

MICROBIOLOGY 20: General Microbiology

Los Angeles Mission College

Spring 2007

Instructor:

Angela Echeverri, Ph.D.

Contact at:

Phone: 818-364-7704 (Office)

818-364-7744 (Lab)

e-mail: angelaecheverri@yahoo.com

Office Hours:

Monday & Wednesday: 12:00-12:30 pm

or by appointment

Held in INST-2016

Section 0284:

Lecture: Mon & Wed 9:00-10:25 am (INST-2016)

Lab: Mon & Wed 10:35 am-12:00 pm (INST-2016)

Credit: 4 Units (UC:CSU)

Prerequisites: Successful completion of Chemistry 51, 65, or 101 and Biology 3 or 6.

Advisory: English 28 or ESL 8

Course Description:

This is an introductory level microbiology class, that will cover the history, classification, morphology, metabolism, genetics, transmission, pathogenicity, epidemiology, and social importance of microorganisms. Students will learn to identify and distinguish among different categories of microorganisms: viruses, bacteria, eucaryotic microbes, and multicellular parasites. The latter part of the lecture will concentrate on microbial diseases and on how the host immune system fights infection. Students will learn important principles of disease prevention and control. The use of the internet and scientific journals as a valuable source of current information will be emphasized. Students will develop laboratory skills that include: record keeping, interpretation of experimental results, and handling, isolating, staining, quantifying, and identification of microbes.

Required Materials:

1. **Microbiology, An Introduction*** 2007. Ninth Edition. G. Tortora, B. Funke, and C. L. Case.
 2. **Laboratory Experiments in Microbiology*** 2007. Eighth Edition. T. Johnson and C. L. Case.
- *Earlier editions of both books are acceptable.*

Evaluation of Student Performance:

Best 3 out of 4 Midterm lecture exams (100 points each)	300
Final lecture examination	200
Laboratory midterm	100
Laboratory final examination	100
Bacterial unknown 1 (Morphological)	50
Bacterial unknown 2 (Identification)	100
Article Review	100
Laboratory skills & participation	50
TOTAL	1000

Grade Scale:

A: 90% or better B: 80-89% C: 70-79% D: 60-69% F: 59% or less

Important: No Make-up exams or laboratories will be given!

If you miss a midterm lecture exam, it will be dropped as your lowest exam.

You will be allowed to miss one laboratory without penalty. Additional absences may affect your grade.

Attendance is mandatory and will affect your grade. Schedule all travel and personal plans accordingly. If you have a conflict, remember this course is offered every semester.

Additional Information

- **Lecture Exams:** Will consist of multiple choice (about 80%), short-answer, matching, and essay questions. Lowest midterm will be dropped. Final exam will be cumulative, but will focus on latter part of the course material.
- **Laboratory Exams:** There will be a laboratory midterm and a final. Will consist of multiple choice, short-answer, matching, and **identification** questions. **Each lab exam will have an open book part and a closed book part.** Closed book part will evaluate identification of microorganisms, interpretation of biochemical tests, and laboratory procedures (e.g.: Gram stain, streak for isolation, etc.). For the open book part of the laboratory exams you will be able to consult your lab notebook.
- **Laboratory Books:** Students will be required to keep a laboratory book in which all questions, tables, charts, and graphs for each exercise are completed. All relevant data must be collected and carefully recorded during the laboratory period. You will be allowed to use your lab books as a source for the open book part of the lab exams.
- **Unknowns** Each student will receive a morphological unknown (50 points) and a biochemical unknown (100 points). Students will characterize their unknowns and identify the second unknown, using various laboratory techniques and culture media. A one or two page typed summary will be turned in for each identification. **See schedule for due dates.**
- **Article Review:** Detailed instructions will be provided by the instructor. Briefly, students will select and read an original scientific article dealing with a microorganism from a peer reviewed journal. Based on the article's findings, write a one page report (**in your own words**) that summarizes the findings and their importance (or lack thereof). Turn in a photocopy of the article with your report. **See schedule for due date.**
- **Laboratory Skills & Participation:** Based on preparation, attendance, completion of labs, lab safety, clean-up, teamwork, microscope care and usage, and appropriate use of equipment and supplies. You will be assigned a microscope for the semester and will be responsible for its proper use and maintenance. I will routinely inspect microscopes before, during, and after you use them.
Five points will be deducted from the 50 point total for each unexcused absence from the laboratory or each time your microscope is stored improperly.

Computer Resources:

I *strongly* suggest you regularly visit the following internet sites:

- Tortora, Funke, and Case Microbiology Website: <http://www.microbiologyplace.com>

This site contains useful quizzes, study guides, and information that will make learning microbiology even more fun! There is even a contest called "Microbe of the Month".

- Microbiology 20 Website at Mission College: <http://www.lamission.edu/lifesciences>

You will find my lecture notes, useful links, handouts, and much more at the click of your mouse!

- Additionally, your textbook comes with two **CD-ROMs** that include interactive exercises, test questions and answers, a glossary, a virtual unknown, and audio pronunciations of scientific names.

Final Words of Advice

This will be an intense, demanding, and hopefully rewarding learning experience. Please keep in mind that we will cover a great amount of material during the semester. Therefore:

- Make every possible effort not to get behind in this course. Expect to study at least 2 to 3 hours for every hour of lecture.
- I suggest that you form study groups and take advantage of my office hours. If you need additional help, let me know as soon as possible, not one week before the final.
- Come to the lectures and laboratories prepared. Read the chapters and laboratory exercises before class!

