

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE401	DESIGN OF STEEL STRUCTURES	4-0-0-4	2016

Prerequisite : CE202 Structural Analysis II

Course objectives:

- To introduce the limit state design of steel structural components subjected to bending, compression and tensile loads including the connections
- To enable design of structural components using timber

Syllabus:

Steel and steel structures – bolted and welded connections- tension members – compression members – beams – roof trusses – purlins – timber structures – columns- composite beams

Expected Outcomes:

The students will be able to

- design bolted and welded connections
- design tension members and beams using the IS specifications
- design columns under axial loads using IS specifications
- design beams and plate girders
- assess loads on truss and design purlins
- design structural components using timber.

Text Books:

1. L S Jayagopal, D Tensing., Design of steel structures, S Chand & Company, 2015
2. S K Duggal., Limit State design of steel structures, Tata McGraw Hill, 2010
3. Subramanian N, Design of steel Structures, Oxford University Press, 2011

References :

1. P. Dayaratnam., Design of Steel Structures ,Wheeler Publishing, 2003
2. Punmia B. C., Jain A. K. and Jain A. K., Design of Steel Structures, Laxmi Publications (P) Ltd, 2017
3. Raghupathi, Steel Structures, Tata McGraw Hill, 2006
4. Ramchandra S and Virendra Gehlot, Design of Steel Structures Vol. II, Standard Book House, 2007
5. V L Shah & Veena Gore, Limit State Design of steel Structures , Structures Publications, 2009
6. William T Segui., Steel Design , Cenage Learning, 6e, 2017
7. IS 800 – 2007, Code of practice for Structural steel design, BIS

COURSE PLAN

Module	Contents	Hours	Sem. Exam Marks %
I	Introduction to steel and steel structures, properties of steel, structural steel sections. Introduction to design: Design loads and load combinations, limit state design concepts. Connections bolted and welded (direct loads)	9	15

II	Tension members-Types of sections – net area- design of tension members- concept of shear lag-use of lug angle-connections in tension members	9	15
FIRST INTERNAL EXAMINATION			
III	Compression members- design of struts- solid and built up columns for axial loads-- design of lacings and battens-column bases- slab base – gusseted base	10	15
IV	Design of beams- laterally restrained and unrestrained – simple and compound beams- plate girders subjected to uniformly distributed loads – design of stiffeners.	9	15
SECOND INTERNAL EXAMINATION			
V	Design of roof trusses- types-design loads and load combinations- assessment of wind loads- design of purlins. Moment resistant/Eccentric connections (in plane and out of plane)	10	20
VI	Design of timber structures: types of timber - classification - allowable stresses-design of beams-flexure, shear, bearing and deflection considerations-Design of columns. Design of composite beam sections with timber and steel.	9	20
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester examination)

Maximum Marks : 100

Exam Duration: 3 Hrs

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

Note : 1. Each part should have at least one question from each module

2 .Each question can have a maximum of 4 subdivisions (a, b, c, d)