



BIOL 250-31 MICROBIOLOGY & LABORATORY SPRING, 2022

Lecture: Tuesday/Thursday 8:00 AM – 9:15 AM MSC 111

Lab: Tuesday/Thursday 10:00 AM – 11:50 AM MSC 104

Credit Hours: 5

Contact Hours: 7

In-Person Web-Enhanced Course

Following SMCC college guideline, for each hour of lecture/lab you should expect to spend three hours studying outside of class.

Instructor: Tracy Anne Filler, VMD MS

Email: tfiller@smccme.edu

Office hours: Available upon request.

Required Text and Materials:

-PRESCOTT'S MICROBIOLOGY by Willey, Sherwood & Woolverton,
11th Edition (E-Text book recommended and available).

-MICROBIOLOGY: LABORATORY, THEORY and APPLICATIONS.

This lab manual is by Leboffe & Pierce, 4th Edition.

-McGraw-Hill CONNECT: CONNECT is a digital study guide provided by the publisher of our textbook. ***You will need to purchase an access code to enter the CONNECT program along with your textbook.*** This code will also provide access to an annotated, highlighted digital copy of the textbook. There will be graded homework assignments for each chapter on these web pages.

-Access to **BRIGHTSPACE** via the internet is required for this web-enhanced course. Brightspace will also provide you the means to access the **CONNECT** program and **ZOOM** for video lectures. Please check your **SMCC email account** and **Brightspace announcements** regularly. I will be updating this site during the semester. Use your SMCC email for all correspondences.

*It is the **student's responsibility** to keep informed of **ALL changes and assignments via email, announcements, and Brightspace posts.***

- PERSONAL PROTECTIVE EQUIPMENT (PPE): Lab Coat, Face Masks (cloth or disposable), Gloves & Safety Goggles are REQUIRED for every in-person laboratory session.

SMCC will provide **ALL** personal protective equipment for students that do not have their own. Gloves of various sizes and masks are available in class as well as sterilized lab coats and goggles that were used in previous years. If you choose to bring your own lab coat and goggles, they will need to remain in the lab during the entire semester. Once lab coats are sterilized at the end of the semester you may take the garment home.

There are no exceptions to these rules. Please note per MCCS published regulations bandanas, neck gaiters and masks with a valve are **NOT** acceptable facial coverings. If you elect to wear a face shield a student will still need to also wear an approved mask.

-VACCINATIONS for COVID-19 have been mandated by the MCCS for in-person classes. This includes a booster if your vaccine series was administered 7 months prior for Moderna or Pfizer (3 months prior for Johnson & Johnson). Please make sure that you provide your vaccination status to the appropriate school authorities. If you have any questions or concerns, please refer to the MySMCC website or contact the Dean of Students.

Since we are an in-person class SMCC has required that students and staff complete a health questionnaire before coming to class. This is to clear students access to the campus. The questionnaire is on the SMCC APP. Please download this program onto your phone. You will also need to use this same APP to scan Q codes for entrance into both the lecture hall and the microbiology lab. All students and staff need to complete this in case there is a need for contact tracing due to a COVID exposure event.

CANCELLATIONS due to Inclement Weather, Facilities Damage, or Instructor Concerns

During the semester a lecture and/or laboratory session could be cancelled or delayed due to either inclement weather or facilities complications at school. Because we do live in Maine and our course is currently scheduled to meet on campus this scenario is likely to occur. All weather-related decisions for closing the school will be made by SMCC and MCCS administration. Students should sign of up for RAVE texts and emails to keep abreast of these events. Any class cancellations due to the concerns of the instructor will be posted on the CLASS CANCELLATION list on MySMCC, Brightspace and via email.

If the lecture and/or lab is cancelled the instructor will post a video on Brightspace that day reviewing material that would have been discussed in class. Students will need to log into Brightspace and review the video before our next scheduled in-person class session. Clicking into the video will be recorded as attendance and completion. Also please note that if there are long term assignments scheduled for completion those due dates are still binding. *AKA you will still need to complete the long-term assignments regardless of the class cancellation.* As always it is the responsibility of the student to check their email, Brightspace announcements and keep abreast of the school's policies.

