



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
23CE5E01	ADVANCED STRUCTURAL ANALYSIS	V	CE	6	2025-26	09-07-2025
COURSE OUTCOMES: Upon successful completion of this course, The student will be able to						
1	Apply moment distribution method and Slope deflection method to portal frames(K3)					
2	Use Kani's method to analyze Continuous beams and portal frames (K3)					
3	Determine support reactions, normal thrust and radial shear for three hinged and two hinged arches (K3)					
4	Carryout lateral Load analysis of structures (K3)					
5	Analyze Cable and Suspension Bridge structures (K4)					
UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	Apply moment distribution method and Slope deflection method to portal frames(K3)		Moment Distribution Method			Chalk & Board, PPT, Tutorial, Videos
		1.1	Analysis of Portal frames with Sway-when both ends of the frame are hinged	T3,R2	02	
		1.2	Analysis of Portal frames with Sway-when both ends of the frame are fixed	T3,R2	02	
		1.3	Analysis of Portal frames with Sway-when one end of the frame is fixed and other hinged	T3,R2	02	
		1.4	Shear force and bending moment diagrams - Elastic curve.	T3,R2	01	
			Slope Deflection Method			
		1.5	Analysis of Portal frames with Sway-when both ends of the frame are hinged	T3,R1	02	
		1.6	Analysis of Portal frames with Sway-when both ends of the frame are fixed	T3,R2	02	
		1.7	Analysis of Portal frames with Sway-when one end of the frame is fixed and other hinged	T3,R2	02	
		1.8	Shear force and bending moment diagrams - Elastic curve.	T3,R2	01	
Total					14	



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II	Use Kani's method to analyze Continuous beams and portal frames (K3)		Kani's Method			Chalk & Board, PPT, Tutorial, Videos
		2.1	Analysis of continuous beams without settlement of supports	T3,R2	02	
		2.2	Analysis of continuous beams—including settlement of supports	T3,R2	02	
		2.3	single bay portal frames without side sway	T3,R2	02	
		2.4	single bay portal frames with side sway	T3,R2	02	
		2.5	Shear force and bending moment diagrams - Elastic curve.	T3,R1	02	
		2.6	Exercise Problems	T3,R1	02	
Total				12		
III	Determine support reactions, normal thrust and radial shear for three hinged and two hinged arches (K3)		Three Hinged Arches			Chalk & Board, PPT, Tutorial, Videos
		3.1	Elastic theory of arches – Eddy's theorem	T2,R2	01	
		3.2	Determination of horizontal thrust	T2,R2	01	
		3.3	Determination of bending moment	T1,R2	01	
		3.4	Determination of normal thrust and radial shear	T2,R2	01	
		3.5	Effect of temperature	T2,R2	01	
		3.6	Hinges with supports at different levels.	T1,R2	02	
			Two Hinged Arches			
		3.7	Determination of horizontal thrust	T1,R2	01	
		3.8	Determination of bending moment	T2,R2	01	
		3.9	Determination of normal thrust and radial shear	T2,R2	01	
		3.10	Rib shortening and temperature stresses	T2,R2	01	
		3.11	Tied arches and Fixed arches (No analytical question)	T2,R2	01	
Total				12		
IV	Carryout lateral Load analysis of structures (K3)		Approximate Methods of Analysis: Application to building frames			Chalk & Board, PPT, Tutorial, Videos
		4.1	Portal Method	T2,R2	01	
		4.2	Problems on portal method	T2,R2	02	
		4.3	Cantilever Method	T1,R2	01	
		4.4	Problems on Cantilever Method	T1,R2	02	
		4.5	Substitute frame method for approximate analysis of multi-storey frames subjected to gravity loads	T2,R2	01	
		4.6	Problems on Substitute frame method	T2,R2	02	
		4.7	Shear force and bending moment diagrams - Elastic curve.	T2,R2	01	
Total				10		



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V	Analyze Cable and Suspension Bridge structures (K4)		Cable Structures and Suspension Bridges			Chalk & Board, PPT, Tutorial, Videos
		5.1	Introduction, Characteristics of cable	T2,R3	01	
		5.2	Analysis of cables subjected to concentrated loads	T2,R3	01	
		5.3	Analysis of cables subjected to uniformly distributed loads	T2,R3	01	
		5.4	Anchor cable	T2,R3	02	
		5.5	Temperature stresses	T2,R3	01	
		5.6	Analysis of simple suspension bridge	T3, R3	02	
		5.7	Three hinged stiffening girder suspension bridges.	T3, R4	02	
		5.8	Two hinged stiffening girder suspension bridges.	T3,R4	02	
Total					12	
CUMULATIVE PROPOSED PERIODS					60	
Text Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1	Dr. V.S. Prasad, Structural Analysis,3 rd Edition, Galgotia publication,2015.					
2	G S Pandit, SP Gupta & R Gupta Theory Of Structures, Vol 1, 1 st Edition, Tata Mcgraw Hill Publishing Co Ltd, 2017.					
3	S Ramamrutham & R Narayan, Theory Of Structures, 9 th Edition, Dhanpat Rai Publishing Company Private Limited, 2017.					
Reference Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1	R.S. Khurmi, Theory of Structures, 12 th Edition, S. Chand Publishers, 2020.					
2	Dr. R. Vaidyanathan & Dr. P.Perumal ,Structural analysis,4 th Edition, Laxmi publications, 2019.					
3	R.C. Hibbeler , Structural analysis, 6th edition, Pearson, New Delhi, 2017					
4	B.C.Punmia, Jain & Jain,"Theory of Structures – II", Laxmi Publications, India, 2015.					
Web Details:						
1	https://nptel.ac.in/courses/105105166/					
2	https://nptel.ac.in/courses/105101086/					

	Name	Signature with Date
i. Faculty	Dr. A. Venkata Krishna	<i>Avul</i> 09/07/25
ii. Course Coordinator	Dr. A. Venkata Krishna	<i>Avul</i> 09/07/25
iii. Module Coordinator	Dr. A. Venkata Krishna	<i>Avul</i> 09/07/25
iv. Programme Coordinator	Dr. G V L N Murthy	<i>Gov</i> 17/7/25

M
Principal