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	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20CE4T01	STRUCTURAL ANALYSIS	IV	CE	5	2023-24	03-01-2024

COURSE OUTCOMES: Upon successful completion of this course, The student will be able to

1	Solve the Propped Cantilever beam and the fixed beam under different loading conditions.[K3]
3	Deduce the Continuous Beams by Clapeyron's theorem of three moments and slope-deflection method.[K3]
4	Apply moment distribution and kani's method to continuous beam. [K3]
5	Determine support reactions, normal thrust and radial shear for three hinged and two hinged arches. [K3]
6	Analyze cable structures and suspension bridges [K4]

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	Solve the Propped Cantilever beam and the fixed beam under different loading conditions. [K3]	1.1	Introduction to propped cantilever	T1,R2	01	Chalk & Board, PPT, Tutorial, videos
		1.2	Slope & Deflection equations for propped cantilever	T1,R2	01	
		1.3	Analysis of propped cantilever subjected to UDL	T1,R2	01	
		1.4	Analysis of propped cantilever subjected to point load	T1,R2	01	
		1.5	Analysis of propped cantilever subjected to point load & UDL	T2,R2	01	
		1.6	Introduction to statically indeterminate fixed beam	T1,R2	01	
		1.7	statically indeterminate beams with U. D. L Load	T1,R1	01	
		1.8	statically indeterminate beams with point load	T1,R2	01	
		1.9	statically indeterminate beams with U. V.L load and couple	T1,R2	01	
		1.10	statically indeterminate beams with combination of loads	T2,R2	01	
		1.11	Deflection of fixed beams	T1,R2	01	
		1.12	Deflection of fixed beams with effect of sinking of support	T1,R2	01	
		1.13	Deflection of fixed beams with effect of rotation of a support.	T2,R2	01	
				Total	13	
II		2.1	Continuous beams introduction	T2,R2	01	
		2.2	Clapeyron's theorem of three moments	T1,R2	01	
		2.3	Application of Clapeyron's theorem of three moments	T2,R2	01	
		2.4	Analysis of continuous beams with constant moment of inertia with ends fixed	T2,R2	01	

	Deduce the Continuous Beams by Clapeyron's theorem of three moments and slope-deflection method. [K3]	2.5	continuous beams with different moment of inertia for different spans	T1,R2	01	Chalk & Board, PPT, Tutorial, videos
		2.6	continuous beams with overhang	T2,R1	01	
		2.7	Effects of sinking of supports	T2,R1	01	
		2.8	derivation of slope deflection equation	T2,R1	01	
		2.9	application to continuous beams with point load & UDL	T1,R2	01	
		2.10	application to continuous beams with two or more point loads	T2,R1	01	
		2.11	application to continuous beams with two or more point loads & Partial UDL	T1,R2	01	
		2.12	application to continuous beams with settlement of supports.	T2,R1	01	
			Total		**12**	
III	Apply moment distribution and kani's method to continuous beam. [K3]	3.1	Introduction to Moment Distribution Method	T1,R2	01	Chalk & Board, PPT, Tutorial, videos
		3.2	Stiffness, carry over and Distribution factors	T2,R2	01	
		3.3	Analysis of continuous beams with sinking of supports	T2,R2	01	
		3.4	Analysis of continuous beams without sinking of supports	T1,R2	01	
		3.5	Portal frames without sway	T2,R2	01	
		3.6	Portal frames Including Sway	T2,R2	01	
		3.7	Effects of sinking of supports	T1,R2	01	
		3.8	Introduction to Kani's Method	T3R1	01	
		3.9	Analysis of continuous beams	T1,R2	01	
		3.10	Including settlement of supports	T2,R2	01	
		3.11	single bay portal frames without side sway	T2,R2	01	
		3.12	single bay portal frames with side sway	T1,R2	01	
			Total		**12**	
IV	Determine support reactions, normal thrust and radial shear for three hinged and two hinged arches. [K3]	4.1	Three Hinged Arches: Elastic theory of arches	T1,R2	01	Chalk & Board, PPT, Tutorial, videos
		4.2	Eddy's theorem – Determination of horizontal thrust,	T2,R2	01	
		4.3	Determination of bending moment	T2,R2	01	
		4.4	Determination of normal thrust and radial shear	T1,R2	01	
		4.5	effect of temperature	T1,R2	01	
		4.6	Two Hinged Arches: Determination of horizontal thrust,	T2,R2	01	
		4.7	Determination of bending moment	T2,R2	01	
		4.8	Determination of normal thrust and radial shear	T1,R2	01	
		4.9	Rib shortening	T2,R2	01	
		4.10	Temperature stresses.	T2,R2	01	
			Total		**10**	
V	Analyze cable structures and	5.1	Lateral Load Analysis Using Approximate Methods : **Introduction**	T1,R2	01	Chalk & Board, PPT, Tutorial,
		5.2	Portal method	T2,R2	01	
		5.3	Problems on portal method	T2,R2	01	
		5.4	**Cantilever Method**	T2,R2	01	

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suspension bridges [K4]	5.5	Problems on cantilever method	T2,R2	01		videos
	5.6	Introduction	T2,R2	01		
	5.7	Characteristics of cable	T2,R2	01		
	5.8	Analysis of cables subjected to concentrated and uniformly distributed loads	T2,R2	01		
	5.9	Anchor cable, temperature stresses	T3,R2	01		
	5.10	Analysis of simple suspension bridge	T3,R2	01		
	5.11	Three hinged stiffening girder suspension bridges.	T3,R2	01		
	5.12	Two hinged stiffening girder suspension bridges.	T3,R2	01		
Content Beyond Syllabus		**Guide Pulley Problems**	T1	01		
			Total		13	
		CUMULATIVE PROPOSED PERIODS			60	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	V.D. Prasad, Structural Analysis, 3rd Edition, Galgotia publication, 2015.
2	Sp Gupta & Gs Pandit, Theory Of Structures Vol 1, 1st Edition, Tata Mcgraw Hill Publishing Co Ltd, 2016.
3	S Ramamrutham & R Narayan, Theory Of Structures, 9th Edition, Dhanpat Rai Publishing Company Private Limited, 2014.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	R.S. Khurmi, Theory of Structures, 10th Edition, S. Chand Publishers, 2016
2	R.C. Hibbeler, Structural analysis, 8th Edition, Pearson publishers, 2014

Web Details:

1	https://nptel.ac.in/courses/105105166/
2	https://nptel.ac.in/courses/105101085/

		Name	Signature with Date
i.	Faculty	A. Venkata Krishna	*(signature)* 03/01/24
ii.	Course Coordinator	A. Venkata Krishna	*(signature)* 03/01/24
iii.	Module Coordinator	A. Venkata Krishna	*(signature)* 03/01/24
iv.	Programme Coordinator	G V L N Murthy (HOD)	*(signature)*

Principal