



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Civil Engineering		LP: CE18601
B.E/B.Tech/M.E/M.Tech : B.E Civil Engineering Regulation: 2018		Rev. No: 01
PG Specialisation : -		Date: 01-03-2022
Sub. Code / Sub. Name : CE18601 Design of Steel Structures		
Unit : I Basics of Structural Steel and Design of Connections		

Unit Syllabus: General -Types of Steel -Properties of structural steel - I.S. rolled sections - Concept of Limit State Design - Design of Simple and eccentric Bolted and welded connections - Types of failure and efficiency of joint – prying action - Introduction to HSFG bolts - Connection Detailing using manual drafting and software

Objective: To impart knowledge on basic concepts of limit state design and steel connections

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction – Common steel structures, merits and demerits of steel structures, properties of structural steel, types of steel sections, considerations in steel design, loads and combinations, structural analysis	4(pg 131-260), 5(pg 1-5)	PPT
2	Design philosophies, Limit State Design Concepts, updates in latest code (IS800-2007)	2, 4(pg 82-126)	PPT
3	Metal joining methods using rivets, welding, bolting – classification, fabrication, illustrations, terminologies, merits and demerits of each, Design of riveted connections	4(pg 324-342)	PPT, board
4	Tutorial 1		PPT
5	Bolted connections – IS 800-2007 specifications, assumption and principles in the design, possible failure modes and the design criteria for them	2, 4(pg 324-345)	PPT
6	(incnumericals) Bolted connections – efficiency of joints	2, 4(pg 324-345)	PPT
7	Bolted connections – design of joints , design for eccentric connections	2, 4(pg 374-390)	board
8	Tutorial 2	2, 5(pg 32-50)	PPT
9	Welded connections – specifications in IS800-2007, design stresses, efficiency of joint , design for eccentric connections	2, 4(pg 437-507)	PPT
10	High tensile bolts – shear capacity, tension resistance, prying forces, interaction between shear and tension	2, 4(pg 354-360)	board
11	connection detailing Connection Detailing using manual drafting and software	Online video	PPT
12	Tutorial 3	1, 2	PPT
Content beyond syllabus covered (if any):			

\* Session duration: 50 minutes



Sub. Code / Sub. Name: CE18601 Design of Steel Structures

Unit : II Tension Members

Unit Syllabus : Behaviour and Design of simple and built-up members subjected to tension – definition of Shear lag and tension splice- Design of lug angles – Tension splice

Objective: To impart knowledge about design concepts of tension members.

Session No *	Topics to be covered	Ref	Teaching Aids
13	Introduction on tension members, types of sections used as tension member, gross area and net area, net effective sections for angles and tees, IS800-2007	1, 2	PPT
14	provisions Design strength of a tension member	2, 5(pg 84-87)	PPT
15	Analysis of member for tensile strength	2, 4(pg 560-580)	PPT
16	Design of tension member with connections – simple member	2, 4(pg 580-581)	board
17	Tutorial 4	1, 2	PPT
	CAT - 1		
18	Design of tension member with connections – double angle	2, 4(pg 580-581)	board
19	Design of tension member with connections – built up section	2, 4(pg 580-581)	board
20	Tutorial 5	1, 2	PPT
21	Lug angles – use, design	2, 4(pg 581-583)	PPT, board
22	Design of tension splice	2, 4(pg 583-584)	PPT, board
23	Design of tension splice	2, 4(pg 583-584)	PPT, board
24	Tutorial 6	1, 2	PPT

Content beyond syllabus covered (if any):

\* Session duration: 50 mins



Sub. Code / Sub. Name: CE18601 Design of Steel Structures

Unit : III Compression Members

Unit Syllabus : Behaviour of short and long columns -Design of simple and built-up compression members with lacings and battens - Design of column bases - slab base and gusseted base - Design of compression member using C programming

Objective: To impart knowledge about design concepts of compression members.

