ROBOTICS (M.S.)

Admission Requirements
Applicants must meet requirements for admission to the Graduate School (http://bulletins.wayne.edu/graduate/general-information/academic-regulations/). Students must have a bachelor’s degree or the equivalent in engineering from an accredited college or university. Students from all science, technology, engineering and math (STEM) disciplines will be considered for admission.

All applicants must be admitted to the Graduate School, the College of Engineering (http://bulletins.wayne.edu/graduate/college-engineering/academic-regulations/), and a department within the college, meeting all applicable admission requirements, including a minimum grade point average of 2.75 for regular admission and 2.5 to 2.74 for qualified admission. Professional experience will be considered in admission.

Program Requirements
The program requires students to complete a minimum of thirty credits using master’s degree Plan A (24 course credits plus a 6 credit master’s thesis) or Plan C (30 credits of coursework). Plan A is intended for students planning to go on to pursue a Doctoral degree. All courses must be graduate-level courses offered within the College of Engineering. The program requires applicants to declare one of three majors:

- **Industrial Automation**, hosted by the Engineering Technology (ET)
- **Intelligent Control**, hosted by the Electrical and Computer Engineering (ECE)
- **Smart Mobility**, hosted by the Computer Science (CSC)

The M.S. in Robotics requires competency in three foundational areas for all three majors. A student must take one of the two courses in each of the 3 foundational areas. In addition to fulfilling the general scholarship requirements of the Division, all course work must be completed in accordance with the regulations of the Graduate School (http://bulletins.wayne.edu/graduate/general-information/academic-regulations/) and the College of Engineering (http://bulletins.wayne.edu/graduate/college-engineering/academic-regulations/).

### Industrial Automation

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>CSC 6110</td>
<td>Software Engineering</td>
<td></td>
</tr>
<tr>
<td>or ET 5600</td>
<td>Python: Industrial Applications</td>
<td></td>
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### Robot Software & Programming

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSC/ECE 5280</td>
<td>Introduction to Cyber-Physical Systems</td>
<td></td>
</tr>
<tr>
<td>or ET 5100</td>
<td>Fundamentals of Mechatronics and Industrial Applications</td>
<td></td>
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### Robot Architectures

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>ECE 5425</td>
<td>Robotic Systems I</td>
<td></td>
</tr>
<tr>
<td>or MIT 5700</td>
<td>Industrial Robots Modeling and Simulation</td>
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### Robot Sensing, Perception, Planning, Dynamics & Control

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<tbody>
<tr>
<td>ECE 7420</td>
<td>Nonlinear Control Systems</td>
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</tr>
<tr>
<td>ECE 7430</td>
<td>Discrete Event Systems with Machine Learning</td>
<td></td>
</tr>
<tr>
<td>ECE 7440</td>
<td>Dynamic Systems and Optimal Control</td>
<td></td>
</tr>
<tr>
<td>ECE 7530</td>
<td>Advanced Digital VLSI Design</td>
<td></td>
</tr>
<tr>
<td>ECE 7690</td>
<td>Fuzzy Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 8999</td>
<td>Master’s Thesis Research and Direction</td>
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### Total Credits

**30**

### Electives

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<tbody>
<tr>
<td>ECE 5440</td>
<td>Computer-Controlled Systems</td>
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<tr>
<td>ECE 5620</td>
<td>Embedded System Design</td>
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<tr>
<td>ECE 6570</td>
<td>Smart Sensor Technology I: Design</td>
<td></td>
</tr>
<tr>
<td>ECE 5690</td>
<td>Introduction to Digital Image Processing</td>
<td></td>
</tr>
<tr>
<td>ECE 5770</td>
<td>Digital Signal Processing</td>
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</tr>
<tr>
<td>ECE 6660</td>
<td>Introduction to VLSI Systems</td>
<td></td>
</tr>
<tr>
<td>ECE 7420</td>
<td>Nonlinear Control Systems</td>
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</tr>
<tr>
<td>ECE 7430</td>
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<td></td>
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<tr>
<td>ECE 8999</td>
<td>Master’s Thesis Research and Direction</td>
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### Total Credits

**16**

### Smart Mobility

<table>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSC/ECE 5280</td>
<td>Introduction to Cyber-Physical Systems</td>
<td></td>
</tr>
<tr>
<td>or ET 5100</td>
<td>Fundamentals of Mechatronics and Industrial Applications</td>
<td></td>
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### Total Credits

**3**
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<th>Course Code</th>
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<tbody>
<tr>
<td>CSC 5100</td>
<td>Introduction to Mobility</td>
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<tr>
<td>CSC 5250</td>
<td>Network, Distributed, and Concurrent Programming</td>
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</tr>
<tr>
<td>CSC 5270</td>
<td>Computer Systems Security</td>
<td>17</td>
</tr>
<tr>
<td>CSC 5825</td>
<td>Introduction to Machine Learning and Applications</td>
<td>17</td>
</tr>
<tr>
<td>CSC 5870</td>
<td>Computer Graphics I</td>
<td>17</td>
</tr>
<tr>
<td>CSC 6280</td>
<td>Real-Time and Embedded Operating Systems</td>
<td>17</td>
</tr>
<tr>
<td>CSC 6800</td>
<td>Artificial Intelligence I</td>
<td>17</td>
</tr>
<tr>
<td>CSC 6860</td>
<td>Digital Image Processing and Analysis</td>
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<tr>
<td>CSC 6870</td>
<td>Computer Graphics II</td>
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<tr>
<td>CSC 7991</td>
<td>Advanced Topics in Computer Science *</td>
<td>17</td>
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<tr>
<td>CSC 8990</td>
<td>Graduate Seminar</td>
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</tr>
<tr>
<td>CSC 8999</td>
<td>Master's Thesis Research and Direction</td>
<td>17</td>
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</table>

* CSC 7991 should be taken with the topic area, Embedded Wireless Networking for Cyber-Physical Systems. Students should consult an advisor before choosing this course as an elective.