



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Gas Dynamics

MECHENG 6501

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

A study of one-dimensional and two-dimensional steady and one-dimensional unsteady compressible flows.

Prerequisites and Co-requisites:

Prereq: 3503 or 3504 (504), and Math 2174, 2255 (255), or 2415 (415); or Grad standing in MechEng; or permission of instructor.

Course Goals / Objectives:

- Analyze steady, one-dimensional compressible flow problems in internal flows with and without friction, heat transfer, and shock waves
 - Analyze steady, one- or two-dimensional compressible flow problems in relatively simple external flows with shock waves and expansion waves
 - Analyze one-dimensional unsteady compressible flow
 - Analyze jet flow with various flow regimes
 - Design a converging-diverging nozzle
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Course Topics:

- Introduction to compressible flows
 - Conservation equations
 - Introduction to wave propagation and normal shocks
 - Flows with friction & heat transfer (Rayleigh and Fanno flows)
 - Oblique shock waves and expansion waves
 - Nozzle and diffuser flows
 - Numerical methods - conservation equations in differential form;
 - Unsteady wave motion;
 - Velocity potential equation
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Designation:

Elective