

**City University of Hong Kong
Course Syllabus**

**offered by Department of Architecture and Civil Engineering
with effect from Semester A 2023/24**

Part I Course Overview

Course Title:	Sustainable Building Development
Course Code:	CA5251
Course Duration:	1 Semester (Some courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.)
Credit Units:	3
Level:	P5
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

This course aims to provide students with knowledge of sustainable building development in the aspects of government policy & regulation, voluntary green building certification scheme, green building design, sustainable construction technology & material, building operation & retrofit, building demolition & material recycling over the life cycle of a building.

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.	appreciate the statutory regulation and voluntary certification scheme for sustainable building development		✓		
2.	explain and apply the concept of passive and active building design			✓	
3.	understand and describe the sustainable construction technology and building material		✓		
4.	appreciate the requirement for sustainable building operation and retrofit		✓		
5.	appreciate the requirement and technology for material recycling during building demolition		✓		
		100%			

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.					Hours / week (if applicable)
		1	2	3	4	5	
Lectures; seminars	Introduce the essential concepts of design, construction, operation and demolition of a building to fulfil the requirements of sustainable building development.	✓	✓	✓	✓	✓	2
Tutorials	Explore and discuss the design approach and practice of sustainable building development through discussion, hand-on exercises or case studies.	✓	✓	✓	✓	✓	1

Semester Hours:	3 hours per week
Lecture/Tutorial/Laboratory Mix:	Lecture (2); Tutorial (1); Laboratory (0)

4. Assessment Tasks/Activities

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

Assessment Tasks / Activities	CILO No.					Weighting	Remarks
	1	2	3	4	5		
Continuous Assessment: 50%							
Mid-term test	✓	✓	✓			25%	
Assignment	✓	✓	✓	✓	✓	25%	
Examination: 50% (duration: 2 hour(s))							
Examination	✓	✓	✓	✓	✓	50%	
						100%	

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%

5. Assessment Rubrics

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

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
Mid-term test	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and concerns of sustainable building development.	High	Significant	Basic	Not even reaching marginal levels
Assignment	1. CAPACITY to INQUIRE and ANALYSE the issues and relevant information and references with respect to given scenarios and context. 2. ABILITY to PRODUCE and ARTICULATE rational, substantiated and original discussion and/or suggestion.	High	Significant	Basic	Not even reaching marginal levels
Examination	1. ABILITY to EXPLAIN and DISCUSS the key concepts, mechanisms, and concerns of sustainable building development.	High	Significant	Basic	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)/ Pass (P) on P/F basis	Failure (F)
Mid-term test	1. ABILITY to RECOGNIZE and EXPLAIN the key concepts, mechanisms, and concerns of sustainable building development.	High	Significant	Moderate	Basic	Not even reaching marginal levels
Assignment	1. CAPACITY to INQUIRE and ANALYSE the issues and relevant information and references with respect to given scenarios and context. 2. ABILITY to PRODUCE and ARTICULATE rational, substantiated and original discussion and/or suggestion.	High	Significant	Moderate	Basic	Not even reaching marginal levels
Examination	1. ABILITY to EXPLAIN and DISCUSS the key concepts, mechanisms, and concerns of sustainable building development.	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.)

Climate change. Government policy. Environmental Impact Assessment. Passive and active building design. Building Information Modelling (BIM). Digital Twin. Green building certification schemes (BEAM Plus, LEED, etc.). Sustainable construction technology. Green building material. Life cycle assessment. Energy and carbon audit. Carbon neutrality. IAQ Certification Scheme. Building retrofit. Building demolition. Disposal and recycling of building material.

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.)

1.	Nil
----	-----

2.2 Additional Readings

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

1.	Kaufui Vincent Wong. Climate change. Momentum Press, 2016. (eBook, Run Run Shaw Library, City University of Hong Kong)
2.	Stephen Tromans. Environmental impact assessment. (KD3372 .T76 2012)
3.	Roberto, Gonzalo and Vallentin, Rainer. Passive House Design: Planning and Design of Energy-Efficient Buildings. Institut fur Internationale, 2014 (eBook, Run Run Shaw Library, City University of Hong Kong)
4.	Ziyad Salameh. Renewable energy system design. (TJ808 .S238 2014)
5.	Wu, Peng. Integrated Building Information Modelling. 1st ed. Sharjah : Bentham Science Publishers, 2017. (eBook, Run Run Shaw Library, City University of Hong Kong)
6.	BEAM Plus New Buildings Version 2.0 (05.2021). BEAM Society Limited.
7.	BEAM Plus Existing Buildings Version 2.0 Comprehensive Scheme (03.2016). BEAM Society Limited.
8.	LEED v4.1 BUILDING DESIGN AND CONSTRUCTION. April 9, 2021. U.S. Green Building Council.
9.	Tam, Vivian Y and Le, Khoa N. Sustainable Construction Technologies: Life-Cycle Assessment. San Diego: Elsevier Science & Technology 2019. (eBook, Run Run Shaw Library, City University of Hong Kong)
10.	Karen Levine. Understanding green building materials. 1st ed. New York : W.W. Norton & Co., c2011. (TD196.B85 R53 2011)
11.	Thad Godish. Indoor environmental quality. Boca Raton, FL : Lewis Publishers, c2001. (TD883.17 .G64 2001)
12.	Code of Practice for Building Energy Audit. 2021. Electrical and Mechanical Services Department, HKSAR Government.
13.	Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings in Hong Kong (2010 Edition). Environmental Protection Department and Electrical & Mechanical Services Department, HKSAR Government.

14.	A Guide on Indoor Air Quality Certification Scheme for Offices and Public Places. 2019. IAQ Management Group, HKSAR Government.
15.	Chow TT. Retrofitting Existing Building (Energy Efficiency) -A Quantitative Approach. Construction Industry Council 2018.
16.	M.N.V. Prasad, Kaimin Shih. Environmental materials and waste: resource recovery and pollution prevention. Academic Press is an imprint of Elsevier, 2016. (TD793 .E56 2016)