The Hong Kong University of Science and Technology

Department of Ocean Science

OCES 1010 Principles and Applications of Environmental Science
3 credits
Spring 2026

1. Instructor:

Prof. Qiong (Joan) Zhang
Phone: 2358 8254; Email: qiongz@ust.hk
Office: CYT 2013A, Department of Ocean Science
Office hour: Fridays 14:00 am – 15:30 am

2. Class Time:

Tuesdays and Thursdays, 09:00AM - 10:20AM

3. Location:

CYT Lecture Theatre L

4. Course Description

This course aims to provide students with a science background to learn and address the environmental issues caused by humans. Key topics include emerging global, regional and local environmental issues; renewable and non-renewable energy; life-supporting systems of our planet and its biodiversity (with focus on marine environment); atmosphere, air pollution and global climate change; water resources and water pollution; ocean plastics and solid waste management; marine environmental health and toxicology. Through the course, students will be able to understand fundamental knowledge of the inter-relationship between life and our environment, the characteristics of the environmental sustainability, pollution and monitoring measures, and technologies used in pollution control and remediation.

5. Intended Learning Outcome

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

- demonstrate fundamental understanding of environmental concepts such as Earth's life-supporting systems and biodiversity, natural resources, pollution and mitigation, and their inter-relationships;
- address challenges in environmental science by integrating scientific knowledge, technical applications, and innovative technology;
- identify and describe different scientific methods to critically evaluate complex, emerging environmental problems at global and local scales;
- recognize the importance of harmony between humans and nature in a sustainable living society;
- develop a broad interest in the environment and connect the knowledge to their major study;
- apply the knowledge in daily life to live more sustainably and to contribute to

environmental protection.

6. Course Assessment Scheme

- Class participation (40%), including attending classes, taking in-class quizzes, etc.
- Midterm Exam (30%)
- Final Exam (30%)

This course will be assessed using criterion-referencing and grades will not be assigned using a curve.

7. Student Learning Resources:

Primary Reference textbook(s):
Cunningham, W.P. and Cunningham, M.A. (2020) Principles of Environmental Science: Inquiry and Application. 9th Edition. McGraw-Hill Companies, Inc.
https://ebookcentral.proquest.com/lib/hkust-ebooks/detail.action?pq-origsite=primo&docID=6327501
Supplementary materials: A range of reading and web resources will be made available on Canvas (canvas.ust.hk) prior to each lecture.

8. Lecture topics and schedule

Wk	Date	Topic	
1	3 Feb	Introduction-why we should care about our environment	
	5 Feb	Evolution, species interactions, and biological communities I	Ch.3
2	10 Feb	Evolution, species interactions, and biological communities II	Ch.3
	12 Feb	Evolution, species interactions, and biological communities III	Ch.3
3	17 Feb	*Holiday break*	
	19 Feb	*Holiday break*	
4	24 Feb	Biomes and Marine Biodiversity I	Ch.5
	26 Feb	Biomes and Marine Biodiversity II	Ch.5

5	3 Mar	Biomes and Marine Biodiversity III	Ch.5
	5 Mar	Human population and dynamics	Ch.4
6	10 Mar	Food Security and Nutrition	Ch.7
	12 Mar	Modern Agriculture	Ch.7
7	17 Mar	Green Revolution and Sustainable farming strategies	Ch.7
	19 Mar	Marine Environmental Health	Ch.8
8	24 Mar	Toxicology and Environmental Toxins	Ch.8
	26 Mar	**Midterm Exam**	
9	31 Mar	Climate, Air and Aquatic Ecosystem Health	Ch.9
	2 Apr	Atmospheric and Ocean Circulation and Climate	Ch.9
10	7 Apr	*Holiday break*	
	9 Apr	Global Climate Change	Ch.9
11	14 Apr	Air Pollution	Ch.10
	16 Apr	Water supply, usage, pollution and remediation	Ch.11

12	21 Apr	Biogeochemical cycling and aquatic ecosystem heath I	Ch.11
	23 Apr	Biogeochemical cycling and aquatic ecosystem heath II	Ch.11
13	28 Apr	Energy, resources, and sustainability	Ch.13
	30 Apr	Solid and Wastes Management	Ch.14
14	5 May	Microplastics: Global and Local Impacts -	
	7 May	Protecting marine environment: our fertile blue soils -	
15		TBD **Final Exam** -	

Chapter numbers refer to those in the major reference by Cunningham and Cunningham (2020).

9. Course AI policy

The use of generative AI is not allowed during exams and in-class quizzes.