

Welcome to Microbiology!

Biology 240

Philosophy

Microbiology affects almost every aspect of human existence. Lynn Margulis said “*We are part of an intricate network that comes from the original bacterial takeover of the Earth. Microbes invented all of life’s essential chemical systems, all of its rules for living and change. Microbes put oxygen into the atmosphere, they built huge structures of rock that changed the face of the Earth, and through symbiosis—they created us.*”

Everyone, scientist or not, needs to have some familiarity with the activities of microorganisms. Knowledge of microbial physiology and genetics has contributed much of what we know today about the fundamental nature of all living organisms.

Microbiology will introduce you to the diversity of microorganisms, their role in nature, and their role in human health and disease. The principles you will study in microbiology are applicable to all biology-related professions including human medicine, veterinary medicine, ecology, and biotechnology.

Goals

After completing this course, you will be able to

1. Use aseptic technique in clinical and laboratory environments.
2. Identify bacteria.
3. Discuss and understand the role of microorganisms in healthy individuals and in infectious diseases.
4. Discuss and understand the principles of cellular metabolism, molecular genetics, and immunology.



Attendance

Regular attendance is expected at every meeting. Role will be taken during each class meeting. When students must be absent because of illness or emergencies they should contact the instructor in advance. A student may be dropped for missing four class meetings. Responsibility for making up work missed because of absence rests with the student.

The Grade of W

You may wish to withdraw from this class. If you withdraw prior to 9-9-11 nothing will appear on your record. If you withdraw between 9-9-11 and 11-15-11, a *W* will appear on your transcript. You will receive a *W* for exceeding four absences prior to 11-15-11. *Anyone exceeding four absences after 11-15-11 will get a final grade of F.*

Requirements

All quizzes, tests, and one final examination must be completed for a passing grade. *No make-up exams will be given.* All laboratory assignments must be completed to earn a passing grade; laboratory will account for approximately 40% of the grade.

Grading	A \geq 88%
	B 75-87%
	C 60-74%
	D 45-59%
	F \leq 44%

Excellent attendance and class participation will be taken into consideration during grading.

Academic honesty. Plagiarized lab reports and papers will receive a score of zero. Refer to the Student Handbook.

Office Hours

Please contact the instructor at any time with questions concerning the course, an assignment, an upcoming quiz, etc.

Skyline College, Office 7214. Phone: 650/738-4376. E-mail: case@smccd.edu

Textbooks - Required

Tortora, G. J., B. R. Funke, and C. L. Case. *Microbiology: An Introduction*, 10th ed. San Francisco, CA: Benjamin/Cummings Publishing Co., 2010.

Johnson, T. R. and C. L. Case. *Laboratory Experiments in Microbiology*, 9th ed. San Francisco, CA: Benjamin/Cummings Publishing Co., 2010.

Study Aids • Class handouts and quizzes are at <http://skylinecollege.edu/case/>

- Text website: <http://www.microbiologyplace.com/>
- *Optional:* Funke, B.R. *Study Guide to Accompany Microbiology: An Introduction*, 10th edition. San Francisco, CA: Benjamin/Cummings Publishing Co., 2010.

Homework and Extra Credit

- The following two homework assignments must be completed. The assignments are on the BIOL 240 web site.
 - Journal article
 - Bacteria report
 - M & M (Disease) report
- **One** additional assignment may be turned in for extra credit. These are on the BIOL 240 web site.
 - Case Histories
 - Food Poisoning
 - Parasitic Helminths (Lab Ex. 36)

Lecture: 9:35-10:50, Tues. and Thurs. *You must arrive on time.*

*Handouts & †quizzes are on the BIOL 240 website.

