SEE2201: FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Fundamentals of Environmental Engineering

Subject Code
SEE - School of Energy and Environment
Course Number
2201

Academic Unit
School of Energy and Environment (E2)

College/School
School of Energy and Environment (E2)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
PHY1201 General Physics I;
BCH1100 Chemistry OR CHEM1300 Principles of General Chemistry;
BCH1200 OR CHEM1200 Discovery in Biology;
MA1200 Calculus and Basic Linear Algebra I or
MA1300 Enhanced Calculus and Linear Algebra I; AND
MA1201 Calculus and Basic Linear Algebra II or
MA1301 Enhanced Calculus and Linear Algebra II

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to systematically introduce students to the fundamental principles in the field of environmental engineering. Building upon the fundamental principles, students will be introduced to the science and engineering analysis methods used to study water and air quality, noise and waste management and their engineering control. This course will lay the groundwork for students to receive further training in more specialized areas of environmental engineering and understand the latest innovative development in the discipline.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the properties of air, water and their contaminants	20		x	
2	Describe the transformation and transport processes of contaminants	20		x	
3	Analyze environmental models	10		x	
4	Practice water and waste engineering and understand the latest innovative technology	25		x	
5	Practice air quality engineering and understand the latest innovative technology	25		x	

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Explain theories and concepts	1, 2, 3, 4, 5	
2	Tutorials	Apply theories and concepts on practical examples	1, 2, 3, 4, 5	
3	Field trip	Visit an engineering facility	4, 5	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments There will be two assignments throughout the semester. Students will complete the assignments to demonstrate their ability to apply their knowledge in topics related to environmental engineering.	1, 2, 3, 4, 5	30	
2	Quiz Students will engage in on-line quiz to demonstrate their understandings on the topics related to fundamental of environmental engineering.	1, 2, 3, 4, 5	30	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

2

Additional Information for ATs

Examination duration: 2 hrs
Percentage of continuous assessment, examination, etc.: 60% by continuous assessment; 40% by exam

To pass a course, a student must do ALL of the following:
1) obtain at least 30% of the total marks allocated towards continuous assessment (combination of assignments, pop quizzes, term paper, lab reports and/ or quiz, if applicable);
2) obtain at least 30% of the total marks allocated towards final examination (if applicable); and
3) meet the criteria listed in the section on Assessment Rubrics.

Assessment Rubrics (AR)

Assessment Task

1. Assignments

Criterion

Ability to analyse and solve problems related to application in environmental engineering

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
2. Quiz

Criterion
Ability to analyse and solve problems related to application in environmental engineering

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
3. Examination

Criterion
Ability to analyse and solve problems related to application in environmental engineering

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Composition and physiochemical properties of contaminants; physical, chemical and biological transformation mechanisms of contaminants; contaminant transport phenomena; reactor models; material-balance models; water and wastewater treatment engineering and design; air pollutant emissions and controls

Reading List

Compulsory Readings

	Title
1	Mackenzie Davis and Susan Masten, Principles of Environmental Engineering and Science. McGraw Hill. (4th Edition) 2024
2	Masters, G.M. and W.P. Ela. 2007. Introduction to Environmental Engineering and Science, 3rd ed. Published by Pearson (May 18th 2023) - Copyright © 2008

Additional Readings

	Title
1	https://www.epd.gov.hk/epd/english/environmentinhk/waste/prob_solutions/WFdev_intro.html
2	https://www.wsd.gov.hk/en/core-businesses/total-water-management-strategy/index.html