MECHATRONICS
ENGINEERING - PH.D.

Contact Information
- Program Coordinator: D. Blake Stringer | Stephanie Fussell | caegraduatem@kent.edu | 330-672-2892
- Speak with an Admissions Counselor (gradadmissions@kent.edu)

Fully Offered
- Kent Campus

Admission Terms
- Fall
- Spring
- Summer

Description
The Ph.D. degree in Mechatronics Engineering provides an advanced theoretical and/or research-oriented curriculum with significant depth in mechatronics related discipline, beyond the general fundamentals of the engineering bachelor's degree.

Admission Requirements
- Bachelor's or master's degree in mechatronics engineering or closely related area (e.g., electrical engineering or mechanical engineering) from an accredited college or university for unconditional admission
- Minimum 3.00 GPA on a 4.00 point scale for unconditional admission
- Official transcript(s) from each institution in which eight or more semester credit hours were attempted
- 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 110 Duolingo English test score

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

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 mechatronics engineering.
3. Communicate problems and solutions in mechatronics engineering clearly, both verbally and in writing.

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 (repeated for 3 credit hours total)</td>
<td>3</td>
</tr>
</tbody>
</table>

Major Electives, choose from the following: 18

- Engineering
  - ENGR 72410 ENGINEERING OPTIMIZATION
  - ENGR 73030 MECHATRONICS
  - ENGR 78005 LINEAR SYSTEM ANALYSIS AND CONTROL

- Control Systems
  - ENGR 78004 OPTIMAL CONTROL THEORY
  - ENGR 78006 NONLINEAR SYSTEMS AND CONTROL
  - ENGR 78007 DIGITAL CONTROL SYSTEMS
  - ENGR 78008 INTRODUCTION TO ROBUST CONTROL

- Robotics and Automation
  - CS 73334 HUMAN-ROBOT INTERACTION
  - ENGR 72620 INDUSTRIAL AUTOMATION AND CONTROL
  - ENGR 77300 MEDICAL ROBOTICS
  - ENGR 77400 ROBOTICS: KINEMATICS AND DESIGN
  - ENGR 78200 AUTONOMOUS UNMANNED AERIAL SYSTEMS

- Machine Intelligence
  - CS 74201 ADVANCED ARTIFICIAL INTELLIGENCE
  - ENGR 78010 MACHINE VISION
  - ENGR 78100 INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS

- Other courses with approval from advisor and/or college
  - Advisor-approved courses in or outside the College of Aeronautics and Engineering

Culminating Requirements

- ENGR 85098 RESEARCH (repeated for 9 credit hours total) 9
- ENGR 85199 DISSERTATION I 2 30

Minimum Total Credit Hours for Post-Baccalaureate Students: 90
Minimum Total Credit Hours for Post-Master’s Students: 60

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 Each doctoral candidate, upon admission to candidacy, must register for ENGR 85199 for a total of 30 credit hours. It is expected that a doctoral candidate will continuously register for ENGR 85199, and thereafter ENGR 85299, each semester, until all requirements for the degree have been met. The dissertation is specialized research, leading to a definitive contribution to the candidate's research focus-area. This contribution should be of sufficient importance to warrant publication in a recognized journal. The candidate must successfully propose and defend their research dissertation in a public setting.