III B.Tech I Semester

15ACE18-STRUCTURAL ANALYSIS- II

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Course Objective:

Indeterminate structures are subjected to different loading with different supported conditions; hence it is necessary for students to study the behaviour of the structures.

UNIT-I

Kani`s Method:- Analysis of continuous beams – including settlement of supports and single bay, single storey portal frames with side sway by Kani's method.

UNIT – II

Flexibility Methods:- Flexibility methods, Introduction, application to continuous beams including support settlements.

Stiffness Method: - Introduction, application to continuous beams including support settlements.

UNIT III

Influence Lines and Rolling Loads :For Statically Determinate Structures- Moving/Rolling and influence lines; Influence lines for beam reactions ; Influence lines for shearing force; Influence lines for bending moment; Calculation of maximum shear force and bending moment at a section for rolling loads; Calculation of absolute maximum bending moment; Influence lines for simple trusses.

UNIT IV

Arches : Three hinged arches, Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature. Two **Hinged Arches:** Determination of horizontal thrust bending moment, normal thrust and radial shear – Rib shortening and temperature stresses, tied arches – fixed arches – (No analytical question).

UNIT – V

Plastic Analysis: Introduction – Idealized stress – Strain diagram – shape factors for various sections – Moment curvature relationship – ultimate moment – Plastic hinge – lower and upper bound theorems – ultimate strength of fixed and continuous beams.

Course Outcomes:

On completion of the course, the students will be able to:

- *Apply the methods of indeterminate truss analysis*
- *Analyze the behavior of arches through different methods of analysis*
- *Use various classical methods for analysis of indeterminate structures*

- *Determine the effect of support settlements for indeterminate structures*
- *Able to analyze the beam and frames for vertical and horizontal loads and draw*

TEXT BOOKS

1. Structural Analysis (Matrix Approach) by Pundit and Gupta – Tata Mc.Graw Hill publishers.
2. Analysis of structures by Vazrani&Ratwani – Khanna Publications.
3. Structural Analysis by D.S.PrakashaRao, Univ.Press, Delhi.Structural Analysis by C.S. Reddy, Tata Macgrawhill, New Delhi.

REFERENCE

1. Theory of structures by Ramamuratam,jain book depot , New Delhi
2. Structural analysis – Hibbler, 6th edition – Pearson publilcation.
3. Structural analysis by R.S.Khurmi, S.Chand Publications, New Delhi.
4. Analysis Of Structures By Dev Das Menon – John wileypubilication.
5. Comprehensive Structural Analysis-Vol.I&2 by Dr. R. Vaidyanathan&Dr.P.Perumal-Laxmi publications pvt. Ltd., New Delhi.
6. Analysis of Structures – Vol. I & 2 by Bhavikatti, Vikas publications.
7. Strength of Materials and mechanics of solids Vol-2 by B.C. Punmia, Laxmi Publications, New Delhi.