

## CE250: Environmental Microbiology

### Instructor:

Claudia Gunsch  
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Phone: 660-5208

### Class Time:

Lectures and Lab Sessions: Tuesday and Thursday, 10:05-11:20

### Office Hours:

Tuesday 2-3 or by appointment

### Textbooks:

1. *Brock Biology of Microorganisms*, 11<sup>th</sup> Edition, Madigan and Martinko
2. Assigned journal articles

### Prerequisites:

CE124L, graduate standing or consent of the instructor

### Grading:

Homework: 10%  
Laboratory Reports: 15%  
Individual Paper/Presentation: 15%  
Midterm (1): 25%  
Final: 35%

### Academic Integrity:

<http://www.gradschool.duke.edu/Regulations/standards.htm>

### Bulletin Description:

CE 250: Environmental Microbiology. Fundamentals of microbiology and biochemistry as they apply to environmental engineering. General topics include cell chemistry, microbial metabolism, bioenergetics, microbial ecology and pollutant biodegradation. Prerequisites: CE124L or graduate standing or consent of the instructor. Instructor: Gunsch. One course.

## Class Schedule:

<i>Class Period</i>	<i>Reading Assignment</i>	<i>Topic</i>
1	Chapter 1	Introduction
2	Chapter 2 and 4	Cell Chemistry
3	Chapter 2 and 4	Prokaryotic Cell Biology
4	Chapter 5	Eukaryotic Cell Biology
5	Chapter 5	Nutrition and Metabolism
6	Lab Handout	<b>LAB 1</b>
7	Chapter 5	Biosynthesis
8	Chapter 6	Microbial Growth
9	Lab Handout	<b>LAB 2</b>
10	Chapter 7	Macromolecules and Molecular Genetics
11	Chapter 8	Metabolic Regulation
12	Class Notes	Kinetics
13	Class Notes	Kinetics
14	Class Notes	Kinetics
15	N/A	<b>MIDTERM</b>
16	Chapter 10	Bacterial Genetics/ <b>LAB 3 Part I</b>
17	Lab Handout	<b>LAB 3 Part II</b>
18	Chapter 10 and 11	Bacterial Genetics/Microbial Evolution
19	Chapter 11	Microbial Evolution/Metabolic Diversity
20	Chapter 17	Metabolic Diversity
21	Lab Handout	<b>LAB 4</b>
22	Chapter 18 and 19	Microbial Ecology / <b>Term Papers Due</b>
23	Journal Articles	Pollutant Biodegradation in Bioremediation and Phytoremediation
24	Chapter 26	Public Health Microbiology
25	Student Term Paper Abstracts	<b>PRESENTATIONS</b>

## Scheduled Laboratory Exercises:

1. Enumeration of Microorganisms
2. Fecal and Total Coliform Enumeration
3. Effect of Nutritional and Environmental Factors on Microbial Growth
4. DNA Isolation by Spooling and Visualization

## Assignments:

- *Homeworks:* There will be 4 homework assignments during the semester which will due 1 week after they are handed out. Homework assignments should be completed individually.
- *Group Laboratory Reports:* Each group should submit a report 2 weeks after the completion of a lab. These reports should include the following sections: title, author names, abstract, introduction, materials and methods, results, discussion and references.
- *Term Papers and Presentations:* Each student in the course will write a 20-page paper (Times New Roman, 12 pt, double space) on a topic of their choice related to the class material. Each paper should include an abstract (~200-300 words) which will be distributed to all students

enrolled in the class prior to the end of semester presentations. Note that the abstract does not count towards the page limit. At the end of the semester, each student will give a 15 minute Powerpoint presentation. It is the responsibility of each student to gain approval from the instructor on their chosen topic.