

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

- analyse structures using force method
- analyse structures using displacement method
- analyse curved beams in plan
- analyse structures using plastic theory

Text Books :

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

References:

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