



*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
An Introduction to Geological and Physical Oceanography
Summer Quarter, 2015
GEOL 20 (4.0 units)

GEOL 20.01
Lec. M, Tu, W, Th @ 12:30 to 2:20 pm

Faculty Christopher DiLeonardo, Ph.D.
Office S14a **Office Hours**
Phone (408) 864-8632 email: dileonardo@deanza.edu

TBA during Summer Quarter by appointment only

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 (Currently in the 11th ed. But the last couple will still work for the course.)

Ocean Discovery Journal: Each student will keep their completed work from discussion activities in a notebook (journal).

Other: Pencil, eraser, millimeter-scale ruler and calculator.

Class Format and Requirements

Oceanography is a four-unit course consisting of four-hours weekly workshop-style instruction, integrating lecture, discussion and one Saturday field trip. The discussion meetings will include either a video viewing and discussion, or a hands-on activity. These activities are designed to give you some practical experience with methods and principles common in oceanography. Students must download the discussion activity for the week from my weekly email to you. You must look this activity over BEFORE coming to class and have it to participate in the activity.

Attendance Policy

Attendance is critically important to your success in this course. In general missing more than a week's worth of class time may result in dismissal from the course. This is NOT automatic though and if you intend to drop the course it is your responsibility to initiate the drop with admissions and records. Also you may not drop OR be dropped from the course once the last day to drop has past.

Note: Failure to properly withdraw from the course will result in a letter grade of "F" for the course.

Tardiness

Arriving late to class or lab can be terribly disruptive to the educational process. It may not seem like much but each individual arriving late distracts from what we are doing in class. Moreover, as many important announcements and the framework of the lecture (putting the learning into perspective) is presented at the beginning of class, these few minutes have HUGE impact on your own learning.

Cheating

Don't do this! If you're found to be engaging in academically dishonest behavior ("cheating") while participating in this course, you will receive a letter grade of F for the assignment and may be referred to the Dean of Students for college disciplinary action. Students found to be cheating on any assignment will call into question the validity of their course assessment and must retake ALL assessment instruments to insure their voracity. There are absolutely NO exceptions to this policy.

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.

Cellular Phones, Tablet Devices (iPADs), Computers, other electronics

Using any electronic devices with the exception of laboratory computers can really derail the educational environment of the class and is strictly prohibited. Computers used to take notes during lecture are allowed as long as they are not being used for another purpose or for online access of any kind. Laboratory computers are for completing laboratory activities only and not to be used for other purposes. If you are found to be using any electronic device during a test, quiz, or exam, you will receive a 0 and be asked to leave the class for the day. This will be considered an absence for purposes of the attendance policy.

Field Workshop

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** 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.

*****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:

150 pts. Activities and Field Work

Activities 100 pts. Given as in-class collaborative assignments.

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

750 pts. Subject Mastery Tests (3 @ 250 pts. each):

Subject Mastery Test 1: Ocean Floor 250 pts.

Given as collaborative/take home Subject Mastery Test.

Part A 250 pts Basic Knowledge and Understanding Questions

Part B 25 extra credit pts Application and Deeper Understanding Questions

Subject Mastery Test 2: Physical Oceanography 250 pts.

Given as collaborative/take home Subject Mastery Test.

Part A 250 pts Basic Knowledge and Understanding Questions

Part B 25 extra credit pts Application and Deeper Understanding Questions

Subject Mastery Test 3: Coastal Oceans and Coastal Processes 250 pts.

Given as collaborative/take home Subject Mastery Test.

Part A 250 pts Basic Knowledge and Understanding Questions

Part B 25 extra credit pts Application and Deeper Understanding Questions

100 pts. Final Exam*

A review of questions from the three subject mastery tests (in-class). Students MUST be present at and pass the final exam to receive a passing grade for the course.

