Comprehensive Exam Syllabus

1 Fluid Mechanics

Vectors and tensors, fluid kinematics, conservation laws, Navier-Stokes equations, viscous flows, potential flows, boundary layer theory, vorticity Dynamics.

2 Computational Fluid Dynamics

Classification of partial differential equations, finite difference method, finite volume method, discretization techniques for elliptic, parabolic and hyperbolic partial differential equations, numerical methods for incompressible flows.

3 Engineering Mathematics

Linear algebra, vector and function spaces, eigenvalue problems, Sturm-Liouville theory, ordinary differential equations, solutions of linear partial differential equations.