Marine Science

Spring 2019 ~ Block 5

The sea, once it casts its spell, holds one in its net of wonder forever.
-Jacques Cousteau

And so castles made of sand fall in the sea, eventually.
-Jimi Hendrix (1967)

Full fathom five thy father lies;
Of his bones are coral made;
Those are pearls that were his eyes:
Nothing of him that doth fade,
But doth suffer a sea-change
Into something rich and strange.
-Shakespeare, *The Tempest* (1611)

Instructor: Madeline S. Marshall, Norton 102, mmarshall@cornellcollege.edu (Office phone: 319.895.4309)

Class meeting times & location: 9-11 am and 1-3 pm (Monday-Friday) in Norton Geology 303; meeting times within those time blocks may change during the term as in-class learning, discussions, and projects fluctuate in relative importance.
Office Hours: By appointment. I will make every effort to respond to emails as promptly as possible, but please plan ahead that I will not generally check or answer emails between 8pm and 8am, or as frequently on the weekends. **If you are confused, struggling, or want to learn more, please do arrange to meet with me — there is not time for you to "wait and see" on the block plan.

Textbook: *Introductory Oceanography* (Thurman and Trujillo, 10th edition); other relevant readings will be posted on the course Moodle website. You are responsible for all assigned readings and content; please check Moodle at least daily for readings and assignments.
**You must have a basic set of colored pencils for several exercises in class. You are welcome to share with a friend, and only require blue, brown, yellow, orange, green, and red. Please come prepared to class every day with paper and a writing utensil, as there will be some in-class questions.
*Textbook chapters assigned in the syllabus are required and will enhance your understanding of the topics covered in class and provide fodder for discussion.

Prerequisites: None. (Class size limited to 25 students.)

Course Description & Objectives:
Marine science explores the broad range of factors that both influence, and are influenced by, the world's oceans. Marine science is thoroughly grounded in geology, and our areas of investigation will expand to include aspects of chemistry, physics, climate, biology, and environment, as they relate to the sea (this is NOT a marine biology course). In addition to expanding your scientific understanding of the sea, my goal is to provide you with the foundation needed to become well-informed, critical thinkers who are able to participate in important societal discussions that involve environmental issues related to oceans, climate, and coastal areas.

We will explore the physical, chemical, and biological aspects of the oceans through lectures, critical thinking exercises, and discussions of the primary literature. Through this course, students will be able to:

1. Develop their critical thinking skills as an individual and in a group.
2. Understand the physical, chemical, and biological properties of the world's oceans.
3. Describe the ways in which the oceans are connected to, and drive, major Earth processes, such as: atmospheric and oceanic circulation, climate and weather, plate tectonics, nearshore environments, and sustainability of human and marine populations.
4. Explain the connections between ocean chemistry, nutrients, currents, and biology.
5. Evaluate and discuss current issues in marine science.
6. Design a research question, carry out literature research, synthesize these ideas, and communicate your results in an engaging manner accessible to the public.

This course supports the Educational Priorities and Outcomes of Cornell College with emphases on knowledge, inquiry, and communication.

Evaluation

The assessment tools in this course include in-class participation (e.g., discussions) and short activities (e.g., reading reflections, worksheets) to keep you on track with the material, and credit will be earned by thoughtfully participating in and completing each exercise. There will also be several quizzes and two exams covering class material. These exams will check your comprehension of the ocean's properties and will emphasize your ability to apply the material you've learned from readings, lecture, activities, and discussion to assess hypotheses and solve problems. You will not have a cumulative exam, but your final project will serve as a higher-order assessment for this course, combining research, synthesis, evaluation, and communication as you create your final products.

Grade Breakdown	
Discussion participation in class/online	15%
Reading reflections	10%
Worksheets/Activities/Blue Planet	15%
Quizzes	10%
Exams (midterm and final, 15% each)	30%
Final Project	20%

Blue Planet I - BBC Documentary Homework

This superb documentary series on the oceans and the life within them is a useful tool for you to become more familiar with marine ecosystems. While we will not spend class time on these videos, you are asked to watch them as homework throughout the block and respond to a series of questions on each (for credit). This documentary is available for streaming on Netflix, or is on reserve on DVD in Cole Library (you may check out each disk, which contains two episodes, for up to 3 hours, and you are welcome to reserve a room in the library to watch these as a group. You are encouraged to discuss with classmates the answers to questions (and the very cool marine animals and environments!), but each student must turn in their own

Grading Scale	
94-100 90-93	A A-
87-89 83-86 80-82	B+ B B-
77-79 73-76 70-72	C+ C C-
67-69 63-66 60-62	D+ D D-
59 or below	F

responses on Moodle. If interested, there is a new second series (Blue Planet II) that is excellent, though you don't need to answer questions about it — available on Netflix or in Cole Library.

