

# Syllabus for BMS 127, Medical Microbiology, Spring 2019

CRN 58810: Lecture R 6:00–8:55, EBS 309; Lab M 6:00–9:05, EBS 313  
CRN 63217: Lecture R 6:00–8:55, EBS 309; Lab W 6:00–9:05, EBS 313  
CRN 61944: Lecture R 6:00–8:55, EBS 309; Lab W 11:10–2:15, EBS 313

**Instructors:** Robbie Haines Fischer      rhfischer@sbcc.edu      Office Hours: M,W 12:30–1:30; R 5:00–6:00  
805-730-8780      Office Location: EBS 314  
Tami Elmfors      Contact information provided in lab

**Required Texts:** Openstax *Microbiology* (2016) ISBN 1938168143. <https://openstax.org/details/microbiology>  
SBCC, *Microbiology Reader* (available only at Campus Store)  
SBCC, *Microbiology Lab Manual* (available only at Campus Store)

**Recommended Text:** Bauman's *Microbiology with Diseases by Taxonomy*, used, any previous edition

**Course Description:** BMS 127 is a 4-unit, college-level course designed to meet the needs and interests of students of both health-related sciences and general biology. It includes investigations of bacteria, viruses, fungi, and protists, with emphases on microbe–host interactions and bacterial biology. This course also investigates the principles of disease transmission and prevention, virology, genetics, and immunology.

**Grades:** Please note that we will not “give” you a grade; we will merely report the grade that you earn. Your overall letter grade for the course will reflect the percentage of points that you accumulate. There is no curve. The best way to find out what you need to do to earn a particular grade is to keep track of your points as the semester progresses.

<u>Point distribution</u>		<u>Percentage earned</u>	<u>Grade</u>
3 Lecture Midterm Exams	300	97–100%	A+
1 Lecture Final Exam	150	93–96%	A
2 Vocabulary Quizzes	50	90–92%	A–
7 Lab Quizzes/Assignments	70	87–89%	B+
3 Lab Mini-Practicals	20	83–86%	B
1 Unknown Bacteria Project	30	80–82%	B–
10 Lecture Quizzes	50	77–79%	C+
1 Lab Exam	100	70–76%	C
Total points possible	770	60–69%	D
		0–59%	F

**Your Success:** Our job in this course is to guide, challenge, and inspire you, not to simply present a stream of facts. Your job in this course is to work *diligently*, *creatively*, and *proactively* to learn the material, not to simply memorize everything we say. (Memorization is the lowest level of learning.) If we do our job, you will get a sense of how fascinating and relevant microbiology is; if you do your job, you will succeed in and enjoy this course.

**Study Tips:** You should not expect to do well in this course unless you follow this advice. The only difference between passing and failing this course is the amount and quality of work that you put into it. Although we will do everything we can to help you in this course, your grade is ultimately up to you.

- The very best way to study is to attempt to teach the material to someone else. Listening to and understanding information is *completely different* than being able to use it or reproduce it under pressure without your notes!
- You should budget into your schedule at least *three hours* of study and reading time for every one hour of lecture time. That's a *minimum* of 8–9 hours every week, exclusive of exam and lab preparation.
- Read the assigned material casually before lecture, and then very carefully read the relevant sections a second time after the lecture. If you don't understand something at that point, ask us.
- Take notes on your post-lecture reading, and incorporate these notes into your lecture notes. Re-write all your notes, cleaning up and re-organizing them as you do.
- Write tests for yourself to *evaluate* and *use* the material; take your tests later to practice doing well on exams.
- Join or form a study group. You're more likely to study if it's scheduled and others are depending on you. Plus, in a study group, you have people to whom you can teach the material. (See first bullet point.)
- Different techniques work for different people, so be creative and proactive in how you *use* the lecture material.

**Attendance and Make-up Policies:** *It is extremely difficult to earn a good grade in this class without attending every lecture and lab!* Although there are no points directly associated with attendance, you should consider each absence or tardiness to be a blow to your grade. You will be held responsible for all announcements made in class, even if you were absent that day. If you know in advance that you cannot be present for an exam—and it's a dire situation that can be documented in writing—I *might* be able to reschedule the exam. I do not guarantee that, though, and each case is considered independently. *Quizzes will not be rescheduled under any circumstances*, and missed labs cannot be made up. Quizzes will be unannounced and will be given in the first ten minutes of lecture or lab. Those who are late will not be given extra time to complete them.

