

# CA4679: ADVANCED ENVIRONMENTAL ENGINEERING

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## Effective Term

Semester A 2022/23

## Part I Course Overview

### Course Title

Advanced Environmental Engineering

### Subject Code

CA - Civil and Architectural Engineering

### Course Number

4679

### Academic Unit

Architecture and Civil Engineering (CA)

### College/School

College of Engineering (EG)

### Course Duration

One Semester

### Credit Units

3

### Level

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

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

CA2169 Environmental Engineering , or SEE2201 Fundamentals of Environmental Engineering

Students must have attempted (including class attendance, coursework submission, and examination) the precursor course(s) so identified.

### Equivalent Courses

BC4679 Environmental Engineering & Management

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

The course focuses not only on the science and engineering principles in minimizing the adverse effects of human activities on the environment, but also on the social, cultural and managerial aspects. Furthermore, the course aims in providing basic knowledge in the area of physics, chemistry, and biology for students to understand current environmental issues, such as solid waste management, air quality and control, and noise pollution problem and management.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)		
1	Design simple unit for physical, chemical and biological treatment processes		x	
2	Design simple solid waste management system		x	
3	Measure and control of air quality		x	
4	Measure and manage noise pollution		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	Lecture	Fundamental principles on solid waste management, air pollution and control, and noise pollution and control	1, 2, 3, 4
2	Tutorial	Reinforcement on fundamental design principles covered by the lectures	1, 2, 3, 4
3	Case Study	Explorative sessions on specific engineering or design scenarios	3, 4

**Assessment Tasks / Activities (ATs)**

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment	1, 2, 3, 4	20	
2	Quiz	1, 2, 3, 4	30	

**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

2

**Additional Information for ATs**

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%

**Assessment Rubrics (AR)****Assessment Task**

Assignment

**Criterion**

CAPACITY to UNDERSTAND fundamental principles pertaining to solid waste management, air pollution and control, and noise pollution and control. ABILITY to DESIGN basic processing units required for solid waste management.

**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**

Quiz

**Criterion**

CAPACITY to UNDERSTAND fundamental principles pertaining to solid waste management, air pollution and control, and noise pollution and control. ABILITY to DESIGN basic processing units required for solid waste management.

**Excellent (A+, A, A-)**

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**Assessment Task**

Examination

**Criterion**

CAPACITY to UNDERSTAND fundamental principles pertaining to solid waste management, air pollution and control, and noise pollution and control. ABILITY to DESIGN basic processing units required for solid waste management.

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Basic

**Failure (F)**

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**Part III Other Information****Keyword Syllabus**

Chemical disinfection; water coagulation; kinetics and population dynamics; trickling filters; activated sludge process; waste generation, minimization, collection, treatment and disposal; air quality standard; air pollution control, noise pollution and management. Sustainable development.

**Reading List****Compulsory Readings**

Title	
1	Nil

**Additional Readings**

Title	
1	Baldasano JM and Power H, Environmental Engineering and Management, Boston, Southampton: WIP Press.
2	Peavy, Rowe and Tchobanoglous, Environmental Engineering, McGraw-Hill, 1985.

3	Vesilind, Worrel and Reinhart, Solid Waste Engineering, Brooks/Cole, 2002.
4	Viessman and Hammer, Water Supply and Pollution Control, 7th Edition, Pearson Prentice Hall.