**Section 1: Flow and Fluid Properties**
viscosity, relationship between stress and strain-rate for Newtonian fluids, incompressible and compressible flows, differences between laminar and turbulent flows. **Hydrostatics:** Buoyancy, manometry, forces on submerged bodies.

**Section 2: Kinematics**
Eulerian and Lagrangian description of fluids motion, concept of local and convective accelerations, steady and unsteady flows.

**Section 3: Integral analysis**
Control volume analysis for mass, momentum and energy.

**Section 4: Differential Analysis**
Differential equations of mass and momentum for incompressible flows: inviscid - Euler equation and viscous flows - Navier-Stokes equations, concept of fluid rotation, vorticity, stream function, Exact solutions of Navier-Stokes equation for Couette Flow and Poiseuille flow.

**Section 5: Inviscid flows**
Bernoulli’s equation - assumptions and applications, potential function, Elementary plane flows - uniform flow, source, sink and doublet and their superposition for potential flow past simple geometries.

**Section 6: Dimensional analysis**
Concept of geometric, kinematic and dynamic similarity, some common non-dimensional parameters and their physical significance: Reynolds number, Froude number and Mach number.

**Section 7: Internal flows**
Fully developed pipe flow, empirical relations for laminar and turbulent flows: friction factor and Darcy-Weisbach relation.

**Section 8: Prandtl boundary layer equations**
Concept and assumptions, qualitative idea of boundary layer and separation, streamlined and bluff bodies, drag and lift forces. **Flow measurements:** Basic ideas of flow measurement using venturimeter, pitot-static tube and orifice plate.