# PhD Course Requirements

## Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROBOT 6000</td>
<td>Mechanics</td>
</tr>
<tr>
<td>ROBOT 6100</td>
<td>Control</td>
</tr>
</tbody>
</table>
| ROBOT 6200  | Motion Planning  
  or          | CS 6300    |
|             | Artificial Intelligence |
| CS 6640     | Image Processing  
  or          | CS 6320    |
|             | Computer Vision |

## Elective Courses

Choose 3 classes from two different categories:

### Mechanics

- ROBOT 7000 Manipulation, Mobility
- ROBOT 7010 System Identification for Robotics

### Control

- ME EN 6200/ ECE 6615 Classical Control Systems
- ECE 6670 Control of Electric Motors
- ME EN 6210/ ECE 6652/ CH EN 6203 State Space Control
- ME EN 7200 Nonlinear Control
- ME EN 7210 Optimal Control
- ECE 6570 Adaptive Control

### Design

- ROBOT 6500 Advanced Mechatronics
- ROBOT 6960 Wearable Robotics
- ECE 6780/ CS 6780 Embedded System Design
- ECE 6960 Robotic Millisystems
- CS 6956 Medical Robotics

### Cognition

- CS 6350 Machine Learning
- CS 6958 Robot Learning

### Perception

- CS 7640 Adv. Image Processing
- ROBOT 7400 Virtual Reality
- ROBOT 6400 Haptics for VR, Teleoperation, and Physical Human-Robot Interaction
- CS 6353 Deep Learning for Image Analysis

## Allied Courses

9-10 Cr. (as needed to reach the 30-credit hour coursework minimum requirement)

- ROBOT 7970 PhD Dissertation

## Seminars

Required

- ME EN 6890 or CS 7930 or ECE 6900
- ROBOT 6800 Robotics Seminar (Enroll in 2 semesters for 1 credit each semester)

## Research

Required

- ROBOT 7970 PhD Dissertation

9-10 Cr. (as needed to reach the 30-credit hour coursework minimum requirement)