

Syllabus: Viscous Fluid Flow (CH 6050)

Properties of Fluids, Fundamental equations of fluid flow: Derivation of Navier-Stokes, continuity and energy equations, Boundary conditions for viscous flow, Some discussion on potential flows: stream function, potential function, Flow separation, Dimensionless parameters, Laminar boundary layers, similarity solutions: Blasius velocity profile for flow over a flat plate, Transition to turbulence: linear stability analysis, Introduction to Turbulence: RANS equations, modeling, etc.

Books:

1. Viscous fluid flow by Frank M. White.
2. Boundary-layer theory by H. Schlichting and K. Gersten
3. Hydrodynamics by H. Lamb