



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Computational Aerodynamics

AEROENG 5615

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Introduction to computational methods used in aerodynamics flow problems.

Prerequisites and Co-requisites:

Prereq: 3570 and 3581, and AeroEng major; or Grad standing in Mechanical or Aerospace Engineering; or permission of instructor.

Course Goals / Objectives:

- Understand the physical and mathematical classification of partial differential equations and their roles in aerodynamics
 - Learn numerical approximations of derivatives which appear in partial differential equations
 - Learn practical applications of the approximate derivatives to the solution of governing equations in aerodynamic problems
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Course Topics:

- Philosophy of CFD and Navier-Stokes eqs.
 - Classification of PDE
 - Finite difference method
 - Marching methods
 - Nozzle flow with explicit finite difference scheme
 - Nozzle flow in conservation form (with and without shock)
 - Relaxation methods, ADI, pressure-correction method
 - Mesh generation, visualization
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Designation:

Elective