



*We shall not cease from exploration  
and the end of all of our exploring  
will be to arrive where we started  
and know the place for the first time.*

T. S. Elliot, The Four Quartets

**Geology 20: General Oceanography ONLINE**  
*An Introduction to Geological and Physical Oceanography*  
**Summer Quarter, 2015**  
**GEOL 20 (4.0 units)**  
**Faculty Christopher DiLeonardo, Ph.D.**

**GEOL 20.64Z**  
**ONLINE**

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*please write: "Oceanography Student" in subject line.*

**Office Hours**

**Tu, W, Th 10:30 am to 11:30 am**  
**W 9:30 am to 10:30 am by appointment**

**Course Delivery: De Anza College Catalyst**  
<http://catalyst.deanza.edu>

**Course Description**

A review of modern concepts in marine geology and physical oceanography that describe the oceans as a unique environment of critical importance to human wellbeing. Emphasis is on specific topics: sedimentary and structural framework of the ocean margins and deep basins, theory of plate tectonics, water mass formation, wind-driven ocean currents, surface water waves and beaches, and tides. A discussion of shipboard instrumentation and undersea vehicles is included.

**Student Learning Outcomes (SLOs) and Course Objectives**

*Student Learning Outcomes are overarching, clear, and assessable statements that identify and define what a student is able to do at the successful completion of a specific course. These outcomes may involve a combination of knowledge, skills/abilities, and/or attitudes that display behavioral evidence that learning has occurred at a specific level of competency.*

**Student Learning Outcomes (SLOs) for GEOL 20: General Oceanography**

1. Apply the principles of scientific methodology to test hypotheses as to how the Earth's oceans work as an integrated system.
2. Use observations and data to characterize the dynamic Earth processes that act to shape the ocean floor and analyze the record of these processes within marine sediments and oceanic crust.
3. Analyze the dynamic movement of the water column of the oceans, through an application of the physical principles of ocean currents, waves, and tides and their effect on coastal systems and processes.
4. Apply scientific methodology and the principles of oceanography to analyze the impact of the ocean system on humanity, from specific natural hazards and the availability, use, and distribution of ocean resources.

## Course Objectives for GEOL 20: General Oceanography

*The course objectives for Oceanography expand out of the overarching Student Learning Outcomes. In general they are intended to foster an understanding of scientific approaches to problem solving and a specific knowledge of the Earth's ocean as an integrated system.*

- A. Examine the use of scientific methodology through the history of geographical and scientific exploration of the ocean system.
- B. Describe the ocean system as an integral part of Earth's environment, with emphasis on those features and processes that are uniquely oceanic.
- C. Examine Earth's plate tectonic framework. Explain the relationship between earthquakes and volcanoes, particularly those in western California, and the geological changes in the sea floor.
- D. Compare the variety of marine geological provinces, from continental shelves to the deep sea, and the physical and geological characteristics of these provinces.
- E. Analyze the chemical and physical properties of seawater, and the importance that these properties have in maintenance of life on the planet.
- F. Describe the distributions of temperature, salinity and density in the oceans, and how the oceans achieve these distributions.
- G. Examine the impact of waves, ocean currents, and tides on the ocean system. Describe the impact of these processes on climate, maritime operations and human exploitation of the marine environment.
- H. Examine critical issues facing the marine environment.
- I. Appreciate the role of oceanographic research in resource development, pollution control, national security, and understanding Earth's climate system.

### Required Materials

**Textbook:** *Essentials of Oceanography* by Trujillo and Thurman 11<sup>th</sup> ed.

**Other:** Regular and reliable access to a computer with good Internet connection (Required).

**Journal:** A notebook to keep activity answers for your use during activity online reviews and for exams. I will refer to the notebook you are keeping as the *Ocean Discovery Journal*.

### About Online Classes

Online courses are different from traditional lecture courses. They offer much more flexibility in completing assignments and learning material from sources other than traditional lectures. However, you will need to have good self-discipline in completing these tasks, especially in a timely manner. This is a four-unit course. This equates to four hours of work per week during a regular quarter. This does not include the extra personal study time needed in addition to those mandatory class hours that the State of California and De Anza College requires. If you are planning on mastering the material covered this quarter, you will need to make sure you 1.) Are engaged in the course at least 4-hours a week (not including study time); 2.) Login at least two different days during the week (to maximize your forum participation points); 3.) Prepare the exams using your notes from online learning tutorials, your completed activities, and your textbook readings.