Final Grade

| Plus | Letter Grade | Minus | Rubric |
|------------------------|-----------------------|------------------------|---|
| A+ > 999 pts | A = 895 to 999 | A- = 875 to 894 | Student displays both a level of knowledge and understanding of the ocean system superior to the general public. |
| B+ = 855 to 874 | B = 771 to 854 | 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. |
| C+ = 730 to 749 | C = 625 to 730 | | Student demonstrates a basic knowledge of the ocean system above that of the general public. |
| D+ = 605 to 624 | D = 520 to 604 | D- = 500 to 519 | Student does not demonstrate knowledge and understanding of the ocean system beyond that of the general public. |
| | F < 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 attend the field trip and be present at, AND PASS, the final examination to receive a passing grade for the course.

Class Schedule

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

| <u>WEEK</u> Dates | <u>Topic:</u> Assignment | <u>Reading</u> |
|---|---|-----------------------------|
| PROLOUGE: THE STUDY OF THE WATER WORLD | | |
| 01 06/29-06/30 | Science and the Study of the Water World <i>An Introduction to the Course and the Science of Oceanography</i> | Chap. 1 <i>Skim only</i> |
| PART I: THE OCEAN FLOOR | | |
| 07/01-07/02 | Secrets of the Deep <i>Exploring the Ocean Floor</i> | Chap. 3 |
| DISC | Activity: Visualizing Topography | |
| 02 07/06-07/09 | The Dynamic Ocean Floor <i>Plate Tectonics & the Origin of Ocean Basins</i> | Chap. 2 |
| DISC | Activity: Plate Tectonics | |
| | The Record of Ancient Oceans <i>Marine Sediments and Erosion of the Ocean Floor</i> | Chap. 4 |
| DISC | Activity: Discovering Sand <i>Subject Mastery Test I download from email and print.</i> | |
| PART II: PHYSICAL OCEANOGRAPHY | | |
| 03 7/13-07/16 | Subject Mastery Test I Monday and Tuesday Due at End of Class on Tuesday <i>In class collaborative Testing</i> | |
| | The Rising Tide: Oceans, Currents and Carbon Dioxide Ocean Circulation & the Climate System | Chap. 7 |
| DISC | Activity: Climate in the news | |
| 04 07/20-07/23 | The Relentless Sea <i>Waves on Water</i> | Chap. 8 |
| DISC | Activity: Sea Level | |
| | Rising Seas <i>Tides and the Rhythmic Rise and Fall of Sea Level</i> | Chap. 9 |
| DISC | Activity: Using Tide Data | |

| <u>WEEK</u> | <u>Topic:</u> | <u>Reading</u> |
|-------------|---------------|----------------|
| Dates | Assignment | |

PART III: COASTAL SYSTEMS

05

07/27-07/28

**Subject Mastery Test II Monday and Tuesday
Due at End of Class Tuesday
*In class collaborative Testing***

The Changing Coastlines of Planet Earth
Beach Processes and Coastal Erosion

Chap. 10

DISC

Activity: Constructing Beach Profiles
Subject Mastery Test II download this week from email.

07/29-07/30

The Oceans at Our Reach
The Coastal Ocean and Our Legacy on a Water World

Chap. 11

DISC

Activity: Coastal Processes
*Subject Mastery Test II due in class on Monday (07/29)
Last day to drop class with W grade Tuesday (07/30)
Subject Mastery Test III download from email and print.*

Critical Issues and the Ocean System
A look at the Critical Issues Impacting the Ocean System

PROLOUGE: OCEANS IN POPULAR CULTURE

06

08/03

MONDAY
Introductory Field Workshop (Required):
*Beach processes and coastal geology of the San Mateo
County Coastline, California. Time: 1:00 am – 2:15 pm*

08/04

**Subject Mastery Test III Tuesday
Due at End of Class Tuesday
*In class collaborative Testing***

08/05

Study Prep Day for Final Exam

Final Exam

Section GEOL 20-01 *Note: Do NOT be late for the final exam*

Thursday 08/06 12:30 pm – 2:20 pm

Bring an appropriate Scantron® and No. 2 pencils to the final exam.

**Students must attend and pass the final exam and participate in the introductory field workshop to receive a passing grade in the class.*

have a great rest of the Summer! Dr. D