# Introduction to Oceanography

**Cabrillo College, Fall Semester, 2013**

**Instructors:** David Schwartz, Wayne Bloechl and Curt Olin

[http://www.cabrillo.edu/~dschwartz/](http://www.cabrillo.edu/~dschwartz/)

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<th>LECTURE TOPICS</th>
<th>Text Assignments</th>
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<tr>
<td>1. Introduction to Oceanography</td>
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<td>9/3</td>
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<td>2. History of Oceanography</td>
<td>Prologue</td>
<td>9/5, 9/10</td>
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<tr>
<td>3. Bathymetry &amp; Sea Floor Topography</td>
<td>3 (83 – 92)</td>
<td>9/10, 9/12</td>
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<td>4. Sea Floor Spreading; &quot;The Origin of Ocean Basins&quot;</td>
<td>2</td>
<td>9/17, 9/19</td>
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<td>5. Shoreline and Coastal Processes</td>
<td>Lecture only</td>
<td>9/24, 9/26, 10/1,</td>
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<td></td>
<td></td>
<td>10/3</td>
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<td>6. Marine Sediments</td>
<td>3 (92 – 109)</td>
<td>10/3, 10/8, 10/10,</td>
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<td></td>
<td></td>
<td>10/15</td>
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<td>7. Seawater Chemistry</td>
<td>5</td>
<td>10/15, 10/17, 10/22</td>
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<td>MIDTERM on Tuesday 10/29 includes all lecture material, the text book and labs</td>
<td></td>
<td>10/29</td>
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<td>8. Winds, Currents and Ocean Circulation</td>
<td>portions of 6</td>
<td>10/31, 11/5, 11/7,</td>
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<td></td>
<td>and 7</td>
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<td>9. Waves</td>
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<td>11/12, 11/14, 11/19</td>
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<td>10. Tides</td>
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<td>11/19, 11/21, 11/26</td>
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<td>11. Glacioeustatic &amp; Geoeustatic Sea Level Changes</td>
<td>Lecture only</td>
<td>11/26, 12/3</td>
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<td>12. Marine Ecology</td>
<td>11</td>
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<td>13. Life in the Water; Plankton &amp; Nekton</td>
<td>portions of 12,</td>
<td>12/10, 12/12</td>
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<td>and 13</td>
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<td>14. Ocean Resources &amp; Pollution</td>
<td></td>
<td>12/12</td>
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<td>15. Comprehensive Final Exam is 10 a.m. - 12:50 p.m. in Room 450</td>
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<td>12/17 (Tuesday)</td>
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**REQUIRED TEXTS:** Both required books are available at the Cabrillo College bookstore.


EVALUATION SYSTEM

Lab Quizzes (six)= ~175 points (~28%)
Lab Projects = 50 - 60 points (~9%)
Beach / Shore Erosion Map = 60 points (~10%)
Midterm = 150 points (~25%) Tuesday October 29th Room 450
Final Exam = 150 points (~25%) Tuesday December 17th 10:00 a.m. Room 450
TOTAL = 595 Points (585 Pts for Beach Profilers)

Optional Research Report = 40 points (see below for more details)

FINAL GRADE BREAKDOWN:
89% and above = A
79% - 88% = B
67% - 78% = C
55% - 66% = D
<55% = F

No make-up quizzes or midterm will be given unless there are verifiable barriers (death in family, hospitalization/illness etc.). Pass / Non Pass (P/NP) is a grade option in this course. If you decide for the P/NP grade option, a signed written agreement must be given to David Schwartz. The deadline for the P/NP decision will be announced in class.

OPTIONAL RESEARCH REPORTS (worth 40 extra points): The Research Reports to choose from are the “Beach Profile Project” or the “INTERNET Research Project”. Both require a final paper that will be due at the last lecture. We will give you some important information that will outline and describe the specific format that all the papers MUST be written in. This format will consist of an Introduction section followed by Materials / Methods, Results, Discussion and Conclusion. You can have one partner for the Beach Profile Research Report (one paper, two names, same grade). The INTERNET Research Report must be a solo effort. Students can not do more than one research report for increased credit. All Research Reports must be printed (not hand written). NOTE: The last day to start all Research Projects is Sunday September 22nd.