TENTATIVE CLASS SCHEDULE

Week	Date	Monday (Lecture/Lab)	Date	Wednesday (Lecture/Lab)
1	2/5	Chapter 1: The Microbial World <i>Orientation/Lab Safety</i> <i>Introduction to Microscopy</i>	2/7	Chapter 1: The Microbial World <i>Ex. 1: Microscopy</i>
2	2/12	Chapter 3: Observing Microbes <i>Ex. 3: Smears and simple staining</i>	2/14	Chapter 2: Chemical Principles <i>Ex. 5: Gram staining</i>
3	2/19	PRESIDENT'S DAY COLLEGE CLOSED	2/21	Chapter 2: Chemical Principles <i>Ex. 6: Acid-Fast staining</i>
4	2/26	Chapter 4: Cell Functional Anatomy <i>Ex. 7: Structural stains*</i>	2/28	Chapter 4: Cell Functional Anatomy <i>Ex. 8: Morphologic Unknown</i>
5	3/5	EXAM 1: Chapters 1-4 <i>Ex. 9: Microbes in the Environment</i> <i>Follow-up: Ex. 8</i>	3/7	Chapter 10: Classification of Microorganisms Chapter 11: Prokaryotes-Bacteria and Archae Domains <i>Ex. 10: Aseptic Technique</i> <i>Follow-up: Ex. 8 and 9</i>
6	3/12	Chapter 12: Eukaryotes-Fungi, Algae, Lichens <i>Ex. 11: Dilution & Streak Technique</i> <i>Follow-up: Ex. 9, & 10</i>	3/14	Chapter 12: Eukaryotes-Protozoa and Multicellular Parasites <i>Ex. 34: Fungi-Yeasts</i> <i>Follow-up: Ex. 11</i>
7	3/19	Chapter 6: Microbial Growth <i>Ex. 35: Fungi-Molds*</i> <i>Follow-up: Ex. 34</i>	3/21	Chapter 6: Microbial Growth Chap. 7: Control of Microbial Growth <i>Ex. 37: Protozoa</i>
8	3/26	Chap. 7: Control of Microbial Growth <i>Ex. 21: Osmotic Pressure & pH</i> <i>Follow-up: Ex. 35</i>	3/28	Chapter 13: Viruses <i>Ex. 22: Growth Control-Heat</i> <i>Follow-up: Ex. 21</i> Morphologic unknown due
9	4/2	SPRING BREAK COLLEGE CLOSED	4/4	SPRING BREAK COLLEGE CLOSED
10	4/9	Chapter 13: Viruses <i>Ex. 24: Chemical Control-Disinfectants and Antiseptics</i> <i>Follow-up: Ex. 22</i>	4/11	Chapter 5: Microbial Metabolism <i>Ex. 33: Unknown Identification</i> Biochemical unknowns given
11	4/16	Chapter 5: Microbial Metabolism <i>Ex. 13: Carbohydrate Catabolism</i> <i>Follow-up: Ex. 33.</i>	4/18	Chapter 8: Microbial Genetics <i>Ex. 14: Carbohydrate Fermentation</i> <i>Follow-up: Ex. 13 & 33.</i>
12	4/23	Chapter 8: Microbial Genetics <i>Ex. 15: Protein Catabolism I</i> <i>Follow-up: Ex. 14</i>	4/25	Chapter 14: Principles of Disease & Epidemiology Article Review Due <i>Ex. 16: Protein Catabolism II</i> <i>Follow-up: Ex. 15</i>
13	4/30	EXAM 3: Chapters 5, 8, 13 & 14 <i>Ex. 17: Respiration</i> <i>Follow-up: Ex. 16</i>	5/2	Chapter 15: Microbial Pathogenicity <i>Ex. 18: Rapid Identification Methods*</i> <i>Ex. 52: Microbes in Water</i> <i>(Bring water sample)</i> <i>Follow-up: Ex. 17</i>

14	5/7	Chapter 16: Nonspecific Immunity <i>Follow-up: Ex. 18 & 52</i> <i>Review for lab midterm</i>	5/9	Chapter 17: Adaptive Immunity: Specific Defenses <i>LAB MIDTERM EXAM</i>
15	5/14	Chapter 17: Adaptive Immunity: Specific Defenses <i>Biochemical unknowns due</i> <i>Ex. 25: Chemical Control:</i> <i>Antimicrobial Drugs</i>	5/16	Chapter 19: Immune System Disorders <i>Ex.54: Microbes in Food:</i> <i>Contamination</i> <i>Follow-up: Ex. 25</i>
16	5/21	EXAM 4: Chapters 15-17 & 19 Chapters 21-26: Human Diseases <i>Follow-up: Ex. 54</i> <i>Review for lab final exam</i>	5/23	Chapter 20: Antimicrobial Drugs Chapters 21-26: Human Diseases Final Review-Last Class LAB FINAL EXAM
17	5/28	MEMORIAL DAY HOLIDAY COLLEGE CLOSED	5/30	LECTURE FINAL EXAM

* *Indicates that only part of lab will be conducted*

FINAL LECTURE EXAM: WEDNESDAY, MAY 30th 2007 9:00 to 11:00 AM.

Important Dates to Remember:

February 20: Last day to apply for a refund of registration and parking fees.

March 4: Last day to drop classes, without a "W" (no refund).

May 6: Last day to drop classes, with a "W" (no refund).

May 29-June 4, 2007: Final Exams

STUDENT LEARNING OUTCOMES

Lecture: Upon completion of this course the successful student should be able to evaluate and summarize a peer reviewed research article in microbiology (or immunology), and write a report using correct scientific terminology.

Means of Assessment: Article review

Laboratory: Upon completion of this course the successful student should be able to correctly *identify* an unknown bacterial specimen by using various staining procedures, metabolic tests, and reference sources.

Means of Assessment: Unknown identification (Exercise 33)