

Microbes and Marine Ecosystems (Biol 650)

Biology Dept., College of Charleston, Fall 2016

Lectures: Grice Marine Lab 101 Wednesday 5:30pm – 7:00pm

Instructor: Dr. Peter Lee

Email: leep@cofc.edu (*absolutely the best way to contact me*)

Office: Hollings Marine Lab, A-203

Office phone: 762-8858 (HML)

Office hours: At HML, *by appointment only*

Useful texts:

Microbial Ecology of the Oceans; Kirchman

Processes in Microbial Ecology; Kirchman

Bacterial Biogeochemistry: The Ecophysiology of Mineral Cycling; Fenchel, King & Blackburn

Open University Series:

Biological Oceanography – An Introduction.

Marine Biogeochemical Cycles

Ocean Chemistry and Deep-Sea Sediments

Seawater: Its Composition, Properties and Behaviour

Waves, Tides and Shallow-Water Processes

Ocean Circulation

Ecological Geography of the Sea; Longhurst

COURSE OVERVIEW:

The **goals** of this course will examine the links between biogeochemistry, oceanography and microbes in a variety of marine ecosystems. Each lecture will focus on a particular ecosystem or microbial process or microbial community, starting with fundamentals concepts and building up to discussions of how new techniques are answering old questions, asking new ones and changing our views of the marine microbial world. Of particular importance will be how those ecosystems might be impacted and altered as a result of regional and global climate change, and how such changes could impact upper trophic level organisms and marine resources. Examples of topics to be considered include dark carbon fixation, oxygen-minimum and anoxic environments, and the role of sea-ice in regulating polar primary productivity. While an understanding of the physical, chemical and biological processes that control the ecological structure and cycling of biologically important elements such as carbon and nitrogen would be an advantage, it is not a prerequisite for the course. Although these topics are defined areas of biological research, as the semester progresses the links among them will become evident.

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We also will focus on mastering several skill sets (*student learning outcomes*) that will be important throughout your college career and later on as professional scientists:

- 1) Critical thinking and writing skills for marine sciences
- 2) Presenting findings in written and oral formats, and leading discussions with your peers.
- 3) Finding, reading, synthesizing and properly citing primary scientific literature

COURSE POLICIES:

IMPORTANT: YOU CANNOT MAKE UP WORK OR BE EXCUSED FROM WORK WITHOUT OBTAINING AN ABSENCE MEMO! ALL ABSENCES MUST BE DOCUMENTED WITH THE ABSENCE MEMO OFFICE!

S.N.A.P.: If you are a student with a disability and need accommodations, please come see me as soon as possible to discuss arrangements for accommodations.

Lecture attendance: The College of Charleston Absence Policy, as described in the student handbook, will be adhered to throughout this course.

Note-taking: Note taking an important skill to develop as a student so feel free to take notes and ask questions to clarify them if you do not understand something. When required, I will provide handouts of figures/images/etc presented in class as course materials via OAKS.

Exam attendance: If you will have a planned absence on the day of an exam – you must notify me BEFORE the exam is given. Any make up (with a documented reason) must be completed before the exam is returned to the class (1-5 days from scheduled exam time). All excuses must be documented via the Absence Memo Office.

Submitting extra credit assignments: Assignments can be handed to me during lectures. They can also be handed into the Grice Marine Lab Office (9am-5pm Monday to Friday). Please ask the administrative assistant (usually Shelly Brew) to mark the assignment with the date and time that the assignment was handed in.

Cell phone use: Please don't!! Students who use their phones during class perform poorly. If I see a student using a phone during class or discussion (unless instructed to do so), I will mark it down and you will lose participation points. You may ask me how many points that you have lost but I will not report them to you. If there is an emergency (e.g. Cougar Alert System) of course those won't count. You may redeem lost points by answering questions in class.