MCCS Disclaimer for all In-Person and Hybrid Courses

While the syllabus represents current plans, there may be changes during the semester in response to the on-going Covid-19 pandemic. Depending on the progression of the virus, it is possible that the College may have to suspend face-to-face instruction. If we must stop face to face instruction anytime during the semester, your instructor will contact you via your SMCC email or the Brightspace course homepage to discuss next steps for the course.

Learning Outcomes for Science Courses

SMCC science courses are designed for students to apply the scientific method and employ the technological skills necessary to function effectively in an increasingly complex world.

Course Description: This course studies the principles and techniques utilized in microbiology. Consideration will be given to microbial anatomy, reproduction and growth, physiology, and the

reaction of microorganisms to their physical, chemical, and biological environment. Laboratory emphasis will be placed on development of proper laboratory techniques and the identification of these microorganisms.

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

Course Objectives: Upon successful completion of this course, the student will be able to:

- ✓ Describe the structure of bacteria and other microorganisms.
- ✓ Understand the cellular functions of microorganisms that promote growth, reproduction, and survival.
- ✓ Apply scientific methodology to the study of the natural world.
- ✓ Conduct qualitative and quantitative analysis of microorganisms.
- ✓ Interpret and evaluate results achieved through research and scientific experimentation.
- ✓ Employ proper, safe laboratory techniques while studying said microorganisms.
- ✓ Research, comprehend and evaluate scientific literature.
- ✓ Use basic statistics to analyze data & understand sources of error
- ✓ Demonstrate the ability to make scientifically informed decisions
- ✓ Present data in written, visual, and oral formats
- ✓ Participate in hands-on and interactive lab activities while practicing the standards of lab safety (see below).

Grading Scale & Description of Assignments

A	93-100	B	83-86	C	73-76	D	63-66
A-	90-92	B-	80-82	C-	70-72	F	< 63
B+	87-89	C+	77-79	D+	67-69		

ASSIGNMENT	% of GRADE	DESCRIPTION
Laboratory Assignment Quizzes	10% 100 points	Lab assignments that are performed virtually will have quizzes to assess competency in these skills.
Examinations- four exams during the semester	40% 400 points (each exam 100 points)	Exams measure your understanding of the assigned course material. PLEASE NOTE: there may be CUMULATIVE questions on the last exam scheduled.
Laboratory Practical Examination	10% 100 points	This test will present experimental scenarios for students to interpret on Brightspace.
Virtual Laboratory Notebook	5% 50 points	Assessment that the virtual laboratory notebook meets all specific requirements for specified lab sessions.
McGraw-Hill CONNECT Homework	12% 120 points	Digital homework questions in CONNECT for each chapter.
Identification & Report of two Unknown Microorganisms	15% 150 points	Identification and Written evaluation of an independent report identifying two unknown microorganisms

Discussion Boards	5% 50 points	Participate in posted Brightspace discussions. Grammar and scientific prose are part of the grade
Class Participation, Completion and Attendance	3% 30 points	Attendance and Participation in required class discussions and lectures is assessed.
	1000 Points	

Homework via CONNECT: There will be questions assigned on **CONNECT** learning pages for each chapter in your book. You may attempt these questions more than once to increase your grade as long as the assignment is submitted before the published due date. This program is to encourage students to read and study the material in the textbook while preparing for the upcoming exam.

Examinations: There will be on-line exam worth 100 points roughly every four weeks during the semester. The material for these exams will include lecture material, laboratory results and assigned reading from the textbook. Please note that you will need to keep up with the reading, labs, and lectures to succeed on these tests.

One examination will be a dedicated **Virtual Lab Practical** on **BRIGHTSPACE**. Questions will contain prose and pictures to identify the outcome of an experiment. The Virtual Lab Practical is to test critical thinking and the ability to interpret experimental results.

Exams are open book, open notes but these tests are **timed** on Brightspace. You will only be permitted to take these tests **once**. You are required to take these tests alone. As per the SMCC honor code

you are not permitted to have any assistance on these examinations from friends, family classmates or the internet. You may also not have anyone take this exam in your place. Failure for follow these rules will result in a zero for the assignment a possible dismissal from the course.

