

General Microbiology

BIOL 310/310L

Fall 2020

Course Syllabus

TR 9:25-10:40 Zoom/RITA 154

Professor: **Matthew E. Rhodes, Ph.D**

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Office: 119 RITA

Office Hours: W 2:00-3:30, R 11:00-12:30 and by appointment

I will do my best to respond to all e-mails within one business day.

Feel free schedule virtual meetings outside of office hours.

Microbiology Lab (310L): RITA 167

Ms. Tracy Hirsch

Required Texts and Materials:

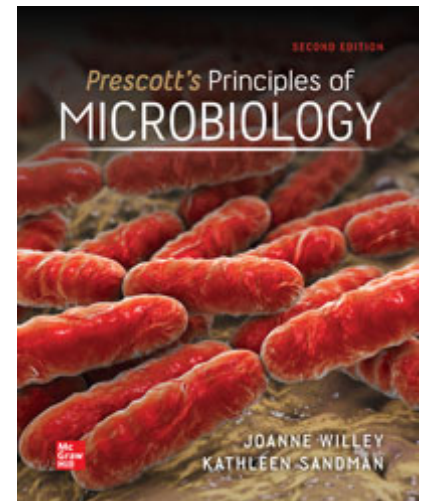
Lecture: *Prescott's Principles of Microbiology*, 2nd Edition

Joanne M. Willey, Kathleen Sandman

Copyright year: **2021**

McGraw Hill Publishing

Bound, binder, ebook



Web Component: *Prescott's Principles of Microbiology*, 2nd Edition

McGraw Hill Publishing provides a smart learn ebook and access to connect.

Assignments posted through connect will be mandatory and will compile a percentage of student's grade for the course.

For help with registration or technical assistance contact

1-800-331-5094 or visit www.mhhe.com/support

See attachment for details on how to get Connect



Computers and Headsets: We will be doing group work both in class, virtually, and at home. Due to social distancing measures, this will be done via zoom. Everybody should be on zoom even if you are attending class in person. You should also bring a headset to use during group work. If this presents a problem for you, please let me know.

Teaching/Class Philosophy:

Let's start by what this class is. This class is a general intro to microbiology. We will attempt to cover a broad variety of topics that fall under the realm of microbiology. However, seeing as that is impossible we will be forced to pick and choose. We will spend comparatively little time on topics that should be covered in other classes (Ex- Eukaryotes) and more of our time on Bacteria and Archaea. We will be paying particular attention to differences between the three domains. Viruses fall somewhere in the middle, but given the current state of

the world we may be spending more time on viruses than usual. We will spend one class period devoted entirely to SARS-CoV-2.

The textbook is not perfect. No textbook is perfect, but it is the best that I can find. We will be omitting chapters and sections of the textbook and in turn replacing them with supplemental readings (see below). These readings are intended to represent relatively recent and fascinating developments in microbiology. But what I find interesting and what you find interesting may be different. If there is a topic you want to explore and have a suggested reading, please pass it along. If I am not able to include it this semester, I may use it in the future. Some of the readings this year were passed along by previous students. And yes these readings will be on the test. In a similar vein, if there are topics related to SARS-CoV-2 that you would like to be discussed, please pass them along as well.

We are in uncharted territory this semester. I personally value student questions, give and take, and in class discussions. We will attempt to cultivate this environment as best we can using technology. We will utilize, poll everywhere, zoom break out sessions, in class assignments, video clips, and demonstrations, frequently. The more you engage with myself and with each other, the better this learning environment will be.

Now a brief note on what this class is not. Some of you may be disappointed to hear that it is not a medical microbiology course. It is not an applied microbiology course. It is not an environmental microbiology course. We will not be focusing on any one aspect of microbiology. However, with the recent revelations on the importance of the human microbiome the distinctions between medical microbiology and environmental microbiology are starting to break down. To be a good doctor, nurse, dentist, etc. it is important to appreciate the human body and organs in their entirety. For too long in modern medicine, microbes have been treated solely as the enemy and we are only now realizing the disservice this might have done to our health.

