

City University of Hong Kong
Course Syllabus

offered by Department of Materials Science and Engineering
with effect from Semester A 2024/25

Part I Course Overview

Course Title: **Building Materials**

Course Code: **MSE6307**

Course Duration: **One semester**

Credit Units: **3**

Level: **P6**

Medium of Instruction: **English**

Medium of Assessment: **English**

Prerequisites: **Nil**
(Course Code and Title)

Precursors: **Nil**
(Course Code and Title)

Equivalent Courses: **AP6307 Building Materials (From the old curriculum)**
(Course Code and Title)

Exclusive Courses: **AP8307 Building Materials (From the old curriculum)**
(Course Code and Title)

Part II Course Details

1. Abstract

The course aims at covering the basic structure and properties of building materials pertinent to the structural applications. Upon successful completion of the course, students are expected to be equipped with elementary understanding of the categories, structures and properties of common building materials. They will also be able to recognize the practical considerations of building materials in structural applications.

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 types, ingredients, and design of structural building materials, especially concrete and reinforcing bars.		√		
2.	Explain the factors affecting the durability of concrete structures.		√		
3.	Select and apply various tests of concrete and other building materials.			√	
4.	Describe the types and function of cladding materials.		√		
5.	Select appropriate materials for internal walls, ceilings and partitions.			√	
6.	Identify latest discoveries and state-of-the-art developments in building materials and to form opinions on relevant issues.			√	√
		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 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.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5	6	
Lecture	Students will engage in formal lectures to gain knowledge about building materials	✓	✓	✓	✓	✓	✓	2
Tutorial	Students will be encouraged to discuss the characteristics and applications of various building materials in daily life examples	✓	✓	✓	✓	✓	✓	0.5
Group project	Students work in groups on self-directed projects relating to properties and applications of building materials in real life situations to consolidate their knowledge in the subject			✓	✓	✓	✓	1

Quizzes or tests will also be held in tutorial sessions.

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	6		
Continuous Assessment: 50 %								
Mid-term tests	✓	✓	✓	✓	✓		25%	
Group project report and presentation			✓	✓	✓	✓	25%	
Examination (duration: 2 hours)	✓	✓	✓	✓	✓		50%	
							100%	

5. Assessment Rubrics

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

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Examination	demonstrates understanding of the scientific principles and the working mechanisms; ability to solve relevant engineering problems	High	significant	moderate	basic	Not reaching marginal level
2. Mid-term tests	demonstrates understanding of the scientific principles and the working mechanisms; ability to solve relevant engineering problems	High	significant	moderate	basic	Not reaching marginal level
3. Group project	Ability to explain, in detail and with accuracy, the information collected and the methods of inquiry Demonstrate capacity for self-directed learning	High	significant	moderate	basic	Not reaching marginal level

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Examination	demonstrates understanding of the scientific principles and the working mechanisms; ability to solve relevant engineering problems	High	moderate	basic	Not reaching marginal level
2. Mid-term tests	demonstrates understanding of the scientific principles and the working mechanisms; ability to solve relevant engineering problems	High	moderate	basic	Not reaching marginal level
3. Group project	Ability to explain, in detail and with accuracy, the information collected and the methods of inquiry Demonstrate capacity for self-directed learning	High	moderate	basic	Not reaching marginal level

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

1. Keyword Syllabus

- General introduction to building materials
Types and applications, ingredients of concrete.
- Steel frame construction
Structural steels, standard sections, methods of joining steel structural members, the construction process of steel structure, flooring and roof decking materials, fireproofing of steel framing.
- Cement
Basic chemical compositions, manufacturing processes, chemical reaction (hydration), properties, and types.
- Aggregates
Types, grading, properties.
- Design of concrete mix
Economic, workability, strength, applications.
- Testing of concrete
Testing of plastic properties, destructive, in-situ and non-destructive testing of hardened concrete.
- Durability
Chemical attack, impact, wear, shrinkage, creep, fatigue, thermal attack.
- Admixtures
Categories, properties and characteristics.
- Special concrete
Light weight concrete, high strength concrete, pre-cast concrete, reinforced and pre-stressed concrete.
- Glass
Structure of glass, classification of glass types, strength of glass and toughening methods, glazing.
- Cladding
Functions of cladding, cladding materials, the curtain wall.
- Materials for interior walls, partitions, ceiling and floorings
Fire walls, plaster, gypsum board, functions of ceiling, flooring materials, stone, brick, tiles, wood, synthetic flooring materials.

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.	"Fundamentals of Building Construction – Materials and Methods", Edward Allen, 2 nd
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	ed, John Wiley & Sons, 1990.
2.	"Basic Construction Materials" T W Marotta, C A Herubin, 5 th ed, Prentice Hall, 1997.