ENVR 2002D – Tides of Change: Climate, Oceans, Ports and the Future of the Maritime World

School:	**Academy of Interdisciplinary Studies**
Subject Area:	**Environment**
Course Credit:	**3**
Instructor:	**LOH Kung Wai Christine**
Pre-requisite/co-requisite:	**Nil**

Notes:

- The syllabi provided here is for reference only and may be subject to changes and adjustments as determined by the course instructors.

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Division of Environment and Sustainability

ENVR2002D Tides of Change: Climate, Oceans, Ports & the Future of the Maritime World

(3 credits)

Summer 2026

1. GENERAL INFORMATION	
Instructor:	Christine Loh
Email:	cloh@ust.hk
Office & Office Hours:	TBA
TA:	TBA
Email:	TBA
Date and Time:	9 a.m. to 11:50 a.m. on every Mon/Wed/Fri from 13 July to 24 July 9 a.m. to 12:20 p.m. on every Mon/Wed/Fri from 27 July to 7 Aug
Room:	HKUST Campus and Hong Kong Maritime Museum

2. COURSE DESCRIPTION

This 4-week, 39-hour summer course offers students an integrated introduction to climate science, ocean systems, and the maritime world. Delivered through a collaboration between HKUST, the Hong Kong Shipowners Association, Institute of Chartered Shipbrokers, and Hong Kong Maritime Museum, the course combines academic expertise with industry and museum-based learning. Students examine how climate dynamics shape the ocean, how coastal and marine environments respond to change, and how meteorology and extreme weather events have influenced Hong Kong's development. Sessions held both on campus and at the Maritime Museum blend scientific foundations with historical perspectives, hands-on activities, and engagement with real instruments, archives, and gallery collections. Students will also explore the global maritime industry, including the role of the International Maritime Organization, the decarbonization of shipping, and the functions of shipowners and shipbrokers. The course provides a multidimensional understanding of how oceans and shipping connect societies, economies, and the planet.

3. COURSE OBJECTIVES

By the end of the course, students will be able to:

1. Explain fundamental concepts in climate science and oceanography, including climate systems, ocean-atmosphere interactions, and the drivers of extreme weather.
2. Describe the history of typhoons and analyse Hong Kong's unique role as a site of observational history and regional storm science.
3. Evaluate key marine and coastal conservation challenges, drawing on museum-based learning and contemporary regional cases.
4. Interpret the role of the International Maritime Organization (IMO) in regulating global shipping, including current efforts on decarbonisation and environmental protection.
5. Identify the major functions and dynamics of the maritime business, including the roles of shipowners and shipbrokers in global trade.
6. Connect scientific, historical, and industry perspectives to articulate how climate change is reshaping oceans, coastal environments, and the maritime sector.
7. Develop an integrated appreciation of the maritime world as a global system, understanding its strategic, environmental, and economic importance.

4. COURSE INTENDED LEARNING OUTCOMES (CILOs)

On completion of this course, students will be able to:

Course Learning Outcomes (CILOs)	Contribution of Learning Outcomes to BSc in EVMT *(See Section 19, write PILO-1, PILO-2, etc.)*
CILO-1: Explain fundamental climate and ocean science concepts relevant to coastal, port, and maritime environments.	PILO-1, PILO-6
CILO-2: Describe the historical development of typhoon science, meteorological observation, and Hong Kong's maritime evolution.	PILO-1, PILO-3
CILO-3: Identify major marine and coastal conservation issues and evaluate implications for environmental management and port operations.	PILO-1, PILO-6, PILO-7
CILO-4: Analyze how climate change affects global shipping and port infrastructure, including risks, adaptation, and decarbonization pathways.	PILO-1, PILO-3, PILO-7
CILO-5: Identify the major environmental, economic, regulatory, and technological forces shaping ports and the global maritime industry.	PILO-1, PILO-3, PILO-5, PILO-7

5. 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.

6. ASSESSMENT SCHEME

Assessment Task	**Contribution to Overall Course grade (%)**	**Due date (DD/MM/YYYY)**
1. Multiple Choice Test 1 taken in class	35%	27 July 2025
2. Multiple Choice Test 2 taken in class	35%	7 August 2025
3. Narrative Essay	30%	10 August 2025
TOTAL:	**100%**	

7. MAPPING of COURSE ILOs to ASSESSMENT TASKS

Assessment Task	**Assessing Course Intended Learning Outcomes** *(Write CILO-1, CILO-2, etc.)*	**Explanation**
1. Test 1	CILO 1, CILO2 & CILO 3	Multiple Choice questions will test the first two weeks of learning
2. Test 2	CILO 3, CILO 4 & CILO 5	Multiple Choice questions will test the second two weeks of learning
3. Narrative Essay	CILOs 1, 2, 3, 4 & 5	The essay will require a demonstration of an integrated understanding of the full course.