General Course Information:

This course begins by examining the history of microbiology, the shapes, sizes, and structure of microorganisms so students become familiar with the world of microbiology. We will then look at microbial growth and how the growth of microbes can be controlled, followed by the means by which microbes obtain energy (physiology), and the flow of information within a microbial cell. Following this understanding of how the microbial cell functions, we will examine the viruses and how these interact with both microbial and animal cells. We end the semester with an introduction to the interactions between microbes and humans, the response of our immune system, and we will examine certain microorganisms and their role in disease.

Student Learning Outcomes: The goal of this course is to demonstrate how microbes have shaped the world and continue to shape the world. Starting all the way back at the origin of life we will investigate the impact that microbial life has had on the evolution of life eventually ending with the effects of microbial life on the human body. To better appreciate how this occurs we will need to understand microbial physiology, metabolisms, and genetics. Upon completion of this course the student should be able to:

1. Discuss the historical development of the field of microbiology.
2. Identify the components of the microbial world with special references to the bacteria.
3. Compare the sizes, shapes, and physical makeup of the bacteria, archaea and viruses.
4. Discuss different theories surrounding the origin of life.
5. Evaluate the role of microorganisms in disease and the prevention and treatment of infectious disease.
6. Describe the varied nutritional types of bacteria at the elementary level.
7. Clarify the fundamentals of the molecular genetics of bacteria.
8. Discuss the principles of molecular biology including DNA structure, DNA replication, transcription, and translation as they pertain to microorganisms.
9. Explain the regulation of gene expression including enzyme activity, induction, repression, DNA binding proteins, and attenuation.

10. Clarify the molecular basis of mutation, genetic recombination, transformation, transduction and conjugation.
11. Evaluate the role that microbes play in regulating human health.
12. Understand how microbes interact with their environments.
13. And others...

Grade Composition:

Lecture (Total 75%):

Exams: (3x 100)	300pts or 50% (16.7% each)
Final Exam	150 pts or 25%
In-Class/At home Assignments	80pts or 13.3%
Connect Assignments	40pts or 6.7%
Participation/Attendance	30pts or 5%

Lab (25%)

Exams

Three in-class (1.25-hour) exams will be given on scheduled dates. The exams will consist of a variety of fill-in-the-blank, drawings, or short answer questions, with minimal multiple choice questions. The exam material will primarily focus on the material covered since the preceding exam, but applicative questions of cumulative material may appear.

Make-up exams are purely at my discretion and are reserved for extreme circumstances only. Contact me as soon as possible if you think you will or if you have missed an exam. No make-ups will be administered after a 48-hour period. See other attendance policies.

If deemed necessary, this course will require the use of an exam proctoring service for the course exams. You are responsible for registering, scheduling, and the cost of the service prior to each exam. Instructions and additional information on proctoring can be found at this link: <https://academicaffairs.cofc.edu/distance-education/online-proctoring/index.php>.

Final Exam

A single final exam will be comprehensive and will count for 25% of the lecture grade. The final exam grade can NOT be dropped and makeups will be offered only under particularly extreme circumstances.

Connect Assignments

For each chapter of Prescott's Principles of Microbiology a connect assignment will be posted. These must be completed through connect prior to the lecture during which that chapter will be discussed (Connect Assignments will generally be due by 9am the day of class). This is to assure that you have read the material and are prepared for class. Personally, I wish this had been around when I was a student. Connect assignments will be graded P/F. In order to pass you must get >90% of the questions right. Reading assignments will often not cover the entire book chapter. You are encouraged to read the entire chapters but exam material will not be taken from material that is not covered in lecture. Your lowest 2 reading assignments will be dropped from your grade.

Supplemental Readings: A variety of supplemental readings will be posted on OAKs for each class. These readings will vary in length and complexity. They range from newspaper articles to primary literature to podcasts. They will be pivotal for in class assignments, discussion boards, homeworks, and content from the

readings will appear on exams. The goal of the supplemental readings (SRs) is to expose you to recent and/or particularly fascinating (in my opinion) discoveries and controversies in microbiology. You will notice on the class schedule that for the last 1/3 of the course the SRs are yet to be determined. Should something pique your interest and you would like to delve into it further please reach out, or if you have a suggested reading.

