# STRUCTURAL ANALYSIS – II

**Course Code: 13CE1121**

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## Course Educational Objectives:

- To impart knowledge of analyzing framed structures using approximate methods and analyse beams using slope deflection method and matrix methods.
- To create a strong understanding of behaviour of arch structures.

## Course Outcomes:

- The student will be able to analyse the given building frames by approximate methods for gravity loads and lateral loads.
- Students will be acquainted with the matrix methods for beams and frames.

## UNIT-I (12 Lectures)

### THREE HINGED ARCHES:

Introduction – Eddy's theorem, determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature – moving loads on three hinged arches.

### TWO HINGED ARCHES:

Determination of horizontal thrust, bending moment and radial shear – basic concepts of fixed and tied arches.

## UNIT-II (10 Lectures)

### SLOPE - DEFLECTION METHOD:

Introduction - Derivation of slope - deflection equation - application to continuous beams including settlement of supports, analysis of single bay-single storey portal frame including side sway.

## UNIT-III (12 Lectures)

### MOMENT DISTRIBUTION METHOD:

Introduction - stiffness and carry over factors – Distribution factors –

Analysis of continuous beams with and without sinking of supports – single bay-single storey portal frames – including sway.

## UNIT-IV (15 Lectures)

### APPROXIMATE METHODS:

Substitute frame analysis by two cycle method, approximate methods of analysis application to building frames by portal and cantilever method (up to two bays and two storeys only).

## UNIT-V (15 Lectures)

### FLEXIBILITY METHOD:

Introduction, calculations of S.I. - application to continuous beams including support settlements. Analysis portal frames upto 3 degree of freedom.

### STIFFNESS METHOD:

Introduction, calculations of K.I - application to continuous beams including support settlements. Analysis portal frames up to 3 degree of indeterminacy.

## TEXT BOOKS:


1. Bhavikatti S.S, *"Analysis of Structures"*, (Vol. I & II), 6th Edition, Vikas Publications, 2009.
2. Vazirani & Ratwani, *"Analysis of structures"*, 19th Edition, Khanna Publications, 2008.
3. B.C. Punmia, *"Strength of Materials and mechanics of solids"*, Vol-II, 10th Edition, Laxmi Publications, New Delhi, 2009.
4. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, *"Theory of Structures"*, 12th Edition, Laxmi Publications, 2004.


## REFERENCES:


1. Pandit and Gupta, *"Structural Analysis (Matrix Approach)"*, Tata Mc Graw Hill, New Delhi, 2008.
2. S.Ramamurtham, R. Narayan, *"Theory of Structures"*, 9th Edition, Dhanapat Rai Publishing Company, 2010.
3. C.S.Reddy, *"Structural Analysis"*, Tata Mc Graw Hill, New Delhi, 2008.