CA4623: MAINTENANCE TECHNOLOGY AND MANAGEMENT

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Maintenance Technology and Management

Subject Code
CA - Civil and Architectural Engineering
Course Number
4623

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

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
BC4623/BC4623F/BC4623P Maintenance Technology and Management

Exclusive Courses
Nil

Part II Course Details

Abstract

The Course aims to equip students with the knowledge and ability to appraise existing buildings and develop suitable schemes of maintenance, repair, refurbishment or rehabilitation as necessary; the knowledge of building defects' diagnosis and repair methodology; management of building maintenance projects; and statutory requirements for building repair and maintenance.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Analyze the principles of building design to anticipate and prevent building component failure;	25		x	
2	Justify and determine the condition of the structure, fabric and component materials and prepare maintenance plans for different building types and client needs including the management of building maintenance projects;	25		x	
3	Identify the building defects diagnosis techniques and recommend different repair approaches;	25			x
4	Explain the statutory requirements relating to building repair and maintenance.	25	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	Lecture	Student will engage to gain the key principles, theories and tools for maintenance technology and management	1, 2, 3, 4	2 hours/week
2	Tutorial	Students will engage in tutorial to discuss the concepts and solve the problems in construction management individually or in a group basis in the tutorial class.	1, 2, 3, 4	1 hour/week

3	Project	Students will engage to take on the role of a project manager for planning a series of tasks under a given scenario; and to create feasible time and resource management plans by application of suitable tools with reasonable assumptions	1, 2, 3	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Mid-term Test	1, 2, 3, 4	20		No
2	Project	1, 2, 3	30		Yes

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

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

Mid-term Test

Criterion

1.1 CAPACITY to DISCUSS key principles, theories and tools for maintenance technology
1.2 ABILITY to USE the scientific techniques in solving the maintenance related problems

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
Project

Criterion
2.1 ABILITY to APPLY suitable techniques to repair defect in existing structures

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
Examination

Criterion
3.1 CAPACITY to RELATE and EXPLAIN the management theories and principles to maintenance technology, and DISCUSS the roles, functions and responsibilities of different parties in a building maintenance project
3.2 ABILITY to USE the scientific techniques in solving the maintenance and repair problems

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

- Maintenance technology; diagnosis of defects in materials, components, assembles and elements; destructive & non-destructive testing; recognition of causes and selection of appropriate remedial methods.
- Maintenance inspection/ survey. Historical buildings repair/maintenance matters. Environmental issues in building maintenance.
- Maintenance management: Statutory requirements relating to building repair and maintenance; maintenance project management.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	CIOB. (1990) 'Maintenance management : a guide to good practice', 3rd ed. CIOB. (TH3351 .C42)
2	Douglas J & Noy E.A. (2011) 'Building surveys and reports', 4th ed. Wiley-Blackwell. (TH439 .N68)
3	Douglas, J. & Ransom, B. (2007) 'Understanding Building Failures', 3rd ed. Taylor & Francis. (TH441 .D68)
4	Duncan, M. (2003) 'Understanding Housing Defects', 2nd ed. EG Books. (TH441 .M37)
5	Emmons, P.H. (1993) 'Concrete Repair and Maintenance Illustrated', R.S. Means Co., Inc. (TA681 .E45)
6	Harris, S.Y. (2001) 'Building Pathology: Deterioration, Diagnostics, and Intervention', John Wiley & Sons, Inc. (TH441 .H295)
7	Ho, D.C.W., Lo, S.M. and Yiu, C.Y. (2005) 'A Study on the Causes of External Finishes Defects in Hong Kong', Structural Survey, 23(5), 386-402.
8	Leung, A.Y.T. and Yiu, C.Y. (2004) 'Building Dilapidation and Rejuvenation in Hong Kong', Hong Kong: Joint Imprint of CityU Press and the Hong Kong Institute of Surveyors. (TH3351 .B835)
9	Riley, M. (2005) 'The technology of refurbishment and maintenance', Palgrave Macmillan. (TH4511 .R55)
10	Watt, D.S. (2007) 'Building Pathology: Principles and Practice', 2nd ed. Blackwell Science. (TH441 .W38)
11	Wordsworth, P. (2001) 'Lee's Building Maintenance Management', 4th ed. Blackwell Science. (TH3351 .L44)
12	Wood, B. (2009) 'Building Maintenance', Wiley-Blackwell. (TH3351 .W663)
13	Yiu, C.Y., Ho, C.W. and Lo, S.M. (2007) 'Weathering Effects on External Wall Tiling Systems', Construction and Building Materials, 21: 594-600.
14	http://www.hkcra.com.hk
15	http://www.bd.gov.hk
16	http://www.hklii.hk