In Class Assignments/Homeworks

Throughout the semester there will be semi-regular in class assignments/homeworks based on classwork and supplemental readings. Sometimes you will be working in small groups and sometimes individually. Sometime these be turned in at the end of the class period, sometimes they will be started in class and finished at home, and sometimes solely at home. They will be graded by the following (10, 9, 5, 0) system. If you do a thorough and complete job you get a 10, if you do an OK job with a few minor mistakes/omissions only you get a 9, if there are numerous minor mistakes, a major omission, or it is obvious that minimal effort was put in (i.e. you scrambled last minute to turn in something) you get a 5, if you turn in nothing you get a 0. I expect pretty much everybody to get 10's/9's on these assignments. They will more or less be graded for completion. I apologize in advance but there are simply too many students for detailed comments on each turned in assignment. Your lowest 1 ICA/HW will be dropped from your grade.

Participation

As we are anticipating a hybrid/fully online course environment, attendance and participation will be assessed differently. Attendance will be monitored via a combination of responses to Poll Everywhere questions and logging in to zoom. Even if you are attending class in person, you should be logged into class zoom to facilitate group work. Participation will encompass both responses to Poll Everywhere questions and a discussion board on the supplemental reading of the day. You will be divided up into small discussion groups, and every student will be expected to post in the discussion group for each supplemental reading. You may have up to 2 unexcused absences. With the coronavirus running rampant, every effort will be made to accommodate excused absences, however an excess of excused absences may necessitate an incomplete.

Lab Grade

A quarter of your grade will be based on the lab component of the course. A more detailed explanation of the lab portion of the class will be provided in individual lab sections.

Extra-Credit

Extra-credit opportunities are entirely up to me and will be relatively minor. IF an extra-credit opportunity is provided it will be provided to the entire student body, (ie no individual extra-credit assignments). These potential extra-credit assignments will be announced in class and are not presented in the syllabus' grade computation.

Syllabus/Schedule Modifications

This syllabus/schedule most likely will change due to hurricanes etc. as the semester progresses depending on the learning environment. I will do my best to adhere to the syllabus as written, but changes will be at my discretion and I will announce any changes both during class and through OAKS. Make sure you stay up to date on any modifications. You should also notice a flex day built-in to the schedule. I anticipate that we will move slightly slower through material than on the syllabus and I will adjust the schedule accordingly. I will make every effort to keep exams on the scheduled dates.

Letter Grade Schedule

It is my expectation that A's are earned with considerable hard work and effort. B's represent above average work. C's are average fluency of the material. And my hope is that nobody get's a D or an F. Generally speaking the test average is somewhere in the mid-70's. It is my intention that the ICA/HW's, connect assignments, participation points, and your lab grade will raise everybody's grade.

<u>Letter Grade</u>	<u>Numerical Range (%)</u>
A	93.0 – 96.9
A -	90.0 – 92.9
B +	87.0 – 89.9
B	83.0 – 86.9
B -	80.0 – 82.9
C +	77.0 – 79.9
C	73.0 – 76.9
C -	70.0 – 72.9
D +	67.0 – 69.9
D	63.0 – 66.9
F	0.00 – 62.9

Tentative Lecture and Exam Schedule

Lecture #	Date	Topic	Assigned readings (read before class!)	Due
1	25-Aug	Course Policies/Procedures. Origin of life		
2	27-Aug	The history of microbiology	Chapters 1 and SR1	
3	1-Sep	Microscopy and Review of Biochemistry	Chapter 2 and Appendix A and SR2	ICA1
4	3-Sep	Prokaryotic Cell Structure I	Chapter 3 part 1 and SRs 3 and 3b	HW2
5	8-Sep	Prokaryotic Cell Structure II	Chapter 3 part 2 and SR 4	HW3
6	10-Sep	The Archaea	SRs 5 and 5B and SR 6	ICA4 and ICA5
7	15-Sep	The Eukaryotes	Chapter 4 and SR7 and SR9*	HW6
8	17-Sep	Taxonomy	Chapter 33.2 and SR8	ICA7
9	22-Sep	Exam 1	Chapters 1-4, 33.2 Appendix A, and SRs 1-8	

