

Year & Sem: E2S1	Course Code: CE2101	Course Name: Structural Analysis	No. of Credits: 4	L 2	T&PS 2	P 0
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UNIT –I: Indeterminate Structural Analysis:

Indeterminate Structural Analysis –Determination of static and kinematic indeterminacies – Solution of trusses with up to two degrees of internal and external indeterminacies – Castigliano's theorem

UNIT – I: Propped Cantilevers & Fixed Beams:

Analysis of propped cantilevers-shear force and bending moment diagrams-Deflection of propped cantilevers. Introduction to statically indeterminate beams with U.D. 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, effect of rotation of a support.

UNIT – III: Continuous Beams:

Introduction-Clapeyron's theorem of three moments- Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spansEffects of sinking of supports-shear force and Bending moment diagrams.

UNIT – IV: 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.

UNIT – V: Moving Loads:

Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load U.D load longer than the span, U.D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

UNIT – VI: Influence Lines:

Definition of influence line for SF, Influence line for BM- load position for maximum SF at a sectionLoad position for maximum BM at a section single point load, U.D.load longer than the span, U.D.load shorter than the span, Influence lines for forces in members of Pratt and Warren trusses.

References/Text Books:

1. Structural Analysis by R C Hibbler, 6th edition, Person India Publication
2. Elementary Structural Analysis - Norris, Wilbur and Utku, McGraw Hill.
3. Basic Structural Analysis - C.S. Reddy, Tata McGraw Hill.
4. Intermediate Structural Analysis - C. K. Wang, McGraw-Hill
5. Theory of Structures - Volumes 1 and 2,
6. S P Gupta and G S Pandit, Tata McGraw Hill.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

1. <http://nptel.ac.in/courses/105101085/>