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
23CE4T03	STRUCTURAL ANALYSIS	IV	CE	5	2024-25	16-12-2024

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

1	Apply energy theorems to analyze simple beams and trusses **(K3)**
2	Solve indeterminate structures by using Castigliano's–II theorem **(K3)**
3	Know the analysis of fixed and continuous beams **(K3)**
4	Use slope-deflection method for analyzing continuous beams and portal frames **(K3)**
5	Analyze continuous beams and portal frames by using Moment – distribution method **(K4)**

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	Apply energy theorems to analyze simple beams and trusses **(K3)**		**Energy Theorems**			Chalk & Board, PPT, Tutorial, videos
		1.1	Introduction- Strain energy in linear elastic system	T3,R2	01	
		1.2	Expression of strain energy due to axial Load	T3,R2	01	
		1.3	Expression of strain energy due to Shear force	T3,R2	01	
		1.4	Expression of strain energy due to Bending moment	T3,R2	01	
		1.5	Castigliano's first theorem	T3,R2	01	
		1.6	Deflections of simple beams	T3,R1	02	
		1.7	Deflections of pin jointed trusses.	T3,R2	02	
		1.8	Exercise Problems	T3,R2	02	
				Total	**11**	
II	Solve indeterminate structures by using Castigliano's–II theorem **(K3)**		**Analysis of Indeterminate Structures**			Chalk & Board, PPT, Tutorial, videos
		2.1	Indeterminate Structural Analysis	T3,R2	01	
		2.2	Determination of static and kinematic indeterminacies	T3,R2	02	
		2.3	Castigliano's–II theorem	T3,R2	01	
		2.4	Solution of trusses with upto two degrees of internal indeterminacies	T3,R2	02	
		2.5	Solution of trusses with upto two degrees of external indeterminacies	T3,R1	02	
		2.6	Exercise Problems	T3,R1	02	
				Total	**11**	

III	Know the analysis of fixed and continuous beams (K3)		**Fixed Beams & Continuous Beams**			**Chalk & Board, PPT, Tutorial, videos**
		3.1	Introduction to statically indeterminate beams	T2,R2	01	
		3.2	SFD and BMD for Fixed beam subjected to UDL.	T2,R2	01	
		3.3	SFD and BMD for Fixed beam subjected to central point load and eccentric point load	T1,R2	01	
		3.4	SFD and BMD for Fixed beam subjected to number of pointloads	T2,R2	01	
		3.5	SFD and BMD for Fixed beam subjected to UVL.	T2,R2	01	
		3.6	SFD and BMD for Fixed beam subjected to couple and combination of loads	T1,R2	02	
		3.7	Deflection of fixed beams	T3R1	01	
		3.8	Effect of sinking of support	T1,R2	01	
		3.9	Effect of rotationof a support	T2,R2	01	
		3.10	Continuous beams introduction	T2,R2	01	
		3.11	Clapeyron's theorem of three moments	T1,R2	01	
		3.12	Application of Clapeyron's theorem of three moments	T2,R2	02	
		3.13	Effects of sinking of supports	T2,R2	02	
		3.14	Exercise Problems	T1,R2	02	
				Total	**18**	
IV	Use slope-deflection method for analyzing continuous beams and portal frames (K3)		**Slope-Deflection Method**			**Chalk & Board, PPT, Tutorial, videos**
		4.1	Introduction	T2,R2	01	
		4.2	Derivation of slope deflection equations	T2,R2	01	
		4.3	Application to continuous beams without settlement of supports	T1,R2	02	
		4.4	Application to continuous beams with settlement of supports	T1,R2	02	
		4.5	Analysis of single bay portal frames without sway.	T2,R2	02	
		4.6	Exercise Problems	T2,R2	02	
				Total	**10**	
V	Analyze continuous beams and portal frames by using Moment – distribution method (K4)		**Moment Distribution Method:**			**Chalk & Board, PPT, Tutorial, Videos**
		5.1	Introduction	T2,R2	01	
		5.2	Stiffness, carry over and Distribution factors	T2,R2	01	
		5.3	Application to continuous beams without settlement of supports	T2,R2	02	
		5.4	Application to continuous beams with settlement of supports	T2,R2	02	
		5.5	Analysis of single bay storey portal frames without sway.	T2,R2	02	
		5.6	Exercise Problems	T2,R2	02	
				Total	**10**	
				CUMULATIVE PROPOSED PERIODS	**60**	

Text Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1	Dr. V.S. Prasad, Structural Analysis,3rd Edition, Galgotia publication,2015.
2	G S Pandit, SP Gupta & R Gupta Theory Of Structures, Vol 1, 1st Edition, Tata Mcgraw Hill Publishing Co Ltd, 2017.
3	S Ramamrutham & R Narayan, Theory Of Structures, 9th 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, 12th Edition, S. Chand Publishers, 2020.
2	Dr. R. Vaidyanathan & Dr. P.Perumal ,Structural analysis,4th Edition, Laxmi publications, 2019.
Web Details:	
1	https://nptel.ac.in/courses/105105166/
2	https://nptel.ac.in/courses/105101085/

		Name	Signature with Date
i.	Faculty	Dr. A. Venkata Krishna	16/12/24
ii.	Course Coordinator	Dr. A. Venkata Krishna	
iii.	Module Coordinator	Dr. A. Venkata Krishna	
iv.	Programme Coordinator	G V L N Murthy (HOD)	

Principal