GE1337: URBAN GREEN CITY: POLLUTION AND SOLUTION

Effective Term
Semester B 2022/23

Part I Course Overview

Course Title
Urban Green City: Pollution and Solution

Subject Code
GE - Gateway Education
Course Number
1337

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

GE Area (Primary)
Area 3 - Science and Technology

GE Area (Secondary)
Area 2 - Study of Societies, Social and Business Organisations

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

Pollution is the by-product of industrialization and urbanization. Growing numbers of cities and surrounding environments throughout the world have now suffered from issues such as air, water, and waste pollution, among many other environmental problems. Clean and healthy urban environments are the critical and essential elements of quality living. In order to develop a sustainable society, it is important to understand and apply new technologies to tackle these pollution problems. This course is designed to enable students to develop a broader perspective and critical understanding of the current pollution issues related to urban environments, as well as to identify possible solutions to these environmental problems based on sound scientific understanding. The comprehensive course contents consist of environmental health and toxicology, food safety and security, air pollution and health effects, climate change, water pollution and resource utilization, wastewater treatment and management, integrated solid waste management, and future sustainable development/environmental ethics. Case studies on Hong Kong and Greater Bay Area environments will also be covered to help students gaining more understanding of the local environments. The major learning activities include lectures, tutorials, and projects.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Comprehend essential urban environmental concepts such as life supporting system, natural resources, sustainability, and their inter-relationships	20	x	x	
2	Describe the source and complexity of environmental pollution and natural resources	20	x	x	
3	Discover pollution issues and apply existing innovative technologies for remedying these problems	20	x	x	x
4	Apprehend the basic biological and chemical behaviour of environmental pollutants	20	x	x	
5	Apply the acquired knowledge to design a future sustainable city and contribute to environmental protection	20		x	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.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Introduction to science and engineering principles, environmental pollution, sustainable development/ environmental ethics.	1, 2, 3, 4, 5	2.5
2	Group discussion/ presentation/tutorial	Practice on problem solving; questions and answers; group discussion.	1, 2, 3, 4, 5	0.5
3	Reading/Self-study/ Project	Data and information collection; critical thinking; report writing	1, 2, 3, 4, 5	3

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Participation: Students involvement throughout the course	1, 2, 3, 4, 5	10	
2	Assignments and Project: Homework assignments, Data and information collection, Report writing	1, 2, 3, 4, 5	40	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

Examination duration: 2 hrs
Percentage of coursework, examination, etc.: 50% by coursework; 50% 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.

Assessment Rubrics (AR)

Assessment Task

1. Participation, assignment and final exam

Criterion

Interpretation, analysis and problem solving in pollution issues

Excellent (A+, A, A-)
Strong evidence of knowledge and skills in the interpretation, analysis and problem solving in pollution issues.

Good (B+, B, B-)
Some evidence of knowledge and skills in the interpretation, analysis and problem solving in pollution issues.

Fair (C+, C, C-)
Student has some understanding of the pollution subject and shows some analytical capability; evidence of interest in the subject.

Marginal (D)
Sufficient familiarity with matters in the pollution field to enable the student to progress without repeating the course.

Failure (F)
Little evidence of familiarity with the field of pollution issues.

Assessment Task
2. Project

Criterion
Originality and evidence of reflection on performance-based on theory and creative views

Excellent (A+, A, A-)
High degree of originality and evidence of reflection on performance-based on theory and creative views.

Good (B+, B, B-)
Some degree of originality. Good coverage with relevant and accurate support on issues.

Fair (C+, C, C-)
Student covers a fair number of issues. However, little evidence of understanding the overall view of the project.

Marginal (D)
Information is relevant but limited. Minimal understanding with poor coverage of the project.

Failure (F)
Irrelevant information with no understanding to the project

Part III Other Information

Keyword Syllabus

Week 1: Introduction to urban pollution
Overview of pollution problems in urban city.

Week 2-3: Environmental health
Connection between environment and health. Hazards. Cause-effect relationship. Scope of environmental toxicology. Measurements of toxicity.

Week 4: Environment and food production and safety
Food demand and production. Green Revolution. Food safety and security.

Week 5-7: Air pollution and control
Air circulation. Global warming. Climate change. Ozone depletion. Greenhouse gases and their cycling in the environment. Air pollution. Acid raining and acidification.

Week 8-10: Water Pollution and Control
Water resources. Water usage. Water cycle. Groundwater. Eutrophication. Hypoxia and anoxia. Water pollution types and remediation.

Week 11: Wastewater treatment technology and management
Wastewater production and quantification. Wastewater treatment technologies.

Week 12: Case studies in Hong Kong: Integrated solid waste management
Types of wastes; 4R approach: Reduce, Reuse, Recycle and Replace; Current challenges

Week 13: Human and Environment: Future sustainable development
Develop sustainable approach to tackle pollution problems, Ocean health and connection with urban environment in Hong Kong. Resource utilization.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Cunningham, W.P. and Cunningham, M.A. (2017) Principles of Environmental Science: Inquiry and Application. Eighth Edition. McGraw-Hill Companies, Inc.

Annex (for GE courses only)

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)

PILO 1: Demonstrate the capacity for self-directed learning

1, 3

PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology

2, 4, 5

PILO 3: Demonstrate critical thinking skills

1, 2, 5

PILO 4: Interpret information and numerical data

3

PILO 6: Demonstrate effective oral communication skills

2

PILO 7: Demonstrate an ability to work effectively in a team

5

PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues

1, 2, 4

PILO 9: Value ethical and socially responsible actions

1, 4, 5

PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation

5

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task

Group power point presentation/Reflection essay/Final exam