RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Civil Engineering, IV-Semester

CE403 Structural Analysis-I

UNIT I Virtual work and Energy Principles: Principles of Virtual work applied to deformable bodies, Strain energy and complementary energy, Energy theorems, Maxwell's Reciprocal theorem, Analysis of Pin-Jointed frames for static loads.

UNIT II Indeterminate Structures-I: Static and Kinematics indeterminacy, Analysis of Fixed and Continuous beams by theorem of three moments, Effect of sinking and rotation of supports, Moment distribution method (without sway)

UNIT III Indeterminate Structures - II: Analysis of beams and frames by slope Deflection method, Column Analogy method.

UNIT IV Arches and Suspension Cables: Three hinged arches of different shapes, Eddy's Theorem, Suspension cable, stiffening girders, Two Hinged and Fixed Arches - Rib shortening and Temperature effects.

UNIT V Rolling loads and Influence Lines: Maximum SF and BM curves for various types of Rolling Loads, focal length, EUDL, Influence Lines for Determinate Structures- Beams, Three Hinged Arches.

References:
1. Rammamurtham, Theory of Structures, Dhanpat Rai .
2. Bhavikatti S.S. Analysis of Structures (I&II) Vikas Publication
 3. B C Punmia, Theory of Structures, Firewall Media.
4. A Kassimali, Structural Analysis, Cengage Learning.
 5. A Ghali, A Neville, T G Brown, Structural Analysis: CRC Press.
 6. Hibbler, Structure Analysis -1, Pearson Education India
 7. C S Reddy, Basic Structural Analysis, Tata McGraw Hill Publishing Company.
 8. Pandit and Gupta, Theory of Structures – I, McGraw Hills
 9. West HH, Fundamental of Structural Analysis, Wiley India
10. Das MM, Structural Analysis, PHI
 11. Thandavamurthy TS, Structural Analysis, Oxford
 12. Muthuku, Azmi I, Basic Structural Analysis, IK International Publisher
13. C KWang, Intermediate Structural Analysis, McGraw Hill
14. J Kinney Sterling, Indeterminate structural Analysis, Addison-Wesley
15. RR Mamuther S Theoty of Structures Dhanpat Rai
 16. Jain O.P.-Jain B.K. Theory& Analysis of Structures (I&II) Nem Chand

Structure Analysis Lab - I

1. To verify Maxwell- Bett's Law.
2. To determine the flexural rigidity of the beam verify it theoretically
3. To determine the deflection of a pin jointed truss and to verify the results theoretically and graphically
4. To verify strain in an externally loaded beam with the help of a strain gauge indicator and to verify theoretically
5 .To study behaviour of different types of columns and find Euler's buckling
load for each case
6. To study two hinged arch for the horizontal displacement of the roller end for a given system of loading and to compare the same with those obtained analytically
7. To study the behaviour of a portal frame under different end conditions.
Apparatus
8. To find the value of flexural rigidity (EI) for a given beam and compare it with theoretical value
9. To determine the deflection of a pin connected truss analytically &graphically and verify the same experimentally
10. To verify the Muller Breslau theorem by using Begg's deformator set