OCES 1010 Principles and Applications of Environmental Science

Fall 2024

1. **Instructors:**

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2. **Class Time**:

Tuesdays and Thursdays, 3:00 – 4:20 pm

3. **Location**: Lecture Theater C

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; 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.

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%)

7. Student Learning Resources:

Primary Reference textbook(s):

Cunningham, W.P. and Cunningham, M.A. (2022) *Principles of Environmental Science: Inquiry and Application.* 10th Edition. McGraw-Hill Companies, Inc.

https://ebookcentral.proquest.com/lib/hkust-ebooks/detail.action?docID=7068839&query=Principles%20of%20Environmental%20ScienceLinks to an external site.

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	Ref.	Instructor
1	3 Sep	Evolution, species interactions, and biological communities I	Ch.3	LW
	5 Sep	Evolution, species interactions, and biological communities II	Ch.3	LW
2	10 Sep	Evolution, species interactions, and biological communities III	Ch.3	LW
	12 Sep	Biomes and Biodiversity I	Ch.5	LW
3	17 Sep	Biomes and Biodiversity II	Ch.5	LW
	19 Sep	Human population and dynamics I	Ch.4	LW
4	24 Sep	Human population and dynamics II	Ch.4	LW
	26 Sep	Food Security and Nutrition I	Ch.7	JZ
5	3 Oct	Food Security and Nutrition II	Ch.7	JZ
6	8 Oct	Food Security and Nutrition III	Ch.7	JZ

	10 Oct	Environmental Health and Toxicology I	Ch.8	JZ
7	15 Oct	Environmental Health and Toxicology II	Ch.8	JZ
	17 Oct	*Midterm Exam*		JZ, LW
8	22 Oct	Atmosphere circulation and climate I	Ch.9	JL
	24 Oct	Atmosphere circulation and climate II	Ch.9	JL
9	29 Oct	Climate change	Ch.9	JL
	31 Oct	Air Pollution	Ch.10	JL
10	5 Nov	Water supply, usage, pollution and remediation	Ch.11	JL
	7 Nov	Biogeochemical cycling and aquatic ecosystem heath I	Ch.11	JL
11	12 Nov	Biogeochemical cycling and aquatic ecosystem heath II	Ch.11	JL
	14 Nov	Energy, resources, and sustainability	Ch.13	OH
12	19 Nov	Solid and Wastes Management	Ch.14	OH
	21 Nov	Microplastics: Global and Local Impacts	Ch.14	OH
13	26 Nov	Microplastics: detection and removal technology	-	OH
	28 Nov	Protecting marine environment: our fertile blue soils	-	OH
14	TBD	*Final Exam*	-	JL, OH

Chapter numbers refer to those in the major reference by Cunningham and Cunningham (2022).