### Modules

A module is specific and discrete learning segment that leads to the understanding of a given topic. Modules will be assigned by topic on Catalyst. Modules include all assignments that will be completed for a particular topic. A module is a specific and discrete learning segment that leads to the understanding of a given topic. Modules are to be completed within the dates specified on the syllabus (schedule is below). More details on

these assignments, including which ones will be turned in, as well as how they will be turned in are explained below and on the assignments themselves.

### **Learning Tutorials**

Learning tutorials online will be used instead of traditional lectures. They may incorporate video lectures or other materials online. Any lectures will be delivered via a link to a YouTube presentation other materials will be offered via a link to an online learning resource. Missing the learning tutorials, much as missing lectures in a traditional class, will severely impact your learning of the subject and impact your work on exams. As much of the exam material comes out of learning tutorials you are encouraged to discipline yourself to go through them in each module and take note. Notes do not need to be turned into me, but will become invaluable resources along with your textbook in completing the exams.

### **Forum Participation**

One time each week for C-level work, or a couple of times a week for A-level or B-level work you will be required to participate in an online forum on topics involving the earth sciences and atmosphere. More details of what will be expected of you can be found in a document called “Forum Participation Guidelines” located at the top center of the course website. Forum posts are not accepted late for any reason. However, you will be allowed to make up one week’s worth of forum participation as there will be a make-up forum provided at the end of the quarter during Final Exam week.

### **Activities**

In each module will be an inquiry-based activity that leverages the learning on that topic. You will commonly write answers down on activity worksheets that you will keep in your *Ocean Discovery Journal*. Once completed you will answer questions online that I will review regarding the activity you completed. The work in your *Ocean Discovery Journals* is for your own use and will not be collected, but it will not be possible to complete the activity reviews without doing the activity first and referencing your journal. Also your journal will be invaluable in preparing your exams for the course.

### **Readings**

This class is designed around an integrated approach to learning. It is very important that you do the reading in the textbook assigned each week. The book will also be an invaluable resource for preparing the midterm and final exam for the course.

### **Academic Policies**

You are advised to consult the [College Catalog](#) or [Student Handbook](#) regarding issues of discipline, cheating, etc. The counseling staff and I are also available to discuss college policy as the need arises.

### **Academic Progress**

You are encouraged to monitor and discuss with me your academic progress in this course. The grading system is clearly outlined below and there will be no “special” projects available to make up for *poor* academic performance. *Note: Failure to properly withdraw from the course will result in a letter grade of “F” for the course.*

### **Field Study**

Enrolling in this course during the term is the option of the student. If the student chooses to enroll in Geology 20 he/she MUST fulfill a field study option (Module 10). Student may attend the Introductory Field Workshop\*. Please see the schedule below for the date and time of the field workshop. As required by state law all student’s participating in the workshop MUST sign the appropriate waiver of liability. Student’s not wishing to participate or who do not wish to sign the waiver and release of liability will be dropped from the class.

For students who live outside of the San Francisco Bay Area or have a conflict with the field trip date... please check the Catalyst site for an alternate field study assignment.

**\*\*Americans With Disabilities Act (ADA) Exemption from Field Work:** *Students with physical limitations or other special needs that would preclude participation in fieldwork will be given an appropriate alternate assignment. Every reasonable accommodation will be provided so that all students can participate and*

benefit from the field experience. If you have questions or concerns regarding access and participation issues please contact your instructor. This exemption only applies to students with documented disabilities that have been verified through the Disabled Students Program & Services Office at De Anza College.

## Grades

Grades are based on objective assessment in the course and your participation in hands-on activities.

1,000 pts for the class:

300 pts. Activities and Field Work

Activities 250 pts. Given as in-class collaborative assignments.

Field Activity\* 50 pts. Mandatory coastal field workshop. Students are responsible for their own travel arrangements.