### **Student Responsibilities:**

- It is your responsibility to keep track of all SBCC administrative deadlines (e.g. drop and withdraw dates, etc.).
- Disturbances to the learning environment will not be tolerated in lecture or lab.
- Phone and laptop use are strictly forbidden in lecture or lab. *Don't even touch your phone while you are in the lab!*
- Treat email as the professional communication that it is. Complex or urgent topics should be handled in person.
- Your safety is taken very seriously. All laboratory safety procedures must be understood and followed at all times.
- Students with an immune-compromising medical situation (e.g. pregnancy, illness, medical treatment) must provide a written note from a licensed health care professional authorizing their participation in this course.

**Academic Honesty:** All instances of cheating, plagiarism, or any other form of academic dishonesty will be reported to the school's administration. Consequences range from receiving an F for the assignment or exam to expulsion from the College. If you're not sure what constitutes academic honesty for a particular situation, please ask me.

### **Student Learning Outcomes:**

- Explain the basic structure, physiology, metabolism, and chemistry of human-associated microorganisms.
- Compare the pathogenesis of microorganisms, including virulence mechanisms and the human immune response.
- Characterize infectious diseases, including both clinical and epidemiological manifestations.
- Using the scientific method and critical thinking, analyze data generated by laboratory experiments.

**What is Learning?** Bloom's Taxonomy is a commonly used classification of what actually constitutes learning. In it, learning objectives are listed from lowest- to highest-order processes. Questions addressing all of these will appear on quizzes and exams throughout this course. Note that memorization is the lowest level of learning. Although often necessary, memorization is rarely sufficient for learning and will not by itself earn anyone a good grade.

- Remembering—Memorize information.
- Understanding—Comprehend the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.
- Applying—Use a concept in a new situation or unprompted use of an abstraction. Apply what was learned in the classroom into novel situations in the work place.
- Analyzing—Separate material or concepts into component parts so that its organizational structure may be understood. Distinguish between facts and inferences.
- Evaluating—Make judgments about the value of ideas or materials.
- Creating—Build a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.

**Disclaimer:** The syllabus and schedule accurately represent our intentions for this course, but they are subject to change. Changes may include the addition of assignments and thus a change in the point distribution used to determine your grade. We will advise the class of any changes in a timely manner. *Being absent from class and missing any such announcements is not an excuse for being unaware of those announcements.*

**Keeping Track of Your Progress:** To calculate your grade at any time, simply divide your score by the total points possible at that time, then multiply by 100 to get a percentage:  $\text{your points} / \text{possible points} \times 100 = \text{your grade}$ .

	points	your score		points	your score		points	your score
Lecture Quiz #1	5	_____	Lab Quiz #1	10	_____	Vocabulary Quiz 1	25	_____
Lecture Quiz #2	5	_____	Lab Quiz #2	10	_____	Vocabulary Quiz 2	25	_____
Lecture Quiz #3	5	_____	Lab Quiz #3	10	_____	Gram Stain Practical	6	_____
Lecture Quiz #4	5	_____	Lab Quiz #4	10	_____	Streak Practical	8	_____
Lecture Quiz #5	5	_____	Lab Quiz #5	10	_____	Pipetting Practical	6	_____
Lecture Quiz #6	5	_____	Lab Quiz #6	10	_____	Unknowns Project	30	_____
Lecture Quiz #7	5	_____	Lab Quiz #7	10	_____	Lab Practical	100	_____
Lecture Quiz #8	5	_____	Lecture Midterm #1	100	_____	Lecture Final Exam	150	_____
Lecture Quiz #9	5	_____	Lecture Midterm #2	100	_____	<b>Total Points</b>	<b>770</b>	_____
Lecture Quiz #10	5	_____	Lecture Midterm #3	100	_____			

