OCES4203 Environmental Impact and Risk Assessment

Course Outline Fall 2024-25

Tuesday and Thursday, 13:30 – 14:50; Room 4502 (L25-26)

1. Course Coordinator and Instructor:

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Office Hours: by appointment

2. Course Description

Credit points: 3

Pre-requisite: CHEM1030 or OCES1010 (or OCES1030 before 2022)

Exclusion: Nil

Brief description:

This course is a basic introduction to environmental impact assessment (EIA) and the EIA process in Hong Kong. The components of an EIA study will be taught, with particular emphasis on ecological impact assessment (EcoIA), impacts to fisheries, air and water quality impact assessment, and environmental risk assessment. Comparisons of the EIA system with mainland China and other countries are explored, as well as the role of public participation, and the types of mitigation measures implemented. The relationships between environmental management, development projects, and sustainable development are examined. Students will have field trips to visit some locations mentioned as examples in the course. The objective of the course is to equip students with a good working knowledge of EIA for future careers, such as with environmental consultancy companies engaged in EIA projects or non-governmental organisations reviewing EIA reports.

3. Intended Learning Outcomes (ILOs)

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

1. understand and be able to describe the EIA process in Hong Kong, and in comparison with other regions;
2. effectively communicate and have working knowledge of the methodologies involved in conducting ecological impact assessment, fisheries impacts, air and water quality impact assessments, and environmental risk assessment;
3. be capable of critically evaluating environmental impacts and environmental risks to human health arising from development projects;
4. be familiar with examples of major EIA projects in Hong Kong through local case studies and field trips;
5. appreciate the relationship between the environment, sustainable development, and human health.

4. Course Assessment Scheme

Written assignments (1 x in-class exercise and 2 x field trip reports): 40%
Final Examination: 60%

Summary of Assessments:

Assessment Task	Contribution to Overall Course Grade (%)	Due Date
Eco-IA In-Class Exercise	10 %	14/10/2024
Field Trip 1 Report	15 %	21/10/2024
Field Trip 2 Report	15 %	25/11/2024
Final Examination – open book	60 %	To be arranged by ARO

Assessment marks for individual assessed tasks will be released within two weeks of the due date.

5. Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Eco-IA In-Class Exercise	ILO 1, ILO 2, ILO 5	This task assesses the students' understanding of how to conduct baseline ecological surveys in environmental impact assessment (EIA) studies, to identify what are sensitive receivers, and to determine species diversity of a habitat. They will also have to apply problem-solving abilities to this exercise and communicate effectively with group members.
Field Trip 1 Report	ILO 1, ILO 2, ILO 3, ILO 4, ILO 5	This task assesses the students' ability to observe and report on the ecology versus the built environment of the field trip location in a report written in the style of an EIA report. They have to critically analyse the impacts of the construction of the artificial bathing beach on the coastal habitat and explain whether the mitigation measures implemented are effective.
Field Trip 2 Report	ILO 1, ILO 2, ILO 3, ILO 4, ILO 5	This task assesses the students' ability to observe, analyse and report on how the current biodiversity and environment might be affected by proposed future development at this location, thus be able to evaluate what consequent impacts might entail. They have to apply critical thinking and propose what might be appropriate mitigation measures.
Final Examination	ILO 1, ILO 2, ILO 3, ILO 4, ILO 5	This task assesses students' in-depth comprehension and their ability to explain the principles and procedures of EIA and environmental risk assessment. Their ability to apply critical thinking will be tested, including how to conduct or evaluate impacts on ecology, fisheries, air and water quality, as well as determine environmental risks to human health and recommend mitigation measures.