THE FOLLOWING IS FOR BEACH PROFILERS ONLY:
- Last Day to Beach Profile Line #1 is 9/22
- Last Day to Beach Profile Line #2 is 10/20
- Last Day to Beach Profile Line #3 is 11/17
- Last Day to Beach Profile Line #4 is 12/8
- Rough Draft of Lines 1 and 2 due in lab/lecture 10/29 & 10/31 or earlier
- Rough Draft of Intro, Materials / Methods due in lab/lecture 11/19 & 11/21 or earlier

Community Activity + Short Report: Anyone enrolled in Ocean 10 may choose to do the “Community Activity + Short Report” project. Upon successful completion of this project, 20 extra points will be added onto your final score. You will need to perform at least one full day (6 to 8 hours +, arranged on your own time) doing some type of community activity to earn 20 points. This activity must be verified and followed up with at least a one-page summary explaining the experience and relating it to the class. Working with Project MATE, Save Our Shores, Surfrider Foundation, The Coastal Watershed Council (CWC), Department of Fish and Game, Moss Landing Marine Labs, Long Marine Lab, CSUMB, Cal Poly, Cabrillo College Oceanography Department, attending seminars or going out to sea are some of our ideas. We encourage other ideas but all endeavors need to be approved by the Instructors before the work begins. The one page summary report is due two weeks (or sooner) after completion of the project. All Community Activity reports must be “Typed” (not hand written).
FALL 2013 SEMESTER LAB INFORMATION

Please Read this entire page very Carefully!

PLEASE BRING COLORED PENCILS AND CALCULATORS TO ALL LABS

Everyone enrolled in this course is required to complete all lab exercises and take 6 lab quizzes by their respective deadlines. An outline of the lab schedule, all reports and projects and quiz dates will be given to you and will also be announced regularly in lecture and lab as the course progresses.

You must do lab work in your lab only. Students may not attend other Ocean 10 labs. Failure to comply with all due dates, deadlines and rules may result in loss of points.

SIX REQUIRED LAB PROJECTS: These projects will be due and collected for evaluation at announced deadlines. No late projects will be accepted and the student will receive a zero unless the student shows verifiable barriers (in hospital), death in family etc…

The following six lab projects are worth 120 points: (110 points if you are Beach Profiling since you are not required to do the “Mystery Beach” project.)

1. Bathymetric Map & Cross Section (Lab 2, 10 points)
2. Tectonic Map & Earthquake Plots from first 5 Labs (Lab 4, 20 points)
3. Beach Sand Chart (Lab 5, 10 points)
4. Tide Plot (Lab 7, 10 points)
5. Mystery Beach (Lab 8, 10 points) (Optional if you are participating in the Beach Profiling Project.)
6. Beach Erosion Map (Lab 8, 60 points)

The following are other Ocean 10 lab activities. These labs do not have any graded “projects” that you will turn in. Information from these labs will be covered on quizzes, the midterm and final exams.

- English / Metric Conversions & Sea Floor Geography (Lab 1)
- Nautical Charts (Lab 3)
- Waves (Lab 6)
- Marine Sediments, Plankton and Plate Tectonics (Lab 9)

PARTICIPATION AND PROMPTNESS:

Participation is required at all class meetings. Missing only one lecture will put you behind. If you cannot attend a lecture or lab it is a good idea to call or leave a message at 479-6495. If a student misses the equivalent of 2 weeks of class, the student may lose points and the Instructor may drop that student. Also, please arrive on time to the lectures! When people arrive late, it is a distraction to many. If you arrive late, quietly sit in the back rows. Please do not walk down the aisle.