The tests are usually available for four to five days, often over a weekend. These windows are published at the beginning of the semester. If you have a conflict with the test window, please inform the instructor **BEFORE** the test opens. Once the test is live students are expected to complete the assignment. Also, because everyone will be taking the exam at different times you **ARE NOT** permitted to discuss these questions with another student during or after the exam until the answers are posted. If you are discovered to be in violation of these policies (**SMCC HONOR CODE**) you will be dismissed from the course & given an 'AF'.

Laboratory Quizzes: There will be either scheduled on-line quizzes and/or virtual lab experiments in **CONNECT** conducted during this semester. These quizzes are to assess student preparation and comprehension of important microbiological lab techniques and concepts. All lab quizzes and **CONNECT** simulations are open book. It is recommended that all students complete these assignments **BEFORE** coming to lab.

Laboratory Notebook: Laboratory notebooks will be virtual. Lab reports will be composed first in WORD and then saved as a PDF file. These assignments will then be uploaded into **BRIGHTSPACE**. Only specific lab experiments will be written. You will be given instructions on maintaining a good laboratory notebook in a separate handout with the lab safety lecture.

Your notebook will be examined and assigned scores during the semester. It is imperative that you keep up with these lab reports and

practice good time management. You will not be able to complete this assignment in one day. This notebook is to mimic a professional lab journal or a patient's record in medicine.

Independent project-Identify Two Unknown Bacteria:

Halfway through the semester, you will begin a project that will take several weeks to complete independently during our laboratory sessions. By using a dichotomous key and the assays already learned, you will identify the *Genus* and *species* of **TWO** unknown organisms by process of elimination. You are then required to write a formal report on this process. The format for this report will resemble a professional scientific journal article and will include the same subdivisions found in your lab notebook.

Grading for the unknown is divided into two sections. Whether this process is completed in class or virtually will depend on the progression of the COVID-19 pandemic. At this time the plan is to work on the project in lab. When you have identified your unknown bacteria, you will be composing a **TERM PAPER** utilizing the scientific method in APA format.

Discussion Boards via BRIGHTSPACE: There will be discussion boards in Brightspace during the semester in which students will post well-crafted, scientific prose in response to a debate question or to an assigned reading. Students will respond to others in the class in a **RESPECTFUL, APPROPRIATE** manner. Anyone who is planning a career in science should be able to articulate their opinions based on first tier, fact checked research while keeping an open mind to the variety of thoughts that others may possess.

Attendance: Active participation in all lectures and lab sessions is also part of this grade. Three (3) points will be deducted from the

attendance/participation points total for every lecture missed. The only excused absences are for legal issues (court) or illness & hospitalization. A doctor's note, COVID test or summons may be required. This policy is to save confusion and favoritism. Please note that if you are **15 minutes late** for any lecture or laboratory session, it is considered an absence. If any issue requiring an absence arises, please contact me as soon as possible.

Five (5) points are deducted for every laboratory session that is missed. Unfortunately, laboratory sessions **cannot be made up in person**. This is even more of a concern this year due to the limited number of students permitted in the laboratory at one time. Often there are multiple experiments conducted during one lab session. These experiments often require two lab periods to complete. The strict attendance policy is to reinforce the importance of active participation in this class. Again, as noted above please contact me as soon as possible if attendance issues occur to discuss concerns.

PLEASE NOTE: Per SMCC policy three absences in a row without communication will result in academic failure ("AF") and dismissal from the course. If you, however, miss **any three lab sessions** (whether in a row or not) you could be also dismissed from the class. Due to the amount of lab material that we cover in each lab I cannot stress how important it is to be present and participating in each experiment.

If you miss an exam or a quiz you must discuss the situation with the instructor. Generally, because the , quizzes, tests and homework are online with multiple days to complete the assignment there is usually no make-up option except in extenuating circumstances. Contact the instructor and the SMCC help desk immediately if you have an issue with an on-line assignment deadline to discuss your options.