Class Courtesies:

- 1) Be on time!
- 2) Turn off all electronic devices that beep (or switch them to silent mode).
- 3) Do not talk on the phone, text, IM, post on Facebook, tweet, snapchat or use any other form of social media or conduct any other non-course related computer activities during class time.
- 4) If something important (an emergency) does occur, please step out of the classroom.
- 5) If you arrive late or have to leave early, please sit in the back (and if possible, let me know before the class starts).
- 6) Be courteous to your colleagues.

Academic honesty: As is the tradition at the College of Charleston, the academic honesty policy and the honor code are followed in this course, which includes, but is not limited to, plagiarism, class disruption, courtesy to peers and faculty. Consult the student handbook for further details. If you have questions on how to correctly cite, paraphrase or document literature sources, it is YOUR responsibility to consult me for assistance. We will be reviewing plagiarism and falsifying data as part of this course, so any violations will be reported to the Honors Board. Please note: Any instances found of copying off the internet, will result in a zero for the assignment, possible failure from the course and referral to the Honors Board. Here is the College's official position:

The 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 XF 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 X 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>

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LECTURE & EXAM SCHEDULE

Date	Day	#	Topic
24-Aug	W		<i>Course and Instructor Introductions</i>
		1	The Impact of Sea Ice
31-Aug	W	2	Microbial Diversity: Physico-Chemical Factors
7-Sep	W	3	Microbial Diversity: Biological and Ecological Geography
14-Sep	W		<i>“Mid-Term Exam” (CITI Training)</i> <i>Attendance Verification</i>
21-Sep	W	4	Microbial Primary Productivity <i>Attendance Verification</i>
28-Sep	W	5	The Cycling of Important Elements
5-Oct	W	6	Ocean Acidification
12-Oct	W	7	Microbial Proteomics (Guest Lecturer)
19-Oct	W	8	Oxygen Minimum Zones
26-Oct	W	9	Thermodynamics and Microbes
27-Oct	Th		<i>Last Day to Withdraw</i>
2-Nov	W	10	Chemosynthetic Ecosystems
7-Nov	M		<i>NO CLASS - Fall Break</i>
8-Nov	T		<i>NO CLASS - Fall Break (Election Day)</i>
9-Nov	W	11	Carbon Fixation in the Dark Ocean
16-Nov	W	12	Exobiology
23-Nov	W		<i>NO CLASS - Thanksgiving</i>
24-Nov	Th		<i>NO CLASS - Thanksgiving</i>
29-Nov	T		Exam Question Handed Out
6-Dec	T		<i>NO CLASS - Reading Day (Storm Day)</i>
7-Dec	T	X	<i>Final Exams Begin</i>
14-Dec	W	X	<i>Final Exams End</i>

COURSE REQUIREMENTS & COURSE GRADE

“Mid-Term” Exam	200 Pts.
Presentations (3 @ 100 points per presentation)	300 Pts.
Participation:	100 Pts.
Final Exam	400 Pts.

Total points: 1000 Pts

Final grade is determined from your final score, which is Total Points divided by 10 (and rounded up to nearest integer)

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

DON'T FORGET: Last day to drop with Grade of “W” is October 27th.

Extra Credit

Extra credit can be earned by completing up to a *maximum* of 4 assignments. Each assignment is worth up to 25 points for a maximum total of 100 points. Assignments can be handed in at any time during the semester. Extra credit work WILL NOT BE ACCEPTED AFTER 5:00pm ON TUESDAY NOV 22nd.

Assignment: Marine microbes in the news.

Find an article in a newspaper, magazine or through a reputable online site relating to topics discussed in this class. Submit a write up summarizing and analyzing the article (minimum of 1 page, not including title, figures, tables or references). Be sure to include a citation of the article in your write-up! The summary must also include at least 3 references from the primary scientific literature that support or refute the article’s claims.

Format restrictions: Font must be *Times New Roman, Arial, Calibri* or *Tahoma* with a font size no greater than 12pt. Line spacing to be 1.5 or less. Margins no greater than 1 inch on each side. Points will be deducted for not adhering to the format restrictions.