Session No *	Topics to be covered	Ref	Teaching Aids
25	Introduction on compression members, types, theory of columns	4(pg 683-710)	PPT
26	IS800-2007 codal provision for compression member design, terminologies, buckling, slenderness ratio	2	PPT
27	Analysis of columns – load carrying capacity of simple and compound member	2, 5(pg 114-121)	Chalk and board
28	Tutorial 7	2	PPT
29	Design of compression members – procedure, effective length, buckling class	2, 4(pg 716-735)	PPT
30	Design of single and built up sectioned compression members	2, 4(pg 742-753)	Chalk and board
31	Tutorial 8	2	PPT
32	Design of laced columns	2, 5(pg 128-131)	board
33	Design of battened columns	2, 5(pg 128-131)	board
34	Column bases – Applications and design	2, 4(pg 754-758)	Chalk and board
35	Tutorial 9	2	PPT
	CAT-2		
36	Compression member design using C Programming, Analysis of a steel compression member using software – ETABS	software	PPT
<b>Content beyond syllabus covered (if any): Analysis of a steel compression member using software – ETABS</b>			

\* Session duration: 50 mins





Sub. Code / Sub. Name: CE18601 Design of Steel Structures

Unit : IV Beams

Unit Syllabus : Design of laterally supported and unsupported beams – Built up beams – Design of plate girders and gantry girders

Objective: To impart knowledge about design concepts of beams

Session No *	Topics to be covered	Ref	Teaching Aids
37	Plastic moment carrying capacity of a section	5(pg 157-166)	PPT
38	Types of beams, cross sections, design procedure	2, 4(pg 807- 810)	PPT
39	Design of laterally supported beams	2, 5(pg 167-172)	board
40	Tutorial 10	2	PPT
41	Design of laterally unsupported beams	2, 4(pg 841-855)	board
42	Built up beams, Beams subjected to biaxial bending	2, 4(pg 875-877)	PPT
43	Tutorial 11	2	PPT
44	Plate girders – elements, design procedure	2, 5(pg 199-226)	PPT
45	End panel design, connection between flange and web plates, bearing stiffeners, end stiffeners, intermediate stiffeners	1, 2	board
46	Design of riveted and welded plate girders	1, 2	PPT
47	Design of gantry girders – procedure	4(Pg 1016-1051)	PPT
48	Tutorial 12	2	PPT

Content beyond syllabus covered (if any):

\* Session duration: 50 mins



Sub. Code / Sub. Name: CE18601 Design of Steel Structures

Unit : V Industrial Structures

Unit Syllabus : Design of roof trusses – loads on trusses – purlin design using angle and channel sections - Introduction to pre-engineered buildings— Analysis and Design of sloped roof industrial structure using analysis software.

Objective: To impart knowledge about design procedures for roof trusses and industrial structures.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Industrial structures – general overview, classifications, illustrations, elements	4(pg 1129-1173)	PPT
50	Roof trusses – applications, elements	5(pg227-229)	PPT
51	Terminologies, specifications, Roof and side coverings, design loads	5(pg227-229)	PPT
52	Wind load – codal provisions IS875	3, 5(pg 231-238)	PPT
53	Numericals on wind pressure calculation	3, 5(pg 240-243)	board
54	Tutorial 13	3	PPT
55	Design of purlins – procedure and problems	2, 5(pg239-240)	board
56	Tutorial 14	2	PPT
57	End bearing	1, 2, 4(pg 1129-1173)	PPT
58	Gantry Girders – applications, terminologies, specifications	4(Pg 1016-1051)	PPT
59	Analysis and design of industrial structure using STAAD.Pro	Software	PPT
60	Tutorial 15	4	PPT
	CAT-3		

Content beyond syllabus covered (if any):  
Analysis and design of industrial structure using E-Tabs

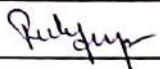
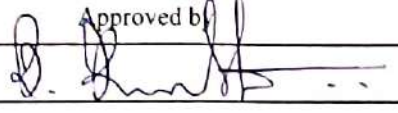
\* Session duration: 50 mins



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**REFERENCES:**

1. "Teaching Resources for Structural Steel Design – Vol. I & II", INSDAG, Kolkatta.
2. IS 800-2007 Indian Standard - General Construction in Steel – code of practice (3<sup>rd</sup> Revision)
3. IS875 (Part 3)
4. Subramanian, N., "Design of Steel Structures", Oxford Publishing House, 2010.
5. Shah, V.L., Venna Gore, "Limit State Design of Steel Structures", Structures Publication, 2009

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Date	01-03-2022	01-03-2022
Remarks *:		
Remarks *:		

\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD