Helicopter Aerodynamics

AEROENG 5610

Description / Conditions

Transcript Abbreviation:
Helicopter Aero

Course Description:
Basic treatment of helicopter aerodynamics, performance, and design.

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Designation:
Elective

General Education Course:
(N/A)

Cross-Listings:
(N/A)

Course Detail

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

Max Credit Hours:
(N/A)

Select if Repeatable:
Off
Maximum Repeatable Credits:
(N/A)

Total Completions Allowed:
(N/A)

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 Co-requisites:
Prereq: 3570 (530 and 570).

Electronically Enforced:
No

Exclusions:
(N/A)

Course Goals and Learning Objectives

Course Goals / Objectives:
Introduce students to the fundamentals of helicopter flight including rotorcraft aerodynamics, design, performance, and control in hover and forward flight

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 out-of-class</th>
<th>Weekly LAB in-class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction and Historical Perspective</td>
<td>3.0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
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<tr>
<td>Momentum Theory</td>
<td>9.0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Blade Element Theory</td>
<td>9.0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Blade Motion, Dynamics, and Control</td>
<td>9.0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>Performance</td>
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<td>0</td>
<td>0.0</td>
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<tr>
<td>Design</td>
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<td>0</td>
<td>0.0</td>
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<td>Total</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>
<thead>
<tr>
<th>Aspect</th>
<th>Percent</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Project</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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</table>

## Representative Textbooks and Other Course Materials:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Year</th>
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<tbody>
<tr>
<td>Principles of Helicopter Aerodynamics, 2nd ed.</td>
<td>J. Gordon Leishman</td>
<td></td>
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</table>

## ABET Student Learning Outcomes

### ABET-CAC Criterion 3 Outcomes:
(N/A)

### ABET-ETAC Criterion 3 Outcomes:
(N/A)
ABET-EAC Criterion 3 Outcomes:

<table>
<thead>
<tr>
<th>Contribution Level</th>
<th>Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant contribution (7+ hours)</td>
<td>1</td>
<td>An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics</td>
</tr>
<tr>
<td>Substantial contribution (3-6 hours)</td>
<td>2</td>
<td>An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors</td>
</tr>
<tr>
<td>Some contribution (1-2 hours)</td>
<td>3</td>
<td>An ability to communicate effectively with a range of audiences - pre-2019 EAC SLO (g)</td>
</tr>
<tr>
<td>Some contribution (1-2 hours)</td>
<td>4</td>
<td>An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts</td>
</tr>
<tr>
<td>Substantial contribution (3-6 hours)</td>
<td>6</td>
<td>An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions</td>
</tr>
<tr>
<td>Substantial contribution (3-6 hours)</td>
<td>7</td>
<td>An ability to acquire and apply new knowledge as needed, using appropriate learning strategies</td>
</tr>
</tbody>
</table>

Embedded Literacies (UG courses only)

Embedded Literacies Info:

Attachments / Additional Notes or Comments

Attachments: (N/A)

Additional Notes or Comments: (N/A)