

CIVL 2410 ENVIRONMENTAL ASSESSMENT AND MANAGEMENT
Spring, 2023–24 Course Syllabus

UNITS : [3-1-0:3]

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<u>SCHEDULE</u> :	<u>Time</u>	<u>Room</u>
Lecture Hour	TTH 13:30-14:50	LTC
Tutorial Hour		
Session I	M 18:00-18:50	4620
Session II	TH 17:00-17:50	1104

COURSE DESCRIPTION

Present current environmental issues and management concepts; apply essential chemical and physical principles required to understand pollution problems; integrate knowledge from science and engineering to solve and assess environmental problems affecting water, air, noise and waste; cover concepts, ordinances and case studies of environmental impact assessment of civil infrastructure projects (Prerequisites: CHEM1010/1020 and CIVL1100).

This course consists of two parts: 1) Lectures about essential concepts and principles in the fields of environmental engineering and management and environmental impact assessment, and 2) an individual project report on a listed environmental impact assessment (EIA) report. For the project report of an EIA project report, students are expected to self-study an executive summary of a listed EIA project available in EPD website to formulate a summary report, with emphases on their understanding and appreciation on the EIA project. Details of the project report will be announced later.

TEXT BOOK

Masters, Gilbert M. and Wendell P. Ela (2014). Introduction to Environmental Engineering and Science, New International Edition. Prentice-Hall, NJ. [Available on-line]

OTHER REFERENCES

Davis, Mackenzie L. and David Cornwell (2013). Introduction to Environmental Engineering, 5th edition. McGraw Hill, NY. [Available in the library course reserve.]

List of EIA Reports available at:

<https://www.epd.gov.hk/eia/english/register/aeiara/all.html>

INTENDED LEARNING OUTCOMES (ILOS)

1. Develop a technical understanding of real-world environmental pollution problems affecting water, air and land resources.
2. Master basic scientific and engineering principles governing methods of solving problems affecting water, air and land resource quality.
3. Understand and formulate key elements of the Environmental Impact Assessment process that govern the application of the process to civil infrastructure projects.
4. Be aware of major environmental issues of today and their implications for human well-being.

RELATIONSHIP TO PROGRAM OBJECTIVES

POE1. Provide students with professional skills in the design, construction and management of civil infrastructures, as well as an awareness of environmental sustainability.

-- This course introduces students to problems affecting water, air and land resources, and methods of predicting, assessing, managing and mitigating their impacts. (ILOS #1, #2, #3, #4)

POE4. Expose students to real world engineering projects as well as cutting edge research to improve their understanding of the profession and technological advancements that can improve current practice.

-- Students are exposed to a real-world environmental impact assessment problem. This will strengthen their understanding of the role of environmental engineering in civil infrastructure development. (ILO #3)

RELATIONSHIP TO PROGRAM OUTCOMES

PO1. Acquire fundamental knowledge in mathematics and science on which civil and environmental engineering research and practice are based.

-- This course introduces students to fundamental physical and chemical principles governing the fate and transport of pollutants in the environment, and their effects on environmental quality. (ILOS #1, 2)

PO2. Understand fundamental principles of engineering science relevant to civil and environmental engineering disciplines.

-- This course introduces students to fundamental engineering principles essential for solving environmental engineering problems and for assessing the environmental impacts of infrastructure projects. (ILOs #1, 2, 3)

PO5. Develop an ability to identify and formulate civil and environmental engineering problems, and propose feasible solutions with an appreciation of their underlying assumptions, uncertainties, constraints, and technical limitations.

-- This course introduces students to environmental engineering problems, and provides appropriate methods of solving those problems. (ILOs #1, 2, 3)

PO8. Obtain in-depth knowledge in at least one major area of specialization within civil and environmental engineering.

-- This course is an introductory course to environmental engineering that provides a foundation for students taking higher-level courses in environmental engineering. (ILOs #1, 2, 3)

PO11. Instill a deep sense of professional responsibilities and the importance of ethical and societal considerations, including public health, safety, environmental conservation, welfare etc.