8. TEACHING AND LEARNING ACTIVITIES

Teaching and learning activities include expert lectures, interactive discussions, case-based learning, and museum-based experiential sessions. Students will engage with current news, archival materials, scientific instruments, and technical documents to deepen understanding of climate science, ocean systems, marine conservation, and the maritime industry. Two in-class multiple-choice tests assess comprehension of key concepts, while a narrative essay enables students to demonstrate integrated understanding across scientific, historical, and industry dimensions.

9. TENTATIVE COURSE SCHEDULE

Week	Topics	Briefly outline what this topic will cover	Indicate which course ILOs this topic is related to
1	Overall Course Introduction & Expectation	To align expectations for the whole course	All ILOs.
2	General introduction to climate science	Climate science that relates to maritime sector	CILO 1
3	General introduction to ocean science	Ocean Science that relates to maritime sector	CILO 1
4	General introduction to modelling of climate and ocean sciences	Showing modelling that helps the maritime industry, such as emissions from ships and how modelling can help policy	CILO 1 and 4
5	History of typhoons in Hong Kong	History of typhoons to illustrate how extreme weather events affect the port and city	CILO 2
6	Marine meteorological services with historical perspectives	The importance of such services to port, city and trade	CILO 2 and 4
7	Meteorological Instruments and Meteorological Observatories in East Asia	Introduction to specific instruments used in East Asia	CILO 2
8	Marine & Coastal Conservation & Maritime Museum Gallery Tour	Introduction to marine biodiversity, using exhibits in the museum	CILO 3
9	Introduction to IMO & Regulation of International Shipping including Decarbonization	Introduction to the UN system, focusing on IMO and its current work on decarbonization including discussion about changing trade patterns	CILO 4 and 5
10	Introduction to Maritime Business I	In partnership with HK Shipowners Association to discuss the shipping business in general	CILO 5
11	Introduction to Maritime Business II	In partnership with shipbrokers to discuss the shipping business in general	CILO 5
12	Final test and farewell	Final test and summary of course	All CILOs

10. REFERENCES/READING MATERIALS

Teaching PPT for each class will be prepared

11. ADDITIONAL RESOURCES

Materials will be prepared together with teaching partners, including news items relating to every aspect of the course.

12. GRADING RUBRICS

TBA

13. FINAL GRADE DESCRIPTORS

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good Performance	Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal Pass	Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.]
F	Fail	Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.]

14. COURSE AI POLICY

Students can use AI for learning but not for the two multiple choice tests although the tests are open book (i.e. no electronics during tests).

15. COMMUNICATION AND FEEDBACK

Communication with students will take place through Canvas and email. Announcements, lecture materials, and updates will be posted regularly. Students may seek feedback by appointment. Feedback on the essay will be provided in written form, following the essay rubric. General feedback on common strengths and areas for improvement will also be shared with the class.

16. LATE SUBMISSION POLICY

The two multiple choice tests will be taken in class and cannot be taken at any other time. For the essay, late submission may be acceptable for medical reasons only and a doctor's note is required to support the late submission.

17. RESUBMISSION POLICY

Resubmissions are not allowed.

18. 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.

19. PROGRAM INTENDED LEARNING OUTCOMES FOR BSC IN ENVIRONMENTAL MANAGEMENT AND TECHNOLOGY (EVMT)	
PILO-1:	Adopt an inter-disciplinary approach to tackle complex real-world problems.
PILO-2:	Communicate effectively with people of different levels and work areas.
PILO-3:	Transfer acquired knowledge to meet changes and challenges in different fields.
PILO-4:	Engage in activities that lead to impact of social improvement.
PILO-5:	Have the ability to create and innovate with divergent thinking.
PILO-6:	Demonstrate proficiency in their knowledge of advanced environmental technologies, environmental management practices and the interface between these technologies and society, business and policy.
PILO-7:	Formulate effective and innovative solutions to environmental problems by integrating and applying concepts from environmental technology, management and sustainable development.
PILO-8:	Understand professional responsibilities and ethical environmental standards and how to exercise them in roles of environmental leaders, policy makers and technical managers.