

GE2329: GREEN BUILDINGS: DISCOVERY AND INNOVATIONS

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Green Buildings: Discovery and Innovations

Subject Code

GE - Gateway Education

Course Number

2329

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

GE Area (Primary)

Area 3 - Science and Technology

Medium of Instruction

English

Medium of Assessment

English

Part II Course Details

Abstract

Climate change and human inhabitant issues are of global concern. In modern cities, urban heat island effect and pollutant generation raise the general public concerns about sustainable living environment. The deteriorating situation and the feasible solutions can be specific to Hong Kong, a city well-known of its high-density and high-rise built environment. Though the key issues and solution approach are in no way the same as in the neighbouring cities, many practical experiences can be shared amongst intellectuals. Targets to reduce carbon emissions that affect everyone have been set in most developed countries. Green building becomes fashionable and the younger generation like to know more about it. This GE course provides a platform for the students of different colleges to come together, and to discover and explore green

building through an introduction of common engineering practices, so as to trigger their innovative thoughts on future developments. The course will be delivered through lectures, tutorials, and group projects.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the environmental problems in human inhabitant from a global perspective, and how the development of big cities has exacerbated these problems over the years.		x		
2	Describe the urban problems of Hong Kong and the importance of green building developments for this modern city.		x	x	
3	Discuss the available technology and practices for generating innovative ideas in relation to green building development internationally, and how they can be adopted for the Hong Kong scenario.			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.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Students will engage in formal lectures to gain knowledge about: · Global warming and pollution generation from big cities in the world; · High-rise and high-density urban environment in big cities. Architectural beauty vs. practicality. Basic features of green buildings and some basic assessment methods; · Contemporary research and development works in green building technologies.	1, 2, 3
2	Tutorials	Students will engage in interactions, discussions and/or debates on: · Comparison of the seriousness of the problems in different big cities; particular emphasis will be for Hong Kong and other big Asian cities; · How green-building developments may improve our urban environment. Features and elements that can be found in other international big cities, and those most suitable for the Hong Kong built environment; · Effectiveness of various techniques and their environmental implications.	1, 2, 3
3	Group project	Students will participate in groups to develop innovative ideas, statistical findings and/or alternative green building solutions tailored for the local built environment.	3

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Group project report and oral presentation	2, 3	50	

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**

1. Group project report and oral presentation

Criterion

CAPACITY to ANALYSE, SYNTHESIS and/or INTEGRATE from various stand points, and to present logical justifications in the group report; able to show evidence of team work in the innovation originality, and with effective oral and written communication skill.

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

2. Examination

Criterion

ABILITY to DISCUSS and EXPLAIN the various key concepts, problems, technology and practices in relation to green building development.

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

Global climate change, urban heat island effect, high-density high-rise built environment in international big cities, importance of green building provisions and social implications.

Green building appreciation: urban development and site selection, energy efficiency, indoor environmental quality, pollution control, materials and water conservation, facilities management. Green building evaluation: international trend and regional concerns, life cycle analysis and carbon audit.

Alternative solutions and innovation measures: site environment, building features and services system provisions, renewable energy opportunities, ventilation and health, comfort and safety strategies.

Reading List

Additional Readings

Title	
1	Kruger, Abe and Seville, Carl. Green building: principles and practices in residential construction, Clifton Park, NY: Delmar Cengage Learning, 2013.
2	Floyd, Anthony C. and Bilka Allen. Green building: a professional's guide to concepts, codes and innovation, Clifton Park, NY: Delmar Cengage Learning, 2012.
3	Henderson, Holley. Becoming a green building professional, Hoboken, NJ: Wiley, 2012.
4	Montoya, Michael. Green building fundamentals: practical guide to understanding and applying fundamental sustainable construction practices and the LEED system, Upper Saddle River, NJ: Prentice Hall, latest edition.
5	Green building: project planning & cost estimating, 3rd ed., Hoboken, NJ: RSMeans, Wiley, 2011.
6	BEAM Plus for New Buildings, BEAM Society Ltd., latest version.
7	BEAM Plus for Existing Buildings, BEAM Society Ltd., latest version.
8	EMSD. Code of Practice for Energy Efficiency for Building Services Installations. Hong Kong SAR Government.
9	ISO 14001: Environmental Management Systems – Specification with Guidance for Use. International Organization for Standardization.
10	USGBC. Advanced Energy Modelling for LEED – Technical Manual. United States Green Building Council.

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, 2, 3

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

1, 2

PILO 3: Demonstrate critical thinking skills

3

PILO 4: Interpret information and numerical data

2, 3

PILO 5: Produce structured, well-organised and fluent text

2, 3

PILO 6: Demonstrate effective oral communication skills

3

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

3

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

1, 2, 3

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 project report