Introduction to Aerospace Engineering I

AEROENG 2200

Description / Conditions

Transcript Abbreviation:
Intro Aero Eng I

Course Description:
An introduction to fundamental concepts leading to aircraft design, with an emphasis on aerodynamics and aircraft performance.

Course Levels:
Undegraduate (1000-5000 level)

Designation:
Elective
Required

Course Detail

Credit Hours (Minimum if “Range”selected):
4.00

Max Credit Hours:
4.00

Check if Repeatable:
Off

Maximum Repeatable Credits:
4.00

Allow Multiple Enrollments in Term:
No

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

Off Campus:
Never

Campus Location:
Columbus

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

Prerequisites and Corequisites:
Prereq: Physics 1250 or 1260 (131); and Math 1152 (152), 1161 (161), 1172 (154), or 1181H, or a grade of C- or above in Math 1544. Prereq or concur: Math 2173 (254), 2153 (153), or 2162 (263).

Electronically Enforced:
No

Exclusions:
Not open to students with credit for 200.

Course Goals and Learning Objectives

Course Goals / Objectives:
Introduce students to the nomenclature and environment of flight
Educate students in the fundamentals of fluid flow and the concepts of lift and drag
Train students in the methodology for prediction of aerodynamic characteristics of aircraft
Introduce aerodynamic concepts of vertical flight and rotocraft performance
Develop in students an understanding of how the equations of aircraft motion can be specialized to steady and accelerated flight
Stimulate understanding of the basic principles with simple laboratory experiences

Check if concurrence sought:
No

Contact Hours

Contact Hours:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Contact Hours For Each Topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight environment, fundamental quantitative concepts, perfect gas law, and the standard atmosphere</td>
<td>LEC 0</td>
</tr>
<tr>
<td>Equations of fluid flow. Equations of conservation of mass, momentum and energy in one dimension</td>
<td>LEC 0</td>
</tr>
<tr>
<td>Elementary thermodynamics; isentropic flow; nozzles</td>
<td>LEC 0</td>
</tr>
<tr>
<td>Applications to subsonic and supersonic wind tunnels</td>
<td>LEC 0</td>
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Applied aerodynamics; Lift of airfoils, finite wings, pressure distributions; drag of bodies, boundary layers and separation

Rotorcraft aerodynamics in hover and forward flight.
Basic momentum-disk theory. Helicopter operation and performance characteristics

Drag estimates of vehicles; parasitic and induced drag
Airplane performance; level and unaccelerated flight; thrust and power
Climbs and glides
Range and Endurance
Accelerated flight: turns, banks, takeoff, and landing
Total

Grading and Texts

Grading Plan:
Letter Grade

Course Components:
Lecture
Lab

Grade Roster Component:
Lecture

Credit by Exam (EM):
No

Grades Breakdown:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exams</td>
<td>40%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>13%</td>
</tr>
<tr>
<td>Lab Reports</td>
<td>12%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>5%</td>
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Representative Textbooks and Other Course Materials:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
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</thead>
</table>
Embedded Literacies (UG courses only)

Embedded Literacies Info:

Attachments / Additional Notes or Comments

ABET Syllabus:
AEROENG_2200_ABET.pdf