There are no laptops and cell phones must be placed on SILENT and stored away during lab and lecture.

Course Outline of Topics & Responsibilities

CHAPTER	TOPIC
1	The Evolution of Microorganisms
2	Microscopy
3	Bacterial Cell Structure
4	Archaeal Cell Structure
5	Eukaryotic Cell Structure
6	Viruses & 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 & Conservation
13	Bacterial Genome Replication
14	Regulation of Gene Expression & Mechanisms of Genetic Variation
17	Recombinant DNA Technology
	Immunology & Current Microbiological Issues

How to Contact the Professor: Because students have limited access to the campus this fall semester the best way to contact me is by SMCC email. I will respond to your questions within 36 hours on Monday, Tuesday & Thursday and within 48-60 hours on Wednesday, Friday, and the weekend. Please include your name and the course

code in the subject line. Please be professional and clear with your queries.

Student Responsibilities:

- ✓ Attend **ALL** required laboratories and lectures.
- ✓ Take careful notes during both laboratory and lecture.
- ✓ Keep up with all the assignments, postings, and readings.
- ✓ Stay current with your readings from the textbook.
- ✓ Keep a detailed virtual laboratory notebook and unknown journal.
- ✓ Participate actively in both class and lectures.
- ✓ Ask questions to help clarify any assignments or material that is confusing and unclear.
- ✓ Turn in all assignments on time. Late assignments will be penalized. Make sure you stay abreast of the course schedule.
- ✓ Turn in college level work that is respectful. No slang terminology, profanity or abbreviations are accepted.
- ✓ Be respectful to your professor and all of your fellow classmates.
- ✓ Review the SMCC honor code in the **COMPASS**. It is imperative to uphold the integrity and decorum of an SMCC student.
- ✓ And finally-**have fun!!!** Yes, this can be an intense course, but I assure you if you plan on pursuing a career in science or medicine this class is imperative to your future. You are here to learn, and I will be the guide.

Laboratory Safety: Rules of the laboratory must be followed, and aseptic technique is required. No visitors are allowed in the lab without prior approval. In this laboratory we will be working with live organisms. Most are considered non-pathogenic or opportunists. There are some strains that are attenuated (pathogenic bacteria that have a reduced capacity to produce disease). Care and precautions

must be addressed. By following instructions and learning to work safely in a lab setting risks can be reduced or even eliminated.

- ✓ Notify the instructor immediately if there is an accident or a problem in lab.
- ✓ Note all of the exits, eye wash stations, chemical showers, and fire extinguishers in the laboratory.
- ✓ Do not eat or drink or chew gum in the laboratory. Leave all food outside on the hall table.
- ✓ Wash your hands before and after the lab session.
- ✓ Wear a lab coat, mask, gloves, and goggles during the lab session.
- ✓ Your lab coat will remain in the lab during the entire semester.
- ✓ **ALL** long hair must be tied back.
- ✓ Maintain social distances of 6 feet and stay home if ill.
- ✓ No open toed footwear or shorts are permitted at any time in lab.
- ✓ Leave all extraneous items such as cell phones, computers and bags in small cubbies or keep them in your car.
- ✓ Carry all tubes in a test tube rack to help minimize spills. Dispose of bacteria and media according to the provided guidelines.

End-of-Course Evaluation

Students can 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 p.m. following the last day of the class. You will receive an e-mail to your student e-mail account when course evaluations are available. Evaluations have no effect on your grade.

Instructors don't see student comments until grades have been submitted.

SMCC Academic Policies

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 207-741-5923.*** 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.

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 “tutoring needed” button 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.

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 207-741-5696 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 207-741-5696 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. 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.

Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account.

Add-Drop: Students who drop a course during the one-week "drop/add" 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 drop/add period. There is no refund for non-attendance.

IMPORTANT: Remaining enrolled after the Drop/Add week means you understand and accept the requirements, policies, and instructions spelled out here, and in Brightspace. Please read all of the files in the welcome (start here) folder in Brightspace before end of the Drop/Add

period to ensure that you understand the requirements and have enough time to devote to this course. You must officially drop the class if you do not plan to continue in the course.

