PCCE4204 **Structural Analysis - I**

Module I

Introduction to statically indeterminate structures with reference to two and three dimensional structures. Determination of static and kinematic indeterminacy in beams and frames

Three moment theorem, Continuous beams and propped cantilevers by consistent deformation method, Fixed beams

Module II

Rolling loads and influence lines for simply supported beams, ILD for reaction, shear force and bending moment at a section, ILD for wheel loads, point loads and udl, maximum bending moment envelope

Analysis of three hinged arches, Suspension cable with three hinged stiffening girders subjected to dead and live loads, ILD for Bending Moment, Shear Force, normal thrust and radial shear for three hinged arches

Module III

Energy theorems and its application (Displacement calculation):

Strain energy method, Virtual work method, unit load method, Betti's and Maxwell's laws, Castigliano's theorem, concept of minimum potential energy. Analysis of redundant plane trusses.

Deflection of pin jointed plane trusses. Analytical method and Williot –Mohr diagram. Introduction to space truss

Text Books:

1. Theory and Problems in Structural Analysis by L Negi, Tata Mc Graw Hill
2. Structural Analysis by Norris and Wilber

Refernce Books:

3. Structural Analysis by V. S. Prasad, Galgotia Publications Private Limited
4. Analysis of Structure by R C Hibller