

BIOL 345 FUNDAMENTALS OF MICROBIOLOGY Winter 2006

Instructor: Craig L. Moyer
Office Hours: **TR:** 2 - 3pm & by appointment @ BI 409
Lecture: **TR:** 10 to 11:20 am in SL 140
Homepage: <http://fire.biol.wvu.edu/cmoyer/cmoyer.courses.html>
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Required Text: Microbial Life, 2002. Perry, Staley and Lory. Sinauer 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
<u>Comprehensive final exam</u>	<u>200</u>
Total Points:	500

The two midterm exams are scheduled outside of the usual 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, Feb 6	5-7pm	SL 150
EXAM II	Monday, Feb 27	5-7pm	SL 150
FINAL	Monday, March 13	8-10am	SL 140

MICROBIOLOGY “TENTATIVE” COURSE OUTLINE

LECTURE DATE	TOPICS
Week 1 Jan 5 R	Historical Perspective Course Introduction: Why Study Microbes?
Week 2 Jan 10 T Jan 12 R	Historical Perspectives on Microbiology Microbes as Cellular Systems An Overview: Comparing Prokaryotic and Eukaryotic Cells The Prokaryotic Cell: Organization and Structure The Prokaryotic Cell: Form and Function
Week 3 Jan 17 T Jan 19 R	Microbial Phylogeny, Taxonomy and Classification Microbial Diversity & Ecology
Week 4 Jan 24 T Jan 26 R	Microbes as Energy Transducers An Overview: Metabolic Strategies Generating ATP Heterotrophic Generation of ATP: Respiration & Fermentation
Week 5 Jan 31 T Feb 2 R	Autotrophic Generation of ATP: Chemolithotrophy Autotrophic Generation of ATP: Photoautotrophy <i>(End of MT#1 Info)</i>
Week 6 Feb 7 T Feb 9 R	Biogeochemical cycles & Microbial Modification of the Biosphere Bacterial Growth Parameters and Measurements Effects of Environmental Factors & Life in Extreme Environments
Week 7 Feb 14 T Feb 16 R	Moyer out of Town Week Microbial Origins of Life - Video “It Came from Outer Space” Impact of Infectious Diseases - Video “SmallPox Deadly Again?”
Week 8 Feb 21 T Feb 23 R	Microbial Genomes & Molecular Processes Bacterial Chromosomes, Comparative Prokaryotic Genomics Regulation of Gene Expression, Attenuation Control <i>(End of MT#2 Info)</i>
Week 9 Feb 28 T Mar 2 R	Microbes as Agents of Infectious Disease Control of Microbial Growth Antibiotics & Antibiotic Resistance
Week 10 Mar 7 T Mar 9 R	Normal Flora, Virulence and Pathogenicity Acellular Pathogens & Emergent Diseases

READING ASSIGNMENTS FOR BIOLOGY 345

Readings are from the required text: Perry, Staley and Lory. 2002. *Microbial Life*. Sinauer Publishers.

LECTURE TOPIC

Overview and Historical Perspective

READINGS

Chapter 1 & 2

Microbes as Cellular Systems

The Prokaryotic Cell, Structure & Function

Chapter 4

Microbial Taxonomy and Classification

Chapter 17

Phylogeny of Microorganisms

Chapter 17

Microbial Ecology

Chapter 24

Microbes as Energy Transducers

Metabolic Strategies

Respiration & Fermentation

Chapter 8

Chemolithotrophy

Chapter 8

Photoautotrophy

Chapter 9

Biogeochemical Cycles

Chapter 24

Metabolic Diversity

Chapter 5

Microbial Growth

Chapter 6

Microbial Genomes & Molecular Processes

Bacterial Chromosomes

Chapter 13

Comparative Prokaryotic Genomics

Chapter 16

Plasmids & Genetic Exchange

Chapter 15

Attenuation

Handout

Microbes as Agents of Infectious Disease

Control of Microbial Growth

Chapter 7

Antibiotics & Antibiotic Resistance

Chapter 7

Normal Flora

Chapter 26

Virulence and Pathogenicity

Chapter 26

Viruses, Viroids, and Prions

Chapter 14

Emergent Diseases

Chapter 29 & 30