## STRUCTURAL ANALYSIS II

#### **Course Objectives:**

- 1. Familiarize Students with Different types of Structures
- 2. Equip student with concepts of Arches
- 3. Understand Concepts of lateral Load analysis
- 4. Familiarize Cables and Suspension Bridges
- 5. Understand Analysis methods Slope Deflection, Moment Distribution, Kanis Method

Course Outcomes: At the end of the course the student should able to

- 1. Analyze three hinged arches and two hinged arches
- 2. Carryout lateral Load analysis of structures
- 3. Analyze Cable and Suspension Bridge structures
- 4. Analyze structures using Slope Deflection.
- 5. Analyze structures using Moment Distribution
- 6. Analyze structures using Kani's Method

## SYLLABUS

## 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 hinges with supports at different levels.

**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-II

**Lateral Load Analysis Using Approximate Methods**: application to building frames. (i) Portal Method (ii) Cantilever Method.

## UNIT – III

**Cable Structures and Suspension Bridges**: Introduction, characteristics of cable, analysis of cables subjected to concentrated and uniformly distributed loads, anchor cable, temperature stresses, analysis of simple suspension bridge, three hinged and two hinged stiffening girder suspension bridges.

#### UNIT-IV

**Slope-Deflection Method:** Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports.

## UNIT – V

**Moment Distribution Method**: Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – Portal frames – including Sway-Substitute frame analysis by two cycle.

# $\mathbf{UNIT} - \mathbf{VI}$

**Kani's Method**: Analysis of continuous beams – including settlement of supports and single bay portal frames with and without side sway.

## **Text Books:**

- 1. Basic Structural Analysis, C. S. Reddy Tata Mc.Graw-Hill, New Delhi.
- 2. Analysis of Structures by T.S. Thandavamoorthy, Oxford University Press, New Delhi
- 3. Analysis of Structures- Vol. I and II, V. N. Vazirani and M. M. Ratwani, Khanna Publishers, New Delhi

## **References:**

- 1. Theory of Structures, B. C Punmia, A. K Jain & Arun K. Jain, Lakshmi Publications
- 2. Theory of Structures, R.S. Khurmi, S. Chand Publishers.
- 3. Structural analysis by R.C. Hibbeler, Pearson, New Delhi.
- 4. Structural Analysis-I, Hemanth Patel, Yogesh Patel, Synergy Knowledgeware, Mumbai Structural Analysis I Analysis of Statically Determinate Structures, P. N. Chandramouli, Yesdee Publishing Pvt Limited, Chenn