Date	Lecture	Reading in <i>Microbiology: An Introduction</i>
8-18	Introduction	pp. 3, 33, 57, 107, 307, 801
8-23	Historical background [†]	Chapter 1; pp. 404-406
8-25	The Microbial World*	Chapter 10, Skim Chapters 11 & 12
8-30	The Microbial World [†]	
9-1	Media and growth	Chapter 6
9-6	Microscopy [†]	Chapter 3
9-8	Cells	Chapter 4
9-13	Cells [†]	
9-15	Energy	pp. 121-123, 47-48
9-20	Enzymes	pp. 115-121
TEST		
9-22	Metabolism *	pp. 124-134, Review Chapter 2
9-27	Metabolism Journal article due	135ff.
9-29	Metabolism	135ff.
10-4	Applied Microbiology* †	pp. 783-789, 797-808
10-6	How microbes cause disease*	Chapter 15
TEST		
10-11	Microbial genetics*	Fig. 2.16, pp. 210-225
10-13	Protein synthesis	226ff.
10-18	Protein synthesis	226ff.
10-20	Microbial genetics* Bacteria report due	
10-25	Biotechnology*	Ch. 9
TEST[†]		
11-1	Control of growth	Fig. 6.15, pp. 157-159, Ch 7, pp. 793-796, Skim Chapter 20
11-3	Control of growth [†]	
11-8	Fungi	pp. 443, 586, 600-601, 695-698, 729-730, 758-759,
11-10	Viruses*	Chapter 13, pp. 223, 226, 392-393, 504, 539-548, 595-600, 605,
11-15	Viruses [†]	620-631, 650, 655-659, 660, 670, 679. 692-694, 721-728, 757-758
11-17	Epidemiology*	Chapters 14; pp. 19-21, 201, 416-418, 444, 649, 715
11-22	HIV Extra credit due	Figure 13.19, pp. 538-548
11-29	Host resistance	Chapter 16
12-1	Immunology*	Chapter 17
12-6	Immunology	Chapter 18
12-8	Immunology	Chapter 19
12-15	FINAL EXAMINATION, 8:10-10:40	

Welcome to Microbiology Lab!

Biology 240

Introduction

Louis Pasteur's statement "*Life would not long remain possible in the absence of microbes*" is more apparent now that microbes are being employed to help solve human problems such as improved food production, mining of ores, and cleaning up toxic wastes. Microbiology is a requirement for many of you because of your career goals—health care provider, disease detective, research scientist, or medical laboratory technician. You will learn the techniques used by these professionals and you will perform the same experiments they do on the job. The aseptic technique you will practice in here is vital to the survival of patients or the production of drugs and other products. Additionally, the basic principals of biological sciences we will study are applicable to human health and welfare.

Required Materials.

Johnson, T. R. and C. L. Case. *Laboratory Experiments in Microbiology*, 9th ed. San Francisco, CA: Benjamin/Cummings Publishing Co., 2010.

SHARPIE pen to label your Petri plates and test tubes

Lab Coat. You will need to wear a lab coat while working in the laboratory. No one will be allowed to work in lab without a lab coat after _____ (date).

Assignments

Lab reports, which follow each lab experiment in the manual are due the period after completion of the lab. Each report is worth 10 points. *Be sure to get your lab report stamped each day. Only stamped lab reports can receive full credit.*

Absolutely no late assignments will be accepted. Should you experience extreme, extenuating circumstances which prevent you from

completing assignments, contact me as soon as possible.

Attendance

Regular attendance is expected at every lab, and you must arrive on time. Role will be taken during each class meeting. If you miss a lab, you may not submit a report for that lab experiment. No make up labs will be available. If you miss a lab, you are still responsible for the information covered during that session. Missing four lab sessions will result in your being dropped from the course.

Grading

All laboratory assignments must be completed to earn a passing grade in the course. Laboratory will account for approximately 40% of your final grade (see lecture syllabus.).

Total lab points: 28 lab reports @ 10 pts each =
Unknown identification = 50 pts
Disease report = 50 pts

Office Hours

Please contact the instructor at any time with questions concerning the course, an assignment, an upcoming quiz, etc. Skyline College, Office 7214. Phone: 650/738-4376. E-mail: case@smccd.net

Laboratory Drawer

One lab. drawer will be assigned to each pair of students during the first laboratory period. Your combination: _____

Check your drawer contents against the inventory list. You will be responsible for these materials. Keep them clean and in good condition.

Open Lab

You may check results and complete lab work during the posted open lab hours.

Lab help: Use the Visual Lab Study Guide at skylinecollege.net/case.



About lab reports

Why Is Accurate Record-keeping Important?

Everyone involved in medicine, research, or product design must keep a legal, scientific notebook. A legal, scientific notebook contains a record of all work done by the health care provider or scientist.

1. To prescribe appropriate treatment and to ensure patient is receiving prescribed treatment.
2. To settle patent disputes, such as when someone argues that they made a discovery first and says a discovery or process belongs to them.
3. When a specialist must report findings from testing, such as in paternity suits, criminal cases, or medical malpractice.

If the records are not produced in an acceptable fashion, they will be inadmissible as evidence or used as evidence of malpractice. The following protocol will help you setup and maintain your lab records.

Record Keeping Procedures:

1. Use only your official Lab Report to record your work. Do not record data on loose pieces of paper.
2. Use only black or blue *pen* to make all entries in your Lab Report.
3. *Do not erase, ink-over, or white-out any errors.* Line through errors so they can still be read. Place your initials by the correction.
4. State the objective (purpose) of each experiment.
5. Avoid abbreviations and codes when possible. Reference or key those used.
6. List all persons from whom samples were obtained, shared, or transferred.
7. Graphs and additional records may be attached to your lab report when necessary.

