MS IN COMPUTING: **ROBOTICS**

A student may pursue an MS with a thesis option, a project option, or a course-only option. The minimum number of credits is 30. Three courses are required, plus an additional three courses must also be taken from a restricted selection as described in Robotics Track Courses.

Two additional elective courses, directly related to the student’s degree, at the 6000-level or higher (not including independent study, seminars, or thesis research hours) from any department are required. Depending on whether a student is pursuing a thesis MS, a project MS, a course-only MS or additional 6000-level or higher courses can be chosen, this time including independent study, seminars, and research credit, in order to reach a 30-credit minimum.

**TRACK FACULTY**
Jake Abbott (ME), Tom Henderson, Tucker Hermans, John Hollerbach (Track Director), Steve Mascaro (ME), Vivek Srikumar, Ross Whitaker

<table>
<thead>
<tr>
<th>COURSE REQUIREMENTS</th>
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<tbody>
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<td>The following three courses are required:</td>
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<tr>
<td>CS 6310 / ME EN 6220</td>
<td>Introduction to Robotics</td>
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<tr>
<td>CS 6370 / ME EN 6225</td>
<td>Motion Planning</td>
</tr>
<tr>
<td>CS 6330 / ME EN 6230</td>
<td>Introduction to Robot Control (pre-requisite for CS 7310 &amp; CS 7320)</td>
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<tr>
<td>CS 7939 / ME EN 7960-001*</td>
<td>Robotics Seminar (Fall semester)</td>
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One course from each of these three areas are required:

**PERCEPTION**
- CS 6320 3D Computer Vision
- CS 6640 Image Processing

**COGNITION**
- CS 6300 Artificial Intelligence
- CS 6350 Machine Learning
- CS 6380 Multi-agent systems

**ACTION**
- ME EN 6240 Advanced Mechatronics
- CS 6360 Virtual Reality
- CS 7310 / ME EN 7230 Robot Mobility and Manipulation
- CS 7320 / ME EN 7220 System Identification for Robotics
- ME EN 7960-07 Haptics

Two additional 6000-level courses are required (excluding independent study, seminars, or thesis research credit).

* The fall session deals with research; current student and faculty presentations, readings; and enrollee presentations. The spring session deals with professional development.

*School of Computing Graduate Handbook - 2017-2018*
PHD IN COMPUTING: ROBOTICS

A minimum of 50 credits is required, of which at least 27 credits must be graduate course work, and at least 14 credits must be dissertation research. Of the graduate course work, three are required courses, plus an additional three courses must be taken from the restricted electives as described in Robotics Track Courses.

Two additional elective courses at the 6000-level or above (not including independent study, seminars, or thesis) from any department are required. Remaining credits to fill the 50-credit minimum may be chosen from other 6000-level or higher courses or from seminars or dissertation research, but not independent study.

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- **COGNITION**
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  - CS 6380 Multi-agent systems

- **ACTION**
  - ME EN 6240 Advanced Mechatronics for Mechanical Engineers
  - CS 6360 Virtual Reality
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* The fall session deals with research: current student and faculty presentations, readings, and enrollee presentations. The spring session deals with professional development.