

BIOL 345 FUNDAMENTALS OF MICROBIOLOGY Winter 2010

Instructor: Craig L. Moyer
Office Hours: TR: 2:00 - 2:50 pm & by appointment @ BI 406
Lecture: TR: 10:00 - 11:20 am in HH 353
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Required Text: Slonczewski and Foster, 2008. *Microbiology: An evolving science*. Norton Publishing Company, ISBN 978-0-393-97857-5. The text is available in hardcover new and used from bookstore, or online for \$60 or \$2/chapter at this link:

https://www.wwnorton.com/orders/intellipay/accessPurchase.asp?site=microbio_ebook

Whether you use the hardcover text or e-book, online study aids are available to you. These include quizzes, study guides, animations, chapter summaries, and links to the websites referred to in each chapter. Access these via this link:

<http://www.wwnorton.com/college/biology/mbio/welcome.asp>

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 potential 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. Make-up exam format will be at the discretion of the professor.

EXAM I	Monday, February 1 st	5-7pm	HH 353
EXAM II	Monday, February 22 nd	5-7pm	HH 353
FINAL	Monday, March 15 th	8:00-10:00am	HH 353

MICROBIOLOGY “TENTATIVE” COURSE OUTLINE

LECTURE DATE	TOPICS
Week 1 Jan 05 T Jan 07 R	Historical Perspective Course Introduction: Why Study Microbes? Historical Perspectives on Microbiology
Week 2 Jan 12 T Jan 14 R	Microbes as Cellular Systems An Overview: Comparing Bacterial, Archaeal and Eukaryal Cells The Microbial Cell: Organization and Structure
Week 3 Jan 19 T Jan 21 R	The Microbial Cell: Form and Function Microbial Taxonomy and Molecular Phylogeny
Week 4 Jan 26 T Jan 28 R	Microbes as Energy Transducers An Overview: Metabolic Strategies Generating ATP (<i>End of MT#1 Info</i>) Heterotrophic Generation of ATP: Aerobic & Anaerobic Respiration
Week 5 Feb 02 T Feb 04 R	Heterotrophic Generation of ATP: Fermentation Autotrophic Generation of ATP: Chemolithotrophy
Week 6 Feb 09 T Feb 11 R	Autotrophic Generation of ATP: Chemolithotrophy Autotrophic Generation of ATP: Photoautotrophy
Week 7 Feb 16 T Feb 18 R	Microbial Modification of the Biosphere Origins of Life (<i>End of MT#2 Info</i>)
Week 8 Feb 23 T Feb 25 R	Microbial Growth & Molecular Processes Affects of Environmental Factors Bacterial Growth Parameters and Measurements
Week 9 Mar 02 T Mar 04 R	Microbes as Agents of Infectious Disease Regulation of Gene Expression Normal Flora
Week 10 Mar 09 T Mar 11 R	Virulence and Pathogenicity Microbial Death & Antibiotic Resistance

READING ASSIGNMENTS FOR BIOLOGY 345

Readings are from the required text: Slonczewski and Foster, 2008. *Microbiology: An evolving science*. Morton.

LECTURE TOPIC

READINGS

Overview and Historical Perspective

Chapter 1.1 to 1.6

Microbes as Cellular Systems

The Microbial Cell

Chapter 2.1 (Review 2.2 to 2.7)

Chapter 3.1 to 3.7; Chapter 4.7

Microbial Taxonomy & Molecular Phylogeny

Chapter 17.3 to 17.6

Microbial Diversity

Optional (Review 18.1 & 19.1)

Microbes as Energy Transducers

Metabolic Strategies

Overview

Chapter 13.1 to 13.3

Respiration & Fermentation

Chapter 13.4 to 13.7

Chemolithotrophy

Chapter 14.1 to 14.5

Photoautotrophy

Chapter 14.6; 15.1 to 15.3

Biogeochemical Cycles

Chapter 22.1 & 22.2

Metabolism in Early Organisms

Chapter 17.1 & 17.2

Microbial Growth & Molecular Processes

Environmental Affects on Growth

Chapter 5.1 to 5.9

Microbial Growth

Chapter 4.1 to 4.6

Plasmids & Pathogenicity Islands

Chapter 7.4 to 7.6

Comparative Microbial Genomics

Chapter 8.7

Microbial Genome Evolution

Chapter 9.1 to 9.7

Regulation via Attenuation

Chapter 10.1 to 10.3

Quorum Sensing

Chapter 10.8

Microbes as Agents of Infectious Disease

Normal Flora

Chapter 23.1 to 23.2

Virulence and Pathogenicity

Chapter 25.1 to 25.8

Antibiotics & Antibiotic resistance

Chapter 27.1 to 27.9