MECHATRONICS ENGINEERING - M.S.

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

About This Program
Looking to advance your career in the field of mechatronics engineering? The M.S. degree in Mechatronics Engineering is the perfect choice. Our program provides students with the skills and knowledge needed to design and develop advanced systems that integrate mechanical, electrical and computer systems. With a focus on real-world applications and hands-on learning, graduates are prepared for careers in industries such as automotive, aerospace and robotics. 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*
Architectural and engineering managers
• 2.6% slower than the average
• 198,100 number of jobs
• $149,530 potential earnings

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

* 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 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
  • Minimum 79 TOEFL IBT score
  • Minimum 77 MELAB score
  • Minimum 6.5 IELTS score
  • Minimum 58 PTE score
  • Minimum 110 Duolingo English score

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>
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<tbody>
<tr>
<td>ENGR 53030</td>
<td>MECHATRONICS</td>
<td>3</td>
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<tr>
<td>ENGR 57200</td>
<td>SYSTEMS ENGINEERING</td>
<td>3</td>
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<tr>
<td>ENGR 58005</td>
<td>LINEAR SYSTEM ANALYSIS AND CONTROL</td>
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<tr>
<td>ENGR 61091</td>
<td>GRADUATE SEMINAR</td>
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Mathematics Elective, choose from the following: 3

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MATH 50015</td>
<td>APPLIED STATISTICS</td>
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<tr>
<td>MATH 52011</td>
<td>MATHEMATICAL OPTIMIZATION</td>
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<tr>
<td>MATH 52031</td>
<td>MATHEMATICAL MODELS AND DYNAMICAL SYSTEMS</td>
<td></td>
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<tr>
<td>MATH 52045</td>
<td>PARTIAL DIFFERENTIAL EQUATIONS</td>
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<tr>
<td>MATH 52201</td>
<td>NUMERICAL COMPUTING I</td>
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<tr>
<td>MATH 52202</td>
<td>NUMERICAL COMPUTING II</td>
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Focus Areas, choose one course from two areas: 6

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>ENGR 58004</td>
<td>OPTIMAL CONTROL THEORY</td>
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</tr>
<tr>
<td>ENGR 58006</td>
<td>NONLINEAR SYSTEMS AND CONTROL</td>
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<tr>
<td>ENGR 58007</td>
<td>DIGITAL CONTROL SYSTEMS</td>
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</tr>
<tr>
<td>ENGR 58008</td>
<td>INTRODUCTION TO ROBUST CONTROL</td>
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Robotics and Automation

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<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>CS 53301</td>
<td>SOFTWARE DEVELOPMENT FOR ROBOTICS</td>
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</tr>
<tr>
<td>CS 53334</td>
<td>HUMAN-ROBOT INTERACTION</td>
<td></td>
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</tbody>
</table>
ENGR 57300  MEDICAL ROBOTICS
ENGR 57400  ROBOTICS: KINEMATICS AND DESIGN
ENGR 58101  AUTONOMOUS UNMANNED AERIAL SYSTEMS
ENGR 62620  INDUSTRIAL AUTOMATION AND CONTROL

Machine Intelligence
CS 54201  ARTIFICIAL INTELLIGENCE
CS 54202  MACHINE LEARNING AND DEEP LEARNING
CS 64201  ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 58101  MACHINE VISION
ENGR 58102  INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS

Other courses with approval from advisor and/or college
Graduate Elective, choose from the following: 3
CS 53301  SOFTWARE DEVELOPMENT FOR ROBOTICS
CS 53334  HUMAN-ROBOT INTERACTION
CS 54201  ARTIFICIAL INTELLIGENCE
CS 54202  MACHINE LEARNING AND DEEP LEARNING
CS 57201  HUMAN COMPUTER INTERACTION
CS 64201  ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 52410  ENGINEERING OPTIMIZATION
ENGR 57300  MEDICAL ROBOTICS
ENGR 57400  ROBOTICS: KINEMATICS AND DESIGN
ENGR 58004  OPTIMAL CONTROL THEORY
ENGR 58006  NONLINEAR SYSTEMS AND CONTROL
ENGR 58007  DIGITAL CONTROL SYSTEMS
ENGR 58008  INTRODUCTION TO ROBUST CONTROL
ENGR 58010  MACHINE VISION
ENGR 58102  INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS
ENGR 58101  AUTONOMOUS UNMANNED AERIAL SYSTEMS
ENGR 60030  QUANTITATIVE METHODS I
ENGR 61096  INDIVIDUAL INVESTIGATION IN ENGINEERING
ENGR 62620  INDUSTRIAL AUTOMATION AND CONTROL

Other courses with approval from advisor and/or college

Culminating Requirements
Choose from the following: 9
Thesis Option 1
ENGR 65098  RESEARCH
ENGR 65199  THESIS I
Non-Thesis Option 2
ENGR 65098  RESEARCH

Graduate Electives (from courses listed above)

Minimum Total Credit Hours: 31

1. 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, whatsoever, count toward the degree).

2. 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 a presentation and/or demonstration.

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 Master of Science 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.