as possible. Please make a private appointment so that we can review your accommodations.

### **TUTORING AND WRITING ASSISTANCE**

Tutoring at USM is for all students, not just those who are struggling. Tutoring provides active feedback and practice, and is available for writing, math, and many more subjects. Walk-in tutoring is available at the Glickman Library in Portland, the Gorham Library, and the LAC Writing Center. For best service, we recommend making an appointment at <https://usm.maine.edu/learningcommons/schedule-tutoring-appointment>

Questions about tutoring should be directed to Naamah Jarnot at 207-780-4554. Interested in becoming a more effective, efficient learner? Check out <https://usm.maine.edu/agile>

### **COUNSELING**

Counseling is available at USM. The best way to schedule an appointment is by phone at 780-5411. More information is available at <https://usm.maine.edu/uahcs>

### **RECOVERY ORIENTED CAMPUS CENTER (ROCC)**

A peer support community for students in recovery from substance abuse and other mental health conditions is available at USM. More information may be found online at <https://usm.maine.edu/recovery> or by contacting ROCC at 207-228-8141.

### **NONDISCRIMINATION POLICY AND BIAS REPORTING**

The University of Southern Maine is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities. The following person has been designated to handle inquiries regarding non-discrimination policies: Amie Parker, Interim Director of Equal Opportunity, The Farmhouse, University of Maine Augusta, Augusta, ME 04333, 207.581.1226, TTY 711 (Maine Relay System). Incidents of discrimination or bias at USM should be reported to Associate Vice President for Student Affairs David Roussel at 207-780-5242.

### **STATEMENT ON RELIGIOUS OBSERVANCE FOR USM STUDENTS**

Absence for Religious Holy Days: The University of Southern Maine respects the religious beliefs of all members of the community, affirms their rights to observe significant religious holy days, and will make reasonable accommodations, upon request, for such observances. If a

student's religious observance is in conflict with the academic experience, they should inform their instructor(s) of the class or other school functions that will be affected. It is the student's responsibility to make the necessary arrangements mutually agreed upon with the instructor(s).

#### **TITLE IX STATEMENT**

The University of Southern Maine is committed to making our campuses safer places for students. Because of this commitment, and our federal obligations, faculty and other employees are considered mandated reporters when it comes to experiences of interpersonal violence (sexual assault, sexual harassment, dating or domestic violence, and stalking). Disclosures of interpersonal violence must be passed along to the University's Deputy Title IX Coordinator who can help provide support and academic remedies for students who have been impacted. More information can be found online at <http://usm.maine.edu/campus-safety-project> or by contacting Sarah E. Holmes at [sarah.e.holmes1@maine.edu](mailto:sarah.e.holmes1@maine.edu) or 207-780-5767.

If students want to speak with someone confidentially, the following resources are available on and off campus: University Counseling Services (207-780-4050); 24 Hour Sexual Assault Hotline (1-800-871-7741); 24 Hour Domestic Violence Hotline (1-866-834-4357).

#### **POLICY ON ACCEPTABLE CONDUCT IN CLASS SETTINGS**

If a student substantially disrupts a class, the professor may ask the student to align with this policy on conduct in a class setting. If the student refuses, the professor may, at their discretion, ask the student to leave. If the professor takes this step, they must attempt to communicate with the student and provide informal counsel and advice. The professor may elect to notify their dean of the situation as well. If the student disrupts the class again, the professor may, at their discretion, provide a written notification to the student, describe the offending behavior, and refer the student's case to the appropriate academic dean and notify the dean of students that an official student conduct code violation has occurred [<https://usm.maine.edu/community-standards-mediation/conduct-process>].

#### **COVID FACE COVERING REQUIREMENT**

Per USM and the University of Maine System, all students, faculty, and staff members are required to wear a face covering, including during all face-to-face classes. Resident students are exempted from this requirement when in their own room in the residence hall. Students seeking additional exceptions from this requirement should refer to the DISABILITY ACCOMMODATIONS section of this syllabus.

<https://www.maine.edu/together/community-guidance/everyone/>