Course Title	Course Code	Credit Hours
Computational Fluid Dynamics	AE-471	2-1

Textbook:

- Jiri Blazek, “Computational Fluid Dynamics Principles and Applications”, Elsevier Science
- John D. Anderson, “Computational Fluid Dynamics – the Basics with Applications”, McGraw Hill

Reference Book:

- H. K. Versteeg, and W. Malalasekera, “An Introduction to Computational Fluid Dynamics: The Finite Volume Method”, Pearson Education Limited

Course Objectives:

In this course, students will learn about the basics of Navier Stokes equations and their solution using numerical techniques. Error and stability analysis of different numerical schemes would be covered.

Course Outline:

- Introduction to Computational Fluid Dynamics: Philosophy of CFD
- Governing Equations of Fluid Dynamics:
    - Continuity Equation
    - Momentum Equation
    - Energy Equation
    - Navier Stokes Equations
- Mathematical Behavior of PDEs:
    - Parabolic PDEs
    - Elliptic PDEs
    - Hyperbolic PDEs
- Numerical Discretization Techniques:
    - Differencing Techniques
    - Implicit and Explicit Techniques.
- Error and Stability Analysis.
- CFD Techniques: Lax Wandroff Scheme.
- CFD Techniques: Maccormack Scheme.
- Numerical Solution of Quasi 1D Nozzle Flow.