

# **NEW Ph D PROGRAMME: SYLLABUS FOR ENTRANCE TEST**

## **Structural Engineering**

Plane Stress and Plane Strain; Theories of Failure; Bending Stress, Shear Stress and Deflection of Beams; Shear Force and Bending Moment in Indeterminate Structures; Torsion; Force Analysis of Trusses; Deflection of Trusses; Influence Line Diagram; Three-hinge Arch; Suspension Bridges; Masonry Structures; Three-moment Theorem; Least Work; Two-Hinged Arch; Slope-Deflection Method; Moment Distribution Method, Frame Analysis; Kani's Method; Secondary Stresses; Stiffness Method; Plastic Theory; Buckling of Columns

Concrete Technology; Working & Limit state design concepts; Design of structural members subjected to flexure, shear, compression, torsion.

Steel Design – Design of Tension and Compression Members, Beams and Beam-Column, Column Bases, Connections, Plate girders; Plastic Analysis of Beam & Frames

## **Soil Mechanics**

Origin of soils, soil classification, Three-Phase system, Fundamental definitions, Relationship and Inter relationships, permeability & seepage, Effective Stress Principle, consolidation, compaction, shear strength

Sub-Surface investigations - scope, drilling bore holes, sampling, Penetration Tests, Plate Load Test, Earth Pressure Theories, effect of water table, slope stability, finite slope, foundation types and foundation design, bearing capacity, effect of shape, water table & other factors, deep foundation.

Building stones-quarrying, geological consideration in the construction of dams and tunnels, geological factors affecting the stability of hill slopes.

## **Fluid Mechanics & Water Resources Engineering**

Fluid Properties; Fluid Statics; Fluid Kinematics; Fluid Dynamics; Open-Channel Flow; Pumps & Turbines; Hydrological Cycle; Hydrograph Analysis; Flood Routing; Flood Frequency Analysis; Ground Water Flow

## **Transportation Engineering**

Transportation Engineering; Highway Materials; Pavement Analysis and Design; Pavement Evaluation and Maintenance; Highway Construction

## **Environmental Engineering**

Quality and Demand of Water; Population Forecast; Ground and Surface Sources; Water Treatment and Distribution; Sewer Appurtenances; Sewage Treatment; Air Pollutants–Classification Sources; Meteorological Aspects, Sampling; Control Methods; MSW – sources, analysis, transfer, transport, disposal