

Computational Fluid Dynamics (CFD-1)

Course Text Books:

Computational Methods for Fluid Dynamics, by: M. Peric

Computational Fluid Mechanics and Heat Transfer, by: D.A. Anderson

An Introduction to Computational Fluid Dynamics, by: H.K. Versteeg

Course Outline:

1. Introduction
2. Basic concepts of fluid flow
3. Classification of partial differential equations
4. Discretization of differential equations
5. Stability analysis and error propagation
6. Finite difference methods for model equations
7. The finite volume methods for structured grids
8. Solution algorithms for pressure-velocity coupling in steady flows
9. Implementation of boundary conditions
10. Solution of linear equation systems
11. The finite volume methods for unsteady problems
12. The finite volume methods for unstructured grids
13. Selected topics in CFD