10	24-Sep	Microbial Growth I	Chapter 5 and SR10	HW8
11	29-Sep	Growth II and Metabolism	Chapter 6 and SRs 11 and 12	ICAs 9 and 10
12	1-Oct	Catabolism	Chapter 7 and SRs 13 and 14	
13	6-Oct	Bacterial Genome Replication	Chapter 9.1-9.2 Skim 9.3 Chapter 10.1 - 10.5	ICA11
14	8-Oct	Gene Expression I	Chapter 11.1 - 11.4 and SR 15	HW12
15	13-Oct	Gene Expression II	Chapter 11.5-11.7 and SR 16	ICA13 if Safe
16	15-Oct	Biogeochemical Cycling	Chapter 20	
17	20-Oct	Exam 2	Chapters 5-7, 9-11, and 20 SRs 10-16	tbd
18	22-Oct	Viruses	Chapter 18 and SR 17	tbd
19	27-Oct	SARs-CoV-2	tbd	tbd
20	29-Oct	Control of Microorganisms in the Environment	Chapter 27 and SR tbd	tbd
21	5-Nov	Antimicrobial Chemotherapy	Chapter 28 and SR tbd	tbd
22	10-Nov	Mechanisms of Genetic Variation	Chapter 12 and SR tbd	tbd
23	12-Nov	Pathogenicity and Infection	Chapter 25 and SR tbd	tbd
24	17-Nov	The Human Microbiome	Chapter 24 and SR tbd	
25	19-Nov	Exam 3	Chapters 12, 18, 24-25, 27,28	
26	24-Nov	Flex Day		tbd
27	1-Dec	Innate Host Response	Chapter 22 and SR tbd	tbd
28	3-Dec	Adaptive Immunity	Chapter 23 and SR tbd	tbd

PREREQUISITES

For this course prerequisites are BIOL 111, 111L, 112, 112L and 211 and One Year of Chemistry. "One Year of Chemistry" means you must have already completed, with passing grades, CHEM 101-101L-102-102L or CHEM 111-111L-112-112L, or the equivalent. For transfer students, the course must have transferred to the CofC as equivalent to the above. BIOL 305 is a prerequisite or corequisite, although CHEM 231 can be substituted for BIOL 211 & 305. Biology also requires MATH 250 Statistics as a prerequisite to all of its upper-level classes.

This course will cover a lot of material and move relatively quickly. It is expected that you are well versed with all material covered in prerequisite classes. This is especially true for students who might have taken the prerequisites a while ago or who have gotten waivers to enroll without the prerequisites. It is your responsibility to ensure that you are up to speed on the necessary background material. If you need any assistance with topics that you are unfamiliar with, I would be happy to provide you with resources.

ATTENDANCE

As of now the expectation is that this will be a hybrid course. A portion of you will attend each class in person and a portion will attend synchronously online. If you are scheduled to attend in-person please take your responsibility seriously. If you are feeling ill or are meant to be quarantined, **do not attend class!!!!** If you are capable of attending in person, come and participate. There are many other students who would prefer to be in the classroom.

The online portion of the class will be conducted synchronously and everyone who is capable of attending will be expected and required to attend. An excessive number of unexcused absences from lecture (excessive = more than 2 in lecture) or from lab (one = excessive in lab) constitutes grounds for dismissal from class and assignment of a grade of WA (equivalent to an F). Official absence notices are handled by the Absence Memo Office, located in the white house at the corner of Glebe & George Streets (67 George Street) next to the Stern Center. If you will be absent on official college business (e.g. athletic events, professional conference), please provide documentation in advance. Excessive excused absences especially in lab will necessitate withdrawal from the class or in rare cases, an incomplete.