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 2nd through 12th week of the fall and spring semesters and the 2nd through 9th week of 12-week summer courses. This period is pro-rated for shorter-length courses usually 75% of the course meeting time; 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 an SMCC e-mail account (no phone calls, please).

The designation “W” will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. ***Failure to attend or ceasing to attend class does not constitute withdrawal from the course.*** There is no refund associated with withdrawal. ***Withdrawals do not affect your GPA. They do affect your course completion rate.***

Mid-Term Grades:

1. Students will receive a mid-term grade at 10 weeks (60%) into the course. This grade will follow the grading scale posted above. The grade will be based on the assignment that have been completed by week 10. This replaces the “Early Alert” period and the “Academic Alert” period. Student progress however continues to be monitored

during the entire semester. This system is intended to raise students' awareness about their performance.

2. Grades below a C at 10 weeks are sent to your advisor who will notify you about scheduling a meeting to discuss strategies for improvement. Think about specific ways you can improve your performance and take these ideas with you to the meeting. If you are performing unsatisfactorily at mid-term, it may be very difficult to earn a passing grade.

3. **Mid-term grades do not change. They DO NOT become part of your permanent record and no other schools have access to them.**

They only reflect your performance during the first 10 weeks of the semester. However, these grades **DO** affect your final course grade, obviously, because your course grade continues to change as the semester progresses and you complete more work. Your final course grade may be different from your mid-Term grades, *i.e.*, higher, lower, or the same, depending on your performance. You should calculate your grade often and know where you stand (see "Calculating your own grade").

4. If your course grade continues to stay at C or above (satisfactory), keep up the good work! If your performance is falling below a C, please make sure to discuss the situation and all available options with your instructor and your advisor.

Administrative failure (grade of "AF"):

1. "Administrative failure" is the consequence of missing three consecutive meetings (lecture or lab), with no prior notification to the instructor regarding the reason. (The time frame for this policy may differ

by course.) Also see “Attendance” policy noted above.

2. A grade of AF is submitted to the Registrar immediately at the end of the day on the third consecutive absence. Basically, an AF grade drops the student from the course. The student may then contact the instructor to request reinstatement in the course. Reinstatement is at the instructor’s discretion and is generally not granted because too much work has been missed by that time. Late work is not accepted, and makeup work is not available. A grade of AF can also be assigned in cases of cheating and other inappropriate conduct. In these cases, additional consequences may be imposed on the student.

3. An AF student can contact the Registrar and request that the grade of AF be changed to “W” (withdrawn) if done before the final drop date. ***Students earning an AF or W are still financially responsible for the course.***

Plagiarism and other forms of Cheating

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. This includes the use of search engines such as GOOGLE during tests and assignments.

If an instructor suspected that a student in any course in which s/he is enrolled 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 also consult with the department chair faculty member 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.

This is a web-enhanced course. Many of the assignments and examinations are on-line and completed outside the classroom. It is of vital importance that all students adhere to SMCC's honor code. This means that no one is permitted to have assistance for any exam or to have another person take the exam in their place. ***If for any reason during the semester the instructor feels that this policy is being violated, I reserve the right to assign specific times for testing so a virtual proctor can be present. This could impact certain individuals or the entire class.*** Cheating and plagiarism are serious offenses that can lead to drastic repercussions. Please follow the SMCC honor code and only submit original work.

Title IX statement: SMCC and the MCCS is committed to making our campuses safer places for students. Because of this commitment,

and our federal obligations, faculty and other employees are considered mandated reporters when it comes to experiences of interpersonal violence (sexual assault, sexual harassment, dating or domestic violence, and stalking). Disclosures of interpersonal violence must be passed along to the University's Deputy Title IX Coordinator who can help provide support and academic remedies for students who have been impacted.

ANTI-DISCRIMINATION STATEMENT: SMCC and the MCCS is an EEO/AA employer, and does not discriminate on the grounds of race, color, religion, sex, sexual orientation, transgender status, gender expression, national origin, citizenship status, age, disability, genetic information or veteran's status in employment, education, and all other programs and activities.