OCES 1010 Principles and Applications of Environmental Science

1. Instructors:

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2. Course Description

Credits: 3

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; atmosphere, air pollution and global climate change; water resources and water pollution; ocean plastics and solid waste management; 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.

3. 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.

4. Course Assessment Scheme

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

5. 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.

6. Lecture topics and schedule

Wk	Topic	Reference	Instructor
1	Introduction to Environmental Science	Ch.1	JL
	Matter, energy and life	Ch.2	JL
2	Evolution, species interactions, and biological communities I	Ch.3	LW
	Evolution, species interactions, and biological communities II	Ch.3	LW
3	Evolution, species interactions, and biological communities III	Ch.3	LW
	Biomes and Biodiversity I	Ch.5	LW
4	Biomes and Biodiversity II	Ch.5	LW
	Human population and dynamics I	Ch.4	LW
5	Human population and dynamics II	Ch.4	LW
6	Food Security and Nutrition I	Ch.7	JZ
	Food Security and Nutrition II	Ch.7	JZ
7	Food Security and Nutrition III	Ch.7	JZ
	Mid-term Exam		
8	Environmental Health and Toxicology I	Ch.8	JZ
	Environmental Health and Toxicology II	Ch.8	JZ
9	Atmosphere circulation and climate	Ch.9	JL
	Air Pollution	Ch.10	JL
10	The hydrological cycle, water supply and usage	Ch.11	JL
	Water conservation and remediation	Ch.11	JL
11	Aquatic ecosystem health	Ch.11	JL
	Energy, resources, and sustainability	Ch.13	OH
12	Solid and Wastes Management I	Ch.14	OH
	Solid and Wastes Management II	Ch.14	OH
13	Microplastics: Global and Local Impacts	-	OH
	Microplastics: detection and removal technology	-	OH
14	*Final Exam*		

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