

CIVL 2410 ENVIRONMENTAL ASSESSMENT AND MANAGEMENT
Spring, 2022–23 Course Syllabus

UNITS : [3-1-0:3]

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<u>SCHEDULE</u> :	<u>Time</u>	<u>Room</u>
Lecture Hour		
	TTH 10:30-11:50	LTA
Tutorial Hour		
Session I	M 15:00-15:50	2502
Session II	F 18:00-18:50	4619

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 is being reinvented into a blended learning course. It consists of two parts: 1) Lectures about essential concepts and principles in the field of environmental engineering and management and 2) a project on environmental impact assessment. The former lasts for over two months and the latter covers the last 3 weeks. For the EIA project, introduction of the background will be first given by the instructor. Students are then expected to self-study (search and learn) the essential concepts needed for the project, formulating ideas that are to be discussed and refined, with guidance from the instructing team. At last, students are asked to prepare an EIA report in a specific area, with emphases on their quantitative analysis and multidimensional considerations from different angles including social, economic, science and engineering aspects.

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.]

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	50%
Final EIA Report	30%
Homework	20%

TENTATIVE SCHEDULE*

<i>Week</i>	<i>Date</i>	<i>Topic</i>	<i>Remarks</i>
1	7-2-23	Course introduction (1)	
	9-2-23	Introduction to environmental engineering, sustainable development, and EIA (2)	
2	14-2-23	Units (3.1) and Mass balance (3.2)	
	16-2-23	Environmental chemistry and biology (4)	Homework 1 (Due on 23/2)
3	21-2-23	Environmental risk (5)	
	23-2-23	Solid waste and management (6)	Homework 2 (Due on 2/3)
4	28-2-23	Water resources and pollution (7.1)	
	2-3-23	Water quality modelling (7.2)	

5	7-3-23		
	9-3-23	Subsurface contamination, modelling and treatment (7.3)	Homework 3 (Due on 16/3)
6	14-3-23	Water supply and treatment (7.4)	
	16-3-23	Wastewater treatment (7.5)	
7	21-3-23	Air quality and pollution (8.1)	
	23-3-23	Air pollution modelling (8.2)	Homework 4 (Due on 30/3)
8	28-3-23	Air pollution control (8.3)	
	30-3-23	Exam break and Q&A for exam	
9	4-4-23	<i>Examine</i>	
	13-4-23	<i>Review of Examine paper</i>	
10	18-4-23	Noise pollution and control (9.1)	
	20-4-23	Noise pollution and control (9.1)	Homework 5 (Due on 27/4)
11	25-4-23	Introduction to EIA report (10.1)	
	27-4-23	EIA report: Legislation, guidelines, and sensitive receivers (10.2)	
12	2-5-23	EIA report: Assessment methodology, identification, assessment, and mitigation of environmental impacts (10.3)	
	4-5-23	EIA report: Residual Impact, monitoring, audit, conclusions, and summary (10.4)	
13	9-5-23	EIA report: Writing	

* subject to change.