Please make every effort to be on time and adhere to social distancing requirements. Electronic devices such as cell phones and smart pads may only be used for educational purposes.

IF you have a DISABILITY that qualifies you for academic accommodations, please provide a letter from Disability Services at the beginning of the semester. I will be happy to discuss your situation via zoom. For more information regarding accommodations, please contact the Office of Disability Services at (843)-953-1431, stop by their office in Lightsey Center Room 104 &/or refer to their web site at <http://www.cofc.edu/~cde/> Any SNAP student must turn in their envelope at least 48 hours before the scheduled test.

The **deadline for WITHDRAWAL** from the course with a grade of "W" is **Wednesday, October 28, 2020**. In accordance with College regulations, withdrawal from the course after that date will be permitted only under dire and unpredictable circumstances, such as sudden serious illness and is largely out of my hands (see "Withdrawal from Courses" in the Undergraduate Catalog).

There will be three full-period TESTS based on lectures, texts, and assigned reading. Tests are tentatively scheduled for the following dates: September 22nd, 2020, and October 20th, 2020, and November 19th, 2020

Expectations:

WORKLOAD:

As the lecture portion of this class is 3 credits. It is expected that every week there will be approximately 9 hours of work/study/review outside of class or 4.5 hours per class. For every class there will be an online textbook reading assignment (on average 1-2 hours), a supplemental reading (30 min – 1 hour), discussion board (30 min), and occasional homeworks or ICA to be finished (1 – 2 hours). The workload will vary and any remaining time should be spent reviewing material/filling out the study guide in preparation for the exams. The workload will most certainly be decreased the week of an exam.

COMMUNICATION:

With Each Other:

When working remotely and online there is the opportunity to abuse the anonymity. Rather than provide detailed guidelines, I'm just going to say act and treat each other with the same dignity as you would in person. For a more detailed considerations see this link <http://blogs.onlineeducation.touro.edu/15-rules-netiquette-online-discussion-boards/> If you ever feel that someone's online communication has made you feel uncomfortable, please bring it to my attention.

With Me:

I will be available for drop in virtual office hours during the times listed above. If you'd like to schedule additional meetings I will do my best to make myself available. I will likewise do my best to respond to all e-mails and relevant discussion board posts within one business day. You might find that a little man joins us for our meetings or his crying may interrupt us. For that matter, he may make an occasional appearance during class time as well.

I. College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the *Student Handbook* at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

Advice From Previous Students Who Have Taken This Course:

- Study, come to class, take notes and ASK QUESTIONS
- Stay on top of the notes/lectures. Don't get behind. A LOT of info.
- Come to class. The powerpoints are great for refreshing but aren't good enough.
- Pay attention to slides and the amount of time spent on one topic, its likely important.
- Focus on Slides! And take notes on the slides. The slides by themselves are not enough.
- Study every night
- Don't take 17 credit hours like me. Be sure you have plenty of time to devote.
- Be ready to learn and have fun
- Need to study a lot
- Review each lecture slide in depth and use the book only as a resource to supplement. Reading relevant figures/legends was helpful.
- Do the chapter reading assignments before class and stay on your game!
- Study your ass off!
- Take good notes of the slides even though they are online. Listen to repeated subject matter.
- Read and reread not just on the exam week.
- Make sure to add notes from class to powerpoints.
- Concentrate on big ideas
- You get out of the class what you put into it
- To continually review notes
- NEVER miss lecture!
- Keep up on studying notes and pay attention to all tables
- Don't skip class. Print off the slides before class to bring in
- Go to class!! Focus on powerpoints.

Institutional Statement

The College of Charleston is committed to promoting the health and safety of our campus community. To that end, all faculty and students must abide by public health guidelines that include practicing social distancing in the classroom and elsewhere on campus, following signage indicating the entrance, exit, and traffic flow in and around campus buildings, wearing a mask or cloth face covering while in the presence of others, washing or sanitizing hands frequently, sanitizing individual and shared learning and work spaces, and staying home when sick. These practices are mandatory. Students will not be allowed to attend class without an appropriate face covering or when showing symptoms of illness.