200 pts. Forum Participation

Weekly Forum Participation 200 pts. Done weekly with the possibility of making up one week during the final exam week. Note each week's forum is worth up to 20 points (see online rubric on Catalyst course site), the total score for forum posts is multiplied by 2.

500 pts. Examinations (2 @ 250 pts. each):

Midterm Exam: Ocean Floor 250 pts.

Collaborative preparation with online testing.

Part A 200 pts Basic Knowledge and Understanding Questions

Part B 50 pts Application and Deeper Understanding Questions

Final Exam: Physical Oceanography and Coastal Processes 250 pts.

Collaborative preparation with online testing.

Part A 200 pts Basic Knowledge and Understanding Questions

Part B 50 pts Application and Deeper Understanding Questions

## Final Grade

Plus	Letter Grade	Minus	Rubric
<b>A+</b> > 999 pts	<b>A</b> = 895 to 999	<b>A-</b> = 875 to 894	Student displays both a level of knowledge and understanding of the ocean system superior to the general public.
<b>B+</b> = 855 to 874	<b>B</b> = 771 to 854	<b>B-</b> = 750 to 770	Student displays a level of knowledge of the ocean system significantly above that of the general public; and a basic understanding of the principles governing the ocean system.
<b>C+</b> = 730 to 749	<b>C</b> = 625 to 730		Student demonstrates a basic knowledge of the ocean system above that of the general public.
<b>D+</b> = 605 to 624	<b>D</b> = 520 to 604	<b>D-</b> = 500 to 519	Student does not demonstrate knowledge and understanding of the ocean system beyond that of the general public.
	<b>F</b> < 500 pts		

Final grades are "non-negotiable" and are based entirely on your performance in class work, collaborative experiences, subject mastery tests and final exam. Once posted, grades cannot be changed unless there is a recording error. This is a matter of State Law. Please don't ask!

\*Each student is required to complete the field trip requirement and the Midterm and Final Exams to pass the course. Students who fail to participate in either exam according to the schedule will fail the course.

## Class Schedule

*Schedule is tentative and may be changed as needed by the instructor*

<u>Module</u> Date Posts	<u>Topic:</u> Assignment	<u>Reading</u>
<b>PROLOUGE: THE SCIENCE OF THE WATER WORLD</b>		
<b>01</b> week 1: 06/29	Science and the Study of the Water World <i>An Introduction to the Course and the Science of Oceanography</i>	Chap. 1
<b>PART I: THE OCEAN FLOOR</b>		
<b>02</b>	Secrets of the Deep <i>Exploring the Ocean Floor</i>	Chap. 3
<b>03</b> week 2: 07/06	The Dynamic Ocean Floor <i>Plate Tectonics &amp; the Origin of Ocean Basins</i>	Chap. 2
<b>04</b>	The Record of Ancient Oceans <i>Marine Sediments and Erosion of the Ocean Floor</i>	Chap. 4
<b>05</b> week 3: 07/13	<u>Midterm Examination</u>	
<b>PART II: PHYSICAL OCEANOGRAPHY</b>		
<b>06</b> 05/11	The Rising Tide: Oceans, Currents and Carbon Dioxide Ocean Circulation & the Climate System	Chap. 7
<b>07</b> week 4: 07/20	The Relentless Sea <i>Waves on Water</i>	Chap. 8
<b>08</b>	Rising Seas <i>Tides and the Rhythmic Rise and Fall of Sea Level</i>	Chap. 9
<b>PART III: COASTAL SYSTEMS</b>		
<b>09</b> week 5: 07/27	The Changing Coastlines of Planet Earth <i>Beach Processes and Coastal Erosion</i>	Chap. 10
<b>10</b>	The Oceans at Our Reach <i>The Coastal Ocean and Our Legacy on a Water World</i>	Chap. 11
<b>11</b> week 6: 08/03	<u>Coastal Field Study</u> <i>Coastal Field Studies see class Catalyst site for details and options for completion of the field study requirement. One option is to attend the Oceanography Field Workshop on Saturday 8/03 from 1:00 to 2:15 pm see site for details.</i>	
<b>12</b>	<u>Final Examination</u> <b>Due: 08/07 5:00 pm PDT</b>	