

**City University of Hong Kong
Course Syllabus**

**offered Division of Building Science & Technology
with effect from Semester B 2017/18**

Part I Course Overview

Course Title:	Green Buildings: Discovery & Innovations
Course Code:	GE2329
Course Duration:	1 semester
Credit Units:	3 credits
Level:	A2, B2
Proposed Area: <i>(for GE courses only)</i>	<input type="checkbox"/> Arts and Humanities <input type="checkbox"/> Study of Societies, Social and Business Organisations <input checked="" type="checkbox"/> Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <i>(Course Code and Title)</i>	Nil
Precursors: <i>(Course Code and Title)</i>	Nil
Equivalent Courses: <i>(Course Code and Title)</i>	Nil
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

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 practices and contemporary R&D activities, so as to trigger their innovative thoughts on future developments. The course will be delivered through lectures, tutorials, site visits, and group projects.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	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.	17%	✓		
2.	Describe the urban problems of Hong Kong and the importance of green building developments for this modern city.	50%	✓	✓	
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.	33%		✓	✓
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 self-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.

3. Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.			Total scheduled hours for individual
		1	2	3	
Lecture	<p>This is the delivery of teaching materials from selected reference books and/or lecture notes on:</p> <p>Global warming and pollution generation from big cities in the world;</p> <p>High-rise and high-density urban environment in big cities. Architectural beauty vs. practicality. Basic features of green buildings and some basic assessment methods;</p> <p>Contemporary research and development works in green building technologies</p>	✓	✓	✓	26 hrs
Tutorial discussion	<p>This involves in-class interactions, discussions and/or debates on:</p> <p>Comparison of the seriousness of the problems in different big cities; particular emphasis will be for Hong Kong and other big Asian cities;</p> <p>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;</p> <p>Effectiveness of various techniques and their environmental implications.</p>	✓	✓	✓	13 hrs
Site visit	<p>This involves guided tour to recognised green building(s) in Hong Kong, and for the exploration on the roles of HKSAR government and private sector in the aspect of global warming and pollution generation.</p>	✓			9 hrs
Project work	<p>This involves innovative ideas, statistical findings and/or alternative green building solutions from the project team tailored for the local built environment</p>			✓	18 hrs

Lecturers and instructors are needed to help in parallel sessions of project oral presentation and site visit. In addition to the 39 normal classroom contact hours, 27 staff contact hours outside classroom are required for site visit and group project supervision.

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.			Weighting*	Remarks
	1	2	3		
Continuous Assessment: <u>50%</u>					
Individual site visit report		✓		15%	Integrative description of the green elements in specific building site
Group project report and oral presentation		✓	✓	35%	Team work: topics to be proposed by student teams after the site visit
Examination: <u>50%</u> (duration: 2 hours)					
Written examination	✓	✓	✓	50%	2 hours, at the end of the semester
* The weightings should add up to 100%.				100%	

Note: A student must obtain a minimum mark of 35 in both coursework and examination, and an overall mark of 40 to pass the course.”

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Individual site visit report	Capacity to demonstrate a comprehensive understanding of the main features of the green building site through quality written and communication techniques, and to highlight their specific relevance to the building.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Group project report and oral presentation	Capacity to analyse, synthesise 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.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Written examination	Able to complete all written questions with good originality and accuracy, and to describe and explain the various key concepts.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

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.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

Tailor-made hand-outs and teaching materials like newspaper/magazine essays will be made available for the students.

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

Printed reference(s):

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: RSMMeans, Wiley, 2011.
6. HKGBC. Hong Kong Green School Guide, 2013. Hong Kong Green Building Council.
7. ASHRAE. ANSI/ASHRAE Standards 55: Thermal Environmental Conditions for Human Occupancy. Atlanta, Georgia, USA, latest edition.
8. ASHRAE. Energy Standard for Building except New Low-rise Residential Buildings, 90.1. Atlanta, Georgia, USA, latest edition.
9. ASHRAE. Ventilation for Acceptable Indoor Air Quality, 62.1. Atlanta, Georgia, USA, latest edition.
10. BEAM Plus for New Buildings, BEAM Society Ltd., latest version.
11. BEAM Plus for Existing Buildings, BEAM Society Ltd., latest version.
12. BS 8233 Code of Practice for Sound Insulation and Noise Reduction for Buildings. British Standard Institution.
13. CIBSE Code for Interior Lighting 2002. London.
14. CIE 117-1995. Discomfort Glare in Interior Lighting. London.
15. EMSD. Code of Practice for Energy Efficiency for Building Services Installations. Hong Kong Government SAR.
16. ISO 7730: Moderate Thermal Environments – Determination of the PMV and PPD Indices and Specification of the Conditions for Thermal Comfort. International Organization for Standardization.
17. ISO 14001: Environmental Management Systems – Specification with Guidance for Use. International Organization for Standardization.
18. USGBC. Advanced Energy Modelling for LEED – Technical Manual. United States Green Building Council.

Online Resources:

1. <http://www.beamsociety.org.hk/> BEAM Society Ltd.
2. <http://www.bd.gov.hk/english/index.html> Buildings Department, Hong Kong Government SAR.
3. <http://www.emsd.gov.hk/emsd/eng/welcome/index.shtml> Electrical and Mechanical Services Department, Hong Kong Government SAR.
4. <http://www.epd.gov.hk/epd/eindex.html> Environmental Protection Department, Hong Kong Government SAR.
5. <http://www.hkgbc.org.hk/eng/> The Hong Kong Green Building Council (HKGBC),
6. http://www.pland.gov.hk/pland_en/tech_doc/hkpsg/index.html Hong Kong Planning and Standards Guidelines.
7. <http://www.bd.gov.hk/english/documents/joint/JPN01.pdf> Joint Practice Note No. 1. Green and Innovative Buildings.
8. <http://www.hkpgbc.org/> Professional Green Building Council.
9. <http://www.wsd.gov.hk/en/home/index.html>. Water Supplies Department, Hong Kong Government SAR.

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:

GE PILO	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	CILOs 1 to 3: Students are advised / required to digest the recommended readings and to search for additional materials for the project assignment.
PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology	CILOs 1 and 2: Students learn to use scientific approach in tackling green building problems and the assessment.
PILO 3: Demonstrate critical thinking skills	CILO 3: Students learn to appreciate how building technologies may improve the built environment, and to generate in-depth questions and to provide thoughtful answers.
PILO 4: Interpret information and numerical data	CILO 2 to 3: Students learn to perform basic quantitative analyses of the green building features and to compare their effectiveness.
PILO 5: Produce structured, well-organised and fluent text	CILOs 2 to 3: Students learn to produce well-organised and fluent presentation materials and reports.
PILO 6: Demonstrate effective oral communication skills	CILO 3: Students learn to perform skilful oral presentation and to give answers to critical questions.
PILO 7: Demonstrate an ability to work effectively in a team	CILO 3: Students learn to contribute and produce quality outputs in the project team
PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues	
PILO 9: Value ethical and socially responsible actions	
PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation	CILOs 1 to 3: Students learn to discover urban problems that the contemporary society faces as results of technological developments and to give innovative recommendations.

GE course leaders should cover the mandatory PILOs for the GE area (Area 1: Arts and Humanities; Area 2: Study of Societies, Social and Business Organisations; Area 3: Science and Technology) for which they have classified their course; for quality assurance purposes, they are advised to carefully consider if it is beneficial to claim any coverage of additional PILOs. General advice would be to restrict PILOs to only the essential ones. (Please refer to the curricular mapping of GE programme: http://www.cityu.edu.hk/edge/ge/faculty/curricular_mapping.htm.)

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