Academic honesty. Discussing lab results with the instructor and your classmates is encouraged. Written lab reports must be in your own words. Plagiarized reports will receive a zero. Refer to the Student Handbook,

Laboratory Experiments in Microbiology, 9th ed.
Cross references to Microbiology: An Introduction, 10th ed

Lab. Ex.	<i>Microbiology</i> Page & Figure Numbers	Lab. Ex.	<i>Microbiology</i> Page & Figure Numbers	Lab. Ex.	<i>Microbiology</i> Page & Figure Numbers
1.	pp. 55-59, 77-79	20.	pp. 119, 257-260, 178, Appendix B	39.	p. 409-413
2.	pp. 59-60	21.	pp. 57, 162-163	40.	pp. 404-406
3.	pp. 164-167	22.	pp. 187-191	41.	pp. 453, 463-470
4.	pp. 164-165	23.	pp. 192-193	42.	pp. 510-512, 526-527
5.	pp. 68-69	24.	pp. 195-205	43.	pp. 287, 510-512
6.	p. 69	25.	pp. 572-573, Table 20.3	44.	pp. 514-518
7.	pp. 69-70, 87-88	26.	pp. 197, 199	45.	pp. 586-595
8.	pp. 70-71	27.	pp. 221-226	46.	pp. 675-676, 685-688
9.	pp. 71-72	28.	p. 231, Fig 8.21	47.	pp. 707-710
10.	pp. 282-283	29.	pp. 234-236	48.	pp. 706, 710-721
11.	pp. 174-175, Figs 6.11, 6.16, & 6.17	30.	pp. 262-264, 289-290	49.	pp. 744-750
12.	pp. 168-169, Figs 6.9 & 6.10, Table 6.5	31.	pp. 247-251, 253-254, Fig 9.1	50.	pp. 330-333, Appendix F
13.	pp. 124-127	32.	pp. 232-233, Fig 8.21	51.	pp. 131-139, 285-287
14.	pp. 132-136, Fig 5.23	33.	pp. 330-333	52.	pp. 175-177, 779-782, Fig 27.14
15.	pp. 136-137	34.	pp. 313-315, 340-345	53.	pp. 175, 779-782, Fig 6.18
16.	pp. 136-137, Fig 5.22	35.	pp. 345-351	54.	pp. 174-175
17.	pp. 127-132	36.	pp. 352-361	55.	pp. 132-136, 797-800
18.	pp. 182-187	37.	pp. 379-382, Fig 13.6	56.	pp. 313-315, 770-772
19.	pp. 161-162	38.	pp. 393-395	57.	pp. 33, 776

Lab. Keep this schedule with your lab manual. Read the assigned lab experiment(s) *prior* to coming to class. Lab. reports are due at the next lab following completion of the experiments; late lab reports will not be accepted. Get your lab report stamped each day.

Hours. _____ AA: 11:10-12:35 _____ AB: 1:10-2:35 _____

Date	Lab	✓ Completed	Score
8-18	Safety Walk due today. <i>Read</i> pp. ix-xv Exercise 26		
8-23	Lab. locker assignment. <i>Read</i> pp. 23-24. Exercise 3		
8-25	Exercise 1. <i>Read</i> pp. 1-2.		
8-30	Exercise 1		
9-1	Exercise 7. <i>Read</i> Ex. 5		
9-6	Exercise 10. <i>Read</i> Ex. 2, 6, 8 & 9		
9-8	Exercise 10. <i>Read</i> Ex. 2, 6, 8 & 9		
9-13	Exercise 11		
9-15	Exercise 22		
9-20	Exercise 12		
9-22	Exercise 13		
9-27	Exercises 14 & 15		
9-29	Exercise 16		
10-4	Exercise 17		
10-6	Exercise 51		
10-11	Exercise 55		
10-13	Exercise 39		
10-18	Exercises 19 & 21		
10-20	Exercise 54		
10-25	Exercises 24 & 25. Choose your M&M		
11-1	Exercises 30 & 45		
11-3	Exercises 30 & 45		
11-8	Exercise 50. <i>Read</i> Ex. 18 and Appendix H. See BIOL 240 web site for the assignment.		
11-10	Exercise 37		
11-15	Exercise 50		
11-17	Exercise 52		
11-22	Exercises 53 & 52		
11-29	Exercise 43		
12-1	Exercise 50. All lab work due.		
12-6	M & M. Exercise 50 due.		
12-8	M & M. Lab check-out.		