Lesson Plan- CE1016 - Structural Design – Steel
Academic year 2015-16
(Semester commencing in June 2015)

Instructional Objectives

Instructional objectives no.	Instructional objectives (IO)
1	To learn the properties of steel sections and design basics and codal provisions- Design of connections
2	To design steel members subjected to tension and compression
3	Design steps involved in beams, built up beams and design of gantry girder
4	Design of elements of roof truss, joints, etc.-use of hand books in steel roof truss design
5	To design light gauge steel sections

Student Outcome

Student outcome number	Student Outcome (SO)
a	an ability to apply knowledge of mathematics, science, and engineering
c	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
e	an ability to identify, formulate, and solve engineering problems

Mapping of Instructional Objectives (IOs) with Student Outcomes (SOs)

Instructional objectives	Student Outcomes		
	a	c	e
1.To learn the properties of steel sections and design basics and codal provisions - Design of connections	x	x	x
2. To design steel members subjected to tension and compression	x	x	x
3. Design steps involved in beams, built-up beams and design of gantry girder	x	x	x
4. Design of elements of roof truss, joints, etc.-Use of hand books in steel roof truss design	x	x	x
5. To design light gauge steel sections	x	x	x

CE1016	**STRUCTURAL DESIGN – STEEL**	**Lecture Hours (L)**	**Tutorial Hours (T)**	**Practical Hours (P)**	**Credits (C)**
		2	**2**	**0**	**3**
	Prerequisites CE1004				

Lesson Plan – 2015-16 **Revision: 0 dated 23/06/2015**

Lecture No.	Topic	No. of hours	IOs	SO	Reference
1.	Introduction -brief recap of Mechanics of Solids, Strength of Materials, RC design- Overview of syllabus	1	1-5	a,c,e	1-9
	UNIT-I INTRODUCTION (15 hours)				
2.	Type of Steel Structures - Properties of Indian Standard rolled steel sections- limit state method of design - partial safety factor - general codal requirements	2	1	a,c,e	1,3,8,9
3.	JOINTS - Bolted and welded connections - modes of failure of joints	1	1	a,c,e	1,3,8,9
4.	Permissible stresses for various types of bolts and welds	1	1	a,c,e	1,3,8,9
5.	Pin connections - lap and butt joints – truss joint	3	1	a,c,e	1,3,8,9
6.	Angle seat connections – stiffened and unstiffened seat connection- moment resistant connections	3	1	a,c,e	1,3,8,9
7.	Beam to beam connections- beam and column splices	4	1	a,c,e	1,3,8,9
	UNIT-2 TENSION AND COMPRESSION MEMBERS (10 hours)				
8.	Design of simple and built up members subjected to tension- tension splices	3	2	a,c,e	1,3,8,9
9.	Compression member- design of simple and built up compression members with lacing and battens	4	2	a,c,e	1,3,8,9
10.	Design of slab base and gusseted base	3	2	a,c,e	1,3,8,9
	UNIT-3 BEAMS (15 hours)				
11.	Design of simple beams based on strength and stiffness as per IS code	4	3	a,c,e	1,3,8,9
12.	Design of built up beams	4	3	a,c,e	1,3,8,9
13.	Curtailment of flange plates- Connection of flange plates and beams	3	3	a,c,e	1,3,8,9
14.	Need for lateral support for compression Flange	1	3	a,c,e	1,3,8,9
15.	Design of Gantry Girder	3	3	a,c,e	1,3,8,9
	UNIT-4 ROOF TRUSSES (10 hours)				
16.	Types of roof trusses for different spans- Estimation of dead, live and wind loads	2	4	a,c,e	1,2,3,4,5,7,9
17.	Design of purlins	3	4	a,c,e	1,2,3,4,5,7,9
18.	Design of roof truss using SP 38	2	4	a,c,e	1,2,3,4,5,7,9
19.	Use of Rolled steel sections and pipes for roof trusses	3	4	a,c,e	1,2,3,4,5,7,9
	UNIT-5 LIGHT GAUGE SECTIONS (10 hours)				

Lecture No.	Topic	No. of hours	IOs	SO	Reference
20.	Introduction – Design of light gauge steel members	2	5	a,c,e	2,3,4,5,6,7,9
21.	Local and post buckling of thin element- light gauge steel compression members	2	5	a,c,e	2,3,4,5,6,7,9
22.	Tension members	3	5	a,c,e	2,3,4,5,6,7,9
23.	Beams and connections.	3	5	a,c,e	2,3,4,5,6,7,9
	Model Examination				
	Total hours	60			

The faculty members handling the course may conduct surprise test according to their convenience. However a question paper in hard copy as well as key shall be made available for the surprise test. The process shall be same as that of cycle tests.

TEXT BOOKS

1. Subramanian .N, "Design of Steel Structures", Oxford University Press, New Delhi, 2008.
2. Ramchandra .S, VirendraGhelot, "Design of Steel of Structures", Volume 1, Scientific Publishers, 2009, New Delhi
3. Duggal .S.K, "Limit State Design of Steel Structures", Tata McGraw Hill Publishing Company, New Delhi, 1st Edn., 2010

REFERENCE BOOKS

4. Ramamrutham .S. & Narayanan .R, "Design of Steel Structures", Dhanpat Rai & Sons, Delhi 1997
5. Vazirani .V.N and Ratwani .M.M, "Steel Structures", Khanna Publications New Delhi, 1992.
6. Arya. A.S. & Ajmani. J.L., "Design of Steel Structures", Nemchand& Bros., Roorkee.(U.P) 3rd Edn. 1986.
7. Dayarathnam .P, "Design of Steel Structures", Wheelers Publishing Co. Ltd., 2nd Edn. 1996
8. Kazimi. S. M. A. and Jindal. R. S., "Design of Steel Structures", 2nd Edition, Prentice Hall of India, New Delhi – 1988.
9. IS CODES : IS 800, IS 801, IS 811 AND SP6(1) (Steel & Light gauge sections).

Course Coordinators

Dr.S.Senthil Selvan

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Faculty handling the courses

Sl. No.	Faculty name
1	**G.Vimalanandan**
2	**H.Thiagu**
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