-- This course exposes students to real world problems affecting environmental resources, and the role of engineers in assessing, managing and mitigating their impacts. (ILOs #3, 4)

ASSESSMENT OF OUTCOMES AND MARK ALLOCATION

Examine 1	40%
Examine 2	30%
Final Project Report of a Listed EIA Report	10%
Homework (best 4 out of 5, no late submission)	20%

TENTATIVE SCHEDULE*

<i>Week</i>	<i>Date</i>	<i>Topic</i>	<i>Remarks</i>
1	1-2-24	Course syllabus and course introduction (1)	
2	6-2-24	Introduction to environmental engineering, sustainable development and carbon management (2)	
	8-2-24	Unit and unit conversion (3.1) Environmental chemistry (3.2)	
3	15-2-24	Mass balance and reaction rate (3.3)	T2-15/2 (Adel) T1-19/2 (Adel) Homework 1 (Due on 22/2)
4	20-2-24	Environmental risk (4)	
	22-2-24	Introduction to EIA (5.1)	T2-22/2 (Jiadong) T1-26/2 (Jiadong)
5	27-2-24	Introduction to EIA report (5.2)	
	29-2-24	Solid waste management (6)	T2-29/2 (Jiadong) T1-4/3 (Jiadong) Homework 2 (Due on 12/3)
6	5-3-24	Water resources and pollution (7.1)	

	7-3-24	Surface water quality modelling (7.2)	T2-7/3 (Gabi) T1-11/3 (Gabi)
7	12-3-24	Surface water quality modelling (7.2)	Homework 3 (Due on 19/3)
	14-3-24	Subsurface contamination and modelling (7.3)	T2-14/3 (Gabi) T1-18/3 (Gabi)
8	19-3-24	Wastewater, groundwater and soil treatment (7.4)	
	21-3-24	<i>Examine 1 (Part 1)</i>	
9	26-3-24	<i>Examine 1 (Part 2)</i>	
10	9-4-24	Review of Exam 1	
	11-4-24	Air quality and pollution (8.1)	
11	16-4-24	Air pollution modelling (8.2)	
	18-4-24	Air pollution control (8.3)	T2-18/4 (Xinyi) T1-22/4 (Xinyi) Homework 4 (Due on 25/4)
12	23-4-24	Noise pollution, modeling and control (9)	
	25-4-24	Noise pollution, modeling and control (9)	T2-25/4 (Yixiao) T1-29/4 (Yixiao) Homework 5 (Due on 2/5)
13	30-4-24	More about the final EIA report	Final EIA report (Due on 9/5)
	2-5-24	Water supply and treatment (10)	T2-2/5 (Arnaud) T1-6/5 (Arnaud) Q&A about final report
14	7-5-24	Guest lecture: Green city (by Prof. Yang Jiachuan)	
	9-5-24	Guest lecture: Green building (by Prof. Wang Zhe)	
		<i>Examine 2 (TBR in the exam week)</i>	

* subject to change.

PROJECT REPORT OF A LISTED EIA REPORT

Each of you are asked to self-study an executive summary of a listed EIA project available in EPD website and to write a summary report of the EIA report, with emphases on your understanding and appreciation on the EIA project. First, you shall identify the EIA project report that you shall be working on. You shall work on the EIA project report who's last two digits of the application number shall match with the last two digits of your student ID number. For example, a student with the last two digits of 99 shall work on a project with the application number of EIA-x99/xxxx. You shall then study its executive summary and identify the most serious environmental impact arises from the project during the construction and the operation periods and the actions for remediating the impacts. Then you will write a summary report of your findings. Your summary report shall cover an introduction of the project (2%), a summary of all potential

environmental impacts (3%), a more-detailed summary of the most serious environmental impact arises from the project, including who are the most affected sensitive receivers, during the construction and the operation periods that you identified and the actions for remediating the impacts provided in the executive summary of the EIA report (5%).

The length of your summary report is expected to be 600 ± 100 words, 1-inch margins, 12-point Times New Roman font, single-spaced, which shall be close to 1 page. There shall be no cover page, no table of content, no table, no figure, and no reference page. The report is due on **9th May 2024** and you shall submit it online.