Course : OCES2001 - Survey of Ocean Science

Instructors : Prof. Hongbin LIU (liuhb@ust.hk), Prof. Yan Wang (yanwang@ust.hk), and Prof. Alex Wyatt (wyatt@ust.hk)

Office hour: Wednesday 14:00 – 15:00, CYT5002, or by appointment

COURSE DESCIRPTION:

The ocean defines the features 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 resource, and environmental concern. 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 (8th edition).
(https://lbdiscover.ust.hk/bib/991012856168803412)

ASSESSMENTS:

Assessment Task	% of final grade
Midterm exam	40%
Final exam	55%
Course participation	5%

Final exam will including materials after the midterm exam. Course participation will be measured by random in-class quiz.

Tentative syllabus

Week	Topic	
1	Introducing Ocean Science	HL
	Ocean Exploration	HL
2	Earth history, Origin of Life	HL
	Earth structure and Plate tectonic	HL
3	Ocean basin and sea floor	HL
	Ocean sediments	HL
4	Wind, pressure, and Earth's rotation	YW
	Ocean gyres and boundary currents	YW
5	Buoyancy fluxes and seawater properties	YW
6	**Mid-term exam**	
	Global overturning circulation	YW
7	Gravity waves and ocean mixing	YW
	Mesoscale eddies and climate prediction	YW
8	Ocean chemistry I: Chemical properties of seawater	AW
	Ocean chemistry II: Nutrient cycles and energy flow	AW
9	Phytoplankton and primary production	HL
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10	Zooplankton and Microbial food web	HL
	Biological pump and iron limitation hypothesis	HL
11	Fisheries oceanography	HL
	Benthic ecology	HL
12	Deep-sea ecology	HL
	Marine resources and development	AW
13	Ocean health and human impacts	AW
	Climate change and the ocean	AW
	Final exam	