



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
20CE6T03	DESIGN OF STEEL STRUCTURES (R20)	VI	Civil Engineering	5	2024-25	18-11-2024

COURSE OUTCOMES: Students are able to

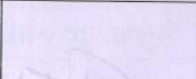
1	Design bolted connections and welded connections. (K3)
2	<i>Design tension members. (K3)</i>
3	<i>Design compression members. (K3)</i>
4	<i>Design column splices, column bases (K3)</i>
5	<i>Design of simple beams and compound beams. (K3)</i>

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I: CONNECTIONS	CO 1: Design bolted connections and welded connections. (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	Bolted connections – definition, terminology, different types of bolts and their purpose.	T4,R2	1	
		1.5	IS 800-2007 Specifications for spacing and edge distances of bolt holes.	T4,R2	1	
		1.6	Types of Bolted connections, types of	T4,R2	1	

			actions on fasteners.			
		1.7	Bolt strength and capacity	T4,R2	1	
		1.8	Problems on bolted connections using lap joint	T4,R2	1	
		1.9	Problems on bolted connections using single cover butt joint	T4,R2	1	
		1.10	Problems on bolted 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 : TENSION MEMBERS	CO2: Design tension members. (K3)	2.1	Tension members: Types of tension members, slenderness ratio, displacement of tension members	T4,R2	01	Chalk & Talk, PPT
		2.2	Behaviour of tension members, modes of failure	T4,R2	01	

III: DESIGN OF COLUMNS		2.3	Factors affecting strength of tension members	T4,R2	01	Tutorial, Active Learning
		2.4	Design of tension members	T4,R2	01	
		2.5	Problems on design of tension members.	T4,R2	01	
		2.6	Problems on design of tension members.	T4,R2	01	
		2.7	Tension member splice	T4,R2	01	
		2.8	Lug angles	T4,R2	01	
		2.9	Problems on lug angles	T4,R2	01	
		2.10	Problems on lug angles	T4,R2	01	
	Total				10	
	CO 3: Design compression members. (K3)	3.1	Design of compression members: effective length of columns.	T4,R2	01	Chalk & Talk, PPT, Tutorial.
		3.2	Slenderness ratio – permissible stresses.	T4,R2	01	
		3.3	Buckling class of cross section	T4,R2	01	
		3.4	IS tables for design stress	T4,R2	01	
		3.5	Design of compression members	T4,R2	01	
		3.6	Problems on design of compression members.	T4,R2	01	
		3.7	Design of compression members, struts etc.	T4,R2	01	
		3.8	Problems on design of struts.	T4,R2	01	
		3.9	Built up compression members	T4,R2	01	
		3.10	IS Tables for design stresses	T4,R2	01	
		3.11	Design of Laced column(Theory)	T4,R2	01	
		3.12	Problems on Design of Laced column	T4,T1	01	
		3.13	Design of Battened column(Theory)	T4,R2	01	
		3.14	Problems on Design of Battened column	T4,T1	01	
		3.15	Design Principles of Eccentrically loaded columns	T4,R2	01	

					Total	15	
IV: DESIGN OF COLUMN FOUNDATIONS	CO 4 : Design column splices, column bases. (K3)	4.1	Splicing of columns: introduction, design procedure	T4,R2	01	Chalk & Talk, PPT, Tutorial	
		4.2	Splicing of columns (Columns are of same size)	T4,R2	01		
		4.3	Splicing of columns (columns are of different sizes)	T4,R2	01		
		4.4	Column bases and their purpose	T4,R2	01		
		4.5	Design of slab base.	T4,R2	01		
		4.6	Problems on Design of slab base with Bolted connections	T4,R2	01		
		4.7	Problems on Design of slab base with welded connections	T4,R2	01		
		4.8	Design of gusseted base.	T4,R2	01		
		4.9	Problems on Design of gusseted base with Bolted connections	T4,R2	01		
		4.10	Problems on Design of gusseted base with Bolted connections	T4,R2	01		
		4.11	Column bases subjected moment.	T4,R2	01		
		4.12	Problems on column bases subjected to moment (Bolted connections)	T4,R2	01		
		4.13	Problems on column bases subjected to moment (welded connections)	T4,R2	01		
					Total	13	
V : BEAMS	CO 5: Design of simple beams and compound beams . (K3)	5.1	Allowable stresses, design requirements as per IS Code	T4,R2	01	Chalk & Talk, PPT,	
		5.2	Plastic Analysis of beams	T4,R2	01		
		5.3	Design of simple beams	T4,R2	01		
		5.4	Design of compound beams	T4,R2	01		
		5.5	Curtailment of flange plates	T4,R2	01		
		5.6	Beam to beam connection	T4,R2	01		
		5.7	Check for deflection shear	T4,R2	01		

		5.8	Check for buckling, bearing	T4,R2	01	Tutorial
		5.9	Design of laterally unsupported beams.	T4,R2	01	
		5.10	Problems on design of laterally unsupported beams.	T4,R2	01	
Total					10	
CUMULATIVE PROPOSED PERIODS					64	

Text Books:

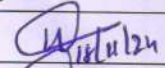
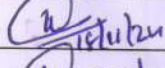
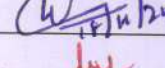
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	N.Subramanian, 'Steel Structures Design and Practice', Oxford University Press,2018.
2	Ramachandra, 'Design of Steel Structures', Vol - 1, Universities Press,2011.
3	S.K. Duggal, 'Design of steel structures' , Tata Mcgraw Hill, and 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.

Web Details

1	https://nptel.ac.in/courses/105105162/
2	https://www.icevirtuallibrary.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	


Principal