Due to social distancing requirements, the number of students allowed in the classroom at one time is significantly reduced. As a result, most in-person courses will include a variety of online and technology enhanced components to ensure continuity of learning for each student throughout the semester. These strategies will vary by course section and students are advised to read each syllabus carefully. Faculty have planned each course to enable all students, whether they are in the classroom or working remotely, to be fully engaged in the learning experience. Before the drop/add deadline, students should decide whether the course plan on the syllabus matches their own circumstance. All faculty will use OAKS to facilitate student access to the course syllabus, course materials, and the gradebook. The College of Charleston's standard grading system is in effect.

There is a possibility that the semester will be disrupted by weather or the pandemic. Every course syllabus will include a plan for a change in modality to ensure the continuity of learning in the event in-person classes must be suspended. Regardless of the method of instruction, all courses will move online for one week after Thanksgiving. Final exams will be administered online. Therefore, all students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

The College anticipates that some members of the community will fall ill or test positive for the coronavirus, and then be required to quarantine thereby missing class, assignments, and assessments. Faculty are expected to provide reasonable accommodations as determined by the content, level, and expectations of their courses for students who become ill or indicate a need to isolate themselves. To the extent possible, arrangements will be made for students with COVID-19 related absences to continue in the class. Faculty are encouraged to make explicit in their syllabus what sorts of accommodations students can expect with respect to missed course meetings, assignments, and assessments. However, students should be aware that extended absences for any reason cannot be accommodated in every course. Missed assignments and assessments may result in poor or failing grades. If a student is absent from class for an extended period, a withdrawal (W) before the deadline should be strongly considered. In all cases, assigning course grades is the responsibility of the instructor consistent with the grading policy published on the syllabus.



STUDENT REGISTRATION/PURCHASING INSTRUCTIONS

What You Need

You will be required to have materials from McGraw-Hill Education which include the textbook (or eBook) and Connect (which includes LearnSmart, your adaptive online study tool, and SmartBook, your adaptive eBook). The required textbook for this class is “**Principles of Microbiology**”, 2nd edition by Joanne Willey. Your online homework assignments, which are only available through Connect, will account for of your grade, so if you do purchase a used textbook, you must also purchase Connect through McGraw-Hill’s website.

Where to Get It

- **Online - All DIGITAL:** You can purchase Connect (no print book, but includes the complete eBook and access to all course content) directly from the course website as well. To register and purchase Connect without the print book, follow the steps below.
Bookstore: The bookstore should have packages of textbooks and connect access available for the course.

How to Register for Connect

1. Go the section web address:
https://connect.mheducation.com/class/m-rhodes-micro_fa2020_1
2. Click the “**Register Now**” Button.
3. Enter your email address.
 - a. If you already have a McGraw-Hill account you will be prompted for your password.
 - b. If you do not have a McGraw-Hill account you will be asked to create one.
4. To access Connect:
 - a. If you already have a registration code (for example, included in the print package from the bookstore), enter it in the “**Have a registration code?**” section.
 - b. If you do not have an access code, select “**Buy Online**” (valid credit card required).
 - c. If you wish to purchase at a later time, you may begin a 14-day **Courtesy Access** period at this time. You will be prompted to upgrade to full Connect access before your courtesy access period expires. You **must** purchase full Connect access in order to maintain access to your course assignments and materials
5. Complete the registration form, and click “**Submit**”

FAQs & Tutorials



Visit the Connect Student Success Academy for online FAQs and tutorials:

<http://www.connectstudentsuccess.com/>

Technical Support

If you need Technical Support (forgotten password, wrong code, etc.) please contact the McGraw-Hill Education **Customer Experience Group (CXG)** at:

(800) 331-5094

www.mhhe.com/support

(Please be sure to get your case number for future reference if you call the CXG line.)