

ENVS3003 Ocean Science
Fall 2014
T,Th 1400-1500

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appointment
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COURSE DESCRIPTION:

The ocean defines the feature of our planet. The ultimate goal of the course is to promote and enhance ocean literacy. Ocean literacy refers to the awareness and understanding of fundamental concepts of the history, functioning, and utilization of the ocean. Students should become ocean literate individuals at the end of this class meaning that s/he understands the ocean's influence on you and your influence on the ocean. Ocean science is a highly interdisciplinary subject. We will cover a wide range of topics such as ocean physics, marine chemistry and geochemistry, geology and geophysics, biological oceanography, ocean engineering, and social sciences. This course will consist of lectures, inquiry-based activities, and group discussions. At the end of the course, students will

- 1) Gain understanding of the importance of ocean processes to the functioning of our planet;
- 2) Acquire basic skills needed to describe, quantify, and understand ocean processes ;
- 3) Be able to communicate about the ocean and the science associated in meaningful way;
- 4) Better appreciate the interdisciplinary nature of ocean science; and
- 5) Experience the excitement of latest oceanographic studies.

SUGGESTED TEXTBOOK AND OTHER REFERENCES:

The compulsory textbook is Oceanography: An Invitation to Marine Science by Tom Garrison. Copies of the 7th edition are available at the bookstore. The 8th edition is experiencing a sale delay in Hong Kong due to copyright issue and therefore we do not recommend it. A very limited number of copies have also been placed on course reserve in the library.

Additional reading materials may be made available through the course website. There will be weekly reading assignments. It is your responsibility to complete the reading before class and come prepared for discussion, clicker questions, or quick writes based on the assigned reading (and hence 5% of your grade on class participation).

ASSESSMENTS:

Assessment Task	% of final grade
Assignments	25%
Mid-term exam	20%
In-class participation	5%
Final exam	50%

There will be a total of 6 problem sets. The lowest grade out of the 6 assignments will be dropped i.e., only 5 of them count towards the final grade. All of them will be posted on the course website on Tuesday by 5 p.m.. Problem sets are due electronically on Thursday before class. NO LATE assignment will not be accepted. A zero will be assigned automatically to late assignment.

Mid-term exam will cover the materials and discussion through the first 6 weeks of the semester. Final exam will focus on the remaining materials. However, you are reminded that concepts covered during the first 6 weeks are crucial for the understanding for the second half. Question type may include multiple choices, short questions, and short essays. Question format and style will mostly be data-oriented i.e., very similar to that of the problem set. There will be NO make-up exams. Students with legitimate academic conflict of schedule must seek approval and reschedule exam with the instructor within the first 2 weeks of the semester.

OTHER CLASS POLICIES

Email communication:

We follow a 24 hour email return policy i.e., please allow at least 24 hours before your email is addressed. Implication: Emails sent to the instructors the day before assignment deadline, midterms or final exams will not be addressed in time before the due date.

Grade dispute:

Grade dispute (including that of problem set) should be requested in writing within 7 days of the announcement of results.

Academic Integrity:

Collaboration is encouraged and valued in this class. However, you have to complete your own work independently. Suspected cheating in assignments will automatically receive a zero and reported to the department. Any other suspected case of cheating, plagiarism, or academic misconduct will be handled according to University policy. Please refer to the <http://tl.ust.hk/integrity/student-1.html> as a refresher of appropriate your academic conduct.

Disability accommodation: To request academic accommodations due to a disability, please contact Advisor to Students with Special Needs. If you have a letter from the advisor indicating that you have a disability which requires academic accommodations, please present the letter to the instructor so we can discuss the accommodations needed for this class within the first 2 weeks of class.

COURSE EXPECTATIONS:

The following expectations will guide our work together.

Instructor Expectation of Students

Our expectations are that you will

- Come to class on time, engage in the course content for the full class time, and refrain from any activities that distract from a positive learning environment, which include the use of cell phone;
- Come to class prepared to participate, having completed assigned reading, writing, and research in advance;
- Participate in class activities in ways that support course goals and demonstrate respect and civility towards all members of the teaching/learning team;
- Take an active role in obtaining information and resources for completion of tasks and assignments in the course and, ultimately, in promoting your own learning;
- Monitor your own learning and contribute feedback to support other members of the teaching/learning team in achieving course goals;
- Maintain the highest standards of academic conduct.

Students' Expectations of Instructors

You can expect that we will

- Begin and end class on time;
- Come to class prepared;
- Provide information and resources to support learning;
- Answer questions promptly and sufficiently;
- Be available to provide additional assistance when needed;
- Provide clear and consistent criteria that can be used fairly in evaluating your learning;
- Welcome input on ways to support you in your achievement of course goals.

COURSE SCHEDULE

This is tentative and is subject to change. Please refer to the course website for the most updated schedule.

Week		Topics	Instructor	Assignment
1	T	Introduction Hydrological cycle	Chan	
	Th	Water budget: past, present, and future	Chan	
2	T	Ocean basins and ocean sediments	Chan	
	Th	Plate tectonic, earthquakes and tsunamis	Chan	Problem set 1 due
3	T	Hydrothermal vents and vent chemistry	Chan	
	Th	Ocean Currents (Wind, Pressure gradient, Coriolis force)	LIU	Problem set 2 due
4	T	Surface circulation (Gyres, Boundary currents)	LIU	
	Th	Air-sea interactions	LIU	
5	T	Physical properties of seawater	Chan	
	Th	Thermohaline circulation	Chan	Problem set 3 due
6	T	Coastal oceanography (Waves and tides)	Chan	
	Th	Mid term	Chan	
7	T	Ocean chemistry I (Ions and carbonate chemistry)	Chan	
	Th	Ocean chemistry II (Isotopes and application)	Chan	
8	T	Pelagic ecosystem: Intro to phytoplankton	Zeng	
	Th	Pelagic ecosystem: Intro to zooplankton	Chan	Problem set 4 due
9	T	Application of geochemical proxies	Chan	
	Th	Marine food Web	Chan/Liu	
10	T	Biogeochemical cycle I	Zeng	
	Th	Biogeochemical cycle II	Zeng	
11	T	Ocean and human activities: fisheries management	Chan	
	Th	Ocean and human activities: pollution and mitigation	Chan	Problem set 5 due
12	T	Ocean and climate change: Ocean acidification, hypoxia	Chan	
	Th	Ocean and climate change: Polar seas	Chan	
13	T	Ocean engineering: Biofuel production, iron fertilization	Chan	
	Th	Ocean engineering: Ocean observatories, AUVs, ROVs Final Exam	Chan	Problem set 6 due