

Biology 310

General Microbiology

Spring 2019

Course Basics

Course Instructor: Dr. Heather Fullerton

Phone: 843.953.7363

E-mail: fullertonhe@cofc.edu

Office: Rita 208

Office hours: **T:** 2:30-3:30pm **W:** 10:30-11:30am and by appointment

Lecture: **M/W:** 3:25-4:40pm

Labs: **T:** 9:00-12:00pm, 12:15-3:15pm

W: 9:00-12:00pm, 12:15-3:15pm

R: 12:15-3:15pm

All labs held in Rita 167

Required Text: Brock Biology of Microorganisms, 15th Edition

Optional text: Techniques in Microbiology: A Student Handbook, 1st Edition

Lab Instructors:

Dr. Moshe Rhodes (rhodesme@cofc.edu)

Office: Rita 119

Office Hours: W 2:00-3:30, R 10:00-11:30 and by appointment

Ms. Tracy Coliano Hirsh (collianohirscht@cofc.edu)

Office Hours: By appointment

Course Objective:

This course serves as an introduction to microbiology with a focus on the central role of microbes in the field of biology, the unique metabolic and organismal diversity of microbes, and their role in history from the origin of life to modern times. In addition, work in this course will help you to further develop and refine your skills in critical thinking, analysis, scientific communication, and interpersonal interactions.

Course Learning Goals:

Upon completing this course, you should be able to:

1. Understand microbiology within its historical context, and relate pivotal discoveries and major advances
2. Describe structure-function relationships of microbial cell components
3. Understand microbial cell growth and regulation of cell division
4. Differentiate mechanisms of antimicrobial agents
5. Describe the mechanisms of regulation of microbial gene expression
6. Relate major pathways of anabolism and catabolism to the role of microbes in their environments
7. Discuss the impact of microbes on human society
8. Consider the role of microbes in the evolution of life on Earth

Laboratory Specific learning goals

1. Use a microscope knowledgeably and with ease
2. Culture various bacterial species per their physiological needs and environmental adaptations
3. Quantify bacteria from samples including food, water, and pure cultures
4. Use selective and differential media to identify unknown bacterial cultures

Course Evaluation & Assessment

Your ability to meet course goals will be determined via your performance on various assignments and exams throughout the semester.

Grading

Grades will be assigned as follows:

		A	>93	A-	90-92
B+	87-89	B	83-86	B-	80-82
C+	77-79	C	73-76	C-	70-72
D+	67-69	D	63-66	D-	60-62
F	<59				

Your grade is weighted with 75% from lectures and 25% from labs.

Lecture Percentage

Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	20%
Online and in class assignments	5%
Poll Everywhere	5%
Total	75%

Lab Percentages

Lab Notebook	6%
Unknown 1	2%
Unknown 2	4%
Lab Quiz	3%
Lab Final	10%
Total	25%

Assignments may be altered at the instructor's discretion during the semester depending on available time and other course constraints.

Please note that grades on Oaks are not be your final grade. The Oaks grades will reflect all work done and should be an indicator to you of your progress.

Exams:

There will be 3 exams throughout the semester and one cumulative final. Each exam is worth 15% of your final grade, whereas the final is 20%. Make-up exams will be provided if there is an emergency at test time, or due a university-sanctioned event, such as participation in a sporting events or academic conferences. If a make-up exam is needed, you will need to get an absence memo. Make-up exams will be written & oral and will be given at a time we deem appropriate and before the graded exam are handed back. If you cannot avoid being gone on an exam day, it is your responsibility to contact me at **least one week** prior to the scheduled test date.

The final exam cannot be taken at another time, unless, as stated in The College Academic Regulations:

1. Two or more exams are scheduled simultaneously.
2. Legitimate and documentable extenuating circumstances prevent the student from completing the examination at the scheduled time (e.g., burial services for an immediate family member).

Extra Credit:

There are no extra credit opportunities in this class. If this is to change, an announcement will be made, in class, and all students will have the opportunity complete the extra credit. Additionally, on exams, there may be questions that can be answered for extra credit.

Poll Everywhere Quizzes

We will have in-class quizzes administered during most lectures that will be given using Poll Everywhere. If you forget your phone or are unable to answer poll everywhere questions electronically, you can hand in your answers on paper that has your name, date and your answer(s) for that lecture period.

The poll everywhere quizzes will be calculated as:

total points received/ (75% of total available points).

In other words, if we have 48 quiz questions, and you get all of them correct, your quiz grade will be 48/36 or 133%. In this example, you can miss 12 questions without any grade penalty.

Assignments:

There will be both in-class and online assignments. The in-class assignments will be due at the end of class and therefore cannot be made up at a later date. You must be in class in order to participate and receive full credit. Any missed in-class activities due to attendance at a university-sanctioned events, such as an away sporting event or scientific presentation, will not be counted against your grade.

