THE OCEANS

OCEA-01, Fall 2014
Instructor: Dr. Kelton McMahon

Course Description:

This course will be an interdisciplinary introduction to the field of oceanography, integrating biological, chemical, geological, and physical processes. The course will cover a number of key topics, including: origins of the oceans and plate tectonics; the hydrologic cycle; salinity and elemental cycles; ocean circulation; primary production and nutrient cycles; plankton and nekton; life in near shore communities; and the ocean's role in global climate (change).

Course Number:

OCEA-1-01, **Fall 2014**. Class No. **21569** Gen Ed Code: **SI** (older codes: IN and Q).

Required Textbook:

***Investigating Oceanography*, by Sverdrup and Kudela. (**Any edition is ok and you can find used versions of earlier editions; several books are also on reserve in S&E Library)

Instructor and TA Information:

Instructor: Dr. Kelton McMahon, Faculty Lecturer in Ocean Sciences
Office EMS D348
2014 Fall Office Hours: Mon., 9-10 AM*
Email: kemcmaho@ucsc.edu

Teaching Assistants:

Lead TA: Rachel Fabian rfabian@ucsc.edu; Tues 10:00AM-12:00PM EMS D480

TA: Valeria Jimenez vjimenez@mbari.org; Wed 2:45PM-4:45PM EMS D402

TA: Anna Lowe ablowe@ucsc.edu; Mon 1:00PM-3:00PM Grad Student Commons rm 208

**note: please check website "contacts" page for any updated TA or Instructor office hours*

Lecture Meeting Time and Place:

Monday and Wednesday 5:00PM-6:45PM Thimann Lecture Hall 003

Attendance is required (5% of grade). Lecture will be the primary basis for this course and associated assignments.

SECTIONS:

Section attendance is required (5% grade).
Weekly sections will introduce the problem sets, where TAs will demonstrate sample problems and provide supplementary information and activities related to the problem sets and exams.

Sections for Fall 2014. All Sections meet in Natural Science Annex 102

Section 01A (21570): Tues 8:30AM-9:40AM; Rachel Fabian
Section 01B (21571) Tues 6:00PM-7:10PM; Anna Lowe
Section 01C (21572) Tues 7:30PM-8:40PM; Anna Lowe
Section 01D (21573) Wed 8:00AM-9:10AM; Valeria Jimenez
Section 01E (21574) Wed 9:30AM-10:40AM; Valeria Jimenez
Section 01F (21575) Thurs 4:00PM-5:10PM; Rachel Fabian

2014 FALL CLASS SCHEDULE

PLEASE NOTE: *This schedule is tentative- exact lecture schedule may change!*
Readings are in Sverdrup & Kudela ("S&K") – "*Investigating Oceanography*"

Wk/Topics	MON	WED		*In Section (Tues- Thurs)*
Wk #1 *Introduction & Origin of the Oceans*	**Oct 6, 2014: Lect. 1** **Introduction to Oceans/ Intro to Charts** *S&K Chpt. Prologue, Chpt 1.4*	**Oct 8, 2014: Lect. 2** **Geo Oce: Ocean Origins & Plate Tectonics I** *S&K Chpt. 1 & 2*		ACTIVITY: **Prob. Set #1**: ***Units /Charts***
Wk #2 *Ocean Basins/ Geological Oceanography*	**Oct 13, 2014: Lect. 3** **Geo Oce: Plate Tectonics II** *S&K Chpt. 1 & 2*	**Oct 15, 2014: Lect. 4** **Geo Oce: Marine Provinces and Sediments** *S&K Chpt. 3*		ACTIVITY: **Prob. Set #2**: **Plate tectonics** **DUE: Prob. Set #1: Units/Charts**
Wk #3 *Chemical Oceanography*	**Oct 20, 2014: Lect. 5** **Chem Oce I: Physical Properties of Water** *S&K Chpt. 4*	**Oct 22, 2014: Lect. 6** **Chem Oce 2: Seawater Chemistry** *S&K Chpt. 5*		ACTIVITY: **Prob. Set #3**: **Seawater Properties** **DUE: Prob. Set #2: Plate tectonics**
Wk #4 *Midterm 1/Physical oceanography*	**Oct 27, 2014: Lect. 7** **MIDTERM EXAM I** **(Chpt 1-5)**	**Oct 29, 2014: Lect. 8** **Phys Oce: Atmospheric Circulation** *S&K Chpt. 6* **DUE: Prob. Set #3: Seawater Properties**		No Section
Wk #5 *Physical Oceanography*	**Nov 3, 2014: Lect. 9** **Phys Oce: Ocean Circulation** *S&K Chpt. 7*	**Nov 5, 2014: Lect. 10** **Phys Oce: Waves** *S&K Chpt. 8*		ACTIVITY: **Prob. Set #4**: **Circulation**
Wk #6 *Physical Oceanography*	**Nov 10, 2014: Lect. 11** **Phys Oce: Tides** *S&K Chpt. 9*	**Nov 12, 2014: Lect. 12** **Phys/Geo Oce: Beaches and Shoreline Processes** *S&K Chpt. 10*		ACTIVITY: **Prob. Set #5**: **Waves/Tides** **DUE: Prob. Set #4: Circulation**
Wk #7 *Midterm 2* ****Weekend Field Trip!****	**Nov 17, 2014: Lect. 13** **MIDTERM EXAM II** ***(Chpt 6-10)***	**Nov 19, 2014: Lect. 14** **Bio Oce: The Benthos** *S&K Chpt. 14*		ACTIVITY: **Prob. Set #6** **Natural Bridges Field Trip** **DUE: Prob. Set #5: Waves/Tides**
Wk #8: *Biological Oceanography*	**Nov 24, 2014: Lect. 15** **Bio Oce: Ocean Productivity** *S&K Chpt. 11.5, 12.6-12.9, 12.11* **DUE: Prob. Set #6: Natural Bridges Field Trip**	**Nov 26, 2014** **No Class** (The night before thanksgiving)		**No section (Turkey Day)**
Wk #9 *Biological Oceanography II*	**Dec 1, 2014: Lect. 17** **Bio Oce: Plankton of the Oceans** *S&K Chpt. 11.1, 12.1-12.5*	**Dec 3, 2014: Lect. 18** **Bio Oce: Nekton and Food Webs** *S&K Chpt. 11.2-11.4,12.10, 13 (skim)*		ACTIVITY: **Prob. Set #7: Seymour Center Field Trip**
Wk #10 *Global change*	**Dec 8, 2014: Lect. 19** **Animal Migration** **DUE: Prob. Set #7: Seymour Center Field Trip**	**Dec 10, 2014: Lect. 20** **Ocean acidification** *S&K Chpt. 16*		ACTIVITY: Prepare for Final

