CA4423: SUSTAINABLE GREEN CONSTRUCTION

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Sustainable Green Construction

Subject Code
CA - Civil and Architectural Engineering
Course Number
4423

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 provides an introduction to sustainable green construction, with a focus on green design and construction of sustainable buildings and infrastructure. Throughout the course, students will not only have a deep understanding of green

construction principles and theory, including the green building assessment systems, but also could seek solutions for the sustainable green construction challenges.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the concepts of green construction, and explain how green construction can create a more sustainable world;		x		
2	Elaborate on how the green construction principles and technologies can be applied in new construction and renovation projects;			x	
3	Evaluate the performance of a green construction project;			x	
4	Critique an existing solution for green construction and propose feasible solutions.				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	Lectures	Interactive lecture on teaching the fundamental knowledge on life-cycle sustainable green construction.	1, 2, 3, 4	1.62 hours/week
2	Site Visit	Visit green building project(s) in Hong Kong or Mainland China.	1, 2	0.23 hour/week
3	Computer Lab Tutorial	Tutorials on modern computer applications in sustainable green construction.	2, 3	0.69 hour/week
4	Case study	Analysis of how to apply the learned knowledge into the real practice.	1, 2, 3, 4	0.46 hour/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Tests	1, 2, 4	10	
2	Individual Assignment	1, 3	15	
3	Group Project	1, 2, 3, 4	20	
4	Participation	1, 2, 4	5	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

Assessment Rubrics (AR)

Assessment Task

Tests

Criterion

Demonstration of the learned knowledge.

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair (C+, C, C-)

Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.

Marginal (D)

Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Assessment Task

Individual Assignment

Criterion

Demonstration of the learned knowledge.

Excellent (A+, A, A-)

Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good (B+, B, B-)

Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair (C+, C, C-)

Student who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material.

Marginal (D)

Sufficient familiarity with the subject matter to enable the student to progress without repeating the course.

Failure (F)

Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Assessment Task

Group Project

Criterion

Demonstration of efforts and level of goal completion.

Excellent (A+, A, A-)

Demonstration of a consistently excellent effort that exceeds explicit project goals.

Good (B+, B, B-)

Demonstration of a consistently good effort that attains the project goals.

Fair (C+, C, C-)

Demonstration of an fair effort that partially attains the project goals.

Marginal (D)

Demonstration of an acceptable effort that merely attains the project goals.

Failure (F)

Demonstration of a poor effort that does not attain the project goals.

Assessment Task

Participation

Criterion

Demonstration of preparation and participation in the course.

Excellent (A+, A, A-)

Demonstrates excellent preparation and ongoing very active involvement.

Good (B+, B, B-)

Demonstrates good preparation and consistent ongoing involvement.

Fair (C+, C, C-)

Demonstrates adequate preparation and sporadic involvement.

Marginal (D)

Present, not disruptive. Demonstrate very little participation.

Failure (F)
Absent.

Assessment Task
Examination

Criterion
Understanding of the fundamental principles and process of sustainable green construction;Understanding of current practice of sustainable green construction in Hong Kong and relevant standards, regulations, and etc.Capability of applying the learned sustainable green construction knowledge for problem solving.

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

Part III Other Information

Keyword Syllabus
BEAM Plus rating system, sustainable design, energy conservation, benchmarking, indoor environmental quality, material usage, water use, best practice, measurement and verification, lean construction, green BIM.

Reading List

Compulsory Readings

	Title
1	Sustainable Construction: Green Building Design and Delivery by Charles J. Kibert (2012)

Additional Readings

	Title
1	Green Building: Principles and Practices in Residential Construction by Abe Kruger, and Carl Seville (2012)
2	Guidebook to the LEED Certification Process: For LEED for New Construction, LEED for Core & Shell, and LEED for Commercial Interiors by Michelle Cottrell (2011)
3	US Green Building Council: http://www.usgbc.org/
4	LEED Reference Guide for Building Design and Construction. USGBC (2013)
5	HK Beam Plus Society: http://www.beamsociety.org.hk/

6	Green BIM: How Building Information Modelling is contributing to Green Design and Construction http://www.beamsociety.org.hk/