



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF CIVIL ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
23CE6T01	DESIGN AND DRAWING OF STEEL STRUCTURES (R23)	VI	Civil Engineering	5	2025-26	10-12-2025
COURSE OUTCOMES: Students are able to						
1	Understand and analyze riveted and welded connections used in steel structures. (K3)					
2	Carryout analysis and design of flexural members and detailing. (K3)					
3	Analyze and design tension and compression members. (K3)					
4	Design columns and column bases with connection detailing. (K3)					
5	Design Plate Girder and Gantry Girder with connection detailing. (K3)					
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I: CONNECTIONS	CO 1: Understand and analyze riveted and welded connections used in steel structures. (K3)	1.1	Introduction: Fundamental Concepts of limit state design of structures	T4,R2	1	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Different types of rolled steel sections available to be used in steel structures.	T4,R2	1	
		1.3	Different types of rolled steel sections available to be used in steel structures. Stress – Strain relationship for mild steel.	T4,R2	1	
		1.4	Riveted connections – definition, terminology, different types of rivets.	T4,R2	1	
		1.5	IS 800-2007 Specifications for spacing and edge distances of rivet holes.	T4,R2	1	
		1.6	Types of riveted connections, types of	T4,R2	1	

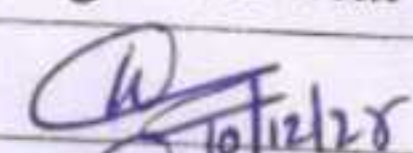
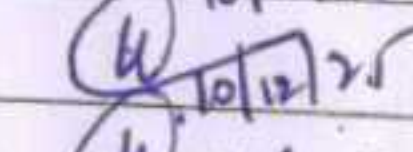
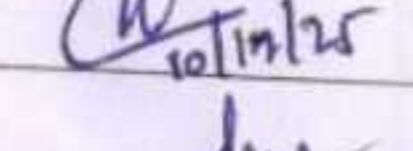
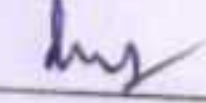
			actions on fasteners.			
		1.7	Rivet strength and capacity	T4,R2	1	
		1.8	Problems on riveted connections using lap joint	T4,R2	1	
		1.9	Problems on riveted connections using single cover butt joint	T4,R2	1	
		1.10	Problems on riveted connections using double cover butt joint	T4,R2	1	
		1.11	Welded connections: Introduction, Advantages and disadvantages of welding.	T4,R2	1	
		1.12	Strength of welds-Butt and fillet welds: Permissible stresses. IS Code requirements	T4,R2	1	
		1.13	Design of fillet weld subjected to moment acting in the plane of the joints.	T4,R2	1	
		1.14	Problems on design of fillet weld subjected to moment acting in the plane of the joints.	T4,R2	1	
		1.15	Design of fillet weld subjected to moment acting at right angles to the plane of the joints.	T4,R2	1	
		1.16	Problems on design of fillet weld subjected to moment acting at right angles to the plane of the joints.	T4,R2	1	
Total					16	
II : BEAMS	CO2: Carryout analysis and design of flexural members and detailing. (K3)	2.1	Allowable stresses, design requirements as per IS Code	T4,R2	01	Chalk & Talk, PPT Tutori
		2.2	Plastic Analysis of beams	T4,R2	01	
		2.3	Design of simple beams, compound beams	T4,R2	01	
		2.4	Curtailment of flange plates, Beam to beam connection	T4,R2	01	

		2.5	Check for deflection shear	T4,R2	01	al, Active Learn ng
		2.6	Check for buckling, bearing	T4,R2	01	
		2.7	Design of laterally supported beams.	T4,R2	01	
		2.8	Problems on design of laterally supported beams.	T4,R2	01	
		2.9	Design of laterally unsupported beams.	T4,R2	01	
		2.10	Problems on design of laterally unsupported beams.	T4,R2	01	
		Total			10	
III: TENSION MEMBERS & COMPRESSION MEMBERS, ROOF TRUSSES	CO 3: Analyze and design tension and compression members. (K3)	3.1	Design of compression members: effective length of columns, Slenderness ratio – permissible stresses.	T4,R2	01	Chalk & Talk, PPT, Tutori al.
		3.2	Buckling class of cross section, IS tables for design stress	T4,R2	01	
		3.3	Design of compression members subjected to axial loading	T4,R2	01	
		3.4	Design of compression members, struts etc.	T4,R2	01	
		3.5	Problems on design of compression members.	T4,R2	01	
		3.6	Problems on design of struts.	T4,R2	01	
		3.7	Design of compression members subjected to axial and eccentric loading	T4,R2	01	
		3.8	Problems on design of compression members subjected to axial and eccentric loading	T4,R2	01	
		3.9	Design of members subjected to direct tension	T4,R2	01	
		3.10	Problems on design of members subjected to direct tension	T4,R2	01	
		3.11	Design of members subjected to direct tension and bending	T4,R2	01	

