

MBios 342: Microbial Ecology Course Syllabus

Course description and objectives

This course is intended to introduce students to the principles of microbial diversity and ecology in a lecture format. Upon completing this course students will be familiar with the roles microbes play in terrestrial, freshwater, and marine ecosystems.

Student Learning Outcomes

Upon completion of this course, student should display the following abilities:

1. Familiarization with bacterial evolution and taxonomy and be able to describe what bacterial speciation means.
2. Demonstrate significant knowledge of microbial ecology, biochemical cycling, and physiology in the natural world.
3. Read and interpret primary literature involving topics of microbial ecology.

What This Course Does Not Do

1. Cover all environmental microbes.
2. Explain all molecular techniques used in diversity studies (some techniques will be covered in lecture and the focus of lab exercises will be cultivation).

Class Schedule

Lecture: We will meet in M-F from 9-10:15 am from **May 5th to June 13th** in Fulmer Hall 150.

Form of Instruction

Course will consist of lectures and discussions. There is no course fee for this course.

Pre requisites

MBioS 305 and 306 (General Microbiology and laboratory), and MBios 303 (Introductory Biochemistry) or permission of the instructor.

Texts

There is no required text for students to purchase. However, the following texts are optional and reserve copies will be available at Owen Science Library:

Microbial Ecology: Fundamentals and Applications (4th edition) by Atlas & Bartha 1998

Environmental Microbiology by Maier, Pepper, and Gerba (1st edition)

Grading

Tests Exams will be worth 80% of the final grade. Two midterms and a final exam will each be for 1 hour each and involve a combination of short answer, fill-in-the-blank, and essay-type questions. Each exam will be worth 100 points for a total of 300 points.

A **10-page written report** will be expected from each student on their microbe of choice. A draft of this report is due midway through the course and peer-review support will be provided. The final report will be worth 75 points for a total of 20% of the final grade.

Attendance Policy

Attendance in lecture is required. Exam questions are heavily based upon discussions in lecture and it is not likely that students will perform well without the benefit of attending lectures.

Disability Statement

Reasonable accommodations are available for students who have a documented disability. Please notify the instructor during the first week of class of any accommodations needed for the course. Late notification may cause the requested accommodations to be unavailable. All accommodations must be approved through the Disability Resource Center (DRC) in Administration Annex 206 (Tel. 335-1566).

Academic Integrity

Cheating in any form will not be tolerated and any instances of dishonesty will be reported to the Office of Student Conduct. The instructor has a “no-tolerance” policy towards cheating, and plagiarism and/or cheating will result in failing the class.

All exams and turned in assignments must have the following statement written on them with the student’s signature...

“I have neither given nor received unauthorized aid on this exam or assignment.”

Instructors

John Dahl

335-7719

johndahl@wsu.edu

office hours: Tuesday and Thursday noon-2 pm

Phil Mixter

335-4937

pmixter@wsu.edu

Schedule of Lectures

The following list of topics will be covered in class:

Day	Date	Topic	Atlas & Bartha	Maier <i>et al.</i>
1	May 5	Microbial ecology: historical perspectives	Chpt 1	Chpt 1
2	May 6	Microbial evolution and biodiversity	2	2
3	May 7	Microscopic methods		9
4	May 8	Culture methods	7	10
5	May 9	Physiological and molecular methods	7	11, 12, 13
6	May 12	<i>Journal article discussion</i>		
7	May 13	Interactions among microbial populations	3	
8	May 14	Biofilms and microbial mats	6	6
9	May 15	Microbial interactions with plants	4	18
10	May 16	Exam #1		
11	May 19	Microbial interactions with animals (pt I)	5	19
12	May 20	Microbial interactions with animals (pt II)	5	20
13	May 21	Microbial communities and ecosystems	6	
14	May 22	<i>Journal article discussion</i>		
15	May 23	Estuarine ecosystems	9	
	May 26	Memorial Day – no class		
16	May 27	Marine ecosystems	9	
17	May 28	Measurements of microbial numbers. Biomass, and activities		
18	May 29	Effects of abiotic factors and environmental extremes on microorganisms	8	
19	May 30	Astrobiology		
20	June 2	Exam #2		
21	June 3	Microorganisms and their natural habitats: air, water, and soil microbiology	9	4, 5, 6
22	June 4	<i>Journal article discussion</i>		
23	June 5	Biochemical cycling (C, H, and O)	10	14
24	June 6	Biochemical cycling (N, S, P, and Fe)	11	14, 15
25	June 9	Biodeterioration control	12	16
26	June 10	Bioremediation	13, 14	16
27	June 11	Biofuel production	15	
28	June 12	Ecological control of pests and disease- causing populations	16	
29	June 13	Exam #3 (semi-cumulative)		

Microbial Ecology: Fundamentals and Applications by Atlas and Bartha (4th edition)

Environmental Microbiology by Maier, Pepper, and Gerba (1st edition)