



Jet Propulsion

MECHENG 7527

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Characteristics and performance of air breathing flight vehicle power plants and their components (inlets, compressors, combustors, turbines, and nozzles).

Prerequisites and Co-requisites:

Prereq: 4510 (510) or AeroEng 4550 (550), or permission of instructor.

Course Goals / Objectives:

- Educate the student in the process of design of engines for very large aircraft
 - Familiarize the student with the details of gas turbine engine design characteristics
 - Educate the student in the details of aircraft component characteristics and engine matching
 - Educate the student regarding the differences between design of engines for large commercial aircraft and the design of engines for fighter aircraft
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Course Topics:

- The aerodynamics of the aircraft
 - The creation of thrust in a jet engine
 - Special topic in aeropropulsion I
 - The gas turbine cycle
 - The principle and layout of jet engines
 - Elementary fluid mechanics of compressible gases
 - Selection of bypass ratio
 - Special topic in aeropropulsion II
 - Dynamic scaling and dimensional analysis
 - Turbomachinery: compressors and turbines
 - Overview of the civil engine design
 - Component characteristics
 - Engine matching – off design
 - A new fighter aircraft
 - Lift, drag, and the effects of maneuvering
 - Engines for combat aircraft
 - Design point for a combat aircraft
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Designation:

Elective