

CE6501 STRUCTURAL ANALYSIS I

DETAILED SYLLABUS

UNIT I INDETERMINATE FRAMES

Degree of static and kinematic indeterminacies for plane frames - analysis of indeterminate pin-jointed frames - rigid frames (Degree of statical indeterminacy up to two) - Energy and consistent deformation methods.

UNIT II MOVING LOADS AND INFLUENCE LINES

Influence lines for reactions in statically determinate structures – influence lines for member forces in pin-jointed frames – Influence lines for shear force and bending moment in beam sections – Calculation of critical stress resultants due to concentrated and distributed moving loads. Muller Breslau's principle – Influence lines for continuous beams and single storey rigid frames – Indirect model analysis for influence lines of indeterminate structures – Beggs deformeter

UNIT III ARCHES

Arches as structural forms – Examples of arch structures – Types of arches – Analysis of three hinged, two hinged and fixed arches, parabolic and circular arches – Settlement and temperature effects.

UNIT IV SLOPE DEFLECTION METHOD

Continuous beams and rigid frames (with and without sway) – Symmetry and antisymmetry – Simplification for hinged end – Support displacements

UNIT V MOMENT DISTRIBUTION METHOD

Distribution and carryover of moments – Stiffness and carry over factors – Analysis of continuous beams – Plane rigid frames with and without sway – Neaylor's simplification.

TEXTBOOKS

1. Vaidyanadhan, R and Perumal, P, "Comprehensive Structural Analysis – Vol. 1 & Vol. 2", Laxmi Publications Pvt. Ltd, New Delhi, 2003.

For Syllabus, Question Papers, Notes & many More

2. L.S. Negi & R.S. Jangid, "Structural Analysis", Tata McGraw Hill Publications, New Delhi, 6th Edition, 2003.

3. Punmia.B.C, Ashok Kumar Jain and Arun Kumar Jain, " Theory of structures", Laxmi Publications Pvt. Ltd., New Delhi, 2004

4. Reddy. C.S., "Basic Structural Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2013.

5. BhavaiKatti, S.S, "Structural Analysis – Vol. 1 & Vol. 2", Vikas Publishing Pvt Ltd., New Delhi, 2008

REFERENCES

1. Wang C.K. , "Indeterminate Structural Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010

2. Devadas Menon, "Structural Analysis", Narosa Publishing House, 2008

3. Ghali.A., Nebille and Brown. T.G., "Structural Analysis - A unified classical and matrix approach" Sixth Edition, SPON press, New York, 2013.

4. Gambhir. M.L., "Fundamentals of Structural Mechanics and Analysis", PHI Learning Pvt. Ltd., New Delhi, 2011.

OBJECTIVES

To introduce the students to basic theory and concepts of structural analysis and the classical methods for the analysis of buildings.