

EEMB 144 Fall 2020

Marine Microbiology

Lectures: MWF 9- 9:50

Location: Online

Discussion Sections: R 9-9:50, 10-10:50; F 8-8:50

Location: Online



Recent methodological advances have led to an explosion of research in marine microbial ecology. Microbe - microbe interactions and their interactions with their chemical and physical environments govern the cycling of elements and energy in the world's oceans. The field of microbial oceanography has evolved from the merger of marine microbiology, microbial ecology and environmental genomics, proteomics, and transcriptomics. It is a rapidly evolving and dynamic field that is interdisciplinary in nature. Subjects covered in this

course will span from traditional microbiology, to microbial biogeochemistry to the use of modern genomic approaches in studying microbial diversity and function in the oceans. We will also discuss how methods first developed to study marine microbes have impacted the fields of human health and “microbiome” research.

Instructor: Professor Craig Carlson (he/his)

Office hours: F 11am-1pm, *and by appointment:* [Zoom link here](#)

Marine Biotechnology Laboratory, Rm 3147

email: craig_carlson@ucsb.edu

Instructor: Professor Alyson Santoro (she/hers)

Open office hours: F 1:00-3:00 pm, *and by appointment:* <https://ucsb.zoom.us/j/8373048950>

Marine Biotechnology Laboratory, Rm 2155 (working from home during Fall 2020)

Email: asantoro@ucsb.edu

TA: Chance English (he/his/him)

Office hours: R 11-12 pm [Zoom Link Thursday](#) & M 10 - 11am [Zoom Link Monday](#)

Marine Biotech Building Conf. Room

email: cje@ucsb.edu

Contacting Us

We are here to support your learning goals throughout the quarter. Office hours are an open time where you can ‘drop in’ to ask questions about the reading, lecture material, assignments,

or how the course relates to your other courses and career goals. It is difficult for us to answer questions about the course material over email, so take advantage of scheduled office hours or contact us about a time to meet. If you are considering graduate or medical school and anticipate asking for letters of recommendation, office hours are a good time to get to know us better.

Course Resources

Text: *Marine Microbiology*, 3rd Ed. by Colin B. Munn; and reading posted on Gauchospace

We realize that textbooks are expensive. But, the opportunity to interact with the course material in multiple formats (digital, paper) is HIGHLY beneficial to your learning, so please consider investing in the print or ebook version of the textbook.

Library course page: <https://guides.library.ucsb.edu/eemb144>

The course library page has additional readings and primary literature that you may find useful if you develop a strong interest in marine microbiology!

Our primary form of communication will be through **Gauchospace** and the course Gauchospace site. Make sure your contact information in Gauchospace is up-to-date so you are updated on all course happenings.

Learning Objectives and Outcomes

This is an upper division undergraduate and graduate level course. The course is designed to introduce the student to principles of microbiology and microbial ecology with an emphasis on the marine environment.

By the end of the quarter you should be able to:

Explain and provide examples of:

- How microorganisms contribute to biogeochemical cycling in the ocean, especially the flow of carbon
- How the “central dogma” of molecular biology is leveraged to understand microbes in the ocean
- How microbial activity controls the habitability of the ocean for other organisms
- How human influence on the environment affects microbial activity and evolution in the ocean

Demonstrate the following scholarship skills:

- Analyze and interpret results from a variety of microbiological methods and apply those methods to analogous situations
- Use mathematical reasoning and graphing skills to solve problems in microbiology
- Effectively communicate fundamental concepts of microbiology in written and oral format
- Identify credible scientific sources and interpret the information in them

Course Organization

The course is divided into six units outlined on the EEMB144 [Lecture Schedule](#). These units are also divided among corresponding tabs on our course Gauchospace page. For each unit you will:

Fri-Mon: Complete the assigned **reading** for the unit

By **Wed, 5 pm:** Complete the **online quiz** in Gauchospace (first week of the unit)

Mon, Wed, Fri: Attend and/or watch online **lectures**

Thurs or Fri: Attend your assigned **Discussion Section**

By **Mon, 5 pm:** Submit your completed **Problem Set** for the previous unit

There are check boxes in Gauchospace you can use to help you track your progress through these required elements during each unit.

