Welcome to Microbiology!

Biology 240

Course Number: BIOL 240 (CRN 80165 & 84828)
Course Title: General Microbiology
Science, Math, Technology Division
4 units
TT, 11:10-12:25
Room: 7106
Lecture must be accompanied by a lab session plus 16 lab hours by arrangement (HBA). This is one hour per week outside of class in addition to homework. This will include following up on an assigned experiment or working on your unknown and M&M. Hours by arrangement work count for 10% of your grade in the class.

Course Prerequisites: Successful completion of a college-level laboratory science course. Recommended: Eligibility for ENGL 846.

Course Classification: Transfer credit: UC; CSU (B2, B3).

Course Description: Morphology, taxonomy, ecology, and physiology of microorganisms, with emphasis on bacteria. Laboratory techniques on culture and identification of bacteria. Recommended for agriculture, biochemistry, nursing, pre-medical and predental, biotechnology engineering, and other life science majors.

Instructor: Please contact the instructor at any time with questions concerning the course, an assignment, an upcoming quiz, etc.
Christine Case
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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 as 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.

Student Learning Outcomes: 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 9-3-18 nothing will appear on your record. If you withdraw between 9-3-18 and 11-14-18, a *W* will appear on your transcript. You will receive a *W* for exceeding four absences *prior* to 11-14-18. Anyone exceeding four absences *after* 11-14-18 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:
Lecture: 60%. Includes 40 points for HBA work.-Log into SARS when doing your HBA hours. Laboratory 40%.

A ≥88%
B 75-87%
C 60-74%
D 45-59%
F ≤44%

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

Class conduct policy: You are also responsible for adhering to the Code of Student Conduct outlined in the College Catalog. Cell phones *must be turned off* during class. No extraneous conversation during class.

Academic honesty. Plagiarized lab reports and papers will receive a score of zero. The work you submit must be your own. The Skyline College Catalog has a complete statement defining cheating and plagiarism.

Skyline College is committed to maintaining a safe and caring college environment. A District website has also been developed which provides you with important information about sexual misconduct and sexual assault. http://smccd.edu/titleix/

Disability: In coordination with the Disability Resource Center office, reasonable accommodation will be provided for eligible students with disabilities. For more assistance, please contact the DRC Bldg 5, Room 5132 or call 650-738-4228.

Textbooks - Required

Tortora, G. J., B. R. Funke, and C. L. Case. *Microbiology: An Introduction*, 13th ed. San Francisco, CA: Pearson, 2019.

Johnson, T. R. and C. L. Case. *Laboratory Experiments in Microbiology*, 12th ed. San Francisco, CA: Pearson, 2019.

Study Aids

- Class website: Class handouts and quizzes are at http://skylinecollege.edu/case/
- Text website: masteringmicrobiology.com

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: 11:10-12:25, Tues. and Thurs. ***You must arrive on time.***

Date	Lecture	Reading in *Microbiology: An Introduction*‡
8-16	Introduction. Complete online questions†	M 3, M 37, M 132, M 168, M 823
8-21	Historical background†	Chapter 1; pp. .98-400
8-23	The Microbial World* †	Chapter 10, CF 141, Skim Chapters 11 & 12
8-28	Media and growth	Chapter 6
8-30	Microscopy†	Chapter 3
9-4—9-11	Cells†	Chapter 4, CC 25, CC 110, CC 424
9-13	Energy	pp. 46, 117-119
9-18	Enzymes	pp. 111-117
	TEST	
9-25—9-27	Metabolism*†	BP 108-109, Review Chapter 2
10-2	Metabolism	pp. 119-135
10-4	Metabolism **Bacteria report due**	135ff, M794
10-9	Applied Microbiology*	M261, pp. 798-804, Ch 28
10-11	How microbes cause disease*	Chapter 15
	TEST	
10-18	Epidemiology*	Chapter 14; CC 689, CC 723, CC 723, CC 761, CC 768, CC 811, CF 218, CF 351, CF 708, CF 731, BP 634-635, BP 672-673, BP 734-735
10-23	Microbial genetics*	Fig. 2.16, BP 206-207
10-25	Protein synthesis	pp. 208-221
10-30	Microbial genetics† **Journal article due**	221ff.
11-1	Biotechnology*	Ch. 9
	TEST	
11-6—11-15	Viruses*†	Chapter 13, CC 179, CF 264, BP 518-519, pp. 544-554, 602-607, 630-638, 668-674, 693-695, 707-711, 739-748, 776-778
11-20	Control of growth† **Extra credit due**	Fig. 6.15, Ch 7, Skim Chapter 20, M 585, CC 559, CF 600, CF 771
11-27	Innate resistance	BP 446-447, Chapter 16
11-29	Immunology*	Chapter 17, M 594
12-4	Immunology Complete online questions†	pp. 524-544, BP 768-769
12-6	Immunology	Chapter 18
12-11	**FINAL EXAMINATION, 11:10–1:40**	

* Handout on the BIOL 240 website.
† Online Quiz.
‡ *Microbiology: An introduction*. M=Exploring the Microbiome, CF=Clinical Focus, CC=Clinical Case, BP=Big Picture, ff=and following pages.

