OCES 3001 Coastal Environmental Monitoring

Course Description
Students will gain hands-on experience in field survey and sampling, laboratory studies including physical, chemical and biological analyses, experimental design, as well as data analyses and presentations. Course topics include coastal survey, water quality monitoring, marine sediment quality monitoring, etc.

Course Objectives
OCES 3001 is a major required course for undergraduate students majoring in Environmental Science in the School of Science at the Hong Kong University of Science and Technology. The primary objectives of this course is to provide students with hands-on experiences in identifying possible sources of pollutants found in various coastal habitats and suggesting solutions of how to improve/ monitor environmental pollutants using advanced instrumentation and technology.

Intended Learning Outcomes (ILOs)
Students will gain essential background knowledge and skills for conducting field and lab works in coastal environmental monitoring. Upon completion of this course, students should be able to

1. Explain the scientific principles underlying the experimental procedures described in individual lab sessions
2. Collect, interpret, and critically analyse scientific data; and draw conclusions from lab studies
3. Practice the common techniques used in coastal environmental monitoring
4. Communicate pollution monitoring and measurement through oral presentation
5. Work independently and collaborate effectively in the teamwork
6. Abide by ethical principles in laboratory work and data interpretation

Course Format
One lab session & tutorial per week

Course Instructor
Dr Cindy Lam (envscindy@ust.hk)

Course Assessment
Individual Work
- 5 Lab Worksheets (30%; each 6%)
- 5 Online Quizzes (15%)
- Continuous Assessment (10%)
- Research Report (20%)

Group Work
- Experiential Lab (25%)
  - Proposal Writing (5%)
  - Group Presentation (15%)
  - Peer evaluation (5%)

Summary Table

Assessment Task	Contribution to Overall Course Grade (%)	Due Date
Lab 1 worksheet	6 %	4 Mar 2026
Lab 2 worksheet	6 %	11 Mar 2026
Lab 3 worksheet	6 %	18 Mar 2026
Lab 4 worksheet	6 %	25 Mar 2026
Lab 5 worksheet	6 %	8 Apr 2026
Quiz 1	3 %	11 Mar 2026
Quiz 2	3 %	11 Mar 2026
Quiz 3	3 %	15 Apr 2026
Quiz 4	3 %	15 Apr 2026
Quiz 5	3 %	15 Apr 2026
Group Project Proposal	5 %	2 Apr 2026
Group Presentation	15 %	6 May 2026
Peer Evaluation	5%	6 May 2026
Individual Research Report	20 %	15 May 2026

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

Lab Manual
Electronic lab manual with additional references will be available in Canvas.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Lab worksheets	ILO 1, ILO 2, ILO 3	This task assesses students' ability to explain scientific principles through collection, interpretation and analysis of scientific data (ILO 1, ILO 2) and practice the common techniques used in coastal environmental monitoring (ILO 3)
Quiz	ILO 1, ILO 2, ILO 3	This task assesses students' foundation understanding of scientific principles underlying experimental procedures (ILO 1, ILO 2), and evaluate the common techniques used in coastal environmental monitoring (ILO 3)

Group Project Proposal	ILO 1, ILO 2, ILO 3, ILO 5, ILO 6	This task assesses students' ability to understand and apply scientific principles to real-life decision solving the challenges in coastal areas (ILO 1, ILO 2), practice the common techniques (ILO 3) through collaboration with their group members (ILO 5) in the lab and in the field (ILO 6)
Group Project Presentation	ILO 1, ILO 3, ILO 4, ILO 5	This task assess students' ability to explain key concepts, principles and practices in coastal environmental monitoring (ILO 1, ILO 3), and learn different methods to present reliable data with their group members (ILO 4, ILO 5)
Peer Evaluation	ILO 4, ILO 5	This task assess students' ability to foster critical evaluation of group members'' contributions to the project, aligning with ILO 4 and ILO 5, and promoting the development of evaluative and communicative skills
Individual Research Report	ILO 2, ILO 3, ILO 6	This task assess students' ability to explain key concepts principles and practices through data collection and experimental design in coastal environmental monitoring (ILO 2, ILO 3), and learn ethical principles in laboratory work and data interpretation

Final Grade Descriptors:

Grades	Short Description	Elaboration on Subject Grading Description
A	Excellent Performance	Students achieving this grade demonstrate a comprehensive understanding of the course materials and consistently perform at an exceptional level. They excel in both theoretical knowledge and practical applications, showing superior analytical skills, creativity in problem-solving, and a thorough understanding of coastal environmental monitoring techniques. Work is completed with precision and minimal errors, meeting or exceeding all requirements for individual and group assessments.
B	Good Performance	This grade reflects a solid understanding of course content and the ability to apply knowledge effectively in most situations. Students exhibit competence in field and laboratory tasks and contribute meaningfully to group projects. While their work meets the

		standards of the course, there may be minor errors or room for improvement in data analysis, interpretation, or presentation quality.
C	Satisfactory Performance	Students earning this grade meet the basic expectations of the course. They demonstrate an adequate understanding of key concepts and skills but may struggle with consistency or depth in analysis and application. Work quality varies, showing satisfactory completion of assignments with occasional errors or oversight in execution and interpretation.
D	Marginal Pass	This grade indicates minimal achievement of the course objectives. Students display limited understanding and application of coastal environmental monitoring techniques and may struggle to meet deadlines or collaborate effectively in group settings. Their work often contains significant errors, gaps in knowledge, or incomplete components.
F	Fail	Students receiving this grade fail to demonstrate the required understanding or skills to achieve the course objectives. They are unable to perform adequately in field, lab, or group activities, and their submitted work does not meet the minimum standards for quality, accuracy, or completeness.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission.

Course AI Policy

The use of Generative AI is not applicable to this course as all lab worksheets, quizzes, and individual research reports.

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.

Course Schedule

Week	Date	Topic	Format	Follow-up lab
1	4 Feb	Course Introduction & Lab Safety	Lecture	/
	7 Feb	Field Sampling – Group A	Field work	Lab 1
	8 Feb	Field Sampling – Group B	Field work	Lab 1
2	11 Feb	*No Class*		
3	18 Feb	*No Class - Public holiday*		
4	25 Feb	Lab 1: Physical Parameters Measurement in Water Samples	Lab	2 Mar
5	4 Mar	Lab 2: Total Coliform and *E.coli* Detection	Lab	5 Mar
6	11 Mar	Lab 3: Microplastics Detection & Quantification Using Raman Spectroscopy Quiz 1 & 2	Lab + Quiz	/
7	18 Mar	Lab 4: Metal Toxicity using Neutral Red Assay & Trace Metal Analysis Experimental Design and Proposal Writing	Lab	/
8	25 Mar	Lab 5: Determination of Total Petroleum Hydrocarbons + Toxicity Assays of Oil-Water Samples Using Brine Shrimp *Artemia salina*	Lab	26 Mar
9	1 Apr	Data Analysis of Lab 5 Submission of Group Project Proposal	Lecture	/
9	8 Apr	*No Class - Midterm Break*		/
10	15 Apr	Experiential Lab (1) Quiz 3, 4 & 5	Lab + Quiz	/
11	22 Apr	Experiential Lab (2)	Lab	/
12	29 Apr	Preparation for Group Project Presentation & Individual Report Writing		/
13	6 May	Group Project Presentation	Presentation	/