K L UNIVERSITY
STRUCTURAL ANALYSIS (13 - CE 203)

Pre – requisite: 13 – ES106, 13 – CE201

Competencies

L	T	P	Cr
3	0	2	4

1. Analyse structure by using energy theorems
2. Analyze the propped cantilever and fixed beams for different loadings
3. Analyze the structure by using slope deflection, moment distribution methods

SYLLABUS

Energy Theorems: Principle of superposition, Maxwell's reciprocal theorem, Betti's theorem, Principles of virtual work, Application of virtual work, Castigliano's theorems, Applications of castigliano's theorem.

Deflection: Relation between curvature, slope and deflection, Deflection curves, Deflection by moment area method, Deflection by conjugate beam method, unit load method.

Propped Cantilevers and Fixed Beams: Analysis of propped cantilevers with point load, partially loaded u.d.l and uniformly varying load, fixed beam with point load, udl, Unsymmetrical concentrated load and varying load,

Analysis of Continuous beams: Clapereyon's theorem of Three moments, analysis of beam with constant EI for all span, varying EI for different span, sinking of supports.

Analysis of Structure by Slope Deflection Method: Difference between force method and displacement method. Advantage of displacement method. Analysis of indeterminate beams, Beams with uneven support settlement, rigid frames by slope deflection method.

Analysis of Structure by Moment Distribution Method: Advantage of moment distribution method, stiffness, carry over and distribution factor, analysis of indeterminate beams and rigid frames, uneven settlement of support for beam and rigid frame by moment distribution method.

TEXT BOOKS:

1. Intermediate Structural Analysis by C. K. Wang, McGraw Hill Book Company, 2010

REFERENCE BOOKS:

1. Basic Structural Analysis by C S Reddy, Tata McGraw Hill publishing Company ltd. Delhi. 2nd edition 2010.
2. Structural Analysis by T.S Thandavamoorthy, Oxford University Press, New Delhi, First edition, 2011.
3. Fundamentals of Structural Mechanics and Analysis by M L Gambhir, PHI learning private limited, New Delhi, 2011.

LIST OF EXPERIMENTS

Students are required to analyze the following structures using Software package (STAAD-Pro)

1. Analysis of continuous beam without sinking of support.
2. Analysis of continuous beam with sinking of support.
3. Analysis of continuous beam with internal hinge.
4. Analysis of portal frame without sinking of support.
5. Analysis of portal frame with sinking of support.
6. Analysis of portal frame with internal hinge.
7. Analysis of Truss without sinking of support.

8. Analysis of truss with sinking of support.
9. Analysis of space frame without sinking of support
10. Analysis of space frame with sinking of support.
11. Analysis of space frame with internal hinge.