BIOL 345 FUNDAMENTALS OF MICROBIOLOGY Spring 1999

Instructor: Craig L. Moyer
Office Hours: **M & W:** Noon-1pm & 3-4pm & by appointment @ BI 409
Lecture: **MWF:** 8am @ CB 285
Homepage: http://fire.biol.wwu.edu/biology/courses.html (go to Courses)

Required Text: Madigan, Martinko and Parker. 1997. *Brock: Biology of Microorganisms,* 8th Edition. Prentice Hall Publishers.

Objectives of the Course:

Seven Central Themes will guide your successful study of Microbiology:

1. Microbiology in its historical perspective;
2. Microbes as cellular systems;
3. Microbes as energy transducers;
4. Microbes as agents of environmental and geochemical change;
5. Microbes as tools for the study of macromolecular processes;
6. Microbes as agents of infectious disease; and
7. Microbes as products of evolutionary change (This theme is intercalated throughout!)

Evaluation of Coursework:

Two lecture exams @ 150 pts each	300
Comprehensive final exam	200
Total Points:	**500**

The two midterm exams are scheduled outside of the 50-minute lecture period to give you time to develop reasoned answers and essays. **Note the dates and times of the exams and work out possible conflicts now.** Make-up exams will be given only if you are excused from the exam BEFORE the scheduled date and time, or, in the event of illness, you have a note from a health professional confirming that you were unable to take the exam during the scheduled time.

EXAM I	Monday, April 19	5-8pm	**BI 212**
EXAM II	Wednesday, May 12	5-8pm	**BI 212**
FINAL	Tuesday, June 8	3:30-5:30pm	**CB 285**

TENTATIVE COURSE OUTLINE

LECTURE DATE	TOPICS
	THEME I. Historical Perspective
Mar 31	Course Introduction: Why Study Microbes?
Apr 02	Historical Perspectives on Microbiology
	THEME II. Microbes as Cellular Systems
Apr 05	An Overview: Comparing Prokaryotic and Eukaryotic Cells
Apr 07	The Prokaryotic Cell: Organization and Structure
Apr 09	The Prokaryotic Cell: Form and Function
Apr 12	Microbial Taxonomy and Classification
Apr 14	Phylogeny of Microorganisms
Apr 16	Microbial Diversity
	THEME III. Microbes as Energy Transducers
Apr 19	An Overview: Metabolic Strategies for Generating ATP
Apr 21	Heterotrophic Generation of ATP: Respiration
Apr 23	Heterotrophic Generation of ATP: Fermentation
Apr 26	Autotrophic Generation of ATP: Chemolithotrophy
Apr 28	Autotrophic Generation of ATP: Photoautotrophy
Apr 30	Microbial Evolution – Metabolic Strategies of Primitive Microbes
May 03	Microbial Origins of Life – Video "It came from Outer Space"
May 05	Microbial Origins of Life – Theories & Models
May 07	Effects of Environmental Factors
May 10	Bacterial Growth Parameters and Measurements
	THEME IV. Microbes as Agents of Environmental and Geochemical Change
May 12	Extreme Environments & Biogeochemical cycles
May 14	Microbial Modification of the Biosphere
	THEME V. Microbes & Molecular Processes
May 17	DNA Replication
May 19	Transcription
May 21	Translation
May 24	Regulation of Gene Expression
May 26	Bacterial Genetics: DNA Transfer
May 28	Viruses: Characteristics & Lifestyles
	THEME VI. Microbes as Agents of Infectious Disease
Jun 02	Normal Flora, Virulence and Pathogenicity
Jun 04	Infectious Diseases, Microbial Death & Antibiotic Resistance

READING ASSIGNMENTS FOR BIOLOGY 345

Readings are from the required text: Madigan, Martinko and Parker. 1997. *Brock: Biology of Microorganisms*, 8th Edition. Prentice Hall Publishers.

LECTURE TOPIC	READINGS
Overview and Historical Perspective	Chapter 1 (Review Chap. 2)
Microbes as Cellular Systems	
The Prokaryotic Cell	Chapter 3
Microbial Taxonomy and Classification	Chapter 15 (15.9)
Phylogeny of Microorganisms	Chapter 15 (15.5-15.8)
Phylogeny of Microbial Diversity	Chapter 16 (Intro); Chapter 17 & 18 (Intro only)
Microbes as Energy Transducers	
Metabolic Strategies	Chapter 4 Chapter 13 (selected)
Microbial Evolution	Chapter 15 (15.1-15.3)
Microbial Growth	Chapter 5
Microbes as Agents of Environinental Change	
Biogeochemical Cycling & Extreme Environments	Chapter 14 (14.7-14.18)
Bioremediation of Pollutants	Chapter 14 (14.19-14.20)
Microbial Modification of the Biosphere	Handouts Provided
Environmental Biotechnology	Chapter 10 (10.12; review rest of chapter)
Microbes & Molecular Processes	
Molecular Processes	Chapters 6 & 7
Bacterial Genetics	Chapter 9 (Intro; 9.1-9.11)
Viruses	Chapter 8 (Intro; 8.1-8.7; 8.12;8.14; selected; 8.23)
Microbes as Agents of Infectious Disease	
Normal Flora	Chapter 19 (Intro; 19.1-19.5)
Virulence and Pathogenicity	Chapter 19 (19.6-19.11)
Pathogenic Microbes	Chapter 22 (22.10); Chapter 23 (selected)
Antibiotics and Chemotherapeutic Agents	Chapter 11 (11.7-11.10); Chapter 12 (12.5-12.6)
Antibiotic Resistance	Chapter 11 (11.13)