

# GEOLOGY 109

## General Oceanography

**Required text:** Trujillo & Thurman, *Essentials of Oceanography*, 10<sup>th</sup>  
 (*older editions acceptable*), [032166812X](http://032166812X)



### Lecture schedule:

	date	topic	readings
1	M 23 Jan	intro	
2	W 25 Jan	Origins of the oceans & life	ch. 1
3	M 30 Jan	“	“
4	W 1 Feb	Plate tectonics	ch. 2
5	M 6 Feb	“	“
6	W 8 Feb	Marine provinces	ch. 3
7	M 13 Feb	“	“
8	W 15 Feb	Marine sediments	ch. 4
	M 20 Feb	<i>holiday</i>	
9	W 22 Feb	“	“
10	M 27 Feb	<b>Midterm 1</b>	-
11	W 29 Feb	The nature of water	ch. 5
12	M 5 Mar	“	“
13	W 7 Mar	Ocean circulation	ch. 7
14	M 12 Mar	“	“
15	W 14 Mar	Waves	ch. 8
16	M 19 Mar	“	“
17	W 21 Mar	The 2004 Indonesian tsunami	“
18	M 26 Mar	The 2011 Tohoku tsunami	“
19	W 28 Mar	Tides	ch. 9
20	M 2 Apr	“	“
21	W 4 Apr	<b>Midterm 2</b>	
	M 9 Apr	<i>Spring break</i>	

	W 11 Apr	<i>Spring break</i>	
22	M 16 Apr	Coasts	ch. 10
23	W 18 Apr	“	“
24	M 23 Apr	Pollution <i>paper due</i>	ch. 11 (> p. 333)
25	W 25 Apr	“	“
26	M 30 Apr	Climate	ch. 6, ch. 7
27	W 2 May	“	“
28	M 7 May	Marine life	ch. 12
29	W 9 May	Marine life	ch. 13
30	M 14 May	Marine life	ch. 14
31	W 16 May	Marine life	ch. 15
32	M 21 May	<b>Final exam</b> , 11:10-2:00 pm	

## Grading:

midterm 1	25%
midterm 2	25%
final (comprehensive)	35%
presentation	5%
field trip	5%
paper	5%

- Exams will include multiple-choice, picture identification, short answers, and longer essay questions derived from the lectures and assigned readings. Answers will be scored according to accuracy, completeness, and clarity.
- Please bring Scantrons (882e, green) and #2 pencils for exams.
- Grade assignment will be by a 90%-A, 80%-B, 70%-C, 60%-D, 50%-and below-F scheme.



## Presentation:

I want you to give brief (10 minute) presentation on a topic to be selected. These topics will match what we are going over on a particular day and will complement the lecture.

If you wish to speak without software, that's fine, but most people will prepare a PowerPoint or Keynote for their talks. You can read my thoughts on making effective presentations here: <http://sciencedenial.blogspot.com/2011/10/whats-wrong-with-scientific.html>.

You can email me finished talks, bring them in on a flash drive or CD, or use your own laptop. If you are bringing in a Mac laptop, be advised that you will need a VGA adaptor specific to your Mac model.

## **Field trips**

I would like you to attend at least one Saturday or Sunday field trip during the semester. I will announce dates later in the term. You should plan on providing your own transportation or caravanning with other students. Depending on tide conditions, we may explore some of the coastal tide pools. We will also examine rocks from a fractured remnant of ancient sea floor--which conveniently happens to be right under our feet. :)

## **Paper**

I would like you to write a brief paper (1000 word min) on a topic to be selected, due Mon 23 Apr. This paper is meant to help you gain more detailed knowledge in one particular aspect of a topic we explore in class. This paper should follow normal MLA formatting.

## **Reaching me:**

The quickest way to get ahold of me is: [geology.prof@yahoo.com](mailto:geology.prof@yahoo.com)

I can also be reached at: [snewton@mycom.marin.edu](mailto:snewton@mycom.marin.edu)

My office phone is 415.485.7526

## **Office hours:**

Where: Science 165 (across hall from classroom)

When:

- MW: 10-11 am, M 2:30-3 pm
- TTh: 5:30-6:30 pm
- I will be happy to arrange other meeting times, if needed

## **Course web page:**

This course has a Moodle page, <http://moodle.marin.edu/course/view.php?id=1717> on which I will post lecture outlines, links, and notes.

I will also repost this information on: <http://www.blackquartz.com/geology.html>

Lecture notes will be posted as .pdf files, and students have benefited in previous terms from printing notes out beforehand as a guide for note-taking.

## **Makeup Tests:**

I will be willing to work around scheduling conflicts for midterms, so long as you notify by email well *before* the exam.

## **Catalog description**

Geology 109 General Oceanography. 3 units. No prerequisites. Three hours of lecture weekly. This general survey course in ocean science is open for any student interested in the physical and biological processes that have formed and maintain the health of Earth's oceans and seas. This course is particularly important for students considering a career in marine science or technology and is strongly encouraged for environmental science majors.

