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| E.G.S.PILLAY ENGINEERING COLLEGE,NAGAPATTINAM |
| DEPARTMENT OF CIVIL ENGINEERINGB.E.CIVIL ENGINEERING |

**CE6501 STRUCTURAL ANALYSIS I   L T P C 3 1 0 4**

 **OBJECTIVES:**

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

 **UNIT I                                                   INDETERMINATE FRAMES                                           (9)**

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 LINE                       (9)**

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                                                                           (9)**

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                                     (9)**

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

**UNIT V                                                MOMENT DISTRIBUTION METHOD                            (9)**

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

**TOTAL (L:45+T:15): 60 PERIODS**

**OUTCOMES:**

Students will be able to

* Analysis trusses, frames and arches.
* Analyze structures for moving loads and will be conversant with classical methods of analysis.

**TEXT BOOKS:**

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

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