

Module Syllabus

Module Title	Steelwork Design		
Module Code	CON4334		
Credit Value	7		
QF Level	4		
Notional Learning Hours	76	Contact Hours	Face-to-face: 26 (Lecture: 19; Tutorial: 5; Lab/Workshop: 2)
			Online: 0
		Self-study Hours: 48 hrs	
		Assessment Hours: 2 hr(s) (<i>Outside Contact/Self-study Hours</i>)	

Module Intended Learning Outcomes:

On completion of the module, learners are expected to be able to:

1. develop limit state design philosophy for structural steelwork design;
2. apply ultimate limited state design methods for simple structural steelwork connections;
3. apply ultimate limited state and serviceability limited state design methods for simply supported structural steel beams; and
4. apply ultimate limited state design methods for structural steel columns in both simple and continuous construction.

Learning Contents and Indicative Contact Hours:

Learning Contents	Indicative Contact Hours
1. Limit state design philosophy for structural steelwork design - Identifying different limit states for designing structural steelwork. - Understanding the general applications of different types of structural steel members. - Understanding the material properties of structural steel. - Overview of the commonly used national and international design codes, including the Chinese National Standard (GB) and Eurocode.	2 hours
2. Application of ultimate limited state design methods for simple structural steelwork connections - Analysis of different types of bolts and their connections. - Analysis of different types of welds and their connections. - Production of valid designs for bolted and welded tension splice connections. - Production of valid designs for beam-column bolted double angle web cleat connections. - Production valid designs for beam-column welded fin plate connections.	8 hours
3. Application of ultimate limited state and serviceability limited state design methods for simply supported structural steel beams - Understanding the concept of effective length, lateral and torsional restraints, destabilizing effects of loads. - Calculation of the design loads for different limit states. - Production of valid designs for simply supported steel beams: classification of sections, lateral torsional instability, moment capacity, buckling resistance moment, shear capacity, deflection check, web buckling resistance and web bearing resistance. - Use of AI tools to generate images of design calculation outputs of a structural steel beam structure	10 hours
4. Application of ultimate limited state design methods for structural steel columns in both simple and continuous construction - Understanding the concept of effective length and classification of sections. - Production of valid designs for steel columns under axial force only. - Production of valid design for simple construction and continuous construction steel columns under combined axial force and moments.	6 hours

Mapping of Learning Contents with Module Intended Learning Outcomes:

	Learning Contents	Module Intended Learning Outcomes			
		1	2	3	4
1	Understand limit state design philosophy for structural steelwork design	√			√
2	Application of ultimate limited state design methods for simple structural steelwork connections	√	√		√
3	Application of ultimate limited state and serviceability limited state design methods for simply supported structural steel beams	√		√	
4	Application of ultimate limited state design methods for structural steel columns in both simple and continuous construction	√			√

Learning & Teaching Strategies:

- *The module consists of 19 hours of Lectures, which will form the major portion of the delivery of the module*
- *5 hours of Tutorials and 2 hours of Laboratory session will be used to enhance the learning and develop skills*
- *Lectures will be the most appropriate method to introduce the basic principles and practices of operations being taught in the module.*
- *During tutorial lessons, real or simulated case study discussion will be employed to inspire learners of this module to develop both standard practices and design solutions in meeting general and specific site constraints in designing structural steelwork.*
- *Assignments and in-class exercises will be given to students allowing them to practice the taught methods and decision-making techniques.*
- *Tests of specific concepts and knowledge under this module will be held at suitable intervals throughout the semester to monitor the progress of the students.*
- *Interaction between peers and tutor/students should be encouraged.*

Assessment Plan:

Continuous Assessment (CA)	50%
End of Module Assessment (EA)	50%
Total	100%

Textbooks:

Learning and teaching package developed by module team

References:

1. ***Code of Practice for the Structural Use of Steel 2011 (2023 Edition)***, Buildings Department, Hong Kong SAR Government.
2. ***British Standard BS 5950: 2000***, Part 1, British Standard Institute.
3. Lam, D., Ang, P. & Chiew, S. P., (2014), ***Structural Steelwork: Design to Limit State Theory***, 4th Ed, CRC Press.
4. ***Steel Designers' Manual***, (2012), 7th Ed, Steel Construction Institute.
5. Trahair, N. S., Bradford, M. A. & Nethercot, D. A., (2001), ***The Behaviour and Design of Steel Structures to BS 5950***, 3rd Ed, Spon Press.
6. Nethercot, D. A., (2001), ***Limit States Design of Structural Steelwork***, 3rd Ed, E & FN Spon Press.
7. ***Steelwork Design Guide to BS 5950-1: 2000, Volume 1, Section Properties, Member Capacities***, (2001), Steel Construction Institute.
8. ***Explanatory Materials to Code of Practice for the Structural Use of Steel***, (2011), Buildings Department, Hong Kong SAR Government.
9. ***Design of Steel Structures: Eurocode 3 - Design of Steel Structures. Part 1-1 - General Rules and Rules for Buildings (Eccs Eurocode Design Manuals)***, (2014), Eccs Eurocode Design Manuals

Creation/Revision Record:

Version	Date	Created/Revised by
<i>First Creation</i>	<i>21 July 2015</i>	<i>Ir CHING Kai Ip</i>
<i>2nd Version</i>	<i>28 Feb 2020</i>	<i>Dr. David CHAN</i>
<i>3rd Version</i>	<i>18 Dec 2024</i>	<i>Ir Brian LEUNG</i>
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