MECHATRONICS ENGINEERING - M.S.

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

Program is pending approval from the Higher Learning Commission. After that final approval, prospective students may apply for admission.

Examples of Possible Careers*

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

Additional Careers
- Research

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

Fully Offered
- Kent Campus

Admission Terms
- Fall
- Spring
- Summer

*Note
Source of occupation titles and labor data is 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.

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.

Admission Requirements
Program is pending approval from the Higher Learning Commission. After that final approval, prospective students may apply for admission.

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>
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<tbody>
<tr>
<td>ENGR 53030</td>
<td>MECHATRONICS</td>
<td>3</td>
</tr>
<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>
<td>3</td>
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<tr>
<td>ENGR 61091</td>
<td>GRADUATE SEMINAR</td>
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Mathematics Elective, choose from the following

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MATH 50015</td>
<td>APPLIED STATISTICS</td>
<td>3</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>
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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>
<tr>
<td>MATH 52202</td>
<td>NUMERICAL COMPUTING II</td>
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Focus Areas, choose one course from two areas:

Control Systems

<table>
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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENGR 58004</td>
<td>OPTIMAL CONTROL THEORY</td>
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<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>
<td>ENGR 58008</td>
<td>INTRODUCTION TO ROBUST CONTROL</td>
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Robotics and Automation

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<tr>
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<tr>
<td>CS 53301</td>
<td>SOFTWARE DEVELOPMENT FOR ROBOTICS</td>
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<tr>
<td>CS 53334</td>
<td>HUMAN-ROBOT INTERACTION</td>
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<tr>
<td>ENGR 52620</td>
<td>INDUSTRIAL AUTOMATION AND CONTROL</td>
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<tr>
<td>ENGR 57300</td>
<td>MEDICAL ROBOTICS</td>
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<tr>
<td>ENGR 57400</td>
<td>ROBOTICS: KINEMATICS AND DESIGN</td>
</tr>
<tr>
<td>ENGR 58200</td>
<td>AUTONOMOUS UNMANNED AERIAL SYSTEMS</td>
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Machine Intelligence

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<tr>
<td>CS 54201</td>
<td>ARTIFICIAL INTELLIGENCE</td>
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<tr>
<td>CS 54202</td>
<td>MACHINE LEARNING AND DEEP LEARNING</td>
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<tr>
<td>CS 64201</td>
<td>ADVANCED ARTIFICIAL INTELLIGENCE</td>
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<tr>
<td>ENGR 58010</td>
<td>MACHINE VISION</td>
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ENGR 58100 INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS

Other courses with approval from advisor and/or college

Graduate Elective, choose from the following: 3

AERN 65250 APPLIED HUMAN FACTORS ENGINEERING
AERN 65280 HUMAN INFORMATION PROCESSING
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 52620 INDUSTRIAL AUTOMATION AND CONTROL
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 58100 INTELLIGENT SENSING AND PLANNING OF UNMANNED AERIAL SYSTEMS
ENGR 58200 AUTONOMOUS UNMANNED AERIAL SYSTEMS
ENGR 60030 QUANTITATIVE METHODS I

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.