

CA2348: SUSTAINABLE ENVIRONMENT

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Sustainable Environment

Subject Code

CA - Civil and Architectural Engineering

Course Number

2348

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

Nil

Equivalent Courses

Nil

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	Describe the key aspects of sustainable design.	x		
2	Discuss the sustainable design strategies for buildings and cities.	x		
3	Design a building envelope using appropriate materials and components to enhance sustainability.		x	
4	Formulate passive climatic strategies in a building, such as natural ventilation and lighting.		x	
5	Explain and apply 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.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will engage in lecture to acquire the knowledge related to sustainable design and assessments.	1, 2, 3, 4, 5
2	Tutorial	Students will engage in tutorials to discuss and participate in activities to solve problems related to the lecture themes.	2, 3, 4, 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

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

- 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

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

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

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.