		3.12	Problems on design of members subjected to direct tension and bending	T4,T1	01	
		3.13	Roof Trusses: Different types of roof trusses – Design loads – Load combinations as per IS Code recommendations	T4,R2	01	
		3.14	Design of purlins, members and joints	T4,T1	01	
		3.15	Problems on design of purlins, members and joints	T4,R2	01	
Total					15	
IV: DESIGN OF COLUMNS, COLUMN FOUNDATIONS	CO 4 : Design columns and column bases with connection detailing. (K3)	4.1	Design of Columns: Built up compression members, Laced column & Battened Column	T4,R2	01	Chalk & Talk, PPT, Tutorial
		4.2	Design of laced column	T4,R2	01	
		4.3	Problem on design of laced column	T4,R2	01	
		4.4	Design of battened column			
		4.5	Problem on design of battened column			
		4.6	Splicing of columns: introduction, design procedure	T4,R2	01	
		4.7	Splicing of columns (Columns are of same size)	T4,R2	01	
		4.8	Splicing of columns (columns are of slightly different sizes)	T4,R2	01	
		4.9	Splicing of columns (columns are of considerably different sizes)	T4,R2	01	
		4.10	Column bases and their purpose, Design of slab base.	T4,R2	01	
		4.11	Problems on Design of slab base with welded connections	T4,R2	01	
		4.12	Design of gusseted base	T4,R2	01	
		4.13	Problems on Design of gusseted base with	T4,R2	01	

			connections			
		4.14	Column bases subjected moment.	T4,R2	01	
		4.15	Problems on column bases subjected to moment	T4,R2	01	
Total					15	
V: DESIGN OF PLATE GIRDER & GANTRY GIRDER	CO 5: Design Plate Girder and Gantry Girder with connection detailing. (K3)	5.1	Design of Plate Girder: Design consideration – IS Code Recommendations Design of welded plate girder	T4,R2	01	Chalk & Talk, PPT, Tutorial
		5.2	Curtailment of flange plates, stiffeners	T4,R2	01	
		5.3	splicing and connections	T4,R2	01	
		5.4	Design of plate girder without stiffners	T4,R2	01	
		5.5	Problem on design of plate girder without stiffners	T4,R2	01	
		5.6	Design of plate girder with bearing stiffners	T4,R2	01	
		5.7	Problem on design of plate girder with bearing stiffners	T4,R2	01	
		5.8	Design of plate girder with intermediate stiffners	T4,R2	01	
		5.9	Problem on design of plate girder with intermediate stiffners	T4,R2	01	
		5.10	Design of Gantry Girder: impact factors - longitudinal forces	T4,R2	01	
		5.11	Design procedure of Gantry girders.	T4,R2	01	
		5.12	Problem on design of Gantry girder.	T4,R2	01	
		5.13	Problem on design of Gantry girder	T4,R2	01	
		5.14	Problem on design of Gantry girder	T4,R2	01	
Total					14	
CUMULATIVE PROPOSED PERIODS					70	

Text Books:	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	N.Subramanian, 'Steel Structures Design and Practice', Oxford University Press, 2018.
2	Ramachandra, 'Design of Steel Structures'; Vol - 1, Universities Press, 2011.
3	S.K. Duggal, 'Design of steel structures', Tata Mcgraw Hill, and New Delhi, 2010.
4	S.S. Bhavakatti, 'Design of Steel Structures', 4 th Edition, I.K. International Publishing House Pvt.Ltd, 2015.
Reference Books:	
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Sarwar Alam Raz, 'Structural Design in Steel', New Age International Publishers, New Delhi, 2010.
2	P. Dayaratnam, 'Design of Steel Structures' S. Chand Publishers, 2012.
3	M. Raghupathi, 'Design of Steel Structures', Tata Mc. Graw-Hill
4	N. Krishna Raju, 'Structural Design and Drawing', University Press, 2009.
IS Codes:	
1	IS 800 : 2007
2	IS 875
3	Steel Tables
Web Details	
1	https://nptel.ac.in/courses/105105162/
2	https://www.icvirtuallibrary.com/doi/abs/10.1680/ssd.30121.0007
3	https://civilengineeringbible.com/article.php?i=99
4	https://www.slideshare.net/YashPatel61/lacing-battening

	Name	Signature with Date
i. Faculty	D.Satish	
ii. Course Coordinator	D.Satish	
iii. Module Coordinator	D.Satish	
iv. Programme Coordinator	G.V.L.N. Murthy	


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