

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE303	STRUCTURAL ANALYSIS -11	3-0-0-3	2016

Pre-requisite: CE201 Mechanics of Solids

Course objectives:

- To equip the students with the force and displacement methods of structural analysis with emphasis on analysis of rigid frames and trusses

Syllabus :

Slope Deflection Method, Moment Distribution Method, Clapeyrons Theorem (Three Moment Equation) , Kani's method of analysis, Beams curved in Plan, Plastic Theory

Expected Outcomes:

The students will be able to

- i. analyse structures using force method
- ii. analyse structures using displacement method
- iii. analyse curved beams in plan
- iv. analyse structures using plastic theory

Text Books :

1. Kenneth Leet, Chia M Uang & Anne M Gilbert., Fundamentals of Structural Analysis, McGraw Hill, 4e, 2010
2. R. Vaidyanathan and P. Perumal, Structural Analysis Volume I & II, Laxmi Publications (P) Ltd., 2017
3. Reddy . C.S., Basic Structural Analysis, Tata McGraw Hill, 3e, 2011

References:

1. Daniel L Schodak, Structures, Pearson Education, 7e, 2014
2. Hibbeler, RC, Structural analysis, Pearson Education, 2012
3. Kinney J. S., Indeterminate Structural Analysis, Oxford & IBH, 1966
4. Negi L. S. and Jangid R. S, Structural Analysis, Tata McGraw Hill, 1997
5. Rajasekaran S. and Sankarasubramanian G., Computational Structural Mechanics, PHI, 2008
6. S.S. Bhavikatti, Structural Analysis II, Vikas Publication Houses (P) Ltd, 2016
7. SP:6 (6): Application of Plastic Theory in Design of Steel Structures, Bureau of Indian Standards, 1972
8. Timoshenko S. P. and Young D. H., Theory of Structures, McGraw Hill, 2e, 1965
9. Utku S, Norris C. H & Wilbur J. B, Elementary Structural Analysis, McGraw Hill, 1990
10. Wang C. K., Intermediate Structural Analysis, Tata McGraw Hill, 1989

COURSE PLAN

Module	Contents	Hours	Sem. Exam Marks %
I	Clapeyrons Theorem (Three Moment Equation) : Derivation of three	7	15

	moment equation - application of three moment equation for analysis of continuous beams under the effect of applied loads and uneven support settlement.		
II	Slope Deflection Method : Analysis of continuous beams- beams with overhang- analysis of rigid frames - frames without sway and with sway - different types of loads -settlement effects	7	15
FIRST INTERNAL EXAMINATION			
III	Moment Distribution Method: Moment Distribution method – analysis of beams and frames – non sway and sway analysis .	7	15
IV	Kani's Method: Kani's Method of analysis applied to continuous beams and single bay single storey rigid frames rigid frames – frames without sway and with sway.	6	15
SECOND INTERNAL EXAMINATION			
V	Beams curved in plan: Analysis of cantilever beam curved in plan, analysis of circular beams over simple supports.	7	20
VI	Plastic Theory: Introduction – plastic hinge concepts – plastic modulus – shape factor – redistribution of moments – collapse mechanisms – Plastic analysis of beams and portal frames by equilibrium and mechanism methods.(Single Storey and Single bay Frames only)	8	20
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester exam)

Maximum Marks :100

Exam Duration: 3 Hrs

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

Note :

1. Each part should have at least one question from each module.
2. Each question can have a maximum of 4 subdivisions (a, b, c, d)