



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Advanced Computational Fluid Dynamics

AEROENG 8873

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Fundamentals of most types of numerical approaches employed to solve fluid dynamics and heat transfer problems.

Prerequisites and Co-requisites:

Prereq: 5615 (615) or MechEng 6507 (707), or equiv.

Course Topics:

- Introduction
 - Finite Difference Methods - Review - Hyperbolic equations - Method of characteristics
 - Finite Volume Methods - FVM for diffusion problems - FVM for convection-diffusion problems
 - Transformation of the Equations for Fluid Motion from Physical Space to Computational Space
 - Solution of the Navier-Stokes Equations - Compressible NS equations - Thin-layer NS equations
 - Grid Generation - The choice of grid - Structured grid
 - Turbulent Flows - Characteristics of simple turbulent flows - Turbulence models
 - Commercial CFD Software: Fluent
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Designation:

Elective