CA4709: DESIGN OF TALL BUILDINGS

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Design of Tall Buildings

Subject Code
CA - Civil and Architectural Engineering
Course Number
4709

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
CA3634 Reinforced and Prestressed Concrete Structures. Students must have attempted (including class attendance, coursework submission, and examination) the precursor course(s) so identified.

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

The course aims at the development of ability for design of high-rise buildings. It offers the student with an opportunity to gain real life design experience, and to develop the ability to identify and solve civil engineering problems in a feasible and creative way, and to apply design procedures, codes of practice and computer software to design conventional steel and concrete high-rise buildings.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Effectively develop and communicate design proposals with architect and service engineers at different design stages;				
2	Design typical lateral load supporting structural systems and flooring systems under various loads including wind and seismic loads;				
3	Apply design procedures, codes of practice and computer software to design conventional steel and concrete high-rise buildings;				
4	Discover, conceive, and propose alternative structural systems based on principles learned from the course.		x	x	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	Students will gain knowledge and ability in the use of codes of practice, and tools for tall building design	1, 2, 3, 4	2.5 hours
2	Tutorial	Students will gain the design concepts by working on design problems using design codes	1, 2, 3, 4	0.7 hours

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Mid-term test	1, 2, 3, 4	20	
2	Assignment 1	1, 2, 3, 4	10	
3	Assignment 2	1, 2, 3, 4	10	
4	Assignment 3	1, 2, 3, 4	10	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

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

ABILITY to APPLY available knowledge and tools in building design.

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

Assignment 1

Criterion

ABILITY to DESIGN lateral load resisting systems for tall buildings.

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
Assignment 2

Criterion
ABILITY to DESIGN reinforced shear wall for tall buildings.

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
Assignment 3

Criterion
ABILITY to DESIGN buildings under the action of wind and earthquake.

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
ABILITY to APPLY available knowledge and tools in building design.

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
Building design, high-rise building, flooring systems, lateral load supporting systems, preliminary design, detailed design, wind loading, seismic loading, computer modelling, project development.

Reading List

Compulsory Readings

	Title
1	Smith, B.S. & Coull, A. 1991, Tall Building Structures: Analysis and Design, John Wiley & Sons, New York.
2	Taranath, B.S. 2012, Structural Analysis and Design of Tall Buildings: Steel and Composite Construction, CRC Press, Boca Raton, FL.
3	Paulay, T. & Priestley, M. J. N. 1992, Seismic Design of Reinforced Concrete and Masonry Buildings, John Wiley & Sons, New York.
4	Bhatt, P., MacGinley, T.J. and Choo, B.S. 2006, Reinforced Concrete - Design theory and examples, Taylor & Francis, New York.
5	Mosley, B., Bungey, J., Hulse, R. and Mosley, W.H. 2007, Reinforced Concrete Design to Eurocode 2, 6th Edition, Palgrave MacMillan, New York.
6	Building (Construction) Regulations 1990, Chapter 123B Building Ordinance, Hong Kong.
7	Buildings Department 2004, Code of Practice for Structural Use of Concrete, the Government of the Hong Kong Special Administrative Region.
8	The Hong Kong Institution of Engineers 2006, Concrete Code Handbook - an explanatory handbook to the Code of Practice for Structural Use of Concrete 2004, Structural Division of the Hong Kong Institution of Engineers.
9	Buildings Department 2004, Code of Practice for Foundations, the Government of the Hong Kong Special Administrative Region.

10	Buildings Department 2004, Code of Practice on Wind Effects in Hong Kong, the Government of the Hong Kong Special Administrative Region.
11	Reynolds, C. E., Steedman, J. C. and Threlfall, A. J. 2008, Reynolds's Reinforced Concrete Designer's Handbook, 11th edition, Taylor & Francis, London.
12	Reynolds, C. E. and Steedman, J. C. 2003, Examples of the Design of Reinforced Concrete Buildings to BS8110, 4th edition, E. & F.N. Spon, London.
13	Institution of Structural Engineers 2002, Manual for the design of reinforced concrete building structures, London, UK.
14	Ambrose, J. 1997, Simplified Design of Concrete Structures, John Wiley & Sons, New York.
15	Buildings Department, Practice Notes for AP&RSE, the Government of the Hong Kong Special Administrative Region.
16	Buildings Department 1996, Fire Resisting Construction, the Government of the Hong Kong Special Administrative Region.
17	Buildings Department 2005, Code of Practice for Structural Use of Steel, the Government of the Hong Kong Special Administrative Region.

Additional Readings

	Title
1	http://www.bd.gov.hk
2	http://www.legislation.gov.hk