Many of the in-class learning activities and assignments will be graded in order to provide you with feedback on how well you understand and can apply the material. These activities often rely on group work and cannot be made up at a later date. You must be in class in order to participate and receive credit. In class assignments and activities will be posted to oaks after the class in which they were completed.

Late assignments are defined as **any assignments turned in after the beginning of class the day, they are due**. Assignments received within 24 hr. after they are due will have - 15% deducted from the total points earned. Assignments received within 48 hr. after they are due will have 30% deducted from the total points earned. No credit will be given for assignments received more than 48 hr. past the time they are due. For example, for an assignment that was worth 10 points but was submitted 2 days late the maximum score you could receive is 70%. Online assignments will be posted to oaks along with associated due dates.

Weekends and holidays count in the hours post-due calculation. Late assignments will only be accepted without penalty for unavoidable circumstances, as determined by the instructor.

Due dates for online quizzes and assignments will be posted along with the assignment. Online assignments will have the same penalties for late submissions.

In April there will be an outside of class assignment. For this assignment, if you are a graduating senior majoring in Biology or Marine Biology, you will take the Biology Majors Field Test (MFT). If you do not fit that criteria, you will complete an alternative assignment. Details on both the MFT and the alternative assignment will follow later in the semester.

Attendance and absences:

Attendance will not be recorded on a daily basis. However, if you miss class you will not receive credit for Poll Everywhere questions, or in-class assignments. It is your responsibility to get notes, lecture materials or copies of activities from your classmates or from the oaks page.

College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, 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 status indicator 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.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. 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>

Oaks:

Reading quizzes, assignments, readings, lab assignments will all be posted on the course website. Lecture PowerPoint slides will be made available following the class period in which they were presented. Additional lab material and course announcements will also be posted on oaks.

Center for Student Learning:

I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies and course content. They offer tutoring (*including a new walk-in Science Tutoring Lab*), Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

General Class Policies

Final Exam:

Tuesday, April 30, 4:00-7:00pm

No Class:

Martin Luther King Jr. Day, Monday January 21

Spring Break, March 17-March 23

Computers & Cell phones:

Computers and cell phones can be used for notetaking and other class related activities, like Poll Everywhere. Turn all cell phones to silent before class. Please be respectful to your classmates and do not email, text or check facebook, instagram, snapchat, etc. during class. Everyone behind you can see that cat video you are watching.

Email:

Email can be an efficient and effective mode of communication. Email is best used for things such as setting up office hour appointments or quick questions about content or assignments (longer questions are best answered during office hours).

Office hours:

Office hours are a fantastic way for you to get questions answered and for you to work one-on-one with the instructor. While there are only 2 formally scheduled office hours can set up an appointment for times that might work better with your schedule.

Attendance:

You should be in your seat, prepared for the day and ready to begin class on time. Late entrances are disruptive to your fellow students. Please be respectful and arrive on time.

Classroom Climate:

I am committed to establishing and maintaining a classroom climate that is inclusive and respectful for all students. Learning includes being able to voice a variety of perspectives, and classroom discussion is encouraged. While students' expressed ideas may vary and/or be opposed to one another, it is important for all of us to listen and engage respectfully with each other. I am also committed to a classroom and campus environment free of discrimination of all kinds. If you feel that the classroom climate does not reflect my commitment as expressed above, I would encourage you to contact me so that we can discuss this. Also, if you have experienced any harassing or discriminatory behavior, to include sexual harassment or sexual violence, I can provide you with information about support resources and reporting options, including those that are confidential.

Lab Specific Policies

Additional Lab Specific Policies will be discussed the first day of lab.

1. General

- a. There is to be no talking during the instruction period of the lab. If you have a question, please raise your hand prior to asking the question. While answering a student's question, please remain quiet so that the student and other class members can hear the reply.
- b. There is to be no talking during the quizzes or practical exams. If you have a question, please raise your hand and remain quiet until the instructor can come to you.
- c. Please turn off all cellular phones before entering the lab and cell phones should remain in your school bag for the duration of the laboratory period. If you use your cell-phone during lab you will be asked to leave the room. This is for safety reasons.
- d. You are required to remain in the laboratory during any tests and quizzes.

2. Laboratory Notebook:

- a. A *bound* laboratory notebook is required and a great way to take notes on experiments and exercises. The pages will need to be numbered and you will need to keep an updated table of contents. You are not required to have a notebook that makes carbon copies. A spiral notebook is not acceptable. Your notebook will be graded and will be your study guide for the midterm and final.
- b. **Before you come to lab**, read the required materials and make any notes necessary in your lab notebook or lab manual. Try making brief, numbered lists of steps, or drawing a flowchart to familiarize yourself with the lab exercises. Results should be recorded in your lab notebook.

