



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Principles of Flight Vehicle Propulsion

AEROENG 4550

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Course Description:

Fundamentals of aerospace propulsion, engine cycles and analysis of various air-breathing and rocket engines.

Prerequisites and Co-requisites:

Prereq: 3570.

Course Goals / Objectives:

- Educate students in the physical principles, concepts, and mathematical analysis that are unique to airbreathing and rocket propulsion
 - Enable students to analyze, develop models for, and to compute solutions for propulsion-related problems encountered in aerospace applications
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Course Topics:

- Intro to aero/space propulsion systems, basic fluid mechanics/thermodynamics, 1-D flow basics, area rule, normal/oblique shock, boundary layer basics
 - Intro to air-breathing engines, actuate disk, performance of ramjet
 - Performance of turbojet, dimension analysis, engine-aircraft matching
 - Turbojet inlet, combustor, and nozzle
 - Axial compressor analysis, performance & limitations
 - Degree of Reaction, axial turbine analysis, disc stress and blade cooling
 - Rocket fundamentals
 - Solid and liquid propellants, performance, nozzles, rocket heat transfer
 - Electrical rocket
 - Exams and review
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Designation:

Required