STRUCTURAL ANALYSIS – II

Course Code: 15CE1123

L	T	P	C
3	0	0	3

Pre-requisites:

Strength of materials, Structural analysis – I.

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 analyze continuous beams and portal frames.

CO 3 Apply Moment Distribution Method for beams and portalframes

CO 4 Apply approximate method for skeletal structures.

CO 5 Analyse continuous and portal frames using flexibility and stiffness

methods.

UNIT-I (10 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 – applicationto

continuous beams including settlement of supports, analysis of single bay- single storey portal frame including side sway.

UNIT-III (10 Lectures)

MOMENT DISTRIBUTION METHOD:

Introduction - stiffness and carry over factors – Distribution factors– Analysis of continuous beams with and without sinking of supports and single bay-single storey portal frames – including sway.

UNIT-IV (10 Lectures)

APPROXIMATE METHODS:

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

UNIT-V (10 Lectures)

FLEXIBILITY METHOD:

Introduction, calculations of S.I.-application to continuous beams including support settlements. Analysis of 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.

5. Pandit and Gupta, “Structural Analysis (Matrix Approach)” Tata McGraw Hill, New Delhi, 2008.

REFERENCES:

1. S.Ramamurtham, R. Narayan, “Theory of Structures”, 9thEdition, Dhanapat Rai Publishing Company, 2010.
2. C.S.Reddy, “Structural Analysis”, Tata McGraw Hill, New Delhi, 2008.
3. R.C. Hibbeler “Structural analysis” 6th Edition, Pearson publications, 2012.