

OBJECTIVES:

- To introduce the students to basic theory and concepts of structural analysis and the classical methods for the analysis of buildings.

UNIT I	INDETERMINATE FRAMES	9
Degree of static and kinematic indeterminacies for plane frames - analysis of indeterminate pin-jointed frames - rigid frames (Degree of statical indeterminacy up to two) - Energy and consistent deformation methods.		
UNIT II	MOVING LOADS AND INFLUENCE LINES	9
Influence lines for reactions in statically determinate structures –influence lines for member forces in pin-jointed frames –Influence lines for shear force and bending moment in beam sections – Calculation of critical stress resultants due to concentrated and distributed moving loads. Muller Breslau"s–Influence lines principle for continuous beams and single storey rigid frames – Indirect model analysis for influence lines of indeterminate structures –Beggs deformeter		
UNIT III	ARCHES	9
Arches as structural forms –Examples of arch structures –Types of arches –Analysis of three hinged, two hinged and fixed arches, parabolic and circular arches –Settlement and temperature effects.		
UNIT IV	SLOPE DEFLECTION METHOD	9
Continuous beams and rigid frames (with and without sway) –Symmetry and antisymmetry – Simplification for hinged end –Support displacements		
UNIT V	MOMENT DISTRIBUTION METHOD	9
Distribution and carryover of moments –Stiffness and carry over factors –Analysis of continuous beams –Plane rigid frames with and without sway –Neelyor"s simplification.		
TOTAL (L:45+T:15): 60 PERIODS		

OUTCOMES:

Students will be able to

- analysis trusses, frames and arches
- analyse structures for moving loads and
- will be conversant with classical methods of analysis.

TEXT BOOKS:

1. Vaidyanadhan, R and Perumal, P, –"CVolmprehensiv.1&Vol Laxmi Publications Pvt. Ltd, New Delhi, 2003.
2. L.S. Negi & R.S. Jangid, "Structural Analysis 6th Edition, 2003.
3. Punmia.B.C, Ashok Kumar Jain and Arun Kumar Jain, " Theory of structures", Laxmi Publications Pvt. Ltd., New Delhi, 2004
4. Reddy. C.S., "Basic Structural Analysis", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2013.
5. BhavaiKatti, S.S, "Structural Analysis –Vol. 1 & Vol. 2", Vikas Publishing Pvt Ltd., New Delhi, 2008

REFERENCES:

1. Wang C.K. , "Indeterminate Structural Analysis", Tata M New Delhi, 2010
2. Devadas Menon, "Structural Analysis", Narosa P
3. Ghali.A., Nebille and Brown. T.G., "Structural Analysis - A unified classical and matrix approach" Sixth Edition, SPON press, New York, 2013.
4. Gambhir. M.L., "Fundamentals of Structural Mechanics and Analysis"., PHI Learning Pvt. Ltd., New Delhi, 2011.