
Title: Microbiology with Laboratory

Course Number: BIOL 250

Credit Hours: 5

Total Contact Hours: 105

Section: 41

Time: Tuesday and Thursday, 9:30 to 10:45am Lecture (Room 111) and

1:00 to 2:50pm Laboratory (Room 104)

Course Syllabus

Course Description

This course is designed to provide the student with an introduction to the principles and techniques of microbiology. Consideration will be given to microbial structure, growth, physiology, and the reaction of microorganisms to their physical and chemical environments. The laboratory will emphasize the development of proper laboratory technique and the identification of microorganisms.

Prerequisites: BIOL-100 or BIOL-124 or BIOL-132.

Course Objectives

Upon successful completion of this course, the student should be able to:

1. Describe the structure of bacteria and other microorganisms,
2. Conduct quantitative and qualitative tests on microorganisms,
3. Interpret and evaluate the results of these tests,
4. Understand the cellular functions that promote growth and reproduction of microorganisms, and
5. Employ the proper laboratory techniques for the study of microorganisms.

Topical Outline of Instruction

1. The Evolution of Microorganisms
2. Microscopy
3. Bacterial Cell Structure
4. Archaeal Cell Structure
5. Eukaryotic Cell Structure and Function
6. Viruses and Other Acellular Infectious Agents
7. Microbial Growth
8. Control of Microorganisms in the Environment
9. Antimicrobial Chemotherapy
10. Introduction to Metabolism
11. Catabolism: Energy Release and Conservation
12. Bacterial Genome Replication and Expression
13. Regulation of Gene Expression, and Mechanisms of Genetic Variation
14. Recombinant DNA Technology

Learning outcomes for science courses at SMCC:

SMCC students recognize the methodology and content of science and its relevance. SMCC students:

1. apply scientific methodology to the study of the natural world.
 2. participate in hands-on and interactive lab activities.
 3. demonstrate the ability to make scientifically-informed decisions.
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Course Requirements

The course is organized into modules that will correspond to chapters in the textbook and lab exercises from your lab manual. There are two 75-minute class periods each week, as well two 1 hour and 50 minute laboratory sessions each week. Attendance and participation in lab is required.

Student Evaluation and Grading

Graded work	% of grade
Exams (4)	60
Presentation	5
Lab notebook	10
Lab quizzes	10
Lab 'Unknown' report	15

There are four equally weighted **exams** given during the semester over the material in the textbook and in the lab exercises. The exams will primarily test the material discussed in lectures and in chapters from your textbook, although you can expect some questions from laboratory exercises (particularly where there is overlap between lecture and lab). Each exam accounts for 15%

of your grade, totaling 60% of your semester grade. Exams will be cumulative, although the majority of the material will be from the weeks after the last exam.

You will be required to take all the **lab quizzes**. The average score on the lab quizzes will account for 10% of the semester grade. You will keep a **laboratory notebook** that will be worth another 10% of the semester grade. Finally, you will be given two unknown bacteria to identify in an independent **lab project**. A report on your identification of these organisms will account for another 15% of the semester grade.

Students will individually research a microorganism/microbiological topic of interest that will culminate in a short **presentation**. Topics, presentation structure, and grading will be discussed after the add/drop period. The presentation will account for 5% of the semester grade.

Use the formula below to calculate your semester grade at any time.

Semester Average = [average of exam scores x 0.6] + [(average of lab quiz scores + average of lab notebook scores) x 0.1] + [score for lab "unknown report" x 0.15] + [score for presentation x 0.05]

Letter grades are assigned following the policy in the SMCC handbook:

A (93 +)	C+ (77-79)	F (below 63)
A- (90-92)	C (73-76)	
B+ (87-89)	C- (70-72)	
B (83-86)	D+ (67-69)	
B- (80-82)	D (63-66)	

Attendance Policy

Attendance at lectures and labs every week is expected and tracked. Be sure to inform me if you will not be attending class or lab. If you are inactive for four consecutive meetings (lab or lecture) or a week without notification, you will be reported to administration as no longer attending the class and a grade of "administrative failure" is submitted to the Registrar.

You must attend class on the day of the exams. Make up exams will be given only in cases of extraordinary circumstances either due to documented illness (with a note from your physician) or death of a family member.

The Exams Are "Open Book" Tests

You may use notes and textbooks to find answers. However, these will be timed exams, and you will have approximately one minute per question.

You will not do well if you have not read the chapters and listened to lectures. The vocabulary and concepts must be familiar to you, so that you can quickly understand what is being asked in these questions. You will do well if you read chapters more than once and study the figures, so that you are able to answer most questions without looking for the answer. Some of the questions may involve a small detail from the chapter, and you will

have a good idea of where to find the answer for a detailed question only if you've studied the chapter well.

You may NOT ask another person the answer to the questions during an exam. Another person may not take your exam for you or with you. If you are discovered taking exams or quizzes with another person, you will be dismissed from the course and given an "F".

How To Do Well On The Exams

Listen to the lectures, take notes, and review the lecture slides. Ask the instructor questions during class or after class. Read the textbook more than once. Take notes from the book and create your own study guide using the headings in each chapter. Bookmark the pages in your textbook where there are tables or summaries so you can find them easily during the test. You may want to copy the tables and figures that are critical, so you don't have to look them up. **You will not have time to look up all the answers.**

Keeping a laboratory notebook

You will be given specific instructions on how to keep a good laboratory notebook. Keep your notebook up to date! Your notebook will be examined from time to time to assign scores. You must have a notebook that will not allow pages to be removed; a spiral notebook or 3-ring binder is not allowed; a bound notebook is required.