Success in the Course

My goals for you upon completing this course are for you to have the ability to read and interpret scientific ideas and articles so you will be able to apply this knowledge to your real-world observations and assessment of current issues, to be able to communicate scientific concepts and content to a non-specialist audience in a comprehensible and engaging manner, and make connections between Marine Science and your other courses (there are many!). Some useful guidelines for succeeding in this course:

1. Push yourself to become fluent in the foundational material and ask questions to ensure you fully understand concepts in class. (Try explaining a topic to a friend or roommate who is not in the class to make sure you know can clearly articulate your ideas.)
2. This course may present new challenges related to spatial reasoning or mathematical concepts, and it is imperative that you leave behind your aversions to those subjects in order to succeed.
3. Revise your writing assignments — a first draft is not the final copy. Proper spelling, grammar, and punctuation are expected.
4. Take advantage of your textbook, readings, classmates, and the instructor as key resources – each will add more depth and another avenue of learning to your experience.
5. The library offers one-on-one tutoring services in geology through the Office of Academic Support and Advising. Contact Brooke Paulsen (bpaulsen) to request a tutor. The sooner, the better!

Class Attendance and Participation Policy

You are expected to attend all class meetings. If you have an unavoidable obligation, you must notify the instructor as soon as possible, and we can discuss how to help you make up and keep pace with the class. It is your responsibility to know anything I say in class (including changes in the schedule, etc.) and for having any handouts or assignments passed out in class — most important information will also be on Moodle (check at least daily!), but do not rely solely on Moodle. If you do miss a class, you should get notes from a classmate and handouts/assignments from me the day you return to class. Attendance will factor into your participation grade.

*You are required to participate. Silently waiting as your classmates answer questions or discuss topics is not acceptable. Your contributions should be substantive — it's **always** possible to find (a) something you learned, (b) something that surprised you, and/or (c) something

that confused you or that led to more questions. Finally, do not sleep/doze off during class. You will be asked to leave. If you are feeling sleepy, please do feel free to stand up and move around; you can also let me know it's time for a short break.

Email Etiquette
It's always worth a reminder of acceptable email practices: I will only respond to your emails if they include a descriptive subject line, a salutation (not "hey" or "sup, dude"), proper spelling and grammar, and a signature or closing. If in doubt, address your emails and papers to "Professor _____" (not "Ms.").
https://www.insidehighered.com/views/2015/04/16/advice-students-so-they-dont-sound-silly-emails-essay

Late Work and Make-Up Policy
Due to the fast-paced nature of the class, policies are necessarily strict. I will **not** accept late assignments for a grade. If an assignment is listed in the syllabus (or on Moodle) as due on a certain day, be prepared with it at 9am, unless otherwise specified. When in doubt, ask! If you require an extension, please see me well before the assignment deadline. Please note that group activities in class inherently cannot be made up. Exams can be made up only in exceptional circumstances and/or by prior arrangement with the instructor.

Academic Integrity
All members of the Cornell College community are expected to act with academic integrity; an important aspect of this is respecting the work of others. Students must explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his own work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading "Academic Honesty."
This is different from working with a partner on a project, which is encouraged. Learning how to communicate your scientific thinking to others is an important skill, and discussing hypotheses with others is an excellent way to further your understanding of a subject. However, I do not condone plagiarism in any way; if you plagiarize an assignment, you will receive a zero; if it happens again, you will be reported to the Dean and receive NC for the course. *Write independently, using your own words and conclusions, and acknowledge collaborators.

Technology Policy
Cell phones must be off (silent, not vibrate) and put away during all class periods. I do NOT want to hear or see them. When using laptops or tablets for class activities, I expect you to use them responsibly and respectfully. If you are using them for non course-related activities, I will give you a verbal warning. If this behavior continues, I will ask you to leave and your grade will be affected.
*You are highly encouraged to take notes and sketch diagrams by hand during class. This is proven to promote better listening and synthesizing of information, and results in a deeper understanding and longer memory of the material. (https://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/)

Academic Accommodations
Cornell College is committed to providing equal educational opportunities to all students. Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability-related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml.
*Please do discuss with the instructor if you are a person with CVD (color vision deficiency), so that labs and other course material can be made accessible (and more enjoyable) for you.

Add/Drop/Withdrawal
This course may be added or dropped within the first three days of the block, as per College policy, with the permission of the instructor. A withdrawal may be granted on the 15th day, provided that you have completed all assignments, participated fully in course activities, and attended all class sessions (1 *excused* absence permitted). NOTE: A 15-day drop will not be granted to students who, in my estimation, have not made a good faith effort to learn and/or complete the course material. A health withdrawal (WH) may be obtained if health issues are serious enough to interfere with course completion. To qualify, you must speak with a health professional either on or off campus and receive written documentation.

See Moodle for Schedule (subject to change)