

# MECHATRONICS ENGINEERING - M.S.

College of Aeronautics and Engineering  
 School of Engineering  
[www.kent.edu/cae](http://www.kent.edu/cae)

## About This Program

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

## Contact Information

- CAEgraduatestudies@kent.edu | 330-672-2892
- Connect with an Admissions Counselor

## Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

## Examples of Possible Careers and Salaries\*

### Mechanical engineers

- 3.9% about as fast as the average
- 316,300 number of jobs
- \$90,160 potential earnings

### Electrical engineers

- 4.6% about as fast as the average
- 193,100 number of jobs
- \$100,830 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 mechatronics engineering or a closely related area (e.g., electrical engineering or mechanical engineering) from an accredited college or university<sup>1</sup>
- Minimum 2.750 undergraduate GPA on a 4.000-point scale
- Official transcript(s) from each institution in which 8+ semester credit hours were attempted
- Goal statement<sup>2</sup>
- Three letters of recommendation<sup>2</sup>
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning one of the following:<sup>3</sup>
  - Minimum 79 TOEFL iBT score
  - Minimum 6.5 IELTS score
  - Minimum 58 PTE score
  - Minimum 110 DET score

<sup>1</sup> Applicants with a bachelor's degree in engineering technology or a non-engineering STEM discipline may be considered for admission before or after completing additional coursework as determined on a case-by-case basis. Applicants should reach out to the College of Aeronautics and Engineering via email (caegraduatestudies@kent.edu) for more information.

<sup>2</sup> Current Kent State undergraduate students who want to apply to the combined B.S./M.S. degree program should contact the College of Aeronautics and Engineering via email (caegraduatestudies@kent.edu) to discuss the process and request waivers for certain admission requirements.

<sup>3</sup> International applicants who do not meet the above test scores may be considered for conditional admission.

## Application Deadlines

- **Fall Semester**
  - Application deadline: March 1  
*All application materials (including applicable fee, transcripts, recommendation letters, etc.) submitted after this deadline will be considered on a space-available basis.*
- **Spring Semester**
  - Rolling admissions

## Program Requirements

### Major Requirements

Code	Title	Credit Hours
<b>Major Requirements</b>		
ENGR 52410 or ENGR 57200	ENGINEERING OPTIMIZATION <sup>1</sup> SYSTEMS ENGINEERING	3
ENGR 53030	MECHATRONICS <sup>2</sup>	3
ENGR 61091	GRADUATE SEMINAR	1
ENGR 68005	LINEAR SYSTEM ANALYSIS AND CONTROL	3
Focus Areas, choose one course from two areas:		
Control Systems		
ENGR 68004	OPTIMAL CONTROL THEORY	
ENGR 68006	NONLINEAR SYSTEMS AND CONTROL	
ENGR 68007	DIGITAL CONTROL SYSTEMS	
ENGR 68008	INTRODUCTION TO ROBUST CONTROL	

