

Syllabus:

Unit No	Content	Mapped COs
I	ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces – Castigliano's first theorem. Deflections of simple beams and pin jointed trusses.	CO1
II	ANALYSIS OF INDETERMINATE STRUCTURES: Indeterminate Structural Analysis – Determination of static and kinematic indeterminacies - Solution of trusses with up to two degrees of internal and external indeterminacies– Castigliano’s second theorem.	CO2
III	FIXED BEAMS & CONTINUOUS BEAMS: Introduction to statically indeterminate beams with uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads – Shear force and bending moment diagrams – Deflection of fixed beams. Effect of sinking of support and effect of rotation of a support.	CO3
IV	SLOPE-DEFLECTION METHOD: Introduction-derivation of slope deflection equations – Application to continuous beams with and without settlement of supports - Analysis of single bay portal frames without sway.	CO4
V	MOMENT DISTRIBUTION METHOD: Introduction to moment distribution method - Application to continuous beams with and without settlement of supports - Analysis of single bay storey portal frames without sway.	CO5

Learning Resource(s)**Text Book(s):**

1. *Analysis of Structures – Vol-I & II* by V.N. Vazirani& M.M. Ratwani, Khanna Publications, New Delhi.
2. *Basic Structural Analysis* by C.S. Reddy, Tata McGraw Hill Publishers, 3rd Edition, 2017.
3. *Theory of Structures* by S. Ramamrutham, Publisher. DhanpatRai Publishing company , ninth edition

Reference Book(s):

1. *Structural Analysis* by AslamKassimali, Cengage Publications, 6th Edition, 2020.
2. *Structural Analysis Vol. I and II* by Dr. R. Vaidyanathan and Dr. P. Perumal, Laxmi Publications, 3rd Edition, 2016.
3. *Introduction to Structural Analysis* by B.D. Nautiyal, New Age International Publishers, New Delhi.
4. *Structural Analysis* by D.S. Prakasarao, University Press.
5. *Strength of Materials and Mechanics of Structures* by B.C. Punmia, Khanna Publications, New Delhi.

e-Resources & other digital material

1. <https://nptel.ac.in/courses/105101085/25-31>
2. https://onlinecourses.nptel.ac.in/noc17_ce25/preview
3. <https://www.edx.org/learn/structural-engineering>