REMINDER

It is each student’s responsibility to keep in touch / communicate with the instructors if you are experiencing difficulties / problems in Ocean 10. We have a strong support system: four Oceanography Instructors, daily office hours, a staff of helpful Student Assistants and a Math Lab that you are welcome to use.

Oceanography Department Office Phone: 479-6495
Cabrillo College Switchboard: 479-6100
David Schwartz’s Office Hours: M/W: 11 - 12, T/TH: 9:00 – 10:00am, F: Arrange Room 705C
Learner Outcomes or Course Goals

Two Learner Outcomes have been defined and they are as follows:
1) Construct and describe maps, charts and graphs and analyze and interpret spatial processes and data relating to geological, chemical, physical and biological oceanography.
2) Solve simple word and numerical problems about oceanography using linear equations and conversion factors.

The following is more information on specific activities associated with the identified Learner Outcomes for Ocean 10:

Activities associated with Learner Outcomes #1
a. Inspect the shore environment and construct a “beach-erosion map” displaying the spatial distribution of protective materials used by humans to retard wave erosion of coastal landforms. (Required semester long project)

b. Construct a bathymetric map and cross section. (Lab 2)

c. Demonstrate navigation techniques using standard nautical charts, parallel rules, hand compass and compass dividers. (Lab 3)

d. Collect and plot real time earthquake data for 5 weeks and recognize trends. (Lab 4)

e. Identify and examine the chemical makeup and general source of common beach sands from around the world. (Lab 5)

f. Survey beach profiles over the semester and interpret and display the results. (Optional research activity & report)

g. Construct a tide plot and analyze the general trends. (Lab 7)

Activities associated with Learner Outcomes #2
a. Calculate English / Metric conversion problems. (Lab 1, 2, 3, 4, and 6 and objective questions throughout the course)

b. Solve problems involving rate, distance and time associated with acoustics, navigation, sea floor spreading, waves, tides and marine sediments. (Objective questions throughout the course)

c. Calculate vertical exaggeration of cross sections given horizontal and vertical scales. (Lab 2 and objective questions throughout the course)

Students needing *accommodations* should contact the instructor ASAP. As required by the Americans with Disabilities Act (ADA), accommodations are provided to insure equal opportunity for students with verified disabilities. If you need assistance with an accommodation, please contact Disabled Student services, Room 810, 479-6379, or Learning Skills Program Room 1073, 479-6220.
### FALL 2013 Ocean 10

**IMPORTANT DATES AND DEADLINES**

- **WEEK #1**: Introduction to course and Lab. The last day to start the Internet Research Project and the Beach Profiling Research Project is September 22nd.

- **WEEK OF 9/10**: (Lab 1 English / Metric Conversions, Earthquake Plots, Sea Floor Geography)

- **QUIZ #1**: WEEK of 9/17 (Covers Lab 1, History of Oceanography & Geologic Time from lecture)

- **QUIZ #2**: WEEK OF 10/1 (Covers Labs 1 and 2 & Sea Floor Topography from lecture) Bathymetric Map and Cross Section both due.

- **QUIZ #3**: WEEK OF 10/15 (Covers Lab 3 Nautical Charts only)

- **QUIZ #4**: WEEK OF 10/22  (Covers Lab 4 & Cont Drift, SFS, P. Tectonics, Marine Sediments from Lecture) Tectonic Map with Earthquake Plot due

- **MIDTERM**: (Tuesday October 29th)

- **Beach Sand Lab 5**: WEEK OF 11/5 and 11/12

- **Waves Lab 6**: WEEK OF 11/19 also review Beach Sand

- **QUIZ #5**: WEEK OF 11/19 (Covers Lab 5 & 6 & Waves from lecture), Beach Sand Chart due.

