GE-251C: The Coastal Ocean

Instructor: Professor Meg Estapa
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Office hours: Fri. 9-11 am, or by appointment

Course Description

An exploration of the physical, biological, and anthropogenic processes that impact marine environments extending from estuaries to the edge of the continental shelf. With the majority of the global human population living near a coastline, the rationale for studying coastal ocean dynamics has never been stronger. Students will discuss topics such as river deltas, estuaries, beaches, coastal circulation, and nearshore marine ecosystems. An emphasis will be placed throughout the course on the ways humans interact with and impact the coastal ocean (e.g. pollution, eutrophication, coastal development, resource extraction) 3 credits. 3 hours lecture per week. Prerequisites are: GE-101 or GE-112, or permission of the instructor.

Class Meetings

Lecture: MW 2:30-3:50 pm, 3 hours per week, Dana 165

Learning Goals

Students completing this course will be able to:

- Understand the physical fluid dynamics governing waves, tides, estuarine circulation, river plumes, coastal currents, and upwelling along fronts;
- Understand the geologic and anthropogenic processes that shape coastal landforms;
- Consider interactions between coastal marine ecosystems and the physical environments hosting them, as well as potential human impacts on these ecosystems;
- Understand the impacts and benefits of the extraction and cultivation of energy, food, and other economic resources from the coastal ocean.
- Create digital, graphical representations of data that clearly communicate scientific results, by making effective design choices.
- Develop effective oral communication skills to deliver scientific information to an audience of peers

Course format

Lectures and analysis workshops: Our lecture periods will consist of a combination of lecture and in-class activities. The coastal ocean is one of the best-observed parts of the marine environment, so whenever possible, we will incorporate analyses of real-world datasets into our investigations. Every other week an in-class workshop will lead into a problem set or written report to be completed as a homework assignment.

Readings: There is no central textbook for this course. However, we will use selected readings from textbooks and from the primary scientific literature, and there will be an assigned reading most weeks. Required readings will be provided to you on Blackboard. In addition, optional

background material will be provided when necessary to help you get up to speed on topics that may be new to you. It is expected that everyone in the class will have different levels of preparation in oceanography, geology, and environmental science, so the optional readings may be especially useful to you at some times and already familiar at others.

Quizzes and Exams: Five in-class quizzes will be given over the course of the semester to assess your understanding of the course material. A cumulative final exam will be given during Finals Week. Exams and quizzes will be mixed-format and designed to test your ability to think critically about the course material.

Class Policies

Attendance: As with any class, attendance and active participation are key. When you are absent or unprepared, it not only impacts your own learning experience, but also that of your classmates. I will strive to be on time and prepared for every class, and I expect the same from all students. If you are late once or twice it's OK, but please enter quietly and find a seat quickly. If you are sick, please rest and recover – but also inform me ahead of your absence. Unless you have a true emergency (for which I will expect documentation), a quick email ahead of class is all it takes. If I excuse your absence, I will still expect you to turn in any written assignment that was due, and make up any missed in-class work. Beginning with your 2nd *unexcused* absence, a 4% penalty to your final grade per unexcused absence will apply, plus a zero for any work due that day. Unavoidable conflicts must be cleared with me well in advance.

Electronic Devices: Electronic devices and cell phones are allowed in class as long as they *do not distract you or those around you.* This means, for example, that cell phones must be silenced, and laptops used only for activities immediately relevant to this class (e.g., note-taking, data analysis, or when the class is actively researching a topic online). This policy, in which electronic devices are present but silent and unobtrusive, reflects the norms of the professional world that you will enter after you graduate. However, if I notice that you or your neighbors are distracted by your device(s), I reserve the right to restrict their use by everyone, for the remainder of the semester. Electronic devices and cell phones are not allowed during quizzes or exams.

Access and Office Hours: I am available for drop-in meetings during my posted office hours. If you are unable to meet during those times, you are welcome to make an appointment with me at a mutually convenient time. The best ways to set a meeting are to catch me in class or email me. You can also reach me by calling my office. I respond to student messages as quickly as possible, and you can expect a response to e-mail requests typically within 48 hours and often much sooner.

Academic Integrity: Plagiarism, cheating, and other violations of academic integrity will not be tolerated, and will result in consequences in accordance with the Skidmore College Student Handbook, https://www.skidmore.edu/student_handbook/honor-code.php. When writing any kind of academic document, sources of information, including internet sources, must be properly cited, in accordance with the Skidmore College Honor Code. Detailed instructions regarding citation conventions are available from the Library.

Group work: You may work with classmates on homework assignments, but *the individual work you turn in must be your own*. If you work with others, you must note somewhere on the assignment who your study partners were. During the semester, there may be occasions where I will ask you to work on an assignment as part of a group. After you present or hand in a group assignment, I will ask each group member for a brief, written evaluation of their own and their team members' contributions to the effort. There may also be occasions where I ask you to work individually without collaboration, and in these cases working with others would constitute an academic integrity violation. I will be clear about my expectations in all cases.

Students with disabilities. If you are a student with a disability and believe you need academic accommodations in this or any class you must make requests for such accommodation to Meg Hegener, the Coordinator for Students with Disabilities. You will also need to provide documentation which verifies the existence of a disability in support of your request. Accommodations must be approved in advance of exams to allow time to make any supporting arrangements. For further information and assistance with this process, call 580-8150, or stop by Student Academic Services in Starbuck.

Grading
Quizzes (5) = 30%
Homework assignments = 30%
Final exam = 30%
Participation = 10%

Unless otherwise specified, all homework assignments must be submitted on Blackboard by 8am on the due date.

Tentative Schedule (continued on next page, and subject to change!)

Week	Monday	Wednesday
Jan. 22-25	Martin Luther King Jr. Day (no classes)	Introductions and overview
Jan. 28-Feb. 1	River deltas	Workshop 1: Delta subsidence
Feb. 4-8	Global rivers	Quiz 1; Homework 1 due
Feb. 11-15	Estuaries: physical processes	Workshop 2: Hudson river estuary
Feb. 18-22	Workshop 2, continued	Estuaries: Chemical processes; Homework 2 due
Feb. 25-Mar. 1	Estuaries: Pollution	Quiz 2
Mar. 4-8	Tides and Waves	Workshop 3: Waves
Mar. 11-15	Spring Break	
Mar. 18-22	Coriolis effect; Homework 3 due	Quiz 3 (on Waves, Tides and Coriolis effect)
Mar. 25-29	Shelf circulation	Ocean renewable energy
Apr. 1-5	Harmful algal blooms	Workshop 4: Hypoxia
Apr. 8-12	Benthic biogeochemistry and ecosystems; Homework 4 due	Quiz 4
Apr. 15-19	Coral Reefs and tropical coasts	Workshop 5: Reef threats

Week	Monday	Wednesday
Apr. 22-26	Arctic coasts; Homework 5 due	Arctic continued; Quiz 5
Apr. 30	Wrap-up: Coasts in the Global Ocean	
Tues. May 7	**Final Exam: 9 am - 12 pm**	