**Structural Analysis:** Basic methods, deflection computations, Energy methods- their applications, analysis of arches, Direct stiffness method, plane stress and plane strain, Basics of Finite element Method

**Numerical methods**: Gaussian elimination method, Interpolation methods, Numerical integration etc.

**Concrete Technology**: Concrete mix design as per IS method. Specifications of super plasticizer and fly ash for use in cement concrete. Durability of Concrete- causes of distress, mechanism, preventive measures and test methods. Self-Compacting concrete and High strength concrete – production methods and applications.

**Repair and Rehabilitation** of masonry and reinforced concrete structures: Cracks – causes and diagnosis. Materials of repair- cement based, epoxy- properties and applications. Methods of repair and rehabilitation- jacketing, externally bonded plates, shotcrete, special methods for earthquake prone structures.

**Load Computation-** IS specification for dead loads, live loads and wind loads for buildings, roof trusses, bridges and tanks etc. Computation of wind loads on structures and effects.

**Reinforced Concrete Design-** Design of members by limit state method- subjected to flexure, torsion, compression and combined loads including footings and foundations.

Design by working stress method- Circular beam, water tanks including Intze tank, culverts

**Structural Steel design:** Member design of hot rolled sections by limit state method- tension member, compression member, bending member, members subjected to combined loads, plate girder, gantry girder.

Design by working stress method- water tanks (rectangular & cylindrical), design of light gauge and tubular sections.