- **QUIZ #6**: **WEEK OF 12/3** (Covers lab 7 & Tides and Sea Level Changes from lecture) Tide Plot Lab (Lab 7) & Mystery Beach Project and BEACH EROSION MAPS DUE all on 12/3 & 12/5

- **Sediment/Plankton Lab #9**: WEEK OF 12/10 (Lab 9 is covered on the Final Exam)

| All Beach Profiles and Internet Research Reports are due on Thursday December 12th |

All Community Activities Reports are due within two weeks upon completion of the project. Failure to comply with all due dates, deadlines and rules will result in loss of points.

*All projects must be printed, not hand-written.*
TENTATIVE LECTURE SCHEDULE

By Date

9/3  Introduction to Ocean Science
9/5  History of Oceanography
9/10 Finish History, begin Sea Floor Topography
9/12 Sea Floor Topography
9/17 Finish Sea Floor Topography, Ocean Basin Evolution
9/19 Ocean Basin Evolution
9/24 Coastal Environment
9/26 Coastal Environment, Intro to Lab #9 Beach Walk
10/1 Coastal Environment
10/3 Finish Coastal Environment, Marine Sediments
10/8 Marine Sediments
10/10 Marine Sediments
10/15 Finish Marine Sediments, Begin Seawater Chemistry
10/17 Seawater Chemistry
10/22 Seawater Chemistry
10/24 Seawater Chemistry + Review

10/29  MIDTERM  (Tuesday) 11:10 a.m. - 12:30 p.m. in Room 450

10/31 Ocean Currents
11/5 Ocean Currents
11/7 Ocean Currents
11/12 Waves
11/14 Waves
11/19 Finish Waves, Begin Tides
11/21 Tides
11/26 Finish Tides, Begin Sea Level Changes
12/3 Sea Level Changes
12/5 Marine Biozones and Ecology
12/10 Primary Production & Plankton
12/12 Plankton and Nekton
12/17 Comprehensive Final Exam (Tuesday) 10:00am – 12:50pm, Room 450

OCEAN 10 BEACH PROFILING PROJECT
Caution: This project is for extremely **reliable, mature and responsible** students only!!! We are looking for students who will (most likely) enjoy the course and students who **like to work in groups**.

**INTRO MEETING:** Monday September 16\(^{th}\)
@ 3:30pm in room 705 at Cabrillo College

**FIELD DATES:** ALL AT THE CAPITOLA ESPLANADE
LINE 1 Wednesday September 18\(^{th}\) @3:30pm
LINE 2 Wednesday October 23\(^{rd}\) @3:30pm
LINE 3 Wednesday November 13\(^{th}\) @3:30pm
LINE 4 Wednesday December 4\(^{th}\) @3:30pm

**FINAL WRAP UP MEETING:** Wednesday December 11\(^{th}\)
@3:30pm in room 705 at Cabrillo College.
All reports due on Tuesday 12/17 or earlier.

Please check and mark your calendars carefully. **A change in your work schedule is not a valid excuse to miss any meeting dates.** If you commit to this project and do not complete it and complete Ocean 10, you will lose up to 50 points off your Ocean 10 total score.

Please read the back and be prepared to sign if you plan on participating in this project.
The following is a Contract for Cabrillo College Ocean 10
Students who choose to participate in the
SLVHS Beach Profiling Project.

Please understand that you as a Cabrillo College Ocean 10 student are acting as a mentor. It is absolutely essential that you attend each session. Changes in your work schedule are NOT a valid excuse. The only thing that would come close would be that you are gravely ill, probably in the hospital or there is a death in the family. Either way, I will require a written note from a doctor or a mortician.

The following is a rubric showing points that will be lost from the 40 total point research paper:
-2 points for each time you are late (by even 1 minute) to any classroom or field meeting.
-5 points for each time you do not attend any session, but you notify David Schwartz first.
-10 points for not attending any session and NOT notifying David Schwartz. He’ll assume you have notified your group.
-5 points each time any assignment is not turned in on time.
-10 points if David Schwartz does not see that assignment within 1 week after it is due.
-50 points for not completing this project but completing Ocean 10.

I have read the following and I understand this commitment and the loss of points that may be applied.

NAME________________________________________