

OCES 4984 Ocean Science and Technology Research Project II

Course Description

Students will undertake a research project in ocean science and technology under faculty supervision. OCES 4974 is the first part of a two-term project. After completion of OCES 4974 in the Fall semester, students will need to register for OCES 4984 in Spring. Through the reading of scientific literature, field/laboratory studies, meetings with supervisors, and presentations in laboratory meetings, students will learn:

- (i) the latest knowledge in their chosen field of research,
- (ii) skills in hypothesis synthesis and testing,
- (iii) experimental design,
- (iv) data collection and analysis, and
- (v) scientific communication. Students will be evaluated for their performance through continuous assessment by the supervisor and an oral presentation held at the end of the Spring semester. For third-year or fourth-year OCES students only. Instructor's approval is required for enrollment.

Intended Learning Outcomes

On successful completion of this course, students are expected to be able to

- 1) Explain in detail the current and emerging trends in the area of ocean science and technology research chosen by the student.
- 2) Demonstrate basic skills in formulating objectives, making hypotheses and designing experiments for a scientific investigation.
- 3) Conduct independent lab experiments and/or field studies.
- 4) Critically analyze and interpret the data of the experiments and/or field studies, address the limitations and biases of the investigation methods, draw scientifically valid conclusions, and explain the importance of the research findings by making reference to existing knowledge.
- 5) Effectively communicate the research findings in oral presentations and in written reports.
- 6) Work independently and collaborate effectively.

Academic Integrity

- 1) The usual academic plagiarism guidelines apply (<https://registry.hkust.edu.hk/resource-library/how-avoid-plagiarism-and-copying>). Where there is a case for academic plagiarism the minimum penalty is zero on the relevant section; the marker reserves the right to escalate to larger penalties (e.g. failing the course, recording a case of academic misconduct, etc.)

Course AI Polocy

- 1) The use of AI tools is allowed for this course for all parts but citations should be given accordingly (e.g. <https://libguides.hkust.edu.hk/ai-literacy/faqs>). Usage without citation is regarded as academic plagiarism and above point applies.

Assessment

1. Experiment (continuous assessment by project supervisor(s)) (30%)
2. Oral presentation (30%)
 - Presentation will be scheduled in **early May**
 - Presentation duration: Each student 10 min + 5 min Q&A
3. Written report (40%)
 - Report will be due on **20 May 2025 (Tuesday)**
*Students should submit their written reports to their corresponding supervisor(s) directly for grading.

OCES 4984 Rubrics for Continuous Assessment, Oral Presentation, and Written Report

Continuous Assessment (30%)

	Exemplary	Satisfactory	Needs Improvement
a) Knowledge (10%)	<ul style="list-style-type: none"> • Demonstrated strong and broad knowledge not only in the project area, but also in related subjects of environmental science • Assimilated a wide range of knowledge into the project 	<ul style="list-style-type: none"> • Demonstrated sufficient knowledge in the project area • Incorporated subject-specific knowledge into the project 	<ul style="list-style-type: none"> • Insufficient knowledge in the project area • Failed to integrate subject knowledge into the project
b) Practical Skills (10%)	<ul style="list-style-type: none"> • Proactive in thinking through and solving problems encountered • Demonstrated high levels of competency in technical skills required for the project 	<ul style="list-style-type: none"> • Exhibited certain ability in solving problems related to the project • Having sufficient technical skills to complete the project satisfactorily 	<ul style="list-style-type: none"> • Failed to solve problems related to the project • Unable to demonstrate technological skills satisfactorily
c) Critical Thinking (5%)	<ul style="list-style-type: none"> • Demonstrated strong ability in analyzing and interpreting data and incorporating ideas from literature • Always actively participated in discussions (e.g. lab meetings, seminars) 	<ul style="list-style-type: none"> • Demonstrated certain ability in analyzing and interpreting data and incorporating ideas from literature • Participated in discussions sometimes 	<ul style="list-style-type: none"> • Failed to analyze and interpret data from the project • Rarely participated in discussions
d) Personal Development (5%)	<ul style="list-style-type: none"> • Always worked effectively with others in the lab • Always able to manage time effectively and was always well-prepared to meet deadlines 	<ul style="list-style-type: none"> • Worked effectively with others most of the time • Managed time effectively in general 	<ul style="list-style-type: none"> • Failed to work in a team • Lacked time management skills

