

The Hong Kong University of Science and Technology
UG Course Syllabus

Principles and Applications of Environmental Science

OCES 1010

3 credits

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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].

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

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

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

Assessment and Grading

- 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.

Final Grade Descriptors:

[As appropriate to the course and aligned with university standards]

Grades	Short Description
A	Excellent Performance
B	Good Performance
C	Satisfactory Performance
D	Marginal Pass
F	Fail

Course AI Policy

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

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Required Texts and Materials

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.

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.

[Optional] Additional Resources

Lecture topics and schedule

Wk	Date	Topic	Ref.
1	1 Sep	Evolution, species interactions, and biological communities I	Ch.3
	3 Sep	Evolution, species interactions, and biological communities II	Ch.3
2	8 Sep	Evolution, species interactions, and biological communities III	Ch.3
	10 Sep	Biomes and Marine Biodiversity I	Ch.5
3	15 Sep	Biomes and Marine Biodiversity II	Ch.5
	17 Sep	Biomes and Marine Biodiversity III	Ch.5
4	22 Sep	Human population and dynamics	Ch.4
	24 Sep	Food Security and Nutrition	Ch.7
5	29 Sep	Modern Agriculture	Ch.7
6	6 Oct	Green Revolution and Sustainable farming strategies	Ch.7
	8 Oct	Marine Environmental Health	Ch.8
7	13 Oct	Toxicology and Environmental Toxins	Ch.8
	15 Oct	Midterm Exam	
8	20 Oct	Climate, Air and Aquatic Ecosystem Health	Ch.9
	22 Oct	Atmospheric and Ocean Circulation and Climate	Ch.9
9	27 Oct	Global Climate Change	Ch.9
10	3 Nov	Air Pollution	Ch.10
	5 Nov	Water supply, usage, pollution and remediation	Ch.11
11	10 Nov	Biogeochemical cycling and aquatic ecosystem health I	Ch.11
	12 Nov	Biogeochemical cycling and aquatic ecosystem health II	Ch.11

12	17 Nov	Energy, resources, and sustainability	Ch.13
	19 Nov	Solid and Wastes Management	Ch.14
13	24 Nov	Microplastics: Global and Local Impacts	-
	26 Nov	Protecting marine environment: our fertile blue soils	-
	TBD	<i>Final Exam</i>	-

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

<https://www.e-education.psu.edu/earth103/node/991>Links to an external site.