

EEES 4540/5540, **Microbial Ecology**
Fall 2006
3 credit hours

Class time and room: MW 2:00 – 3:15, BO 2083

Instructor: **Von Sigler**, Assistant Professor of Environmental Microbiology,
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Office hours: By appointment

Prerequisites: EEES 2150, Biodiversity; or BIOL 2100 Basic Microbiology; or
consent of instructor

Required text: None

Supplementary text: Alcamo, I.E., *Microbes in Society: An Introduction to
Microbiology*, Jones and Bartlett Pub.
Atlas, R.M. and Bartha, R. *Microbial Ecology*, Fourth Edition
Addison Wesley Longman, Inc.
Maier, R.M., Pepper, I.L., and Gerba, C.P. *Environmental
Microbiology*, Academic Press.

We are only beginning to understand the great diversity of microbes and their impacts, both beneficial and detrimental, on our society. Microbes play many roles in our lives from agents of disease and bioterrorism to vehicles of biotechnology and agricultural advancement. The major objective of this course is to learn how microorganisms impact our environment, public health, agriculture, and biotechnology by discussing the important roles microbes play in everyday life. Specific objectives include:

1. Provide an overview of the microbial world that introduces the major organisms that shape our lives including bacteria, viruses, protists and fungi.
2. Discuss the roles of microbes in our lives including food production and safety, industrial and agricultural biotechnology, disease and resistance, and environmental technology.
3. Understand how microorganisms interact in populations and communities and how environmental conditions impact microbial function.

Tentative course set-up/schedule: I aim to keep this course informal and interactive. Since the study of microbial ecology requires knowledge of several disciplines including microbiology, bacteriology, environmental science, chemistry, biology, and ecology, it is likely that all students will not share similar background knowledge. Therefore, I will lecture at a pace that the class finds comfortable. With the exception of exam dates and due dates for writing assignments, I will not stick to a predetermined schedule of lectures.

Outlines of the lecture notes will be available online on the Microbial Ecology course website:

<http://www.eescience.utoledo.edu/Faculty/Sigler/COURSES/Course%20list.htm>

The website will be populated with lecture notes as the semester progresses.

We will cover a variety of topics including:

- Why microbes matter (video)
- History of microbial ecology
- The Microorganisms
 - Viruses
 - Bacteria (video)
 - Protozoa
 - Algae
 - Fungi
- Microbial phylogeny, systematics and taxonomy
- Methodology to study microorganisms
 - Enumerating bacteria
 - Measuring microbial biomass
 - Measuring microbial activity
 - Characterizing populations
 - Biochemical methods
 - Molecular methods
- Microbial growth, nutrition and metabolism
- Microbial interactions
 - Interactions within a single population
 - Interactions among diverse populations
- Control of microorganisms
- Food safety
- Microbes in agriculture
- Microbes in the environment
- Indicator organisms and environmental transmission of pathogens

Grading: Grades will be earned based on your performance on written exams, quizzes, and a presentation (graduate students). The point distribution is as follows:

Exam I	Sept. 18	100 points
Exam II	Oct. 18*	100 points
Exam III	Nov. 20	100 points
Exam IV	Dec. 14 (12:30 - 2:30)	100 points
Quizzes (4)	Unannounced	40 points total
Final presentation (Grads. only)	Final week of class	50 points
Total points		450 or 490 points

* might be changed

Attendance: I will not take attendance, however your presence in this course will greatly impact your grade. If you miss a class, it is your responsibility to get the class notes (additional to those online) from a fellow student. **I will not provide them.**

Missed exams can only be made-up if a written letter explaining the reason for the absence (including a contact phone number of doctor, mechanic, alarm clock manufacturer, etc)) is presented to the instructor *at the time of the student's next attended class*. Missed quizzes cannot be made up.

Academic dishonesty: Academic dishonesty in this course will not be tolerated. Examples of academic dishonesty include:

1. Obtaining or using work other than your own on tests, exams, quizzes or assignments.
2. Unauthorized use of calculators or other programmable equipment during tests, exams, or quizzes.
3. Unauthorized use of study aids, answer or crib sheets.
4. Soliciting or providing answers on exams, tests or quizzes.

Students who violate the above policy can expect disciplinary action. Disciplinary action may consist of receiving a zero on the assignment, failing the course, being reported to the Dean of Students, or other action as deemed appropriate by the course instructor.