Rubrics for the Assessment of Oral Presentation (30%)

	Exemplary	Satisfactory	Needs Improvement
a) Knowledge & Organization (15%)	<ul style="list-style-type: none"> • Demonstrated sound understanding of the topic • Well and clear explanation on specific terms with good examples • Figures and graphs are well-presented and integrated from relevant sources • Presented with logical organization and coherent information 	<ul style="list-style-type: none"> • Demonstrated a fair understanding of the topic • Fair explanation on specific terms without showing the examples • Figures and graphs are presented and integrated with some inappropriate sources • Presented with logical organization and coherent information in most parts 	<ul style="list-style-type: none"> • Insufficient understanding of the topic • No explanation on specific terms nor showing the examples • Figures and graphs are poorly presented and extracted from inappropriate sources • Lacked organization and coherence in the presentation
b) Presentation Skills (7.5%)	<ul style="list-style-type: none"> • Showed excellent presentation skills • Good time management 	<ul style="list-style-type: none"> • Showed good command of presentation skills • Fair time management 	<ul style="list-style-type: none"> • Showed poor presentation skills in most parts • Poor time management
c) Q&A (7.5%)	<ul style="list-style-type: none"> • Gave correct answers to all questions raised by the audience • Demonstrated outstanding critical thinking skills 	<ul style="list-style-type: none"> • Gave correct answers to most questions • Demonstrated satisfactory critical thinking skills 	<ul style="list-style-type: none"> • Unable to give correct answer to any question • No critical thinking skills

Rubrics for the Assessment of Written Report (40%)

	Exemplary	Satisfactory	Needs Improvement
a) Comprehension of Findings (20%)	<ul style="list-style-type: none"> • Highly effective presentation of data in text and graphics. • Data were sufficiently analyzed using appropriate statistical tools • Able to interpret all data accurately, summarize all findings and draw inferences that are consistent with the data and scientific reasoning • Provided adequate and appropriate reasoning for unexpected results and future direction of the research 	<ul style="list-style-type: none"> • Sufficient skills in the presentation of data in text and graphics • Most data were analyzed with appropriate statistical tools and • Able to interpret and summarize most of the findings and draw inferences that are consistent with the data and scientific reasoning • Provided some suggestions for unexpected results and future direction of the research 	<ul style="list-style-type: none"> • Ineffective presentation of data in text and graphics. • Unable to analyze the results statistically / understand statistical results • Insufficient / inaccurate interpret of findings • Inferences are not consistent with the data and scientific reasoning • Cannot provide any suggestions for unexpected results or future direction of the research
b) Language & Organization (10%)	<ul style="list-style-type: none"> • All contents were logically presented and well organized • Excellence in scientific writing and use of English • Less than 10% similarity checked under turnitin 	<ul style="list-style-type: none"> • Most contents were logically presented and well organized • Sufficient skills in scientific writing and use of English with only a few errors • 10-30% similarity checked under turnitin 	<ul style="list-style-type: none"> • Failed to present contents in a logical and organized manner • Unable to demonstrate skills in scientific writing and/or use of English • Over 30% similarity checked under turnitin
c) Citation & References (10%)	<ul style="list-style-type: none"> • Adequately and accurately cites ideas and information of others • Reference list is complete and well-organized 	<ul style="list-style-type: none"> • Cites ideas and information of others with only few errors and omissions • Some errors and omissions in the reference list and/or its formatting 	<ul style="list-style-type: none"> • Grossly inadequate and inaccurate citation of ideas and information of others • Multiple errors and omissions in the reference list and /or its formatting