BIOL 504/504L: Applied and Environmental Microbiology

Course Instructor:  Dr. Heather Fullerton
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Office: Rita 229
Credits: 4 (including laboratory)
Office hours: By appointment only (https://calendly.com/dr_fullerton/openoffice)

Course Description:
A lecture and laboratory study of the special applications of microbiology to domestic water and wastewater and solid wastes, food and dairy products, and industrial processes. Includes the microbial distribution and its role in various marine and freshwater, terrestrial, animal, and product environments. Lectures three hours per week; laboratory three hours per week.

Course Objectives:
Graduate students will be required to attend all Applied and Environmental microbiology lecture and laboratory sections of the class and participate in all tests, discussions, and assignments. The essential ecological roles and global distribution of microbes. You will become familiar with the importance of microbes to humans and the biosphere. This course will explore new methods and analytic technologies to better understand environmental microbiology. The laboratory portion will be a mix of field collections, in-class experiments, and data analysis, with the outcomes being the ability to grow environmental microbes based on their nutritional requirements, familiarity with sequencing techniques for identification of microbial species and student research project. Each graduate student will be responsible for leading one lecture and discussion for the course. This course is cross-listed with Applied and Environmental Microbiology 410.

Required Texts
Journal articles for reading will be distributed through our course oaks site.

Class Requirements
Prerequisite(s): none

Student Learning Outcomes
1. Demonstrate an understanding of contemporary methods of microbiology analysis and their associated limitations in evaluating natural populations.
2. Synthesize of primary literature focusing on microbial ecology and biography as related to selective pressure differences across marine environments.
3. Demonstrate critical thinking skills through independent scientific literature evaluation, and discussion
4. Analysis of microbial ecological data pulled from public data repositories
5. Present synthesis of methods in microbial ecology by leading one lecture and discussion

Office Hours:
All office hours will be held at a scheduled time using the link below.
https://calendly.com/dr_fullerton/microbiology-office-hours

Course Evaluation & Assessment
Your ability to meet course goals will be determined via your performance on assignments, laboratories, and essays throughout the semester. Assignments may be altered at the instructor’s discretion during the semester depending on available time and other course
constraints. Assignments that are due to oaks will be accepted up to 3 days past the due date with a 10% reduction in grade for every 24 hours late.

Assessment types
1. Primary literature synthesis essays (300 pts each) Three separate synthesis essays summarizing parts of lecture and incorporating peer-reviewed literature.
2. Annotate bibliography (200 pts) based upon lecture presentations
3. Presentation (150 pts) of one lecture with discussion of methods in microbial ecology
5. Development of isolation protocol (50 pts) for organisms with specific metabolic requirements

Grading
A ≥ 90%, B+ ≥ 87%, B ≥ 80%, C+ ≥ 77%, C ≥ 70%, F < 70%

OAKS
OAKS, including Gradebook, will be used for this course throughout the semester to provide the syllabus and class materials and grades for each assignment, which will be regularly posted.

Inclement Weather, Pandemic or Substantial Interruption of Instruction (3.8)
If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. 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.

Lecture 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. You must be in class to participate in discussions and earn participation points, these cannot be earned by later.

Laboratory Attendance:
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. If you are feeling unwell and must miss lab then it is the responsibility of the student to arrange for a make-up lab. It is not possible to attend the lab virtually or to make up lab virtually due to the nature of the hands-on skills of microbiology.

Our Classroom Community Strives to be Fully Inclusive:
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 respectively with each other. I am also committed to a classroom and campus environment free of discrimination of all kinds.

I will check email frequently during regular working hours and will respond in 24 hours or less on weekdays. I will check email infrequently after 6pm and on weekends, so expect longer wait times for a response.

Laboratory Notebook:
a. A laboratory notebook is required (no spiral notebooks). 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. Your notebook will be graded.

b. **Before you come to lab**, read the required laboratory exercises, and rewrite or print out the materials and methods to your lab notebook. It may be helpful to make brief, numbered lists of steps, and/or drawing a flowchart of the lab exercise(s).

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**Safety:** *Additional safety information will be provided in lab.*

a. Close-toed shoes and a lab coat is required. Gloves are be used while working with stains, hazardous chemicals, and bacterial cultures. Gloves and lab coats are not to be worn outside the lab. Gloves will be provided for you, but you are required to bring a lab coat.

b. Long hair needs to be tied back or put up. This will prevent your hair from catching fire or falling into the bacterial cultures.

c. Wash hands at the beginning the lab period and before you leave the laboratory room.

d. Lab benches will need to be cleaned with disinfectant at the beginning of the laboratory period and after you have completed the laboratory exercises.

**College of Charleston Honor Code & 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 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 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](http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php)

**Preferred Name and Pronoun Information:**
I will gladly honor your request to address you by the name and gender pronouns of your choice - mine are she/her/hers. Please advise me of this early in the semester via your college-issued email account or during office hours so that I may make the appropriate notation on my class list. More info can be found here [Preferred Name and Pronoun](#)
Veterans and Active Duty Military:
Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.

This course will provide equal access.
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**, and for contacting me one week before exam accommodation is needed.

I am happy to work with all students to ensure that they have equal access to the educational experience of this class. Any student eligible for and needing accommodations because of a disability is requested to speak with me during the first two weeks of class or as soon as you have been approved for services so that reasonable accommodations can be arranged.

This College abides by section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. If you have a documented disability that may have some impact on your work in this class and for which you may require accommodations, please see an administrator at the Center of Disability Services/SNAP, 843-953-1431 or me so that such accommodation may be arranged.

Physical & Mental Health Resources
If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). If you find yourself experiencing any mental health challenges (anxiety, depression, stressful life events, sleep deprivation, loneliness, and/or homesickness) please consider contacting either the Counseling Center (professional counselors at [http://counseling.cofc.edu](http://counseling.cofc.edu) or 843.953.5640) or the Cougar Counseling Team (certified volunteers through texting "4support" to 839863 or visit [http://counseling.cofc.edu/cct/index.php](http://counseling.cofc.edu/cct/index.php)). You can also visit both on campus on the 3rd floor of Robert Scott Small. These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

Food & Housing Resources
If you are facing challenges in securing food and housing please contact the Dean of Students for support ([http://studentaffairs.cofc.edu/about/salt.php](http://studentaffairs.cofc.edu/about/salt.php)). You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. For more information about food and housing assistance that is available to you, visit [http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php](http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php)