Machine Intelligence	
CS 54201	ARTIFICIAL INTELLIGENCE <sup>1</sup>
CS 54202	MACHINE LEARNING AND DEEP LEARNING <sup>1</sup>
CS 64201	ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 58010	MACHINE VISION <sup>1</sup>
ENGR 68102	INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS
Robotics and Automation	
CS 53301	SOFTWARE DEVELOPMENT FOR ROBOTICS <sup>1</sup>
CS 53334	HUMAN-ROBOT INTERACTION <sup>1</sup>
ENGR 62620 & ENGR 62621	INDUSTRIAL AUTOMATION AND CONTROL and INDUSTRIAL AUTOMATION AND CONTROL LABORATORY
ENGR 67300	MEDICAL ROBOTICS
ENGR 67400	ROBOTICS: KINEMATICS AND DESIGN
ENGR 68101	AUTONOMOUS UNMANNED AERIAL SYSTEMS
Other courses with approval from advisor and graduate program representative	
Graduate Elective, choose from the following: 3	
CS 53301	SOFTWARE DEVELOPMENT FOR ROBOTICS <sup>1</sup>
CS 53334	HUMAN-ROBOT INTERACTION <sup>1</sup>
CS 54201	ARTIFICIAL INTELLIGENCE <sup>1</sup>
CS 54202	MACHINE LEARNING AND DEEP LEARNING <sup>1</sup>
CS 64201	ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 52410	ENGINEERING OPTIMIZATION <sup>1</sup>
ENGR 52710 & ENGR 52711	ADDITIVE MANUFACTURING AND 3D PRINTING and ADDITIVE MANUFACTURING AND 3D PRINTING LABORATORY <sup>1</sup>
ENGR 58010	MACHINE VISION <sup>1</sup>
ENGR 60030	QUANTITATIVE METHODS I
ENGR 61096	INDIVIDUAL INVESTIGATION IN ENGINEERING
ENGR 62620 & ENGR 62621	INDUSTRIAL AUTOMATION AND CONTROL and INDUSTRIAL AUTOMATION AND CONTROL LABORATORY
ENGR 65270	HUMAN FACTORS ENGINEERING
ENGR 65400	ADVANCED DYNAMICS
ENGR 65401	VIBRATIONS
ENGR 65501	ADVANCED FLUID MECHANICS
ENGR 65502	COMPUTATIONAL FLUID DYNAMICS
ENGR 67300	MEDICAL ROBOTICS
ENGR 67400	ROBOTICS: KINEMATICS AND DESIGN
ENGR 68004	OPTIMAL CONTROL THEORY
ENGR 68006	NONLINEAR SYSTEMS AND CONTROL
ENGR 68007	DIGITAL CONTROL SYSTEMS
ENGR 68008	INTRODUCTION TO ROBUST CONTROL
ENGR 68101	AUTONOMOUS UNMANNED AERIAL SYSTEMS
ENGR 68102	INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS
Other courses with approval from advisor and graduate program representative	
Mathematics Elective, choose from the following: <sup>1,3</sup> 3	
MATH 50015	APPLIED STATISTICS
MATH 52011	MATHEMATICAL OPTIMIZATION
MATH 52031	MATHEMATICAL MODELS AND DYNAMICAL SYSTEMS
MATH 52045	PARTIAL DIFFERENTIAL EQUATIONS
MATH 52201	NUMERICAL LINEAR ALGEBRA

MATH 52202	NUMERICAL APPROXIMATION AND OPTIMIZATION
<i>Culminating Requirement</i>	
Choose from the following: 9	
Thesis Option <sup>4</sup>	
ENGR 65098	RESEARCH
ENGR 65199	THESIS I
Non-Thesis Option <sup>5</sup>	
ENGR 65098	RESEARCH
Graduate Electives (from courses listed above)	
<b>Minimum Total Credit Hours:</b>	<b>31</b>

- <sup>1</sup> Students who have completed the undergraduate equivalent of the graduate course may not take the graduate course toward the degree. Example, students who completed ENGR 42410 may not take ENGR 52410.
- <sup>2</sup> Students who completed ENGR 43030 may not take ENGR 53030 toward the degree. Instead, they must discuss an appropriate alternative with their advisor, to be approved by the graduate program representative.
- <sup>3</sup> Before registering for a mathematics (MATH) course, students must contact the Department of Mathematical Sciences to request a prerequisite override.
- <sup>4</sup> Students selecting the thesis option complete 3 credit hours of ENGR 65098 and must continually register for ENGR 65199 for maximum 6 credit hours toward the degree (students may need to register for ENGR 65299 to complete the thesis requirement; however, those credit hours do not, under any circumstances, count toward the degree).
- <sup>5</sup> Students selecting the non-thesis option complete 3 credit hours of ENGR 65098 and 6 credit hours from the elective options in the program. At minimum, the non-thesis activity requires a report and presentation and/or demonstration.

## Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
-	3.000

- No more than one-half of a graduate student's coursework may be taken in 50000-level courses.
- Grades below C are not counted toward completion of requirements for the degree.

## 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.