OCES 4984 Ocean Science and Technology Research Project II
Spring 2025-26

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 Fall 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.

Meeting with supervisors

Students are required to meet with their supervisor for a minimum of one hour each week to discuss project progress, findings, and any challenges encountered.

Assessment

1. Experiment (continuous assessment by project supervisor(s)) (40%)

2. Oral presentation (30%)
   - ➢ Presentation will be scheduled in **Study Break (within 11-15 May 2026)**
   - ➢ Presentation duration: Each student 10 min + 5 min Q&A
   - ➢ The content of the presentation should include:
     - i. Introduction to the research topic
     - ii. Project objectives
     - iii. Research methodology

3. Written report (30%)
   - ➢ Report will be due on **after the oral presentation (TBA)**
     *Students should submit their written reports to their corresponding supervisor(s) directly for grading.
   - ➢ The content of the report should include:
     - i. A short literature review related to the research topic
     - ii. Project objectives
     - iii. Research methodology
     - iv. Preliminary results (if any)
   - ➢ Note: Turnitin and similar provides evidence (via text similarity scores) but are themselves not the sole basis for determining a plagiarism case.

Important Notes:

* 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.)

* 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.

Rubrics for Continuous Assessment (40%)

	Exemplary	Satisfactory	Needs Improvement
a) Knowledge	• 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	• Demonstrated sufficient knowledge in the project area • Incorporated subject-specific knowledge into the project	• Insufficient knowledge in the project area • Failed to integrate subject knowledge into the project
b) Practical Skills	• Proactive in thinking through and solving encountered problems • Demonstrated a high level of competency in technical skills required for the project	• Exhibited certain ability in solving problems related to the project • Having sufficient technical skills to complete the project satisfactorily	• Failed to solve problems related to the project • Unable to demonstrate technological skills satisfactorily
c) Critical Thinking	• Demonstrated strong ability in analyzing, interpreting data and incorporating ideas from literature • Always actively participated in discussions (e.g. lab meetings, seminars)	• Demonstrated certain ability in analyzing and interpreting data and incorporating ideas from literature • Participated in discussions sometimes	• Failed to analyze and interpret data from the project • Rarely participated in discussions
d) Personal Development	• Always worked effectively with others in the lab • Always able to manage time effectively, always well-prepared, meeting set deadlines	• Worked effectively with others most of the time • Managed time effectively in general	• 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	• Demonstrated sound understanding of the research topic • Well-defined and clear project objectives • Presented with logical organization and coherent information	• Demonstrated a fair understanding of the research topic • Has defined project objectives • Presented with logical organization and coherent information in most parts	• Insufficient understanding of the research topic • Poorly defined or no project objectives • Lacked organization and coherence in the presentation
b) Project objectives	• Created clearly defined, realistic and achievable project objectives • Delivered project timeline with milestone	• Created a general sense of defined, realistic and achievable project objectives • Delivered general project timeline with milestone	• Defined overly board, unrealistic and unachievable project objectives • Lacked project timeline and milestone
c) Research methodology	• Explained clearly all of the methodological approach • Described how data is collected and analyzed in the research • Evaluated and justified clearly the methodological choices	• Explained most of the methodological approaches • Described briefly how data is collected and analyzed in the research • Evaluated and justified briefly the methodological choices	• Poorly explained the methodological approaches • Minimal or no description on data collection and analysis • Poorly evaluated and justified the methodological choices
d) Presentation Skills, Q&A	• Showed excellent presentation skills • Good time management • Gave correct answers to all questions raised by the audience • Demonstrated outstanding critical thinking skills	• Showed good command of presentation skills • Fair time management • Gave correct answers to most questions • Demonstrated satisfactory critical thinking skills	• Showed poor presentation skills in most parts • Poor time management • Unable to give correct answer to any question • Little to no critical thinking skills

Rubrics for the Assessment of Written Report (30%)

		Exemplary	Satisfactory	Needs Improvement
a)	**Comprehension of Findings**	• 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 appropriate reasoning for unexpected results and/or future direction of the research	• 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/or future direction of the research	• 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 and/or future direction of the research
b)	**Language & Organization**	• All content was logically presented and well organized • Excellence in scientific writing and use of English	• Most content was logically presented and well organized • Sufficient skills in scientific writing and use of English with only a few errors	• Failed to present content in a logical and organized manner • Unable to demonstrate skills in scientific writing and/or use of English
c)	**Citation & References**	• Adequately and accurately cites ideas and information of others • Reference list is complete and well-organized	• Cites ideas and information of others with only few errors and omissions • Some errors and omissions in the reference list and/or its formatting	• Grossly inadequate and inaccurate citation of ideas and information of others • Multiple errors and omissions in the reference list and /or its formatting