3/4 B.Tech. FIFTH SEMESTER

CE5T4 STRUCTURAL ANALYSIS – II Credits: 4

Lecture: 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Objectives:

- To learn classical methods for analyzing indeterminate structures and special structures and
- To solve indeterminate structures by influence lines. To learn classical methods for analyzing indeterminate structures and special structures and
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- To solve indeterminate structures by influence lines.

Learning outcomes:

At the end of course the student will be able to:

- Analyze three hinged, two hinged arches and cables.
- Use Portal and Cantilever methods for multi storied building analysis
- Have experience with Moment distribution, Kani's, Flexibility and Stiffness methods

UNIT I
THREE HINGED ARCHES:
Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature.

UNIT – II
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-III
CABLES AND SUSPENSION BRIDGES:
Introduction, Equilibrium of cables, Cables subjected to Concentrated Load and UDL**,** Cables with ends at different levels and Effect of Temperature, Suspension bridge-analysis

UNIT-III
LATERAL LOAD ANALYSIS:
Application to building frames. (i) Portal method (ii) Cantilever method.

UNIT – IV
MOMENT DISTRIBUTION METHOD:
Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – storey portal frames – including Sway-Substitute frame analysis by two cycles.

UNIT – V

KANIS' METHOD:
Analysis of continuous beams – including settlement of supports and single bay portal frames with side sway.

UNI – VII
FLEXIBILITY METHOD:
Introduction, application to continuous beams including support settlements.

UNIT – VIII
STIFFNESS METHOD:
Introduction, application to continuous beams including support settlements.

Learning resources

Text books:
1. Analysis of Structures – Vol. I & 2, (3rd edition- Vol. I, 2nd edition- Vol. 2) by Bhavikatti, S.S., Vikas publications, 2008.
2. Analysis of structures– Vol. I & 2, (16th edition- Vol. I, 17th edition- Vol. 2) by Vazrani and Ratwani, Khanna Publications, 2005.
3. Strength of Materials and mechanics of solids Vol-2, (1st edition) by Punmia, B.C., Laxmi Publications, New Delhi, 2007.

Reference books:
1. Theory of structures, (9th edition) by Ramamuratam, S., Dhanpat Rai Publications, 2010.
2. Structural Analysis (Matrix Approach) (2nd edition) by Pundit and Gupta, Tata McGraw-Hill, 2008.
3. Basic Structural Analysis, (2nd edition) by Reddy, C.S., Tata McGraw-Hill, New Delhi, 2009.