## **Student learning outcomes**

Upon completion of this course, students will be able to:

1. Describe the scientific method using examples such as the proof of Earth's spherical nature or its rotation;
2. Explain direct inverse relationships as illustrated using the factors related to the law of gravitation and the development of empirical laws;
3. Explain gravitation, the Earth's rotation and revolution in the production of the tide producing forces and observed tide curve characteristics;
4. Discuss physical, chemical, and evolutionary models of: the Earth's internal zones (oceanic and continental crust, mantle and core as well as lithosphere/ asthenosphere models); the ocean's water, salts and gasses; the atmosphere; and the marine biosphere;
5. Distinguish the interactions between atmosphere and oceans which create wind waves as well as surface and thermohaline ocean currents
6. Explain the interactions between lithosphere and oceans in the production of seismic sea waves which contribute to the variety of shorelines;
7. Identify the interactions between oceans, land and organisms in marginal ocean environments which contribute to the variety of shorelines;
8. Define the interrelationships between physics, chemistry, crustal geology and the distribution of marine sediments;
9. Identify the physical, chemical, geological and biological characteristics of the San Francisco Bay estuary, ways in which man has altered the natural environment, and the implications of such alterations.

### **Critical Thinking**

1. Presented with a structurally deformed outcrop of ophiolitic rocks the student will identify the types of folds and faults that have deformed the exposed rock, the tectonic forces involved in the deformation and the relative timing of the events that have led to the formation of the ophiolite with special emphasis on the location of ophiolitic rocks exposed in Marin County.
2. Given a selected set of igneous, sedimentary and metamorphic rocks the student will be asked to define that general area of the ocean basin those rocks types may form in.

3. Students are required to draw and label a diagram depicting the plate tectonic processes and resulting rock types that over geologic time led to the formation of the western margin of North America.
4. Discuss in specific detail the physical processes that control the north Pacific gyre and the changes observed in this gyre during an El Nino year
5. Discuss in specific detail the oceanic control over the weather patterns of the San Francisco Bay area.

### **Other stuff:**

Please turn off cell phones and pagers prior to class commencement. Please do not text-message.



This course is meant as a transferable equivalent of an introductory oceanography course at the university level. For attendance and conduct policies, please see the catalog.

Plagiarism occurs when a student misrepresents the work of another as his or her own. Plagiarism may consist of using the ideas, sentences, paragraphs, or the whole text of another without appropriate acknowledgement, but it also includes employing or allowing another person to write or substantially alter work that a student then submits as his/her own. Any assignment found to be plagiarized will be given an “F” grade (and could result in an F in the class). All instances of plagiarism will be reported to the Dean of the Division, and further action may be taken by the College.

I wish to make this course as accessible as possible to students with disabilities or medical conditions that may affect any aspect of the course assignments or participation. I encourage you to communicate with me at the outset of the course any accommodations that will improve your experience of (or access) to the course. If you feel this is appropriate for you, I encourage you to talk to Disabled Student Services, at 415.485.9406, about how to improve your experience here.

### **General study tips:**

The following is a list of suggestions for you to improve your experience for my class:

1. Take notes.  
Most terms there are some students who just sit in class, their arms folded, staring at me and not taking notes. I don't know how they expect to pass the class—and, generally, they don't. To do well, at a bare minimum, you need to write down everything important I say in the class.
2. Prepare for essay questions by outlining.

Essay questions will not be a surprise to you in this class; when you see the test question, you'll realize that I spent a lot of time discussing these major topics. Before the test, take a blank sheet and try to answer a major question cold. Then go back to the notes and see what you missed. Then repeat this process a day later, gradually filling in the gaps. Using this method, you'll have it firmly in your grasp by test time.

3. Make a mnemonic to help you remember key points.  
Many years ago, in a class on graphic design, I learned that the four cardinal aspects of good design are: Contrast, Repetition, Alignment, Proximity. How do I remember these?
4. Learn the vocabulary.  
Science requires learning a lot of vocabulary, as does any foreign language. If you were taking German or Russian, you would of course make flash cards to help you learn the vocabulary—and most importantly, to help you identify which words you had not mastered. Do the same in this class.
5. Don't sweat the spelling.  
Ey ham naught goin two take uff fur schpellin sow lang az eye kan mayk out da wurd. Eye no itz hawd with zeez weird siunc werds.
6. Never use "like."  
Using "like" in formal writing is a mistake. Do not say what an object is *like*; say what it *is*. You might object that you want to make analogies: A ship to an ocean is like a plane to the sky. Don't try to be cute. ☺ Just tell me what it *is*.
7. The possessive of "it" does not use an apostrophe.  
Some professors think that if a student does not know this by college, then it's a hopeless case. However, I am an optimist, and I think that this mistake—and its hold on students—well, it's just one more thing to learn.
8. Leave margins. On essay questions, do not take up every bit of space on the page. Leave me some room to write comments. Ask for more paper if you need it.
9. "Data" is plural. Do not write, "The data shows..." Instead write: "The data show..."
10. Be specific. Do not be vague.  
Science is all about the details. Back up your statements with numbers and facts.