

# CA29401: SUSTAINABLE ENVIRONMENT

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## Effective Term

Semester A 2022/23

## Part I Course Overview

### Course Title

Sustainable Environment

### Subject Code

CA - Civil and Architectural Engineering

### Course Number

29401

### Academic Unit

Architecture and Civil Engineering (CA)

### College/School

College of Engineering (EG)

### Course Duration

One Semester

### Credit Units

3

### Level

A1, A2 - Associate Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

CA29401 Environmental Studies - Sustainable Design and Building Systems

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

This course aims to introduce the elements of building in response to the environment, and various mechanism between architecture and sustainable design.

### Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify the key aspects of sustainable design.	x		
2	Explore the sustainable design strategies for buildings and cities.	x		
3	Develop a building envelope using appropriate materials and components to enhance sustainability.		x	
4	Incorporate passive climatic strategies in a building, such as natural ventilation and lighting.		x	
5	Understand sustainable building assessment systems in Hong Kong and other areas.		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	Consists of oral presentations by instructors intended to present information on a particular subject. Other forms of teaching and learning activities will also be used to stimulate students' participation during a lecture.	1, 2, 3, 4, 5

2	Tutorial	Activity complementary to the lecture classes to provide more opportunities for student-instructor and student-student interaction. Students will be engaged in more detailed discussions on the lecture materials and/or assessment tasks in a tutorial.	2, 3, 4, 5	
3	Seminar	Consists of oral presentations by instructors and/or external guests, which focuses on a selected topic relating to the integrated studio or the various subject area courses.	3, 5	

**Assessment Tasks / Activities (ATs)**

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment	1, 2, 3, 4, 5	60
2	Mid-term test	1, 2, 5	20

**Continuous Assessment (%)**

80

**Examination (%)**

20

**Examination Duration (Hours)**

1.5

**Additional Information for ATs**

Students must attain a minimum mark of 30 in all assessment components AND an overall mark of 40 to pass the course.

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

Assignment

**Criterion**

- 1.1 Identification of the key aspects of sustainable design.
- 1.2 Clear explanation of the sustainable design strategies for buildings and/or cities.
- 1.3 Incorporation of passive climatic strategies in buildings.
- 1.4 Develop building envelop using appropriate materials and components to enhance sustainability.
- 1.5 Understand sustainable building assessment systems in Hong Kong and other areas.

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

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal level

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**Assessment Task**

Mid-term test

**Criterion**

- 2.1 Identification of the key aspects of sustainable design.
- 2.2 Clear explanation of the sustainable design strategies for buildings and/or cities.
- 2.3 Understand sustainable building assessment systems in Hong Kong and other areas.

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

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal level

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**Assessment Task**

Examination

**Criterion**

- 3.1 Identification of the key aspects of sustainable design.
- 3.2 Clear explanation of the sustainable design strategies for buildings and/or cities.
- 3.3 Understand sustainable building assessment systems in Hong Kong and other areas.

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

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal level

**Assessment Task**

Examination

**Criterion**

Examine critically all relevant sustainable technologies and building services technologies demonstrated in this course,

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

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal level

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

- Introduction to sustainability: factors of sustainability; ecological footprint; local and worldwide sustainable benchmarks; building ecosystem; building life-cycle.
- Passive climatic design: Climatic factors; climate and outdoor design conditions; natural ventilation and lighting; infiltration; solar design.
- Sustainable design: Principles and strategies; site design; energy management; renewable energy; sustainable material selection; water management; indoor air quality; alternative energy; environmental systems; sustainable building assessment methods.

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

Title	
1	Nil

**Additional Readings**

Title	
1	Mendler, Sandra and Odell, William, The HOK Guidebook to Sustainable Design, John Wiley & Sons, Inc., 2000
2	The European Commission for Energy, A Green Vitruvius - Principles and Practice of Sustainable Architectural Design, James & James, 1999
3	Michael McEvoy, Mitchell's: External Components, Longman 1994

4	David J Clarke, 'Green Cladding', "Building Journal Hong Kong China", January 2000
5	Vic Mulgrave, Details in Architecture Vol.1-5, Images Pub., 1999
6	Gauzin-Muller, Dominique, Sustainable architecture and Urbanism - Concepts, Technologies, Examples, Birkhauser, 2002
7	Smith, Peter, Architecture in a Climate of Change: A Guide to Sustainable Design, Elsevier, 2005
8	Lim, Bernard and Leung, Man-kit, "Passive Environmental Strategies for Architectural Design", Building Hong Kong: Environmental Considerations, HK University Press 2000
9	Peter Gorer & Toby Bath, "Pacific Crossings Seminar - Green Building Rating Systems", AIA Hong Kong, 2006
10	Brown, G.Z. and DeKay, M. (2001) Sun, wind and light. Architectural design strategies, New York: Wiley.