

ESP 152
COASTAL OCEANOGRAPHY
Bodega Marine Lab, August–September 2008
CRN 61104

This course addresses the oceanography of coastal waters, including shelf, bays, river plumes, nearshore waters and estuaries. Our focus is on transport patterns, how they are forced (i.e., hydrodynamics) and what implications they have for ecological & environmental problems. The course is based in physical oceanography, but with a strong emphasis on the integrative understanding of coastal waters as a system. There is a west-coast (California) bias, with comparative material from other regions (e.g., Chile, Mexico, South Africa, Spain, Portugal). Field/boat-based learning is used in addition to lectures and assignments. The content is most relevant for students interested in fields such as oceanography, ecology, environmental engineering, geology and hydrology.

APPROACH.

The approach is to focus on concepts, avoiding in-depth mathematical analysis and material that requires specific prior courses; however, prior courses in classical physics and calculus are very helpful.

AIMS.

- To be familiar with and understand common **flow features**/patterns
- To understand primary **forcing of flow** (the causes of flow features)
- To obtain insight to the disciplines of **physical oceanography** and environmental hydrodynamics (“*know what you don’t know*”)
- To develop an appreciation of **the role of transport** in coastal marine systems – and thus in environment/ecology/geology/climate issues (the effects of flow features)

GRADING.

A letter grade will be assigned.

Undergraduate grading will be based on the following:

- 45% of grade from three quizzes (3 x 15%)
- 10% of grade from class participation
- 45% of grade from lab reports (12.5% for 1st and 2nd, 20% for 3rd)

Graduate grading will be based on the following:

- 45% of grade from three quizzes (3 x 15%)
- 5% of grade from class participation
- 20% of grade from three lab reports (5% for 1st and 2nd, 10% for 3rd)
- 30% of grade from paper linking course material to thesis topic

CLASS TIMES.

- All day (8am–6pm), Thursdays & Fridays, 7 August to 5 September.
- Additional events on other days.
- Provisional schedule detail (subject to change, following consultation):

Mon 4 August 2008

9:00am – Introduction and Welcome

Thu 7 August 2008

9:00am – Lecture #1 – **Introduction to Coastal Oceanography**

1:00pm – Lab: Tidal Seas DVD/discuss – LAB REPORT #1 due 8/14

Fri 8 August 2008

8:30am – Discussion (Lecture 1)

9:00am – Lecture #2 – **Tides**

Thu 14 August 2008

8:30am – Discussion (Lecture 2)

9:00am – Lecture #3 – **Wind forcing**

1:00pm – Lab: Data access and analysis – LAB REPORT #2 due 8/21

Fri 15 August 2008

12:30pm – Discussion (Lecture 3)

13:00pm – Lecture #4 – **Waves**

Tue 19 August 2008

TBD – Lab: R/V Mussel Point Grp1 – LAB REPORT #3 due 9/2

Wed 20 August 2008

TBD – Lab: R/V Mussel Point Grp2 – LAB REPORT #3 due 9/2

Thu 21 August 2008

8:30am – Lecture #5 – **Mixing & Stratification**

TBD – Lab: R/V Mussel Point Grp3 – LAB REPORT #3 due 9/2

Fri 22 August 2008

8:30am – FIRST QUIZ (Lectures 2–4)

10:00am – Lecture #6 – **Buoyancy forcing**

Wed 27 August 2008

4:00pm – Seminar (Jon Warrick, USGS): river plumes in CA

Thu 28 August 2008

8:30am – Warrick guest lecture

10:00am – Lecture #7 – **The Equations**

1:00pm – Lab: Flow demo & obs

Fri 29 August 2008

8:30am – SECOND QUIZ (Lectures 5–7)

10:00am – Lecture #8 – **Coastal Upwelling**

Wed 3 September 2008

2:00pm – Guest lecture & discussion (Raz Rasmussen)

4:00pm – Seminar (Raz Rasmussen, SIO/UCSD): larval dispersal

Thu 4 September 2008

9:00am Lecture #9 – **Estuaries (and Bays)**

Fri 5 September 2008

9:00am – Lecture #10 – ***Land Runoff***

12:00pm – Lab – Estuary field trip (need cars)

Tue 9 September 2008

1:00pm – THIRD QUIZ (Lectures 8–10)

OFFICE HOURS.

Open-door policy. No official hours, but always welcome. You are also welcome to schedule an appointment via email.

CLASS MATERIALS.

Handouts, readings and lecture presentations will be posted on
Zoea\Seastar\BML\BML_Classes\Coastal_Oceanography

REFERENCE TEXT.

There is no textbook for the class.

Readings will be provided and books are available on the Reserve Shelf in the Library. Pertinent books include the following:

Mann & Lazier – *Dynamics of Marine Ecosystems: Biological-Physical Interactions in the Oceans*

Denny – *How the Ocean Works: An Introduction to Oceanography*

Open University – *Shallow Water Processes*

A typical physical oceanography textbook, “*Introduction to Physical Oceanography*” by Robert H Stewart, is web-available and can be used as an additional reference ...

http://oceanworld.tamu.edu/home/course_book.htm

EMAIL LISTSERVE.

All summer students can be emailed via bmlsummer@ucdavis.edu