FINAL EXAM (Chpt 11-14,16), FALL 2014:
Monday Dec 15th, 2014 7:30-10:30pm Thimann Lecture Hall 003 (Same room as our class)

GRADED ASSIGNMENTS:

* Attendance at all lectures (5%)
* Attendance at all sections (5%)
* Homeworks: Allowed to drop one homework assignment but only if submitted
    * 5 Quantitative problem sets (20%)
    * 2 Field trip (week 7 and week 9) (10%)
* Three Exams
    * Midterm I (20%)
    * Midterm II (20%)
    * Final (20%)

HOMEWORKS:

Homework assignments are meant to reinforce your understanding of main class topics. Note: You can drop your lowest score from your homeworks with no penalty as long as you complete and turn in all assignments. This means that 30% of your grade for homeworks will be based on your top 6 of 7 total scores. However, you cannot simply skip an assignment and drop it later. (Note: exam scores cannot be dropped):

1) **Take-Home Problem Sets (5):** Five quantitative problem sets are meant to expand on material in lecture- *they are not necessarily derived directly from lecture material or the book*. In order to complete the problem sets, **you must attend section**! No advanced math is required- but the problem sets require thinking in a quantitative way, and applying basic math or supplied equations to understand ocean processes.

2) **Field Trips (2):**

    Field trip 1 (Natural Bridges): This field trip will be at Natural Bridges State Beach and tidepools. It will take place on the weekend of **week 7 (in the afternoon, either Sat Nov 22 or Sun Nov 23)**. The field trip consists of collecting data and making observations. Due to the timing of favorable tides (as well as liability constraints) **it is not possible to make up this field trip**, nor conduct it independently another day.

    Field Trip 2 (Seymour Center): This field trip is a self-guided outing to the Seymour Center at the UCSC Long Marine Lab on Terrace Point. **This can be done any time you choose during weeks 8-9 of the quarter (from Nov 24-Dec 5, 2014).**

    More information on both fieldtrips will be available on the website and in class.
    Note: *if you cannot make these field trip times for any reason, please consider taking this class another quarter*! Again, make-ups are not possible, but this class is given almost every quarter.

EXAMS:

The course has three exams: two midterms and a final- each of equal weight (20% each). They are multiple-choice and short answer format and will not be cumulative.

No-Makeup Exam Policy: Makeup exams will not be scheduled. They will be allowed ONLY for medical reasons or in other extraordinary circumstances. **This means: do NOT ask to take your exam early or late**! If you believe you have an extraordinary circumstance, contact Dr. McMahon at the beginning of the quarter.

Illnesses/ exceptional circumstance: After the fact make-ups will *not* be considered. If you are cannot make it to the exam due to illness or some exceptional circumstance, you must contact the instructor or

TA **before the exam begins** (email or phone message). If you do not take the exam and give no prior notice, you will receive a zero.

Important Note on Lectures & Exam Material: ***Lectures are the primary source of material for this class- so attendance is a key to doing well***! Lecture material will also be the primary source for all exam questions. The readings in the book are very important, however book coverage is supplemental to lectures. For some topics (e.g., climate change and effects on the ocean), coverage in the book is limited.

GENERAL GRADING, LATE POLICY, AND GETTING HELP

Overall Grades: are assigned on a "curved" basis. They are based on the percentages listed on pg. 3.

No-Late Work Policy: Homework assignments are generally due the week after each section (*see detailed schedule*). We ask that you complete your work on time. **No late work will be accepted- NO EXCEPTIONS.**

Getting Help: If you have questions about or need help on the assignments, we invite you to come to instructors' and TAs' office hours. If you can't make office hours, we encourage you to make an appointment to meet with instructors or TAs. Be proactive. While this is an introductory course, it is a rigorous course nonetheless. Concepts and skills build on each other and can quickly get away from you if you do not seek help when you need it.

Academic Integrity, Plagiarism and Cheating

Any test, paper, or report submitted by you and that bears your name is presumed to be your own original work. Although for some parts of this class you will be working in groups, all of the written work you submit in this course must be completely your own.

To receive credit for questions on assignments and exams, you must show all your work in order to demonstrate that you worked independently. Working in groups is allowed only when explicitly directed for some section and field trip assignments.

WHAT THIS MEANS IN PRACTICE: You should draw your own graphs and tables, work through your own calculations, showing all steps, and write out any short answers by yourself in your own words. You may not copy another student's work. **You also cannot use another student's work as a model.**

Consequences: Students who submit work containing plagiarized material or whose answers appear to be clearly written out as a joint project, will be given a grade of zero for the work. Please be aware that we are also required by official UCSC guidelines to report suspected and/or admitted cases of such dishonesty to your college provost, which will result in a permanent record, and possible additional consequences such as suspension or dismissal from UCSC.