Writing a report on the independent lab project: identification of two unknown bacteria

Halfway through the semester, you will begin a project that will take several weeks of independent work, normally during our laboratory sessions. You'll be given instruction on how to carry out identification using a dichotomous key (using a process of elimination) and you will have learned about the assays already. There will be a rubric that describes how to write up your independent research in a format resembling a professional journal article.

You must write the entire report in your own words and sentences. Points are deducted if you have copied sentences or paragraphs from another student or from a source on the internet.

This report is due on Wednesday of the last week of classes. This deadline is a firm deadline. The report will not be accepted after that day.

How To Contact Your Professor

The quickest way to contact your instructor and get a response is by sending an e-mail through campus e-mail. My e-mail address is emann2@smccme.edu. If you would like to meet in person, I will be available immediately following the lecture and lab sessions or by appointment. If you email me after 6 pm, do not expect a response until the next morning.

Teacher Evaluation

If you have a question or a suggestion about the course format in general or an exam question in particular, please feel free to contact me directly. I do want to hear how the course could be improved. Students should complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal. Students can access the course evaluations beginning one week before the end of classes. The deadline for submission of evaluations occurs Monday at 5 PM following the last day of class. You should receive an email to your student email account when course evaluations are available.

Textbooks and Supplies

Prescott's Microbiology Willey, Sandman and Wood
McGraw-Hill 11th edition, 2019 ISBN : 9781264073375

Connect Online Access for Microbiology (optional) ISBN: 9781264075515

Microbiology: Laboratory Theory and Application Leboffe and Pierce
Morton Publishing 4th edition, 2015 ISBN : 9781617312502

Composition notebook, or laboratory notebook

Laboratory coat (a coat will be made available to you, but you may purchase and bring a new one for yourself)

Safety and Miscellaneous

No cell phone use during class or laboratory. You may use a laptop for taking notes during lecture, but please refrain from surfing the web as this is very distracting for other students.

Long pants and closed toe shoes are REQUIRED for lab. This is a safety issue and you will not be allowed to participate in the lab without the correct attire.

Covid Precautions

Students must be fully vaccinated and masks covering the nose and mouth must be worn. Scarves, masks with air vents and neck gaiters are not acceptable. In addition, students need to fill in the daily health screening every day you are going to be on campus. To do this, you'll need the smcc app (<http://smcc.campusapp.com/>). QR codes will not be used this semester. Ventilation is important, so dress warmly - a window is always going to be open a crack.

Snow Days

If the campus is closed because of inclement weather, class will be cancelled for up to two incidences. After this, asynchronous lectures will be recorded and students will be responsible for learning this material.

Policies for all courses at Southern Maine Community College:

1. ADA (Americans with Disabilities Act):

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call (207) 741-5798. If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923. Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

2. SMCC Pay-for-Print Policy:

Each semester students receive a \$20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The College's pay-for-print system monitors printing on all printers (including those in general access labs, library printers, Tutoring Services, Campus Center Lounge and technology labs). Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account. Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the Help Desk at 741-5696 to have a special account set up. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the Help Desk at 741-5696 or send an e-mail to helpdesk@smccme.edu.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student's account.

3. Add/Drop Policy:

Students who drop a course during the one-week "add/drop" period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

4. Withdrawal:

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the Fall and Spring semesters and the second through ninth week of twelve-week Summer courses.

This period is pro-rated for shorter-length courses, usually 75 percent of course meeting times; please check with the Registration Office. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Registration Office. This process must be completed either in person or by using SMCC e-mail accounts.

5. Plagiarism:

If an instructor suspects that a student has knowingly committed a violation defined in the Maine Community College System Policy on Student Grade Appeals and Academic Misconduct, the instructor has the authority to review the alleged misconduct and determine the grade that the student should receive for the assignment and the course. The instructor may assign a failing grade for the assignment or course and may require the student to complete additional work for the course. The instructor may consult with the department chair and/or the College's chief academic officer prior to making such decisions. If a student seeks to challenge an instructor's determination, the student should submit a grade appeal. Grade appeal forms are available in the Advising Office on the South Portland Campus or in the administrative offices in the Learning Commons on the Midcoast Campus. An instructor may also refer the matter to the College's disciplinary officer for review under the procedures of the MCCS Student Code of Conduct.

6. The Learning Commons:

The library, tutoring and writing centers, and reference/research assistance (typically located on the second floor of South Portland's Campus Center and in the Midcoast's LL Bean Learning Commons and Health Science Center) will be fully available online during the fall 2020 semester.

Here you can find free academic support through individually scheduled and drop in, online tutoring. You can also find information literacy/research librarians, and professional academic strategy/planning mentoring online. While the physical space of the Learning Commons will not be available at this time, we can also work with you to set up zoom classrooms for small group study. Services are offered by appointment or as drop-in assistance.

To access services:

- Visit My Learning in My Maine Guide or
- Select the "tutoring needed" button if it appears inside your Brightspace course.

Whether On Site or Online, students have consistently reported that the Learning Commons is a friendly, risk-free, and helpful place to seek academic support. It has also been shown that those who make use of the Learning Commons do better in a course than those who do not. We strongly encourage you to take advantage of this valuable and enjoyable resource.
