City University of Hong Kong
Course Syllabus

offered by School of Energy and Environment
with effect from Semester A 2017/18

Part I Course Overview

Course Title:	Building Performance Assessment
Course Code:	SEE6116
Course Duration:	One semester
Credit Units:	3
Level:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	SEE8116 Building Performance Assessment
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course aims to provide students with basic knowledge of the design construction and operation of low energy and green buildings. The outcome is to furnish students with the skills to assess if a particular building is fulfilling its design targets and aspirations. Typical subjects covered may include:

• targets for sustainable buildings' energy and water usage
• new concepts in high performance, low-carbon buildings
• trends in voluntary & mandatory methods to rate performance
• Hong Kong – the building stock, its status and necessary upgrade
• international trends in building performance evaluation techniques
• building energy simulation, IAQ modelling and introductory CFD modelling in buildings

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.	Identify why building performance assessment is crucial to a low-carbon society & sustainable development	20%	✓		✓
2.	Assess the contribution of new materials, technologies and procedures to realise higher standards	20%		✓	
3.	Appreciate buildings' holistic performance and the role of computer simulations' real-time response in the assessment	20%	✓	✓	✓
4.	Link the interaction of government policy with business activity to achieve required outcome	15%	✓		✓
5.	Evaluate the relative merits of voluntary and mandatory means to prompt socially and environmentally responsible behaviour	15%	✓	✓	
6.	Development of personal skills: (a) Analyse complex options & apply information to develop a proposal (b) Effective personal research including reasoned argument (c) Ability to be concise and persuasive in viewpoints (d) Negotiate and work within peer group to express/ present views	10%		✓	✓
		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	
Lecture	Lectures are used to describe and illustrate the basic concepts and the working principles.	✓	✓	✓	✓	✓	2 hrs per wk
Tutorial	Tutorials are used to explain their suitable applications through practical examples, numerical exercises, real cases, class assignments and discussions.	✓	✓	✓	✓	✓	1 hr per wk
Analysis	Student will be divided into group to carry our real life case study.	✓	✓	✓	✓	✓	3 hrs per wk

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	4	5			
Continuous Assessment: 60%								
Continuous Assessment 1	✓	✓	✓	✓	✓		20%	
Continuous Assessment 2	✓	✓	✓	✓	✓		20%	
Class Test	✓	✓	✓	✓	✓		20%	
Examination: 40% (duration: 2 hours, if applicable)								
							100%	

1. **Assignments** are in the form of procedural descriptions, assigned numerical analysis and discussions, and technical writing on project cases.
2. A **Test** may consist of short questions, multiple-choice questions, and numerical calculations.

Examination duration: 2 hrs
Percentage of coursework, examination, etc.: 60% by coursework; 40% by exam

To pass a course, a student must do ALL of the following:

1) obtain at least 30% of the total marks allocated towards coursework (combination of assignments, pop quizzes, term paper, lab reports and/or quiz, if applicable);
2) obtain at least 30% of the total marks allocated towards final examination (if applicable); and
3) meet the criteria listed in the section on Assessment Rubrics.

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 In-class exercises	Ability to analyse, calculate and solve practical problems in Building Performance	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Assignments	Ability to analyse, calculate and solve practical problems in Building Performance	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Final exam	Ability to analyse, calculate and solve practical problems in Building Performance	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.)

- Building energy use and distribution
- Green building design and features: green roof/wall, shading devices, building thermal insulation, smart glass, solar films, daylight utilization, natural ventilation, hybrid systems, green living quality, phase change materials applications
- Contemporary problems: planning density, over-cooled indoor environment, screen-like building, urban heat island effects
- Environment assessment criteria: HKBEAM, BEAM-Plus, LEED rating system, OTTV regulations
- Advanced technological developments: advanced glazing systems, building integrated photovoltaic/thermal systems, LED lighting, zero-energy building features, Building energy management systems (BEMS)
- Building simulation tools, Computational Fluid Dynamics

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.	A Handbook of Sustainable Building Design & Performance, eds. Mumovic & Santamouris, Earthscan 2009
2.	BEAM Society. BEAM2009NB: Building Environmental Assessment Method 2009 for New Buildings.

2.2 Additional Readings

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

1.	ASHRAE Standard 90.1 (2007)
2.	Buildings Department. Building (Energy Efficiency) Regulation (Cap. 123)
3.	Buildings Department. OTTV Criteria and Calculation Notes (2000)
4.	BEAM Society. BEAM2009EB: Building Environmental Assessment Method 2009 for Existing Buildings.
5.	EMSD. Hong Kong Energy End-use Data (latest version)
6.	EMSD. Performance-based Building Energy Code. (latest revision)
7.	IEA – Energy Performance Certification of Buildings, A Policy Tool to Improve Energy Efficiency (Policy Pathways 2010)