

CA3619: DESIGN OF STRUCTURAL ELEMENTS

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Design of Structural Elements

Subject Code

CA - Civil and Architectural Engineering

Course Number

3619

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

CA2673 Structural Mechanics and CA2674 Construction Materials

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

Equivalent Courses

BC3619/BC3619P Design of Structural Elements

Exclusive Courses

Nil

Part II Course Details

Abstract

The course provides fundamental knowledge of limit state design with structural steel. It introduces the design concept and procedures of applying current code of practice to design steel members in building and civil engineering structures. This course provides the necessary backgrounds for studying the topics in structural analysis and design.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the importance of the general concept, principles and procedures of structural design;	15	x		
2	Explain the importance of the general concept of limit state design and select appropriate design philosophy for typical structures;	15	x		
3	Analyse and design simple steel members under tension, compression, flexural, shear, combined loads, bolted and welded connections;	70		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 some basic theories and concept of important structural behaviors	1, 2, 3	2
2	Tutorial	Students will implement the design concepts by working on design problems using design codes	3	1

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1	Assignments	1, 2, 3	20	Yes
2	Tests	1, 2, 3	30	No

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

Assignments

Criterion

ABILITY to EXPLAIN various design concepts, and to DESIGN various structural elements.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Below standard

Assessment Task

Tests

Criterion

ABILITY to DESIGN different structural elements.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Below standard

Assessment Task

Examination

Criterion

ABILITY to EXPLAIN various design concepts, and to DESIGN various structural elements.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Below standard

Part III Other Information

Keyword Syllabus

Design philosophy and process, steel and concrete design codes; limit state design; design loads, tension members, compression members, flexural members, beam-columns, shear strength, bolted and welded connections, reinforced concrete, properties of reinforced concrete; design of reinforced concrete sections.

Reading List**Compulsory Readings**

Title	
1	EN 1990 'Eurocode: Basis of structural design'.
2	EN 1991 'Eurocode 1: Actions on structures'.
3	EN 1993 'Eurocode 3: Design of steel structures'.
4	Buildings Department (2011), Code of Practice for the Structural Use of Steel 2011.
5	Buildings Department (2011), Code of Practice for Dead and Imposed Loads 2011.

Additional Readings

Title	
1	Luis Simoes da Silva, Rui Simoes and Helena Gervasio (2010), Design of Steel Structures: Eurocode 3, ECCS Eurocode Design Manuals, Ernst & Sohn: A Wiley Company.

2	Nethercot, D. A. 2001, Limit State Design of Structural Steelwork, 3rd Ed, Spon Press, London.
3	Trahair, N. S. & Bradford, M. A. 1988, The Behavior and Design of Steel Structures, 2nd Edition, Chapman and Hall, London.
4	TATA Steel Advance sections CE marked structural sections, Eurocode version.
5	Buildings Department (2004), Code of Practice on Wind Effects in Hong Kong 2004.
6	Department of Justice 1997, Chapter 123, Cap 123B - Building (Construction) Regulations
7	http://www.steel-sci.org/
8	http://www.eurocodes.co.uk/