

ESSC 3300 – Ocean and Climate

Spring 2022

Tu Th 14:30 - 16:15 (ERB 703/404)

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Office Hours: Yen Joe Tan, **Tue** 16:30 – 17:30 (MMW 317), or by appointment
Teng-fong Wong, **Tue** 16:30 – 17:30 (MMW 318), or by appointment

Required Text: None

Recommended Reading:

- a. Talley, L.D., G.L. Pickard, W.J. Emery, and J.H. Swift, 2011, *Descriptive Physical Oceanography, An introduction*, 6th edition, Academic Press. The text can be accessed at ScienceDirect –
<https://www.sciencedirect.com/book/9780750645522/descriptive-physical-oceanography>
- b. Stewart, R.H., 2008, *Introduction to Physical Oceanography*. The text can be accessed at the Texas A&M University Libraries –
<https://oaktrust.library.tamu.edu/handle/1969.1/160216>
- c. Trujillo, A.P., and H.V. Thurman, 2019, *Essentials of Oceanography*, 13th edition, Pearson. This title is on reserve in the University Library reference desk. E-copies are also available.

Course Grade:

Part 1

Quizzes 10%

Lab exercises 25%

Mid-term exam 15%

Part 2

Problem sets 20%

Final exam 30%

Part 1 – Prof. TAN Yen Joe

Jan 11, 13	Introduction + Seafloor Mapping (Lab 1: Juan de Fuca plate)
Jan 18, 20	Plate Cooling + Mantle Melting (Lab 2: Phase diagrams)
Jan 25, 27	Seismic Reflection + Mid-Ocean Ridges (Lab 3: MOR reflection profiles)
Feb 1, 3	No class (Lunar New Year)
Feb 8, 10	Sediment Transport + Continental Margins (Lab 4: ²¹⁰ Pb sedimentation)
Feb 15, 17	Sequence Stratigraphy + Deep Sea Sediments (Lab 5: Deep-sea sedimentation)
Feb 22, 24	Seawater + Paleoceanography (Mid-term)

Part 2 – Prof. WONG Teng-fong

Mar 1, 3	Temperature, salinity, and density; Oceanic heat budget
Mar 8, 10, 15	Basics of geophysical fluid dynamics
Mar 17	Ocean circulation; Response of upper ocean to winds
Mar 22, 24	Currents without friction: geostrophic flow
Mar 29, 31	Wind-driven ocean circulation; Vorticity
Apr 5	No class (Ching Ming Festival)
Apr 7	No class (Reading Week)
Apr 12, 14	Global circulation; Climate and oceans; ENSO
Apr 19, 21	Ocean waves

Final examination (3 hr)

*exact syllabus subject to change

Academic Honesty and Plagiarism

Attention is drawn to university policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at <http://www.cuhk.edu.hk/policy/academichonesty/>. With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures. For group projects, all students of the same group should be asked to sign the declaration. For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment. Assignments without the receipt will not be graded by teachers. Only the final version of the assignment should be submitted via VeriGuide.
