MECHATRONICS ENGINEERING - M.S.

College of Aeronautics and Engineering
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 mechatronics-related discipline, beyond the general fundamentals of the engineering bachelor’s degree.

Contact Information
• Program Coordinator: Ali Abdul-Aziz, Ph.D., P.E. | CAEgraduates@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 8+ 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 to waive) by earning one of the following:
  • Minimum 79 TOEFL iBT score
  • Minimum 6.5 IELTS score
  • Minimum 58 PTE score
  • Minimum 110 DET score

1 International applicants who do not meet the above test scores may be considered for conditional admission.

Application Deadlines
• Fall Semester
  • Application deadline: March 1
  • Applications submitted after this deadline will be considered on a space-available basis.
• Spring Semester
  • Application deadline: Rolling admissions

Program Requirements
Major Requirements

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<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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<td>ENGR 57200</td>
<td>SYSTEMS ENGINEERING</td>
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<td>ENGR 61091</td>
<td>GRADUATE SEMINAR</td>
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<td>ENGR 68005</td>
<td>LINEAR SYSTEM ANALYSIS AND CONTROL</td>
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<td>MATH 50015</td>
<td>APPLIED STATISTICS</td>
<td>3</td>
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<td>MATH 52011</td>
<td>MATHEMATICAL OPTIMIZATION</td>
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<td>MATH 52031</td>
<td>MATHEMATICAL MODELS AND DYNAMICAL SYSTEMS</td>
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<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

Control Systems
ENGR 58004 | OPTIMAL CONTROL THEORY                        |
ENGR 68006 | NONLINEAR SYSTEMS AND CONTROL                 |
ENGR 68007 | DIGITAL CONTROL SYSTEMS                       |
ENGR 68008 | INTRODUCTION TO ROBUST CONTROL                |

Robotics and Automation
CS 53301  | SOFTWARE DEVELOPMENT FOR ROBOTICS             |
CS 53334  | HUMAN-ROBOT INTERACTION                       |
ENGR 62620 | INDUSTRIAL AUTOMATION AND CONTROL             |
ENGR 67300  MEDICAL ROBOTICS
ENGR 67400  ROBOTICS: KINEMATICS AND DESIGN
ENGR 68101  AUTONOMOUS UNMANNED AERIAL SYSTEMS

Machine Intelligence
CS 54201  ARTIFICIAL INTELLIGENCE
CS 54202  MACHINE LEARNING AND DEEP LEARNING
CS 64201  ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 58010  MACHINE VISION
ENGR 68102  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 64201  ADVANCED ARTIFICIAL INTELLIGENCE
ENGR 52410  ENGINEERING OPTIMIZATION
ENGR 58004  OPTIMAL CONTROL THEORY
ENGR 58010  MACHINE VISION
ENGR 60030  QUANTITATIVE METHODS I
ENGR 61096  INDIVIDUAL INVESTIGATION IN ENGINEERING
ENGR 62620  INDUSTRIAL AUTOMATION AND CONTROL
ENGR 67300  MEDICAL ROBOTICS
ENGR 67400  ROBOTICS: KINEMATICS AND DESIGN
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/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.