STRUCTURAL ANALYSIS – II

Course Code: 13CE1121

L	T	P	C
4	1	0	3

Course Outcomes:

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

CO 1 Analyse two hinged and three hinged arches

CO 2 Apply slope deflection method to analyse continuous beams and portal frames.

CO 3 Apply Moment Distribution Method for beams and portal frames

CO 4 Apply approximate method for skeletal structures.

CO 5 Analyse continuous and portal frames using flexibility and stiffness methods.

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.