

# MECHATRONICS ENGINEERING - PH.D.

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

## About This Program

Join the forefront of robotics and automation research with a Ph.D. degree in Mechatronics Engineering. Collaborate with world-renowned experts, access state-of-the-art facilities and unlock a world of advanced career opportunities. Enroll now and be part of the next generation of innovators. 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\*

### Engineering teachers, postsecondary

- 8.6% much faster than the average
- 44,600 number of jobs
- \$103,600 potential earnings

### Engineers, all other

- 1.3% slower than the average
- 170,100 number of jobs
- \$103,380 potential earnings

### Electronics engineers, except computer

- 1.4% slower than the average
- 134,900 number of jobs
- \$107,540 potential earnings

### Aerospace engineers

- 2.8% slower than the average
- 66,400 number of jobs
- \$118,610 potential earnings

## Operations research analysts

- 24.8% much faster than the average
- 105,100 number of jobs
- \$86,200 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 or master's degree in mechatronics engineering or closely related area (e.g., electrical engineering or mechanical engineering) from an accredited college or university
- Minimum 2.750 GPA on a 4.000 point scale
- 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.

## 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

Code	Title	Credit Hours
<b>Major Requirements</b>		
ENGR 81091	GRADUATE SEMINAR (repeated for 3 credit hours total)	3
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 78101	AUTONOMOUS UNMANNED AERIAL SYSTEMS
Machine Intelligence	
CS 74201	ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 78010	MACHINE VISION
ENGR 78102	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 <sup>1</sup>	0-30
<i>Culminating Requirements</i>	
ENGR 85098	RESEARCH (repeated for 9 credit hours total) 9
ENGR 85199	DISSERTATION I <sup>2</sup> 30
<b>Minimum Total Credit Hours for Post-Baccalaureate Students:</b>	<b>90</b>
<b>Minimum Total Credit Hours for Post-Master's Students:</b>	<b>60</b>

<sup>1</sup> 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).

<sup>2</sup> 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.

## 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.

## Full 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.