6. Final Grade Descriptors

Grades	Short Description	Elaboration on Subject Grading Description
A	Excellent Performance	Students demonstrate a thorough understanding of EIA procedures and impacts of development projects. They consistently demonstrate exceptional levels of critical thinking and problem-solving skills. These students show a profound awareness of how development projects can affect the environment, be able to critically evaluate impacts, and are able to recommend appropriate mitigation measures. They show a thorough understanding of the difficult balance between development and conservation and can communicate effectively from different perspectives of a problem.
B	Good Performance	Students exhibit a strong understanding of the EIA procedure and are able to apply their knowledge adequately. They demonstrate competent analytical skills and the ability to evaluate environmental impacts. They are generally consistent in connecting the course material to real-world applications but may miss providing more in-depth explanations.
C	Satisfactory Performance	Students demonstrate a satisfactory grasp of the fundamental concepts of EIA. They can provide basic explanations to problems but cannot identify or provide an in-depth evaluation of environmental impacts. Their problem-solving skills are adequate. These students show a reasonable awareness of local environmental issues but may not fully grasp the complex relationships between development, sustainability and conservation.
D	Marginal Pass	Students demonstrate a minimal understanding of the EIA process and application. They may grasp basic concepts but have difficulty relating lecture cases to real-world situations. Their problem-solving approaches are too simplistic and may lack in-depth understanding of the issues and thus are able to identify only some, but not all, of the environmental impacts or propose limited mitigation measures.
F	Fail	Students have not met the minimum requirements for the course. They show a lack of understanding of the basic procedures in EIA and risk assessment and are unable to identify impacts of even basic scenarios. They demonstrate a failure to engage with the lecture materials or field visits, and they are unable to provide explanations or recommend solutions to environmental impacts.

7. Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission.

8. Course AI Policy

The use of Generative AI may be used for this course with the understanding that although it may help in the writing of reports in terms of English language, EIA reports involve a certain style, and the assignments are very topic-specific (e.g. field trip reports), which GenAI may not be able to assist with. Any use of GenAI must be declared in the assignments.

9. 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.

10. Student Learning Resources

Lecture notes and supplementary course materials will be made available on Canvas (canvas.ust.hk) prior to each lecture.

Key References from Environmental Protection Department (EPD):

1) Environmental Impact Assessment Ordinance (EIAO), EPD (http://www.epd.gov.hk/epd/eia/english/legis/index1.html)
2) Technical Memorandum on EIA Process, EPD (http://www.epd.gov.hk/epd/eia/english/legis/index3.html)
3) EIA Reports uploaded to the EPD website (http://www.epd.gov.hk/epd/eia)

11. Course Schedule

Three hours of lectures per week (2 lectures per week), includes in-class activities.

Two field trips are planned, but these have to be arranged on weekends in order to avoid time clashes with other courses.

Wk	Date	Topic
1	3 Sep (Tue)	L1. Introduction to Environmental Impact Assessment (EIA)
	5 Sep (Thu)	L2. Population, Environment and Development of Hong Kong
2	10 Sep (Tue)	L3. EIA in General and in Other Countries
	12 Sep (Thu)	L4. The EIA Process in Hong Kong
3	17 Sep (Tue)	L5. Ecological Impact Assessment (EcoIA) I
	19 Sep (Thu)	L6. EcoIA II - Case Study 1: Artificial Bathing Beach in Lung Mei, Tai Po
4	24 Sep (Tue)	L7. EcoIA III – Baseline Survey Methods
	26 Sep (Thu)	L8. Shannon-Wiener Diversity Index, Example: Intertidal Baseline Survey
5	*01 Oct (Tue)*	*Public Holiday – No Class*
	03 Oct (Thu)	L9. In-Class Exercise on EcoIA
6	08 Oct (Tue)	L10. Water Quality Impact Assessment I
	10 Oct (Thu)	L11. Water Quality Impact Assessment II – FCZs and Eutrophication
	12 Oct (Sat)	Field Trip 1 – Lung Mei Artificial Bathing Beach, near Tai Po
7	*15 Oct (Tue)*	*No Class – compensation for Field Trip 1*
	17 Oct (Thu)	L12. Fisheries & Mariculture in Hong Kong – Background Information
8	22 Oct (Tue)	L13. Fisheries Impacts in EIA
	24 Oct (Thu)	L14. Case Study 2 – Harbour Area Treatment Scheme (HATS)
9	29 Oct (Tue)	L15. Environmental Risk Assessment I
	31 Oct (Thu)	L16. Environmental Risk Assessment II
10	05 Nov (Tue)	L17. Case Study 3 – HKIA Three Runway System (3RS)
	07 Nov (Thu)	L18. Air Quality Impact Assessment I
11	12 Nov (Tue)	L19. Air Quality Impact Assessment II
	14 Nov (Thu)	L20. Lok Ma Chau & Northern Metropolis Development
	16 Nov (Sat)	Field Trip 2 – Lok Ma Chau/San Tin [to be confirmed]
12	*19 Nov (Tue)*	*No Class – compensation for Field Trip 2*
	21 Nov (Thu)	L21. Environmental Monitoring & Audit (EM&A)
13	26 Nov (Tue)	L22. 3RS EM&A – Guest Lecture by Ms. Julia Chan (of Mott MacDonald)
	28 Nov (Thu)	Course Review