The Hong Kong University of Science and Technology

Physical Oceanography

OCES 3203

3 credits

Pre-requisites: OCES 2003 AND {MATH 2350 OR [(MATH 2111 OR MATH 2121 OR MATH 2131) AND (MATH 2351 OR MATH 2352)]}

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Consultation Hours: straight after class

Course Description

The ocean is dynamic and how it transports and stores tracers in marine environments highlight the crucial role of physics to other areas of marine sciences. This physical oceanography course provides an in-depth analysis of the topics encountered in Descriptive Physical Oceanography, with a strong focus on the *quantitative* aspect (as opposed to the previous qualitative aspect).

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Describe oceanic physical processes and the role in the ocean

2. Quantify and describe said physical processes in a technical fashion

3. Present the technical scientific contents relating to physical oceanography

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

All written assessments are to be sent in as a pdf or png and submitted on Canvas. Don't send me a word document.

For all assignments themselves, students are allowed a 1 week grace period with no questions asked (but you need to let us know on or before the assignment due time). Any further requests for extensions will require some proof (e.g. medical note, proof of internet going down such as electrical outage so Canvass ubmission was not possible). Measure of lateness will be done via the Canvas timestamp, and will be at 1% per minute penalty (i.e. don't bother handing anything in after 100 mins, because you already got zero).

Assessment Task	Contribution to Overall Course grade (%)	Due date
Assignment 1	25%	Wednesday 12th Mar

Assignment 2	25%	Monday 7th Apr
Assignment 3	25%	Monday 28th Apr
Oral presentation and exam	15%	*
Attendance and in-class participation	10%	

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
All assignments	ILO1, ILO2	All handed in assignments require students to provide an outline and explanation of the context (ILO1), perform calculations (ILO2) and evaluate their results (ILO3) in a coherent manner.
Oral presentation and exam, and attendance and in class participation	ILO1, ILO2, ILO3	Task assesses on oral presentation skills (ILO3), a crucial aspect of scientific communication. The primary focus is on communication of technical content (ILO2), framed in terms fo the broader context (ILO1).

Grading Rubrics

All assessments assignments are marked out of 34, with full marks being 30 (so 34/30 still only gets you 30/30). Roughly 22 marks will be given for "book work", which will get you a B. The marks associated with the questions thereafter are deliberately challenging, so you have to work for that A. Each assignment span over two weeks.

For class attendance, 22 sessions are scheduled, and discounting the add/drop period, students should turn up to at least 14 of these for full credit (zero credit for those who turn up for 6 or less, going up as a linear function of number of classes attended).

Final Grade Descriptors:

See also provided model good and bad hand-ins provided on the course GitHub page.

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance (>85% in the course)	Shows mastery of knowledge and understanding of the main subject matter, can problem-solve and critically evaluate approach, strong ability in communicating scientific and technical content.
B	Good Performance (70 – 85% in the course)	Shows good knowledge and understanding of the main subject matter, competence in problem-solving and some evaluation of approach, and the ability to communicate scientific and technical content.
C	Satisfactory Performance (50 – 70% in the course)	Shows adequate knowledge and understanding of the main subject matter, some issues with problem-solving, some ability to communicate scientific and technical content.
F	Fail (<50% in the course)	Shows poor knowledge and understanding of the main subject

		matter, struggles with problem-solving, unable to communicate scientific and technical content.

Course AI Policy

Use of AI is allowed and encouraged and by all means use it to help you code, but it is somewhat irrelevant in that most of the content is marked according to the scientific content anyway.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include a marked up PDF report with marked up comments, and a breakdown of the marks. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission Policy

Given the arrangements already for no-questions asked extensions and the use of continuous assessment, no resubmission or alternative assignments will be provided under normal circumstances.

Required Texts and Materials

All notes should be self contained, otherwise the content is in the Vallis textbook.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

[Optional] Additional Resources

- Vallis (2006), "Atmospheric and oceanic fluid dynamics" 1st edn, Cambridge University Press
- Vallis (2017), "Atmospheric and oceanic fluid dynamics" 2nd edn, Cambridge University Press