How to Succeed in This Course

In this course, like all upper division courses, the expectation is that you will spend *at least* 3 hours per week outside of class going over the course material. This time should be spent reviewing the lecture material, discussing course material in study groups, actively doing the readings and completing the problem sets. Keeping up with the work and seeking help from the professors and the TA when you need help are keys to success with this class.

Learning Assessments

Comprehension Quizzes: There will be seven quizzes given throughout the quarter, i.e. one for each subject block. You will have the opportunity to attempt each quiz question twice. The quizzes are scored credit/no credit, with a grade of 70% or higher required to receive credit.

Problem Sets: There will be **five** problem sets assigned throughout the quarter, which will ask you to apply the concepts from lecture and your reading to solve problems. These problem sets are designed to help you synthesize material and be prepared for the final examination. You are welcome to consult with classmates to discuss the problems, but all submitted work should be

your own and in your own words. It is to your own advantage to make sure that you can do all the problems on the problem set, as these are direct preparation for the final.

Final Exam: The final will be comprehensive but will emphasize new material. The exam will be based on concepts discussed in lecture and readings.

Evaluation:

20% - Online quizzes (7 total; only best 6 used in grade, 3.33% each; credit/no credit)

50% - Problem sets (5 total; 10% each)

10% - Attendance and participation in Discussion Section

20% - Final Exam

We will use the Gradebook in Gauchospace to keep track of assessments.

Student Resources

A quick link to [Student Wellbeing Resources](#) is now available at the very top right menu bar of Gauchospace. Nearly all student resources are still functioning remotely during the pandemic, so do not hesitate to reach out to get the help you need.

Non-discrimination policy: All students have the right to learn and participate in a classroom environment free of intimidation, harassment, and discrimination based on characteristics such as gender, race, age, sexual orientation, disability, religious or political beliefs and affiliations. We will address any related issues that surface immediately; please help us to cultivate a positive classroom environment by communicating any concerns that you have.

Accommodations for students with learning and physical differences: We are dedicated to facilitating students with learning and physical differences. Please see us for support for this class.

Providing academic accommodations to students with disabilities is a shared responsibility of the campus. Students with disabilities are responsible for ensuring that the [Disabled Students Program \(DSP\)](#) is aware of their disabilities and for providing DSP with appropriate documentation. DSP is located at 2120 Student Resource Building and serves as the campus liaison regarding issues and regulations related to students with disabilities. The DSP staff works in an advisory capacity with a variety of campus departments to ensure that equal access is provided to all disabled students.

General academic support: Campus Learning Assistance Services (CLAS) offers instructional groups, drop-in tutoring, writing and ESL services, skills workshops and one-on-one consultations. CLAS is located on the third floor of the Student Resource Building.

Gender and Sex Discrimination Policy and Student Support: Under Title IX, university students are protected from harassment and discrimination based on gender and sex. If a student feels uncomfortable or in need of support at any time related to their gender, sex, and/or sexual orientation, please contact your TA and/or course instructor(s) immediately. If a student would like to disclose information related to pronouns, name changes, or identities, we encourage you to do so. UCSB's Resource Center for Sexual and Gender Diversity on the 3rd floor of the Student Resource Building is also available to advocate and be of support to students.

Managing stress: Personal concerns such as stress, anxiety, relationships, depression, cultural differences, can interfere with the ability of students to succeed and thrive. For resources, contact UCSB Counseling & Psychological Services (CAPS).

Mental health services: If you are experiencing any difficulties meeting class requirements, or any difficulties in your personal life, please contact Counseling and Psychological Services. For information, please call (805-893-4411) or visit their website (www.counseling.ucsb.edu).

Copyright of Course Materials

Our lectures and course materials, including PowerPoint presentations, exams, this syllabus, and similar materials, are protected by U.S. copyright law and by [University policy](#). Profs. Carlson and Santoro are the exclusive owners of the copyright for those materials we create. You may take notes and make copies of course materials for your own use. You may also share those materials with another student who is enrolled in this course.

You may not [reproduce, distribute or display \(post/upload\)](#) lecture notes or recordings or course materials in any other way — whether or not a fee is charged — without our express prior written consent. You also may not allow others to do so.

If you do so, you may be subject to student conduct proceedings under the UC Santa Barbara Student Code of Conduct.

Similarly, you own the copyright in your original papers and exam essays. If we are interested in posting your answers or papers on the course web site, we will ask for your written permission.