

# ENVR 412 Ecological Microbiology

## Spring 2012 Syllabus

**Instructor:** Dr. Jill R. Stewart  
MHRC 1301  
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**Time:** 11:00a – 12:15p Tuesday and Thursday

**Location:** McGavran-Greenberg Building, Room 1305

**Text:** Brock Biology of Microorganisms  
Madigan, Marinko, Stahl and Clark (eds.), 13<sup>th</sup> Edition

Purchase of textbook is highly recommended but not required. The text is strongly recommended for students who do not already own a microbiology or molecular biology text that covers much of this material.

**Supplement:** Unseen Life on Earth – Telecourse

**Grading:** Three exams (100 pts each; 300 pts total)  
Class project and group presentation (50 pts)  
Presentation of a journal article (30 pts) and participation in journal discussions (20 pts)

*Note: the 3<sup>rd</sup> exam will be administered during final exams but will not be cumulative.*

**Attendance:** Attendance is encouraged and will likely be required for a student to do well on exams. Exam questions will be based on lecture material.

### Objectives:

This is intended as an intermediate course for students with some background in microbiology who are interested in the role of microorganisms in environmental processes. The course is process oriented rather than descriptive. The student's goal should be an understanding of how microbes contribute to driving global processes as well as human and environmental health. The class project will explore in detail a particular topic in Microbiology.

## Outline and Schedule:

Date	Topic	Reading Assignment (from Brock 12 <sup>th</sup> edition)
Tuesday, Jan. 10	Introduction	Chapter 1
Thursday, Jan. 12	Microbial Anatomy	Chapter 3
Tuesday, Jan. 17	Metabolism	4.4-4.12; Chapters 13 and 14
Thursday, Jan. 19	Biosynthesis & Regulation	4.1; 4.13-4.16; 8.1-8.6
Tuesday, Jan. 24	Microbial Growth	5.1-5.8
Thursday, Jan. 26	Traditional Methods – Enumeration, Biomass and Activity	4.1-4.3; 5.9-5.11; Ch. 22
Tuesday, Jan. 31	Molecular Methods	22.3-22.7
Thursday, Feb. 2	Microbial Genetics	Chapters 6, 10 and 12
Tuesday, Feb. 7	Microbial Diversity	Chapter 16. 17.1; 19.1, 20.6
Thursday, Feb. 9	<b>Exam 1</b>	
Tuesday, Feb. 14	Guest Research Lecturer (Dr. David Singleton – lecturer)	
Thursday, Feb. 16	Biogeochemical Cycling	23.1-23.2; 24.1-24.5
Tuesday, Feb. 21	Effects of Environmental Factors / Microbes in Extreme Environments	5.12-5.18
Thursday, Feb. 23	Microbes on Surfaces	23.3-23.5
Tuesday, Feb. 28	Soil and Subsurface Microbiology	23.6-23.7
Thursday, March 1	Estuarine and Marine Microbiology	23.9-23.12
Tuesday, March 6	Spring Break (no class)	
Thursday, March 8		
Tuesday, March 13	Biodegradation (Dr. Fred Pfaender – lecturer)	24.7-24.10
Thursday, March 15	Bioremediation (Dr. Fred. Pfaender – lecturer)	24.7-24.10
Tuesday, March 20	Wastewater Microbiology	35.1-35.3
Thursday, March 22	<b>Exam 2</b>	
Tuesday, March 27	Microbial Agents of Disease	Chapters 27, 34 & 35
Thursday, March 29	Virology	Chapter 9
Tuesday, April 3	Parasitology	35.6
Thursday, April 5	Microbial Transport and Source Tracking (Jen Shields – lecturer)	
Tuesday, April 10	Food Microbiology and Food Safety (Jen Shields – lecturer)	Chapter 36
Thursday, April 12	Microbial Removal in Engineered Systems	Chapter 35
Tuesday, April 17	Student Presentations	
Thursday, April 19	Student Presentations	
Tuesday, April 24	Student Presentations	
Exam Slot	<b>Exam 3</b>	