Welcome to Microbiology Lab!

Biology 240

Course Number: BIOL 240 (CRN 80165 & 84828)
Course Title: General Microbiology
Science, Math, Technology Division
4 units
TT, 9:10-10:25 or 1:10-2:25
Room: 7237
Lecture must be accompanied by a lab session plus 16 lab hours by arrangement. That is, 1 hr/wk following up on an assigned experiment or working on your unknown identification.

Course Prerequisites: Successful completion of a college-level laboratory science course. Recommended: Eligibility for ENGL 846.
Course Classification: Transfer credit: UC; CSU (B2, B3).

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

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Philosophy: 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.
Lab Manual: Johnson, T. R. and C. L. Case. *Laboratory Experiments in Microbiology*, 12th ed. San Francisco, CA: Pearson, 2019.
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.

No late assignments will be accepted. Should you experience extreme, extenuating circumstances that 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: 27 lab reports @ 10 pts each =
Unknown identification = 55 pts
M&M = 50 pts

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. Log

in/out at the computer in the Equipment Room to document your *16 lab hours by arrangement*.

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

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.

Date	Lab	✓ Completed	Score
8-16	Safety Walk *due today*. *Read* pp. 1-5 Exercise 26		
8-21	Lab. locker assignment. *Read* pp. 33-34. Exercise 3		
8-23	Exercise 1. *Read* pp. 1-2.		
8-28	Exercise 1		
8-30	Exercise 7. *Read* Ex. 5		
9-4	Exercise 10. *Read* Ex. 2, 6, 8 & 9		
9-6	Exercise 10. *Read* Ex. 2, 6, 8 & 9		
9-11	Exercise 11		
9-13	Exercise 22		
9-18	Exercise 12		
9-20	Exercise 13		
9-25	Exercise 14		
9-27	Exercise 15		
10-2	Exercise 16. Start Exercise 48		
10-4	Exercise 17		
10-9	Exercise 50. *Read* Ex. 18 and Appendix H. See BIOL 240 web site for the assignment.		
10-11	Exercise 50		
10-16	Exercise 39. *Exercise 48 due.*		
10-18	Exercise 50. Choose your M & M.		
10-23	Exercises 19 & 57		
10-25	Exercise 54		
10-30	Exercise 24		
11-1	Exercise 25		
11-6	Exercise 30		
11-8	Exercise 30		
11-13	Exercise 55. *Exercise 50 due.*		
11-15	Exercise 37		
11-20	Exercise 52		
11-27	Exercises 53 & 52		
11-29	Exercise 44 (modification in Canvas)		
12-4	M & M (Everyone must be ready to present.)		
12-6	M & M. Lab check-out.		

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.

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***Laboratory Experiments in Microbiology*, 12th ed.**
Cross references to *Microbiology: An Introduction*, 13th ed.

	Microbiology Page & Figure Numbers		*Microbiology* Page & Figure Numbers		*Microbiology* Page & Figure Numbers
1	pp. 52–55, 73–75	21	pp. 157–159	42	pp. 281–293, 511–512
2	p. 52–55	22	pp. 182–185	43	pp. 511–512
3	p. 159	23	pp. 186–187	44	pp. 516
4	p. 164	24	pp. 187–196	45	pp. 592–607
5	pp. 61, 64–65	25	pp. 578–579, Table 20.3	46	pp. 590–593, 701–707
6	p. 64	26	pp. 178, 191, 408-411	47	pp. 724–726
7	pp. 65–66, 81–83	27	pp. 215–221	48	pp. 722–723, 727–739
8	pp. 66, 83	28	pp. 226, Fig. 8.22	49	pp. 762–763
9	pp. 66–69	29	pp. 232–234	50	pp. 277–281, Appendix E
10	p. 280	30	pp. 258–260, 285–286	51	pp. 277–281, Fig. 10.9
11	pp. 164, 169–171	31	pp. 243–247	52	pp. 171, 798–799
12	pp. 162–163	32	pp. 227–228, Fig. 8.23	53	pp. 171, 798–799, Fig. 6.18
13	pp. 119–121	33	pp. 324–328	54	pp. 168–171
14	pp. 128–131, Fig. 5.23	34	pp. 308, 337–341	55	pp. 128–131, 814–815
15	p. 133	35	pp. 341–346	56	pp. 308–309, 789–793
16	p. 133, Fig. 5.22	36	pp. 347–355, Fig. 25.22	57	pp. 794–795
17	pp. 123–128	37	pp. 370, Fig. 13.6		
18	pp. 134–135, 277–281	38	pp. 386–387		
19	pp. 155–157, 160–161	39	pp. 413–418		
20	pp. 114–115, 152–154, 165–168, Fig. 6.15, Appendix B	40	pp. 398–400		
		41	pp. 463–469		