3. Attendance:

- a. Attendance at your registered lab meeting time is mandatory. There will be **no** make-up labs. You should assume that each lab period will take the entire period. Additionally, you will be required to record your lab results after incubation of cultures. For example, if an incubation is 24hours and your lab is scheduled at 12:15 on Thursday, you will need to come into micro lab afternoon on Friday to record your results.
- b. Students who will miss lab for a university-sanctioned event (e.g. sports, music performance, etc.) need to notify the laboratory instructor no later than one week prior to the lab to be missed so that appropriate arrangements can be made.

- c. If you miss **3** or more labs, for any reason, then you will receive a WA (withdrawn for excessive absences) for the course (BIOL 310 and 310L). This will impact your GPA similar to receiving an ‘F’.
4. **Safety:** *Additional safety information will be provided in lab.*
- Close-toed shoes are required (that means no flip-flops or sandals). If you wear inappropriate footwear, you **WILL NOT BE ALLOWED TO STAY IN LAB.**
 - Wearing a lab coat is required.
 - Gloves should be used while working with stains, hazardous chemicals, or if you have open wounds/abrasions on your hands.
 - Long hair needs to be tied back or put up. This will prevent your hair from catching fire or falling into the bacterial cultures
 - Wash hands at the beginning the lab period **and** before you leave the laboratory room.
 - Lab benches will need to be cleaned with disinfectant at the beginning of the laboratory period and after you have completed the laboratory exercises.
 - Cell phones will remain in school bags, off the laboratory bench at all times.

Special Arrangements:

The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services / SNAP, located on the first floor of the Lightsey Center, Suite 104. **Students approved for accommodations are responsibility for notifying me**, during my office hours, as soon as possible and for contacting me one week before accommodation is needed.

Center for Student Learning:

I encourage you to utilize the Center for Student Learning’s (CSL) academic support services for assistance in study strategies and course content. They offer tutoring (*including a new walk-in Science Tutoring Lab*), Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

Tentative Lecture and Exam Schedule

	Dates	Topic	Readings
Week 1	Jan 9	Course overview Historical Perspective	1.1-1.6 1.9-1.14
Week 2	Jan 14 Jan 16	Cell Structure & Growth <i>In-class assignment</i>	2.1-2.7, 2.10 5.1-5.3 & 5.5
Week 3	Jan 21 Jan 23	MLK Jr Day – No Class Cell Structure, Growth & Motility	1.5-1.8 2.9-2.13 5.6-5.8 7.2-7.5
Week 4	Jan 28 Jan 30	Genome Replication Exam 1	4.1-4.4

Week 5	Feb 4 Feb 6	Genome Replication & Organization <i>In-class assignment</i>	7.6-7.7 9.3-9.6 11.1, 11.2, 11.5-11.8 23.5
Week 6	Feb 11 Feb 13	Transcriptional Regulation <i>In-class assignment</i> Transcriptional Regulation & Protein synthesis	4.5 6.1-6.6, 6.8, 6.11-6.14 15.18 23.8
Week 7	Feb 18 Feb 20	Transcriptional Regulation & Protein synthesis Exam 2	4.7-4.13
Week 8	Feb 25 Feb 27	Microbial Lifestyles <i>In-class assignment</i> Energetics	5.3-5.14 6.7 15.17 3.4-3.12
Week 9	Mar 4 Mar 6	Energetics continued Carbon Metabolism	14.7, 14.19 21.1
Week 10	Mar 11 Mar 13	Carbon Metabolism Exam 3	14.5, 14.16-14.17, 14.20, 14.21
Week 11	Mar 18 Mar 20	Spring Break – No Class	
Week 12	Mar 25 Mar 27	Photosynthesis Photosynthesis continued	14.1-14.4 15.1-15.7
Week 13	April 1 April 3	Nitrogen & Sulfur cycles Nitrogen & Sulfur cycles Continued <i>In-class assignment</i>	21.3-21.4 14.6, 14.9, 14.11-14.15 15.9-15.13
Week 14	April 8 April 10	Nitrogen & Sulfur cycles continued <i>In-class assignment</i> Ecology & Phylogeny	13.3, 13.7, 13.10 20.1-20.3. 20.5, 20.6, 20.10, 20.14
Week 15	April 15 April 17	Metagenomics Animal Associated Microbes	9.1-9.2, 9.7-9.8 19.8 23.9, 23.12-23.13
Week 16	April 22	Microbial Ecology In-class final review	24.1-24.5, 24.10-24.11
Final Exam		Saturday, April 30, 2018	