AEROSPACE ENGINEERING - PH.D.

College of Aeronautics and Engineering
www.kent.edu/cae

About This Program
Embark on a journey of discovery and innovation in aerospace engineering with our Ph.D. degree, where you will be challenged to push boundaries, uncover new knowledge and contribute to the advancement of this exhilarating field. Read more...

Contact Information
• Program Coordinator: Ali Abdul-Aziz, Ph.D., P.E. | CAEgraduatestudies@kent.edu | 330-672-1032
• Connect with an Admissions Counselor: U.S. Student | International Student

Program Delivery
• Delivery: In person
• Location: Kent Campus

Examples of Possible Careers and Salaries*
Aerospace engineers
• 2.8% slower than the average
• 66,400 number of jobs
• $118,610 potential earnings

Architectural and engineering managers
• 2.6% slower than the average
• 198,100 number of jobs
• $149,530 potential earnings

Avionics technicians
• 4.4% about as fast as the average
• 22,800 number of jobs
• $67,840 potential earnings

Engineering teachers, postsecondary
• 8.6% much faster than the average
• 44,600 number of jobs
• $103,600 potential earnings

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics’ Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements
• Bachelor’s degree in aerospace engineering or a closely related area from an accredited college or university
• Minimum 2.750 undergraduate or graduate GPA on a 4.000 point scale
• Official transcript(s)
• Goal Statement
• Three letters of recommendation
• English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
  • Minimum 550 TOEFL PBT score (paper-based version)
  • Minimum 79 TOEFL IBT score (internet-based version)
  • Minimum 77 MELAB score
  • Minimum 6.5 IELTS score
  • Minimum 58 PTE score
  • Minimum 100 Duolingo test score

For more information about graduate admissions, visit the graduate admission website. For more information on international admission, visit the Office of Global Education website.

Application Deadlines
• Fall Semester
  • Application deadline: November 1

Applications submitted after this deadline will be considered on a space-available basis.

Program Requirements

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 81091</td>
<td>GRADUATE SEMINAR (taken three times)</td>
<td>3</td>
</tr>
<tr>
<td>Advisor-approved courses 1</td>
<td></td>
<td>0-30</td>
</tr>
</tbody>
</table>

Engineering-Focus Electives, choose from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENGR 72410</td>
<td>ENGINEERING OPTIMIZATION</td>
</tr>
<tr>
<td>ENGR 78001</td>
<td>ORBITAL MECHANICS</td>
</tr>
<tr>
<td>ENGR 78002</td>
<td>SPACECRAFT ATTITUDE DYNAMICS, DETERMINATION AND CONTROL</td>
</tr>
<tr>
<td>ENGR 78004</td>
<td>OPTIMAL CONTROL THEORY</td>
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</table>

Dynamics and Control

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENGR 78005</td>
<td>LINEAR SYSTEM ANALYSIS AND CONTROL</td>
</tr>
<tr>
<td>ENGR 78006</td>
<td>NONLINEAR SYSTEMS AND CONTROL</td>
</tr>
<tr>
<td>ENGR 78007</td>
<td>DIGITAL CONTROL SYSTEMS</td>
</tr>
</tbody>
</table>

Structure and Materials

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENGR 72111</td>
<td>STRENGTH OF MATERIALS FOR ENGINEERS</td>
</tr>
<tr>
<td>ENGR 72363</td>
<td>MATERIALS SELECTION IN DESIGN AND APPLICATIONS</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>ENGR 75901</td>
<td>INTRODUCTION TO FINITE ELEMENT METHOD AND APPLICATIONS</td>
</tr>
<tr>
<td>ENGR 78003</td>
<td>SPACECRAFT DESIGN</td>
</tr>
<tr>
<td>ENGR 78102</td>
<td>INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS</td>
</tr>
</tbody>
</table>

Additional courses as approved by advisor

### Culminating Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 85098</td>
<td>RESEARCH (repeated for 9 credit hours total)</td>
<td>9</td>
</tr>
<tr>
<td>ENGR 85199</td>
<td>DISSERTATION I ²</td>
<td>30</td>
</tr>
</tbody>
</table>

**Minimum Total Credit Hours for Post-Baccalaureate Students:** 90

**Minimum Total Credit Hours for Post-Master's Students:** 60

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1. Post-baccalaureate students may apply toward the 30 credit hours a maximum 15 credit hours of coursework outside the College of Aeronautics and Engineering and 9 credit hours of research (maximum 18 credit hours total of research toward the degree).

2. Doctoral candidates, upon admission to candidacy, must register for ENGR 85199 for a total of 30 hours. It is expected that doctoral candidates will continuously register for ENGR 85199—and, thereafter, ENGR 85299—each semester until all requirements for the degree have been met. The doctoral candidate must successfully propose and defend their research dissertation in a public setting before the dissertation committee.

### Program Learning Outcomes

Graduates of this program will be able to:

1. Conduct literature searches, comprehend advanced research materials and uncover connections between related work.
2. Perform research, discovery and integration by applying advanced knowledge of aerospace engineering.
3. Communicate clearly problems and solutions in aerospace engineering, both verbally and in writing.

### Full Description

The Ph.D. degree in Aerospace Engineering provides an advanced theoretical and/or research-oriented curriculum with significant depth in aerospace-specific disciplines, beyond the general fundamentals of the engineering bachelor’s degree.