## Lecture Schedule and Reading Assignments

Lec #	Date	Topic	Reading
1	17 Jan	Introduction, Overview and History of Microbiology	Chs. 1, 3
2		Chemistry of Life	Ch. 7
3	24 Jan	Nucleic Acid Function, Genetic Code	Ch. 10, 11
4		Gene Expression	Ch. 10, 11
5	31 Jan	Taxonomy	Chs. 1, 3-5
6		Cell Structure	Chs. 1, 3-5
	7 Feb	<b>MID-TERM #1 (lectures 1-6)</b>	—
7		Viruses	Ch. 6
8	14 Feb	Viral Diseases I	Chs. 21-26
9		Viral Diseases II	Chs. 21-26
10	21 Feb	Viral Diseases III	Chs. 21-26
11		Microbial Metabolism	Ch. 8
12	28 Feb	Growth and Reproduction I	Ch. 9
13		Growth and Reproduction II	Ch. 9
	7 Mar	<b>MID-TERM #2 (lectures 7-13)</b>	—
14		Innate Immunity	Ch. 17
15	14 Mar	Adaptive Immunity I	Ch. 18
16		Adaptive Immunity II	Ch. 18
17	21 Mar	Mutualism	—
18		Virulence I	Chs. 15, 16
	28 Mar	— <i>SPRING BREAK</i> —	—
19	4 Apr	Virulence II	Chs. 15, 16
20		Virulence III	Chs. 15, 16
	11 Apr	<b>MID-TERM #3 (lectures 14-20)</b>	—
21		Prokaryotic Genetics	—
22	18 Apr	Eukaryotic Pathogens I	Chs. 21-26
23		Eukaryotic Pathogens II	Chs. 21-26
24	25 Apr	Prokaryotic Pathogens I	Chs. 21-26
25		Prokaryotic Pathogens II	Chs. 21-26
26	2 May	Prokaryotic Pathogens III	Chs. 21-26
27		Epidemiology	Ch. 16
	9 May	<b>COMPREHENSIVE FINAL EXAM 6:00 p.m. – 8:00 p.m.</b>	—

## Lab Schedule

Week/Date	Monday	Wednesday
Week 1 14, 16 Jan	Lab Introduction and Safety The Scientific Method	Lab Introduction and Safety The Scientific Method
Week 2 21, 23 Jan	— HOLIDAY —	Ubiquity of Microbes
Week 3 28, 30 Jan	Microscopy Aseptic Technique Culturing and Pure Culture <b>Vocabulary Quiz</b>	Microscopy Aseptic Technique Culturing and Pure Culture <b>Vocabulary Quiz</b>
Week 4 4, 6 Feb	Smears Staining	Smears Staining
Week 5 11, 13 Feb	Enumeration Water Testing	Enumeration Water Testing
Week 6 18, 20 Feb	— HOLIDAY —	Kirby-Bauer Test
Week 7 25, 27 Feb	Bacteriophages Plaque Assay	Bacteriophages Plaque Assay
Week 8 4, 6 Mar	Unknown Project I <ul style="list-style-type: none"> <li>• Diagnostic Media</li> <li>• Streak Isolation</li> </ul>	Unknown Project I <ul style="list-style-type: none"> <li>• Diagnostic Media</li> <li>• Streak Isolation</li> </ul>
Week 9 11, 13 Mar	Unknown Project II <ul style="list-style-type: none"> <li>• Additional Media</li> <li>• Culture Characteristics</li> </ul>	Unknown Project II <ul style="list-style-type: none"> <li>• Additional Media</li> <li>• Culture Characteristics</li> </ul>
Week 10 18, 20 Mar	Unknown Project III <ul style="list-style-type: none"> <li>• Additional Tests and Stains</li> <li>• Researching Candidates</li> </ul>	Unknown Project III <ul style="list-style-type: none"> <li>• Additional Tests and Stains</li> <li>• Researching Candidates</li> </ul>
Week 11	— <i>SPRING BREAK</i> —	
Week 12 1, 3 Apr	Controlling Microbial Growth <b>Streak Isolations due</b>	Controlling Microbial Growth <b>Streak Isolations due</b>
Week 13 8, 10 Apr	Transformation <b>Unknown Results Due</b>	Transformation <b>Unknown Results Due</b>
Week 14 15, 17 Apr	PCR I <b>Gram Stain Practical</b>	PCR I <b>Gram Stain Practical</b>
Week 15 22, 24 Apr	PCR II <b>Pipetting Practical</b>	PCR II <b>Pipetting Practical</b>
Week 16 29 Apr, 1 May	<b>Comprehensive Lab Practical</b>	<b>Comprehensive Lab Practical</b>