City University of Hong Kong
Course Syllabus

offered by School of Energy and Environment
with effect from Semester A 2020/21

Part I Course Overview

Course Title:	Fundamentals of Environmental Engineering
Course Code:	SEE2201
Course Duration:	One semester
Credit Units:	3
Level:	B2
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	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: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

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.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe the properties of air, water and their contaminants	20%		✓	
2.	Describe the transformation and transport processes of contaminants	20%		✓	
3.	Analyze environmental models	10%		✓	
4.	Practice water and waste engineering and understand the latest innovative technology	25%		✓	
5.	Practice air quality engineering and understand the latest innovative technology	25%		✓	
** If weighting is assigned to CILOs, they should add up to 100%.*		100%			

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

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

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: __60__%							
Assignments	✓	✓	✓	✓	✓	30%	
Quiz	✓	✓	✓	✓	✓	30%	
Examination: __40__% (duration: 2 hours, if applicable)							
** The weightings should add up to 100%.*						100%	

Examination duration: 2 hrs

Percentage of coursework, examination, etc.: 60% by coursework; 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 coursework (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.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Assignments	Ability to analyse and solve problems related to application in environmental engineering	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Quiz	Ability to analyse and solve problems related to application in environmental engineering	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	Ability to analyse and solve problems related to application in environmental engineering	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

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

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nazaroff, W.W. and L. Alvarez-Cohen. 2000. Environmental Engineering Science. John Wiley & Sons, Inc.
2.	Masters, G.M. and W.P. Ela. 2007. Introduction to Environmental Engineering and Science, 3rd ed. Prentice-Hall, Inc.
3.	Wark, K., C.F. Warner, and W.T. Davis. 1998. Air Pollution: Its Origin and Control, 3rd ed. Addison Wesley Longman, Inc.

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

Nil