

**City University of Hong Kong  
Course Syllabus**

**offered by Division of Building Science and Technology  
with effect from Semester A 2018/19**

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**Part I Course Overview**

<b>Course Title:</b>	Maintenance Technology and Management
<b>Course Code:</b>	BST22741
<b>Course Duration:</b>	1 semester
<b>Credit Units:</b>	3 credits
<b>Level:</b>	A2
<b>Proposed Area:</b> <i>(for GE courses only)</i>	<input type="checkbox"/> Arts and Humanities <input type="checkbox"/> Study of Societies, Social and Business Organisations <input type="checkbox"/> Science and Technology
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Nil
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	Nil
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

## Part II Course Details

### 1. Abstract

This course aims to enable students to:

- evaluate existing buildings with strategies appropriate for maintenance, refurbishment, alterations and additions, conservation and revitalization according to legal and stakeholders' requirements;
- examine building obsolescence, diagnose building defects and manage maintenance works; and
- assess the inter-relationship between design and maintenance with relevant cost studies.

### 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.	Explain the principles and practices of building design and maintenance to minimise defects in buildings.		✓	✓	✓
2.	Conduct condition and structural surveys for the existing building structures, fabric, components, finishes and services.		✓	✓	✓
3.	Analyse the causes and diagnose the remedial methods for common building defects.		✓	✓	✓
4.	Evaluate and apply relevant strategies to manage maintenance works in compliance with client's requirements.		✓	✓	✓
5.	Demonstrate ability in such transferable skills as communication, interpersonal, leadership, teamwork and critical thinking.		✓	✓	✓
		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.						Hours/week (if applicable)
		1	2	3	4	5		
Lecture (Average class size: Around 100 students)	Students learn this course through the designated lectures supplemented by studio.	✓	✓	✓	✓	✓		1 hour/week
Studio	Studio are conducted in groups to encourage active participation and interaction among students by means of problem based exercises, case studies, presentations etc.	✓	✓	✓	✓	✓		2 hours/week

**Teacher-directed learning approach** is adopted to provide an overview and rationales of key concepts and principles of the related topics. Understanding of the relevant concepts, principles and skills is further consolidated by directed self-reading, studio discussions and assignment exercises. Thus, independent **self-directed learning** by students is emphasised. During the studio sessions, student-directed **case study** approach is adopted to strengthen student's learning and also build up student's practical skills. Students are required to act as a professional to provide the appropriate solutions to the identified problems.

**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			
<b>Continuous Assessment: 40%</b>								
Project assignment: This is a group project regarding principles and practices of building design and maintenance as well as condition and structural surveys. Students are assessed individually based on written report, oral presentations and peer/self assessment.	✓	✓			✓		10	
Case study: This is a group case study project regarding application of maintenance knowledge and skills to analyze the causes, diagnosis and remedial methods as well as management strategies to manage maintenance works in compliance with client's requirements. Students will be assessed individually based on written report, oral presentations and peer/self assessment.			✓	✓	✓		20	
Test in the form of multiple choice questions and/or short questions.	✓	✓	✓	✓			10	
<b>Examination: 60% (duration: 2.5 hour, if applicable)</b>								
Examination in the form of multiple choice questions, short questions and/or essay type questions.	✓	✓	✓	✓			60	
							100%	

\* The weightings should add up to 100%.

Note: A student must obtain a minimum mark of 35 in both coursework and examination components 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 as stated in Item 4, with the following rubrics.)*

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Project assignment	Ability to discover and analyze the principles and practices of building design and maintenance as well as condition and structural surveys.	High	Significant	Moderate	Basic	Below marginal
2. Case study	Ability to discover and analyze the application of maintenance knowledge and skills to synthesize the causes, diagnosis and remedial methods as well as management strategies to manage maintenance works in compliance with client's requirements.	High	Significant	Moderate	Basic	Below marginal
3. Test	Ability to discover and analyze those learned in CILOs 1-4.	High	Significant	Moderate	Basic	Below marginal
4. Examination	Ability to discover and analyze those learned in CILOs 1-4.	High	Significant	Moderate	Basic	Below marginal

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

#### 1. Keyword Syllabus

Obsolescence of buildings, consideration of maintenance upon material selection, design and construction stages, choice between maintenance and re-development, design provisions and access for inspection and maintenance; health, safety and environmental issues in maintenance.

Deterioration factors of building structure, fabric, components and services, economics of maintenance and value engineering techniques in design, equipment and material selections, financial considerations and applications in repair or replacement.

Assessment of existing buildings and their environment, condition survey, structural survey, dilapidated schedules & reports.

Alteration and Addition works, adaptation, extension and conservation for existing and historical buildings; renovation and fitting out; design, construction and legal considerations, planning and execution.

Dangerous buildings, unauthorized building works, temporary works and supports, associated building control. Symptoms, diagnosis and remedies for common exterior building defects such as failure of foundation, envelope & canopy.

Problems and remedial methods resulting from dampness penetration and condensation; waterproof and roofing system failure; basement leakage, window defects.

Problems and remedies for cladding systems e.g. curtain walls, stonework, precast concrete cladding, glass reinforced concrete, brickworks.

Reinforced concrete defects, non-destructive tests, destructive tests, remedial methods under different conditions.

Common defects and remedies in plastering, rendering, wall tiling, painting, flooring and internal finishes.

Hazardous materials, asbestos installations, identification, eradication and disposal methods, legislative requirements.

General timber defects, dry rot, wet rot, termites, beetles, preservation treatments, methods of elimination under various situations.

Defects and rectifications for building services installations such as mechanical ventilation, air-conditioning, fire services, plumbing, drainage, electrical, gas, lift, escalator, security and building management system.

#### 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.)

Nil

##### 2.2 Additional Readings

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

1.	Buildings Department, HKSAR: <a href="http://www.bd.gov.hk/english/index_e.html">http://www.bd.gov.hk/english/index_e.html</a>
2.	Harrison, H. W. and P.M. Trotman (2000) <i>Building services: performance, diagnosis, maintenance, repair and the avoidance of defects</i> , London: CRC.
3.	Hinks, J. and Cook, G., (1997) <i>The Technology of Building Defects</i> , London: E. & F. N. Spon.
4.	Oxley R. (2003) <i>Survey and repair of traditional buildings : a sustainable approach</i> , Shaftesbury, Dorset: Donhead.
5.	Paul A. (2001) <i>Lee's Building maintenance management</i> , 4th ed., Oxford, Malden, MA: Blackwell Science.
6.	RICS (2002) <i>Building maintenance: strategy, planning and procurement: guidance note</i> , Coventry: RICS.
7.	Seeley I. H. (1996) <i>Building economics: appraisal and control of building design cost and efficiency</i> , 4th ed. Houndmills, Basingstoke, Hampshire: Macmillan.