Principles of Flight Vehicle Propulsion

AEROENG 4550

Description / Conditions

Transcript Abbreviation:
Prin of Propulsion

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

Course Levels:
Undegraduate (1000-5000 level)

Designation:
Required

Course Detail

Credit Hours (Minimum if “Range” selected):
3.00

Max Credit Hours:
3.00

Check if Repeatable:
Off

Allow Multiple Enrollments in Term:
No

Course Length:
14 weeks (autumn or spring)
12 weeks (summer only)

Off Campus:
Never

Campus Location:
Columbus
Principles of Flight Vehicle Propulsion - 2/3

Instruction Modes:
In Person (75-100% campus; 0-24% online)

Prerequisites and Co-requisites:
Prereq: 3570.

Electronically Enforced:
No

Exclusions:
Not open to students with credit for 550.

**Course Goals and Learning Objectives**

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

Check if concurrence sought:
No

**Contact Hours**

Contact Hours:

<table>
<thead>
<tr>
<th>Topic</th>
<th>LEC</th>
<th>REC out-of-class</th>
<th>REC in-class</th>
<th>Weekly LAB in-class</th>
<th>Weekly LAB out-of-class</th>
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</thead>
<tbody>
<tr>
<td>Intro to aero/space propulsion systems, basic fluid mechanics/thermodynamics, 1-D flow basics, area rule, normal/oblique shock, boundary layer basics</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Intro to air-breathing engines, actuate disk, performance of ramjet</td>
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<td>0</td>
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<tr>
<td>Performance of turbojet, dimension analysis, engine-aircraft matching</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Turbojet inlet, combustor, and nozzle</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Axial compressor analysis, performance &amp; limitations</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Degree of Reaction, axial turbine analysis, disc stress and blade cooling</td>
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<td>0</td>
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<tr>
<td>Rocket fundamentals</td>
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<tr>
<td>Solid and liquid propellants, performance, nozzles, rocket heat transfer</td>
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Grading and Texts

Grading Plan:
Letter Grade

Course Components:
Lecture

Grade Roster Component:
Lecture

Credit by Exam (EM):
No

Grades Breakdown:

<table>
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<th>Aspect</th>
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<tr>
<td>homework</td>
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<tr>
<td>class participation</td>
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<td>midterms I &amp; II</td>
<td>50%</td>
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<td>final exam</td>
<td>25%</td>
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Representative Textbooks and Other Course Materials:

<table>
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<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
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<tbody>
<tr>
<td>Mechanics and Thermodynamics of Propulsion</td>
<td>Hill, P and</td>
<td>2010</td>
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<td></td>
<td>Peterson, C.</td>
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ABET Student Learning Outcomes

Embedded Literacies (UG courses only)

Embedded Literacies Info:

Attachments / Additional Notes or Comments

ABET Syllabus:

AEROENG_4550_ABET.pdf